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Review of SDDOT's Highway Access Control Process

Study SD99-01
Final Report

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16. Abstract <p>This report presents the results and recommendations of a review of the South Dakota Department of Transportation's (SDDOT) highway access control process. This document presents recommendations that improve South Dakota's access policy. The document also recommends access criteria for driveway locations and design, a recommended permitting process, access management authority in South Dakota, the benefits of improved access management, tools for local government, performance measures, and an implementation plan. The principal purpose of the review of SDDOT's highway access control process was to develop improved access policies, design guidelines and procedures for applying them. The policies, guidelines and procedures are intended to:</p> <ul style="list-style-type: none"> • Improve highway safety by minimizing the number, severity, and cost of accidents arising from access onto and off the highway system. • Preserve investments in highways and roads by maintaining the functional integrity of the system. • Provide consistency and predictability regarding access. • Improve coordination and consistency between state and local governments regarding access policies. • Update the 1970's access management policies and design guidelines to provide an improved and consistent basis for managing highway access. <p>Broad based stakeholder understanding of the safety and system benefits from improved access management formed an important element of the project.</p>			
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Executive Summary



This executive summary presents the results and recommendations of a review of the South Dakota Department of Transportation's (SDDOT) highway access control process.

A. Objectives and Study Tasks

The principal objectives of the review of SDDOT's highway access control process were to develop improved access policies, design guidelines and procedures for applying them. The purpose of the review is to recommend policies, guidelines and procedures that will:

- Improve highway safety by minimizing the number, severity, and cost of accidents arising from access onto and off the highway system.
- Preserve investments in highways and roads by maintaining the functional integrity of the system.
- Provide consistency and predictability regarding access.
- Improve coordination and consistency between state and local governments regarding access policies.
- Update South Dakota's 1970's access management policies and design guidelines to provide an improved and consistent basis for managing highway access.

The objectives of the study as specified in the project's scope of work is listed in Exhibit E-1 below:

Exhibit E-1 Project Objectives

1. Develop access policies, design guidelines, and procedures for applying them, that state and local agencies can use to control access to rural and urban highways.
2. Define performance measures, identify sources of supporting data, and validate their ability to assess the effectiveness of access policies that are actually applied.
3. Use the recommended measures, to evaluate the potential value of consistent application of sound access policy at corridors and locations in South Dakota where access is proliferating, placing capacity and safety at immediate or imminent risk.
4. Equip state and local agencies to educate elected officials, business and community leaders, and regulatory staff on the application and advantages of the access policy, process recommendations, procedures.

Achievement of these objectives required the development of materials that can communicate the benefits of improved access control and foster the cooperation of state, regional, and local interests. Broad based stakeholder understanding of the safety and system benefits from improved access management was also an important success factor for the project.

2. Study Tasks

The objectives were addressed through a number of tasks. The tasks specified in the original request for proposals are listed and the steps taken to perform them described.

Tasks 1. Meet with the project's technical panel to review the project's scope and work plan.

The consultant project manager and the lead technical analyst met with the technical panel to identify their priorities and objectives for the project.

Task 2. Review and summarize the highway access regulations and policies of state and local agencies in South Dakota.

The statutory basis for access management was evaluated. This involved a review of statute, administrative rules, case law, and local jurisdictions' ordinances and code.

Task 3. Through interviews with state and local planning professionals and other stakeholders, develop background and identify key issues related to control of highway access in South Dakota.

Issue identification interviews were conducted in the early phases of the project and in the later phases of the project through roundtable discussions with SDDOT employees and workshops involving local jurisdictions and others.

Task 4. Through review of current and recent literature, and through contact with other states that are geographically and demographically similar, identify concepts and techniques for controlling highway access that are applicable to South Dakota's needs.

Drawing on the consultant teams knowledge and information assembled from other states approached applicable to South Dakota were developed and reviewed by the Technical Panel in a number of panel meetings.

Task 5. Develop information, based on state and regional data, to support legislation, rule making, and application of rules, citing information on: accidents, costs, capacity impacts, long- and short-term economic effects on businesses, impacts on freight movements, pedestrian and non-motorized mobility, mitigation costs, community preservation, and preservation of public investment.

This information was developed using the results from national research studies, assembling South Dakota specific data, and conducting case study analysis.

Task 6. Meet with the project's technical panel to summarize the findings of prior tasks and to propose, for the panel's approval, concepts that will form the technical basis for the remaining tasks.

During the course of two Technical Panel meetings the results, concepts, and other products from the prior tasks were presented to the panel.

Task 7. Draft an improved access policy for state highways and local roads and streets, identifying any legislation needed to allow its adoption.

Draft policies and legislative recommendations were developed, reviewed, and finalized. They are included in this document.

Task 8. Draft design guidelines that address criteria, spacing, and limitations on highway access based on highway's functional classifications.

Draft guidelines and criteria were developed, reviewed, and finalized. They are included in this document.

Task 9. Propose a process to incorporate the recommended procedures and designs into local platting, building permits, land use planning decisions, and SDDOT reviews and approvals.

A series of model ordinances and guidelines for local government were developed. They are included in this document. In addition, recommended changes to SDDOT permit process are included in this document.

Task 10. Draft a model ordinance, consistent with the state policy and design guidelines, that local agencies can adopt with minimal revision.

Model ordinances were drafted, reviewed, and finalized. They are included in this document.

Task 11. Propose practical measures, and identify supporting information sources for evaluating the effectiveness of access policies applied at the state and local level. Assess the measures' utility by applying them to a selected sample of existing locations in South Dakota where various access control policies have been applied. Estimate how much the degradation of the arterial function costs in lost travel time, vehicle operating cost, and expenditures on infrastructure improvements and capacity expansions.

This study recommends performance measures for evaluating the implementation of new access policy. The measures can not be applied until the policy is in place. However, the study involved conducting a number of case studies that demonstrated the potential safety and preservation of capacity benefits of improved access management.

Task 12. Prepare an implementation plan for equipping state and local Officials to market the access policy, design guidelines, authorization process, and model ordinance to constituents throughout the state.

An implementation plan with a work breakdown, assignment of responsibility, and estimated labor required was developed, reviewed, and finalized. It is included in this document.

Task 13. Prepare a technical memorandum and meet with the project's technical panel to review the draft highway policy, design guidelines, model ordinance, effectiveness measures, and implementation plan.

A series of draft research chapters were prepared to address this task. They were reviewed over the course of 4 separate panel meetings.

Task 14. Conduct a series of regional workshops with elected officials, business leaders, developers, motor carriers, and other interests affected by highway access policies to validate the draft highway policy, design guidelines, model ordinance, effectiveness measures, and implementation plan.

Four well-attended regional workshops were conducted with stakeholders involved in or with an interest in access management. The workshop provided input on the draft study findings and recommendations. Four workshops were also held with SDDOT region offices.

Task 15. Revise the draft highway policy, design guidelines, model ordinance, and effectiveness measures, based upon the comments and direction of the technical panel as well as feedback obtained from the regional workshops.

The input from the workshops was used to revise prior work products and is reflected in this document.

Task 16. Prepare materials that state and local agencies can use to educate elected officials, business and community leaders, and regulatory staff on the application and benefits of the access policy, process recommendations, and authorization procedures, and provide training necessary for their use.

Briefing packets on the benefits of access management were prepared and a brochure. This can be used to support implementation. In addition, eleven case studies were prepared.

Task 17. Prepare a final report summarizing research methodology, findings, conclusions and recommendations.

A draft final report was reviewed by the Technical Panel and then finalized.

Task 18. Make executive presentations to SDDOT's Research Review Board and a meeting of local associations concerned with highway access policy.

An executive presentation was made to SDDOT's Research Review Board.

B. Methodology

The following work steps were taken:

- Performed a review of access regulations and policies in South Dakota.
- Identified access management issues.
- Evaluated national experience applicable to South Dakota.
- Developed factual information to support policy.
- Conducted regional workshops with key stakeholders to obtain input.
- Developed access policy and access guidelines and criteria.
- Developed process for incorporating recommendations into land-use and development review.
- Drafted model ordinance and developed permitting process recommendations.
- Prepared implementation plan.

C. Policy—Findings and Recommendations

The analysis found that South Dakota's access policies should be modernized and strengthened.

Recommendation #1: Adopt the following policies for providing safe, efficient access to the highway system.

- Protect the public's investment in the highway system by preserving its functional integrity.
- Use police powers and existing statutory authority, and promote the modernization of South Dakota Codified Law to ensure the safe and efficient management of access.
- Establish and maintain an access classification system that defines the planned level of access for different highways in the state.
- Provide a consistent statewide approach to the management of access to the state highway system.
- Maintain and apply access criteria based upon best engineering practices to guide driveway location and design, to implement the access classification system.
- Coordinate with local jurisdictions to ensure that South Dakota's access policy and criteria are addressed early in decisions affecting land use.
- Provide advocacy, educational, and technical assistance to promote access management practices among local jurisdictions.

- Undertake proactive corridor preservation through coordination with local units of government on corridor management, the purchase of access rights, and other investments.
- Require traffic impact analysis for developments that impact the safety and capacity of the highway system.

A. Access Classification System—Findings and Recommendations

Recommendation #2: Adopt the recommended access classification system based on the level of importance/functional role of South Dakota’s highways, the area served (rural or urban) and the volume of traffic.

SDDOT should develop and maintain an access classification system to preserve the functional integrity of the highway system. The purpose of the classification system is to specify the planned level of access for different roadways in the state.

The recommended classification system, detailed in Exhibit E-2, distinguishes between urban, non-urban, and low volume routes by their level of importance or functional role.

Exhibit E-2: Recommended Access Classification System

Level of Importance/ Functional Role	Undivided or Divided	Area
Expressways	Undivided	Non Urban
		Urban
	Divided	Non Urban
		Urban
Principal Arterials	Undivided	Non Urban—low volume ¹
		Non Urban
		Urban
	Divided	Non Urban
		Urban
Minor Arterials	Undivided	Non Urban—low volume ¹
		Non Urban
		Urban
Collectors	Undivided	Non Urban—low volume ¹
		Non Urban
		Urban—Primarily through traffic
		Urban—Primarily local traffic

- ¹ Low volume is defined as 550 or fewer Annual Daily Traffic.

D. Access Criteria—Findings and Recommendations

Recommendation #3: Adopt access location criteria for signal spacing bandwidth and distance, median opening and access spacing that will be used to evaluate access permit applications and guide project design.

The recommended criteria are summarized in Exhibit E-3 on the following page.

Access location criteria are recommended that preserve the functional integrity of highways, provide for smooth and safe traffic flow, and afford abutting property an appropriate degree of access. The recommended access criteria for signalized and unsignalized driveways and at-grade intersections are based on the following general considerations:

- Allowable access should vary by roadway classification, facility type, access type, roadway speed, and development density.
- Access spacing criteria do not have to be consistent with existing access practices.
- Allowable tolerances for deviations from the desired criteria generally should vary with the access type or functional class of the roadway involved. These tolerances are greater for collectors and minor arterials than they are for principal arterials.
- Traffic signal spacing criteria for both driveways and at-grade public intersections should be related to roadway speed and should govern both intersecting public streets and access drives. They should take precedence over the unsignalized spacing criteria in situations where there is the potential for future signalization.
- Locations for signalized at-grade intersections ideally should be identified first. Unsignalized right-turn and left-turn access points should then be selected based on existing and desirable future signal locations. Right-turn in and out should be located with consideration of corner clearance and driveway spacing.
- Reasonable alternative access must be considered. However, care should be exercised to avoid merely transferring problems.
- Access for land parcels that do not conform to the spacing criteria may be necessary when no alternative reasonable access is available. The basis for these exceptions or variances should be identified.

Exhibit E-3: South Dakota Access Location Criteria

Level of Importance/ Functional Role	Undivided or Divided	Area	Signal Spacing Bandwidth*	Signal Spacing Distance (mile)	Median Opening Spacing (mile) ¹	Minimum ² Unsignalized Access Spacing (feet)	Denial of Direct Access When Other Available
Expressway	Undivided	Non Urban	N/A	N/A	N/A	½ mile	Yes
		Urban	40-45% ⁴	1/2 ⁴	N/A	½ mile	Yes
	Divided	Non Urban	N/A	N/A	1/2 F 1/2 D	½ mile	Yes
		Urban	40-45% ⁴	1/2 ⁴	1/2 F 1/2 D	½ mile	Yes
Principal Arterials	Undivided	Low volume	N/A	N/A	N/A	N/A ³	No ³
		Non Urban	45%	1/2	N/A	660	Yes
		Urban	40-45% ⁴	1/4 - 1/2 ⁴	N/A	250—660 ⁴	Yes
	Divided	Non Urban	45%	1/2	1/2 F 1/4 D	660	Yes
		Urban	40-45% ⁴	1/4 - 1/2 ⁴	1/4 - 1/2 F ⁴ 1/8 - 1/4 D ⁴	250—500 ⁴	Yes
Minor Arterials	Undivided	Low volume	N/A	N/A	N/A	N/A ³	No ³
		Non Urban	45%	1/2	N/A	660	Yes
		Urban	35-40% ⁴	1/4 - 1/2 ⁴	N/A	200—450 ⁴	Yes
Collectors	Undivided	Low volume	N/A	N/A	N/A	N/A ³	No ³
		Non Urban	N/A	N/A	N/A	N/A ³	No ³
		Urban - Primarily through traffic	35-40% ⁴	1/4 - 1/2 ⁴	N/A	150 - 350 ⁴	Yes ⁵
		Urban - Primarily local traffic	N/A	N/A	N/A	N/A ⁴	No ³

¹ N/A = Not Applicable; F = Full Movement; D = Directional Only.

² Stricter Standards could apply if set by other jurisdictions.

³ Considerations other than unsignalized access spacing should govern, e.g., sight distance.

⁴ Where a range of spacing is shown, the greater distance or bandwidth would apply to posted speeds of 45 mph or higher.

⁵ If so conference among the governing authorities.

* Bandwidth measures how large a platoon of vehicles can pass through a series of signals without stopping for a red traffic light. It represents a “window of green” in which motorists travelling along a roadway will encounter a series of green lights as they proceed. For example, a bandwidth of 45 percent indicates that, if a traffic signal has a 100-second cycle length, there is a 45-second band in which a platoon of vehicles will encounter green lights as they travel along a roadway.

E. Retrofit Techniques—Findings and Recommendations

Recommendation #4: Adopt recommended retrofit techniques for driveway consolidation/relocation, corner clearance and left-turn entrances and exits.

The recommended access location and design criteria describe the desired outcome for access connections. In many locations that are fully developed it may not be possible to achieve these desired conditions. In these cases retrofit techniques should be used to the maximum extent feasible to accomplish the access policy goals.

The aim of the retrofit techniques is to reduce the number of access connections (conflict points) and reduce their adverse effects by applying a variety of techniques; in this way the current undesirable situation can be improved. As feasible, the following techniques should be applied as part of retrofit during reconstruction projects:

- Consolidate and/or relocate driveways.
- Require adjacent properties to share access.
- Coordinate driveway locations on both sides of the roadway.
- Maximize corner clearance by locating access as far from the intersection as possible (i.e. near the property line).
- Provide separate left-turn entrances and exits at major traffic generators.
- Install barrier to prevent uncontrolled access along property frontage.
- Install driveway channelizing island to discourage left-turn maneuvers.

F. Permit Process—Findings and Recommendations

Recommendation #5: Implement improvements to the permit process to standardize South Dakota's access permitting application, decision and coordination procedures.

SDDOT's permitting procedures are not consistently applied. There is considerable variation between regions.

SDDOT's access permitting procedures should be improved to strengthen the process for making an application, processing an application, making the permit decision, and coordination during development and subdivision review. This recommendation involves standardizing the forms used to apply for and review access permits. It also provides the Area Engineer with a signature authority for permit approval.

B. Access Management Authority—Findings and Recommendations

Recommendation #6: Strengthen access management authority in South Dakota through modernizing current statutes.

The evaluation of South Dakota's statutory authority found that:

- South Dakota statute provides a weak basis for implementing a modern access management program.
- Existing statute does enable SDDOT to designate controlled access routes.

The study recommends that South Dakota's statutes are modernized to provide SDDOT with the authority to establish standards and procedures that ensure safe and efficient access to the highway system on the entire system, not just the controlled-access facilities. In addition, SDDOT should use existing authority to designate controlled-access facilities. Existing authority can be used to implement the access classification on controlled-access facilities. Highways can be designated as controlled-access facilities with access managed based upon the adoption of the access guidelines recommended by this project.

G. Benefits of Access Management—Findings

The analysis of national research and experience from other states indicates that improved access management in South Dakota has the following benefits:

- **Minimizes access-related accidents.** Improved access management reduces the number, severity and cost of access-related accidents. Analysis of South Dakota's statewide accident data found that between 1995 and 1997 there were more than 5,300 accidents identified as driveway accidents. This included 13 fatalities. Driveway-access accidents cost South Dakota about \$36.5 million per year.
- **Preserves investment in highways and major roads.** The recommendations will prolong the useful life of existing roads and maintains or increases their capacity to carry traffic. This will free scarce resources that would otherwise be spent on major widening or new roadway projects for maintenance and operation of existing roadways.
- **Improves access to property adjacent to highways and roads.** This provides safe and easy access to businesses adjacent to the roadway, making them more attractive and inviting to potential customers.
- **Preserves private investment.** This provides predictability for the development process and maintains accessibility to businesses.

Analysis of South Dakota's statewide accident data found eleven case studies from around the state show the real benefits of applying access management principles in South Dakota (Exhibit E-4), along with the negative consequences when access management is not addressed (Exhibit E-5).

Exhibit E-4: Examples of Good Practice in South Dakota

Case Study Location	Illustrates	Benefits of Access Management Treatments
Louise Avenue and 26 th Street Corridor, Sioux Falls, SD	Median treatment. New construction with access management.	<ul style="list-style-type: none"> By meeting with developers and landowners and presenting the plan for the street pattern, city and state officials experienced fewer problems when reviewing development plans and negotiating access points. By planning for limited access, the city and state were able to maintain a high level of service on the new 26th Street interchange and adjacent roadways. Increased building setbacks along the corridor have resulted in fewer visibility problems for motorists. The integration of land use and transportation planning provided access standards as part of the zoning approvals.
Russell Street Corridor from I-29 to Minnesota Avenue Sioux Falls, SD	Good urban arterial.	<ul style="list-style-type: none"> Effective access management has helped this highway successfully fulfill its mission of providing a safe route and promoting through traffic movements. Property owners and businesses located along this corridor are provided the necessary access required by an adequate number of service roads adjacent to this route. The integrity of the route has been maintained and intersection modifications have been made to improve opposing traffic movements.
12 th Street from Interstate 29 to Kiwanis Avenue, Sioux Falls, SD	Median treatment. Additional lanes.	<ul style="list-style-type: none"> Effective access management, through the use of median treatments, has helped this arterial successfully fulfill its mission of providing a safe route and promoting through traffic movements. By working with property owners before and during modifications along the arterial, buy-in to the treatments was generally achieved and the overall outcome positive. An adequate number of service roads and consolidated accesses adjacent to this route provide property owners and businesses along this corridor with the necessary access. The integrity of the route has been maintained and intersection modifications have been made to improve opposing traffic movements.
Burr Street (SD37) and Norway Avenue, City of Mitchell, SD Burr Street (SD37) and Kay Street, City of Mitchell, SD	Left turns from through travel lanes. High accident locations.	<ul style="list-style-type: none"> The addition of the left-turn signal phase as a result of the increase in traffic volume has decreased the number of rear-end accidents.
US 212 in Watertown from 19 th Street East 2.4 miles to 1.0 miles east of I-29	Left turns from through travel lanes.	<ul style="list-style-type: none"> Construction of a left-turn lane at a truck stop has resulted in better traffic flow and fewer accidents.
County Road 366 east of Yankton, Yankton County, SD	Left turns from through travel lanes.	<ul style="list-style-type: none"> Curve widening and two left-turn lanes have resulted in better traffic flow and fewer accidents.

Exhibit E-5: Case Study Examples of Problem Areas in South Dakota

Case Study Location	Illustrates	Problems Due to Lack of Access Management
Pierre's Hwy 14 truck bypass along the eastern edge of the City of Pierre, SD	Strip development with frequent access drives. Median treatment. High accident locations.	<ul style="list-style-type: none"> • This strip of Pierre's highway system has become very attractive for major commercial establishments due to the high traffic volume. • New businesses demand individual curb cuts, which increase the congestion and the number and frequency of conflict points. • Major truck/auto/pedestrian conflicts will continue to occur and will increase in frequency as development on the north end of the bypass continues and as traffic volumes increase.
41 st Street and Shirley Avenue, City of Sioux Falls, SD	Left turns from through travel lanes. High accident locations.	<ul style="list-style-type: none"> • Rear-end and left-turn accidents need to be prevented, while maintaining the capacity of the intersection. • If no action is taken, the accidents will continue or increase in number.
41 st Street and Carolyn Avenue, City of Sioux Falls, SD	Left turns from through travel lanes. High accident locations.	<ul style="list-style-type: none"> • Traffic cannot exit Carolyn Avenue onto 41st Street, and there are inadequate gaps in traffic to allow eastbound left-turning traffic on 41st Street access to Carolyn Avenue. Also, when the signal at the intersection at 41st Street and I-29 ramps is red, traffic backs up through this intersection. • This traffic backup blocks the Carolyn Avenue entrance, preventing eastbound traffic from entering Carolyn Avenue and preventing southbound traffic from exiting Carolyn Avenue. • The rear-end accidents involving westbound traffic are probably the result of the traffic signal at 41st Street and I-29 ramps, rather than being related to the 41st Street and Carolyn traffic. • If no action is taken, the accidents will continue to be a problem and traffic may tend to avoid this intersection, adding volumes to other intersections in the area.
Intersection of West Main Street and Sheridan Lake Road., City of Rapid City, SD	Left turns from through travel lanes. High accident locations.	<ul style="list-style-type: none"> • Rear-end accidents occur a short distance east of the intersection. • Access to a business is too close to the intersection. The intersection cannot function to provide proper access to the business, and the driveway interferes with the traffic flow of the intersection.
County Highway #2 North of State Highway 10 along Lake Traverse in Roberts County	Strip development with frequent access drives.	<ul style="list-style-type: none"> • Properties have limited sight distance as they access the highway because of a steep grade. • The trees and the winding pattern of the highway causes some safety problems, especially if drivers do not stop when leaving their property, as sight distance is limited in some areas. • One solution to the problem would be to build a service road at a lower elevation.

H. Tools for Local Government—Findings and Recommendations

Recommendation #7: Assist local governments in the development of local ordinances for access permitting, land development, major traffic generators and access management plans to help support SDDOT's policies and criteria.

Successful access management policies and criteria will be implemented through coordination between South Dakota Department of Transportation (SDDOT) and local units of government. This includes joint planning for protecting critical corridors, adoption of development review practices that consider access criteria, and support for enacting ordinances and other actions favorable to SDDOT's access policy and guidelines. Strengthening the partnership among SDDOT, counties and cities is a key to implementing access policy.

As part of this project, city and county level model ordinances were drafted that support access management in the following areas:

- **Access Permitting.** Proper access location and design is paramount for preserving the functional integrity of city or county streets, providing for smooth and safe flow, and affording abutting properties an appropriate degree of access. The draft model ordinances produced by this project include ordinances for unsignalized access (driveways and intersections), signal spacing, corner clearance, sight distance, and nonconforming access features.
- **Land Development.** The interdependence of land development and access controls is another important dimension of regulating access. Subdivision regulations, lot-split requirements, and development review provide an opportunity to assure proper access and street layout in relation to existing or planned roadways.
- **Major Traffic Generators.** The recommended policy developed for this project is that developments that generate 100 or more peak hour in plus out trips are considered to be major traffic generators. Major traffic generator ordinances may have limited applicability for some cities and counties in South Dakota. However, model ordinance code was developed for those situations where it does apply.
- **Access management plans.** Access management plans are intended to facilitate coordination of access between public roads and surrounding developments. These plans delineate current and future access points on the highway as well as lay out a means for achieving the plan, including the elimination of non-conforming access.

C. Implementation Plan

Recommendation #8: Adopt the recommended implementation plan for addressing project recommendations.

The implementation plan describes the work elements required to adopt the recommended access policy and statewide classification, strengthen statutory authority, prepare an access procedures manual, provide education, training and tools for local government, and prepare access plans for high priority segments (Exhibit E-6). An implementation management and communication strategy is also outlined.

**South Dakota Department of Transportation
Exhibit E-6: Implementation Plan Summary**

Work Elements	2000									2001								
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1. Adopt Recommended Access Policy and Establish Implementation Responsibilities		█	█															
2. Adopt Policy and Statewide Access Classification			█	█	█	█	█	█	█	█	█	█						
3. Incorporate Access Design Criteria into Roadway Design Manual	█	█	█															
4. Strengthen Statutory Authority	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
5. Prepare Access Permit Procedures Manual				█	█	█	█	█	█	█	█	█	█	█	█			
6. Provide Education, Training, and Tools to Local Government					█	█	█	█		█				█	█	█	█	
7. Prepare Access Plans for Selected High Priority Segments and Identify Access Management-related Improvements Eligible for Project Funding										█	█	█	█	█	█	█	█	█
8. Implementation Management and Communication				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

I. Introduction



This report presents the results and recommendations from a review of the South Dakota Department of Transportation's (SDDOT) highway access control process. The report recommends access criteria for driveway locations and their design, improvements to the permitting process, and strengthening the legal authority for access management in South Dakota. It also documents the benefits of improved access management, and provides tools for local government and an implementation plan.

A. Background and Purpose

Access management is the process that manages access to land development while simultaneously preserving the flow of traffic on the surrounding public road system in terms of safety, capacity, and speed. Streets and highways constitute a valuable resource as well as a major public investment. It is essential to operate them safely and efficiently by managing the access to and from abutting properties. Owners have a right of reasonable access to the general system of streets and highways. Roadway users also have certain rights. They have the right to freedom of movement, safety, and efficient expenditure of public funds. The need to balance these competing rights is especially acute where significant changes in land use have occurred or are envisioned to occur. The safe and efficient operation of the highway system calls for effectively managing the access to adjacent developments.

The principal purpose of the review of SDDOT's highway access control process was to develop improved access policies, design guidelines and procedures for applying them. The policies, guidelines and procedures are intended to:

- **Improve highway safety by minimizing the number, severity, and cost of accidents arising from access onto and off South Dakota's highway system.** Nationwide, various studies have documented that good access management can significantly reduce the number of traffic accidents, including: fatal, injury, and property damage crashes.
- **Preserve investments in South Dakota's highways and roads by maintaining the functional integrity of the system.** Access management prolongs the useful life of existing roads and maintains or increases their capacity to carry traffic. It frees scarce resources that would otherwise be spent on major widening or new roadway projects for maintenance and operation of existing roadways.
- **Provide consistency and predictability regarding access.** The project provides clearer policy direction and guidelines that will enable a consistent approach to access management.
- **Improve coordination and consistency between state and local governments regarding access policies.** Local governments' policies regarding access onto city

streets and county roads, subdivision review, and other development review impacts access policy goals. For the state system, successful access management requires effective coordination and consistency with local government.

- **Update the 1970's access management policies and design guidelines to provide an improved and consistent basis for managing highway access.** Dating from the 1970s, the current policies and guidelines do not adequately address today's challenges.

Achievement of these goals also required the development of materials that can communicate the benefits of improved access control and foster the cooperation of state, regional, and local interests. Broad based stakeholder understanding of the safety and system benefits from improved access management was also an important success factor for the project.

1. Objectives

The principal objectives of the review of SDDOT's highway access control process were to develop improved access policies, design guidelines and procedures for applying them. The purpose of the review is to recommend policies, guidelines and procedures that will:

- Improve highway safety by minimizing the number, severity, and cost of accidents arising from access onto and off the highway system.
- Preserve investments in highways and roads by maintaining the functional integrity of the system.
- Provide consistency and predictability regarding access.
- Improve coordination and consistency between state and local governments regarding access policies.
- Update South Dakota's 1970's access management policies and design guidelines to provide an improved and consistent basis for managing highway access.

The objectives of the study as specified in the project's scope of work is listed in Exhibit I-1 on the following page:

Exhibit I-1 Project Objectives

1. Develop access policies, design guidelines, and procedures for applying them, that state and local agencies can use to control access to rural and urban highways.
2. Define performance measures, identify sources of supporting data, and validate their ability to assess the effectiveness of access policies that are actually applied.
3. Use the recommended measures, to evaluate the potential value of consistent application of sound access policy at corridors and locations in South Dakota where access is proliferating, placing capacity and safety at immediate or imminent risk.
4. Equip state and local agencies to educate elected officials, business and community leaders, and regulatory staff on the application and advantages of the access policy, process recommendations, procedures.

Achievement of these objectives required the development of materials that can communicate the benefits of improved access control and foster the cooperation of state, regional, and local interests. Broad based stakeholder understanding of the safety and system benefits from improved access management was also an important success factor for the project.

2. Study Tasks

The objectives were addressed through a number of tasks. The tasks specified in the original request for proposals are listed and the steps taken to perform them described.

Tasks 1. Meet with the project's technical panel to review the project's scope and work plan.

The consultant project manager and the lead technical analyst met with the technical panel to identify their priorities and objectives for the project.

Task 2. Review and summarize the highway access regulations and policies of state and local agencies in South Dakota.

The statutory basis for access management was evaluated. This involved a review of statute, administrative rules, case law, and local jurisdictions' ordinances and code.

Task 3. Through interviews with state and local planning professionals and other stakeholders, develop background and identify key issues related to control of highway access in South Dakota.

Issue identification interviews were conducted in the early phases of the project and in the later phases of the project through roundtable discussions with SDDOT employees and workshops involving local jurisdictions and others.

Task 4. Through review of current and recent literature, and through contact with other states that are geographically and demographically similar, identify concepts and techniques for controlling highway access that are applicable to South Dakota's needs.

Drawing on the consultant teams knowledge and information assembled from other states approached applicable to South Dakota were developed and reviewed by the Technical Panel in a number of panel meetings.

Task 5. Develop information, based on state and regional data, to support legislation, rule making, and application of rules, citing information on: accidents, costs, capacity impacts, long- and short-term economic effects on businesses, impacts on freight movements, pedestrian and non-motorized mobility, mitigation costs, community preservation, and preservation of public investment.

This information was developed using the results from national research studies, assembling South Dakota specific data, and conducting case study analysis.

Task 6. Meet with the project's technical panel to summarize the findings of prior tasks and to propose, for the panel's approval, concepts that will form the technical basis for the remaining tasks.

During the course of two Technical Panel meetings the results, concepts, and other products from the prior tasks were presented to the panel.

Task 7. Draft an improved access policy for state highways and local roads and streets, identifying any legislation needed to allow its adoption.

Draft policies and legislative recommendations were developed, reviewed, and finalized. They are included in this document.

Task 8. Draft design guidelines that address criteria, spacing, and limitations on highway access based on highway's functional classifications.

Draft guidelines and criteria were developed, reviewed, and finalized. They are included in this document.

Task 9. Propose a process to incorporate the recommended procedures and designs into local platting, building permits, land use planning decisions, and SDDOT reviews and approvals.

A series of model ordinances and guidelines for local government were developed. They are included in this document. In addition, recommended changes to SDDOT permit process are included in this document.

Task 10. Draft a model ordinance, consistent with the state policy and design guidelines, that local agencies can adopt with minimal revision.

Model ordinances were drafted, reviewed, and finalized. They are included in this document.

Task 11. Propose practical measures, and identify supporting information sources for evaluating the effectiveness of access policies applied at the state and local level. Assess the measures' utility by applying them to a selected sample of existing locations in South Dakota where various access control policies have been applied. Estimate how much the degradation of the arterial function costs in lost travel time, vehicle operating cost, and expenditures on infrastructure improvements and capacity expansions.

This study recommends performance measures for evaluating the implementation of new access policy. The measures can not be applied until the policy is in place. However, the study involved conducting a number of case studies that demonstrated the potential safety and preservation of capacity benefits of improved access management.

Task 12. Prepare an implementation plan for equipping state and local Officials to market the access policy, design guidelines, authorization process, and model ordinance to constituents throughout the state.

An implementation plan with a work breakdown, assignment of responsibility, and estimated labor required was developed, reviewed, and finalized. It is included in this document.

Task 13. Prepare a technical memorandum and meet with the project's technical panel to review the draft highway policy, design guidelines, model ordinance, effectiveness measures, and implementation plan.

A series of draft research chapters were prepared to address this task. They were reviewed over the course of 4 separate panel meetings.

Task 14. Conduct a series of regional workshops with elected officials, business leaders, developers, motor carriers, and other interests affected by highway access policies to validate the draft highway policy, design guidelines, model ordinance, effectiveness measures, and implementation plan.

Four well-attended regional workshops were conducted with stakeholders involved in or with an interest in access management. The workshop provided input on the draft study findings and recommendations. Four workshops were also held with SDDOT region offices.

Task 15. Revise the draft highway policy, design guidelines, model ordinance, and effectiveness measures, based upon the comments and direction of the technical panel as well as feedback obtained from the regional workshops.

The input from the workshops was used to revise prior work products and is reflected in this document.

Task 16. Prepare materials that state and local agencies can use to educate elected officials, business and community leaders, and regulatory staff on the application and benefits of the access policy, process recommendations, and authorization procedures, and provide training necessary for their use.

Briefing packets on the benefits of access management were prepared and a brochure. This can be used to support implementation. In addition, eleven case studies were prepared.

Task 17. Prepare a final report summarizing research methodology, findings, conclusions and recommendations.

A draft final report was reviewed by the Technical Panel and then finalized.

Task 18. Make executive presentations to SDDOT's Research Review Board and a meeting of local associations concerned with highway access policy.

An executive presentation was made to SDDOT's Research Review Board.

B. Methodology

The methodology followed is summarized below:

- **Performed a Review of Access Regulations and Policies in South Dakota.** This step evaluated how effectively contemporary access management can be implemented under existing laws, administrative rules and procedures in South Dakota.
- **Identified Access Management Issues.** This involved undertaking a series of issue identification interviews with key participants and stakeholders, including key SDDOT managers, in headquarters and the regions, representatives of local jurisdictions, and other stakeholders.
- **Evaluated National Experience Applicable to South Dakota.** This step involved assisting South Dakota to learn from the experience in other states. This evaluation drew on the project team's similar evaluation as part of access management work for Montana, Michigan, Oregon, Colorado, and Florida. This was supplemented by conducting a scan of neighboring states and access management activities.
- **Developed Factual Information to Support Policy.** This involved developing factual information to demonstrate the safety corridor preservation and other benefits of updated access management. The approach had three elements:
 - Conclusions were drawn and evidence cited from national research into accidents, costs, capacity impacts, effects on business, and other variables.
 - South Dakota's safety data was used to generate specific estimates of the safety benefits.

- Illustrative case studies specific to South Dakota were conducted. The case studies illustrate benefits from access management such as preserving public investment, community preservation, and benefits to property owners.
- **Conducted Regional Workshops with Key Stakeholders to Obtain Input.** This provided the opportunity for involving key stakeholders: elected officials, business leaders, developers, motor carriers, and others to validate and provide input on the draft access policy, design guidelines, model ordinances, and other project work products.
- **Developed Access Policy.** Input from the workshops, technical panel and the results of the previous steps provided the basis for developing recommendations for an access management policy applicable to South Dakota.
- **Developed Access Guidelines and Criteria.** This included the identification of where access should be allowed or denied for various classes of roads, what should be the allowable spacing for signalized and unsignalized access connections, and where should alternative access be required.
- **Developed Tools for Local Government Including Model Ordinances.** The study recommended a process for incorporating the recommendations into the land-use and development review process. This involved conducting interviews, reviewing documented procedures, and requirements to determine the effectiveness of current practices. Weaknesses with current procedures were documented and recommendations developed to strengthen them. Ordinances in South Dakota were reviewed and existing inventories of relevant ordinances used in other states were drawn upon. This was then used to prepare model ordinances applicable to South Dakota.
- **Developed Permitting Process Recommendations.** The recommendations are based on input received during group interviews involving process participants in each of SDDOT's regions and review of current documented policies, procedures, and business practices.
- **Prepared Implementation Plan.** This prepares a work breakdown and plan for implementing the recommended new access management policy and procedures.

C. Organization of Work Products

The main body of this report is organized into the following sections:

- II. Access Policy.** This chapter recommends a new access policy to be adopted by the South Dakota Department of Transportation.
- III. Access Criteria.** This chapter recommends criteria for the location of highway access points and design guidelines for these access points. It also provides retrofit techniques for use in developed areas.

- IV. Permit Process.** This chapter presents recommendations for improving SDDOT's access permitting procedures and practices.
- V. Access Management Authority in South Dakota.** This chapter presents the results of a review of the legal framework that currently governs access management in South Dakota.
- VI. Benefits of Improved Access Management in South Dakota.** This chapter outlines the benefits of improving access management policy and practices in South Dakota.
- VII. Tools for Local Government.** This chapter presents the tools that can be used to assist local jurisdictions and SDDOT to improve the coordination between the development review process and land use planning and access management.
- VIII. Implementation Plan** This chapter provides a plan for implementing the recommendations and work products from SDDOT's access policy review project.

Each of these sections presents the findings and recommendations developed through the review of SDDOT's highway access control process.

Appendix A: Informational Workshops on Access Management. This appendix summarizes the results of four public and four SDDOT workshops held in Pierre, Mitchell, Rapid City and Aberdeen in November 1999 to review preliminary project findings and recommendations.

Appendix B: Draft Access Management Brochure. This appendix presents an example draft brochure that could be used as part of a communication strategy for implementation.

II. Access Policy



A. Introduction

This chapter recommends a new access policy to be adopted by the South Dakota Department of Transportation. The recommendations specify the State's policy interest in managing access to and from properties abutting the highway system safely and efficiently. The intent is to provide a clear statement of policy goals for access to and from the highway system. These goals can provide guidance to SDDOT employees, local units of government, developers, and the general public on the desired level of access to plan for.

The policy should apply to all current and planned roadways on the State Highway System. The policies apply to the location, design, construction, and maintenance of all connections, intersections, and improvements to the highway right-of-way. The recommended policies and access criteria address the number, location, and design of access points to the state highway system from abutting land.

B. Policies

Streets and highways are a valuable resource as well as a major public investment. The state has an important interest in ensuring the safe and efficient operation of this system. The state is responsible for safely and efficiently managing access to and from abutting properties to address this interest. The recommended policies address the state role in providing safe, efficient access to the highway system through access management.

Access management is a comprehensive approach to managing roadway access. It is a process for providing access to land development, while maintaining the safety and efficiency of travel on surrounding roadways. This is achieved through the systematic application of policy, planning, regulatory, and design strategies aimed at managing the location, design, and operation of driveways, medians, median openings, signals, and street connections to a roadway.

The policies balance the rights of property owners to have reasonable access to the general system of streets and highways with the rights of road users to freedom of movement, safety, and the efficient expenditure of public funds. The policies and recommended access guidelines balance these competing rights. The goal is to manage access to land development while simultaneously preserving the flow of traffic on the public road system in terms of safety, capacity, and speed.

2. Policy: Protect the public's investment in the highway system by preserving its functional integrity through the use of modern access management practices.

SDDOT will use modern access management practices to provide a systematic means of balancing access needs from abutting properties with its responsibilities to ensure safe, efficient, and cost effective transportation for the traveling public.

This policy is best implemented using established traffic engineering and roadway design principles to minimize disruptions to the through traffic that would reduce the highway's safety and efficiency. The principles established by this policy include:

- Limit the number of conflicts.
- Separate basic conflict areas.
- Reduce interference with through traffic due to turns into or out of a site.
- Provide sufficient spacing between at-grade intersections.
- Maintain progressive speeds along arterials.
- Provide adequate on-site storage areas.

The specific techniques for managing access are described in Chapter III: Access Criteria.

2. Policy: Establish and maintain an access classification system that defines the planned level of access for different highways in the state.

The access control policy study recommends that SDDOT establish an access classification system. The access classification system forms the basis for access management. It defines where and what level of access is desired for developments abutting the highway system. The access classification establishes access goals according to the purpose and importance, functional characteristics, and design features. The access classification provides a mechanism to vary access criteria as appropriate according to different functional classifications and abutting land uses.

3. Policy: Use police powers and existing statutory authority, and promote the modernization of South Dakota Codified Law to ensure the safe and efficient management of access.

The analysis of the legal basis for access management found that South Dakota Codified Law (Chapter 31-24-1) does not appear to allow SDDOT to deny access on non-controlled-access routes. This is the majority of the SDDOT system. Further, there is no specific provision for public safety or the use of engineering practices in the location or design of access. Existing statute does enable SDDOT to designate controlled access routes.

This policy recommends that SDDOT use existing authority to designate access controlled facilities and establish access criteria for them using police powers. These standards would provide the basis for all new permit decisions. (Sections 31-8-3 and 8-5 allow the SDDOT to regulate access by police power). The policy further recommends that SDDOT seek legislation to modernize the applicable statutes so that they provide SDDOT with the authority to establish standards and procedures that ensure safe and efficient access to the highway system on the entire system, not just the controlled access facilities.

4. Policy: Maintain and apply access criteria based upon best engineering practices to guide driveway location and design to implement the access classification system.

This policy involves SDDOT maintaining and applying a set of access criteria governing the location and design of connections to the state highway system. This study provides specific and detailed recommendations for these criteria. (See Chapter III Access Guidelines). The application of the criteria during project design, reconstruction, and through the permit process will ensure the safe, efficient, and cost-effective operation of the highway system.

5. Policy: Permit exceptions to the SDDOT's access criteria only where retrofit techniques have been applied.

This policy recommends that in those locations where it is not possible to achieve the access criteria, retrofit techniques must be applied. In this way, an access location that does not meet SDDOT's access criteria will only be authorized after consideration of the applicable retrofit techniques (see Chapter III: Retrofit Techniques).

6. Policy: Provide a consistent statewide approach to the management of access to the state highway system.

The intent of this policy is to ensure consistent policies, procedures, and practices are used statewide in the process through which access permits are issued. The intent is to ensure that customers are treated consistently in different parts of the state and that employees make approval decisions based on standardized procedures that implement the access policy.

7. Policy: Coordinate with local jurisdictions to ensure that the state's access policy and criteria are addressed early in decisions affecting land use.

This policy recognizes that the land use decisions that local units of government make through platting, development review, and zoning can result in the need for access to the State Highway System. SDDOT will establish and maintain procedures for coordinating with local jurisdictions regarding access to state highways prior to

plat approval. The objective is to ensure that this access is consistent with the state's access policy, the access classification system, and the adopted access criteria.

8. Policy: Provide advocacy, educational, and technical assistance to promote access management practices among local jurisdictions.

SDDOT will cooperate with local units of government and provide technical assistance to increase understanding of the benefits of the state's access policy and criteria. The assistance will explain the technical requirements of the guidelines and how local units of government can help to preserve the safe and efficient operation of the highway system through their land use decisions.

9. Policy: Undertake proactive corridor preservation through coordination with local units of government in corridor management, the selective purchase of access rights, and other investments.

Purchasing access rights on all corridors is prohibitively expensive. However, because the purchase of access rights provides the strongest means for implementing the access policy and criteria for critical sections in these corridors SDDOT may selectively purchase access rights. SDDOT would undertake joint corridor management planning with affected local jurisdictions in high priority corridors to preserve the functional integrity of the corridor. The policy would make access management improvements eligible for construction expenditures including improvements off the state system, such as reverse frontage or access in order to preserve the higher functional role of the corridor.

10. Policy: Establish procedures for determining developer responsibilities for paying for improvements that address the safety and capacity impacts of major development.

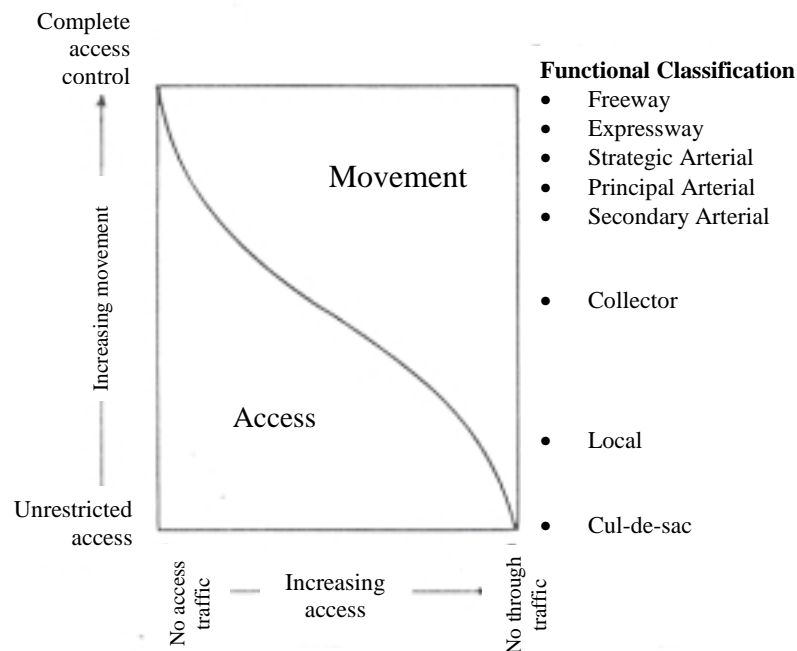
SDDOT shall establish and maintain procedures for conducting a traffic impact analysis when access to the highway system is requested for developments that generate a high volume of trips. This policy is to ensure that traffic analysis is undertaken as part of the development review process. The recommended policy is that access permit requests for developments that generate a higher volume of peak hour trips are subject to a traffic impact analysis.¹ This analysis will use accepted traffic engineering practices to determine landowner financial responsibilities for signals, turning bays, and other design features that are required for safe efficient access that accommodates the forecast volume of traffic. The applicant would pay for any required traffic impact study. Procedures for administering this policy will include provision for waiving the cost or the need for the study under certain circumstances.

¹ SDDOT would establish procedures that specify how, when, and by whom the analysis would be conducted. An applicable threshold to be considered is 100 in plus out trips.

D. Access Classification System—Policy Recommendations

The entire road system is traditionally classified by relating the proportion of through movement to the proportion of access such as shown in Exhibit II-1. Freeways, which have full control of access and serve only the movement function, are at one end of the scale; the local street and cul-de-sac, which predominantly provide for land access, are at the other end of the scale because they have little or no through movement. Collector and arterial streets normally must provide a balance between movement and access functions; it is along these streets that access management actions become important. The three main factors that separate these types of roads are traffic volumes (capacity), travel speed, and trip distance.

Exhibit II-1: Functional Classification



The recommended classification system reflects:

- The functional class of highway.
- Highway design features (especially the presence or absence of a median divider).
- Degree of urbanization (a proxy for development intensity, intersection frequency, and travel speed).

SDDOT should develop and maintain an access classification system to preserve the functional integrity of the highway system. The purpose of the classification system is to specify the planned level of access for different roadways in the state.

2. Access classification system

The recommended classification system is detailed in Exhibit II-2. The classification system distinguishes between urban, non-urban, and rural low volume routes by their level of importance or functional role. The policy recommendations apply to the state system.

Exhibit E-2: Recommended Access Classification System

Level of Importance/ Functional Role	Undivided or Divided	Area
Expressways	Undivided	Non Urban
		Urban
	Divided	Non Urban
		Urban
Principal Arterials	Undivided	Non Urban—low volume ¹
		Non Urban
		Urban
	Divided	Non Urban
Urban		
Minor Arterials	Undivided	Non Urban—low volume ¹
		Non Urban
		Urban
Collectors	Undivided	Non Urban—low volume ¹
		Non Urban
		Urban—Primarily through traffic
		Urban—Primarily local traffic

¹ Low volume is defined as 550 or fewer Annual Daily Traffic.

Exhibit II-3 provides background on the low volume category by showing the proportion of centerline miles in each classification by average annual daily traffic.

Exhibit II-3: Centerline Miles by Average Annual Daily Traffic (AADT) by Functional Classification (State System)

	550 or less ADT		551 to 1500 ADT		1501 and greater AADT		Total	
	<i>Miles</i>	<i>Percent</i>	<i>Miles</i>	<i>Percent</i>	<i>Miles</i>	<i>Percent</i>	<i>Miles</i>	<i>Percent</i>
Expressways	0.0	0.0%	212.9	33.3%	425.8	66.7%	638.7	100%
Principal Arterials	153.3	5.8%	1232.3	47.0%	1236.1	47.1%	2621.7	100%
Minor Arterials	1205.0	35.6%	1771.2	52.3%	412.3	12.2%	3388.6	100%
Collectors	1089.8	81.2%	205.3	15.3%	47.7	3.6%	1342.7	100%

3. Classification system categories

The recommended access criteria are based on the following classification system categories:

a. Level of importance/functional role

The recommended classification system uses function as the basis of determining the importance of a highway. The higher classifications place higher priority on through traffic than providing access points. The classification system uses functional classification to distinguish between interstate, principal arterials, minor arterials, collectors, and local systems.

The level of importance parallels the functional classification system; however, the intention is for the classification system to reflect future plans for roads. In this way any roads on city street plans that will become arterials should be classified as arterials. The classification system reflects current and planned functional roles.

Expressways. The function of expressways is to provide multi-lane capability that is safe and allows efficient high speed and high volume traffic movements. Private access to expressways is minimal. Public road connections are highly controlled and must be spaced appropriately.

Interstate (Principal Arterials). The function of the Interstate System is to accommodate high volumes of high-speed traffic at the highest levels of safety. Access is permitted only at interchanges. The access policy recommendations do not address the interstate system; these are already addressed satisfactorily through statute and policy.

Principal Arterials. The main function of the principal arterial system is to accommodate through traffic. South Dakota's rural principal arterials are

mainly two-lane, but there are some four-lane facilities. It is recommended that principal arterials be designated as access controlled facilities subject to the access criteria recommended in Chapter III.

Minor Arterials. The main function is again to accommodate through traffic; however, many of the non-urban minor arterials are also serving local trips. Typically, South Dakota's minor arterials have significantly lower traffic volumes than the principal arterials.

Collectors. The collectors provide access to the principal arterial system. They provide access from and to residential, commercial, and industrial areas. They also provide for local traffic circulation. Providing access is their dominant role and access is generally to be accommodated based upon safety considerations such as sight distance.

b. Undivided or Divided Cross Section

The access classification distinguishes between undivided and divided facilities. These classifications are treated differently in the access criteria where specific issues such as median openings are addressed. Divided facilities are defined as those with non-traversable medians.

c. Area

The access classification system distinguishes between different areas. The distinction is based on the current and expected intensity of land development abutting the highway. Roadways in the different areas will be treated differently. A task for implementation and ongoing access management will be assigning highways to these categories. Therefore, a practical easy-to-maintain approach was used to define the areas. This approach reflects the intensity and pattern of land development in South Dakota.

The following defines the different area categories:

(1) Non-urban low volume

- All roads that have a current AADT of 550 or less are defined as rural low volume. This threshold was based on a review of the current distribution of traffic on the system. It also is consistent with other criteria used by roadway design for shoulder width and pavement treatments. The purpose in establishing low volume as a category is to avoid creating new procedural requirements in an environment where current practices are adequate.

(2) Non-urban

- This category is defined as all roadways outside of an urban service boundary. These are areas where the abutting land-use is not currently nor planned to have urban services. In many parts of the state the adjacent or the abutting land use is

agricultural. An issue to be resolved in implementing the classification system will involve addressing areas that have some level of development but are not incorporated or do not have an urban service boundary.

(1) Urban

- This category includes those sections of highways that are in incorporated areas and their extraterritorial limits. This is generally three miles for cities with a comprehensive plan. Roads in this category will have a varied pattern of existing access depending upon the intensity of development on the abutting land. The expectation is that, in this category, the existing pattern of access will often be more suited to retrofit, and access criteria may be difficult to achieve. New access requests and reconstruction projects will aim to meet the access criteria recommended for this category. In some cases local units of government may choose to adopt stricter standards than state access criteria.
- In urban areas the classification system will be applied to both current and future functional roles. This would be based on the city street plan.

(3) Urban collectors primarily through and local traffic

- The purpose of the distinction between the categories of collectors is to provide guidance to local units of government. The Technical Panel indicated that at the local level there are occasions in which the functional classification does not reflect the importance of the facility for local circulation or through traffic. The distinction between primarily through traffic and primarily local traffic provides a mechanism for a more refined treatment of collectors by local units of government. Local units of government would assign collectors to this category to support their roadway design and access management.

d. Implementing Authority

The access policy is implemented using existing authority to designate controlled-access facilities. Highways can be designated as controlled-access facilities with access managed based upon the adoption of the access guidelines recommended by this project.

In addition, the study (see chapter on legal authority) recommends that South Dakota modernizes the applicable statutes so that they provide SDDOT with the authority to establish standards and procedures that ensure safe and efficient access to the highway system on the entire system, not just the controlled access facilities. In urban areas, cities can adopt ordinances to implement these and other studies on those roads over which they have jurisdiction.

e. Implementing Elements

This study identifies implementing elements for the recommended access policy. The policy can be implemented through: access criteria (guidelines), the

permit issuance process, a high priority corridor preservation program, coordinating development review process with the access classification system, and organizational development work to increase understanding and support for access management.

(1) Access guidelines

- This study of access control policy recommends access guidelines for adoption by SDDOT. These guidelines implement the access classification system by specifying criteria for: access spacing, signal spacing, median opening spacing, denial of direct access when other access is available and other criteria. The guidelines provide detailed recommendations on access features that should be managed and the design of these features. (The recommended access guidelines are provided in Chapter III).
- The policy recommends that these guidelines be established as access criteria and that implementation be further strengthened by SDDOT designating controlled access routes using current statutory authority. For these routes the criteria would be adopted as standards. These standards could then provide the basis for all new permit decisions. They would also be used to guide any reconstruction of existing facilities.
- The controlled access facilities should be identified and established through a public consultative process that involves local units of government and the citizens of South Dakota.

(2) Permit process

- Criteria for issuing approach permits would be governed by the access criteria and conditional on the type of use of the driveway. A separate procedure is recommended to implement the policy relating to traffic impact analysis.

(3) Corridor management/preservation

- The study recommends as a matter of policy that SDDOT use construction program funds to selectively undertake improvements as part of corridor management that preserve the functional integrity of the corridor. This could include using state funds off the state system provided they are used for projects that preserve the corridor.

(4) Purchase of Access Control

- Purchasing access rights on all corridors is prohibitively expensive. In addition, it is not in the interests of the South Dakota taxpayers for SDDOT to purchase access rights when their health, safety, and welfare can be ensured through using the appropriate access criteria. However, on occasion, SDDOT should consider purchasing access control. Purchasing access control can be effective when done before development has occurred. It is very costly and disruptive if required to retrofit a facility. Therefore access rights should only be purchased selectively as a secondary strategy.

- The following principle should guide the purchase of access rights: access rights may be purchased in those corridors where SDDOT seeks to ensure access location spacing above the current standards.

(5) Interjurisdictional coordination and cooperation

- Successful access management requires careful coordination between land use and transportation objectives. In South Dakota, different units of government have different transportation and land use responsibilities.
- SDDOT, the counties, and cities, have primary responsibility to manage the safety and operations of the state's highways and major arterials. Cities and counties within unincorporated areas have the authority to plan and manage land use.
- Local government land use decisions have major impacts on the access conditions along the highway. Every time the local unit of government approves a land subdivision, a new bundle of access rights is endowed on each newly created lot. If the subdivision has been well designed, these lots will be accessed via internal streets connected to the highway at properly spaced intersections, and not by individual, direct driveways onto the highway. Cities and counties have broad authority to plan and regulate land use through zoning and subdivision controls and thereby manage access, if they choose to do so.
- The policy and access classification system is implemented through coordination with local units of government. This includes joint planning for protecting critical corridors, adoption of development review practices that consider access criteria, and support for enacting ordinances and other actions favorable to SDDOT's access policy and guidelines.
- Strengthening the partnership among SDDOT, counties and cities is a key to implementing access policy. This will involve broad-based educational programs regarding the statewide access classification system, corridor management planning, and access related roadway improvements. The recommended approach is to begin providing information and incentives for cooperation, and not providing mandates.

(6) Technical assistance and communication

- Increasing understanding about the access policy objectives and the steps that can be taken to preserve the system is a key element for improving access management in South Dakota.
- Although some local governments consider access management in their land use decisions, many do not, for a number of reasons. One reason is a lack of knowledge and understanding. Many local officials are simply not aware of the problems that can result from poorly spaced or designed access along the major highways. Others seem to feel that highway operation issues are not their concern or responsibility. Many are not aware of the techniques of access management and do not have adequate technical support for their development review process.

- In addition, access problems take a number of years to appear in many South Dakota communities. Large problems arise from many small, uncoordinated decisions over time. When the problem becomes apparent, the best solutions are usually no longer available.

III. Access Criteria and Design



A. Introduction

This chapter recommends criteria for the location of highway access points and design guidelines for these access points. These recommendations provide the principal mechanism for implementing the policy recommendations.

The criteria can be applied to implement the access classification system, to evaluate access permit requests, and to guide the design of new or reconstructed highway facilities. The recommendations are applicable to state, county, and city roadways.

The access management criteria distinguish between:

- Location of access points, and
- Design of the access points.

The recommendations are intended to supplement the South Dakota Road Design Manual. The recommendations draw on best practice from other states and applied research.

It is important to note that there are few national policies or standards to draw on. The American Association of State Highway and Transportation Officials (AASHTO) currently does not have a specific access management policy but does state the following:

“The degree of access control required depends on the demands placed on the arterial. Because the rural arterial has greater importance than the local roads and collectors that usually serve all access needs, and cannot normally provide features associated with freeways, the arterial is most influenced by the use of access control. Provision of access control is vital to the concept of an arterial if it is to provide the service life for which it is designed.”²

It also includes these statements:

“Driveways are, in effect, at-grade intersections and should be designed consistent with the intended use. The number of accidents is disproportionately higher at driveways than at other intersections; thus their design and location merit special consideration.”³

The recommended access management criteria should apply to the likely future function and design, rather than merely to the present road. This will serve to protect, from undue encroachment, roads that are planned for upgrading. Access may be provided where no reasonable alternative access is available, or where it is in the general public interest to do

² American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets* (Washington, D.C., 1994), p. 510.

³ *Ibid.*, p. 793.

so. This generally can occur in undeveloped areas but it may not be practical in urban and suburban settings. Where access must be provided, it should be limited to right-turns only where possible (i.e., where there is a median).

B. Access Location Criteria

Access location criteria are recommended that preserve the functional integrity of highways, provide for smooth and safe flow, and afford abutting property an appropriate degree of access. The recommended access criteria for signalized and unsignalized driveways and at-grade intersections are based on the following general considerations:

- Allowable access should vary by roadway classification, facility type, access type, roadway speed, and development density.
- Access spacing criteria do not have to be consistent with existing access practices.
- Allowable tolerances for deviations from the desired criteria generally should vary with the access type or functional class of the roadway involved. These tolerances are greater for collectors and minor arterials than they are for principal arterials.
- Traffic signal spacing criteria for both driveways and at-grade public intersections should be related to roadway speed and should govern both intersecting public streets and access drives. They should take precedence over the unsignalized spacing criteria in situations where there is the potential for future signalization.
- Locations for signalized at-grade intersections ideally should be identified first. Unsignalized right-turn and left-turn access points should then be selected based on existing and desirable future signal locations. Right-turn in and out should be located with consideration of corner clearance and driveway spacing.
- Reasonable alternative access must be considered. However, care should be exercised to avoid merely transferring problems.
- Access for land parcels that do not conform to the spacing criteria may be necessary when no alternative reasonable access is available. In these cases the permit applicant should identify the basis for any exceptions.

The recommended access location criteria are summarized in Exhibit III-1 and discussed in detail in the following sections.

Exhibit III-1: South Dakota Access Location Criteria

Level of Importance/ Functional Role	Undivided or Divided	Area	Signal Spacing Bandwidth*	Signal Spacing Distance (mile)	Median Opening Spacing (mile) ¹	Minimum ² Unsignalized Access Spacing (feet)	Denial of Direct Access When Other Available
Expressway	Undivided	Non Urban	N/A	N/A	N/A	½ mile	Yes
		Urban	40-45% ⁴	1/2 ⁴	N/A	½ mile	Yes
	Divided	Non Urban	N/A	N/A	1/2 F 1/2 D	½ mile	Yes
		Urban	40-45% ⁴	1/2 ⁴	1/2 F 1/2 D	½ mile	Yes
Principal Arterials	Undivided	Low volume	N/A	N/A	N/A	N/A ³	No ³
		Non Urban	45%	1/2	N/A	660	Yes
		Urban	40-45% ⁴	1/4 - 1/2 ⁴	N/A	250—660 ⁴	Yes
	Divided	Non Urban	45%	1/2	1/2 F 1/4 D	660	Yes
		Urban	40-45% ⁴	1/4 - 1/2 ⁴	1/4 - 1/2 F ⁴ 1/8 - 1/4 D ⁴	250—500 ⁴	Yes
Minor Arterials	Undivided	Low volume	N/A	N/A	N/A	N/A ³	No ³
		Non Urban	45%	1/2	N/A	660	Yes
		Urban	35-40% ⁴	1/4 - 1/2 ⁴	N/A	200—450 ⁴	Yes
Collectors	Undivided	Low volume	N/A	N/A	N/A	N/A ³	No ³
		Non Urban	N/A	N/A	N/A	N/A ³	No ³
		Urban - Primarily through traffic	35-40% ⁴	1/4 - 1/2 ⁴	N/A	150 - 350 ⁴	Yes ⁵
		Urban - Primarily local traffic	N/A	N/A	N/A	N/A ⁴	No ³

¹ N/A = Not Applicable; F = Full Movement; D = Directional Only.

² Stricter Standards could apply if set by other jurisdictions.

³ Considerations other than unsignalized access spacing should govern, e.g., sight distance.

⁴ Where a range of spacing is shown, the greater distance or bandwidth would apply to posted speeds of 45 mph or higher.

⁵ If so conference among the governing authorities.

* Bandwidth measures how large a platoon of vehicles can pass through a series of signals without stopping for a red traffic light. It represents a “window of green” in which motorists travelling along a roadway will encounter a series of green lights as they proceed. For example, a bandwidth of 45 percent indicates that, if a traffic signal has a 100-second cycle length, there is a 45-second band in which a platoon of vehicles will encounter green lights as they travel along a roadway.

2. Signalized Intersections

a. Overview

Traffic signal spacing, along with the uniformity of spacing, governs the performance of urban and suburban arterials. Signals account for most of the delay that motorists experience, constraining capacity during peak travel periods with attendant queuing and back-ups. Signals can also delay vehicles during both peak and off-peak periods if randomly located, ineffectively coordinated, or improperly timed. In addition, closely or irregularly spaced signals can reduce arterial travel speeds, resulting in an excessive number of stops even under moderate traffic volumes thereby increasing the potential for accidents.

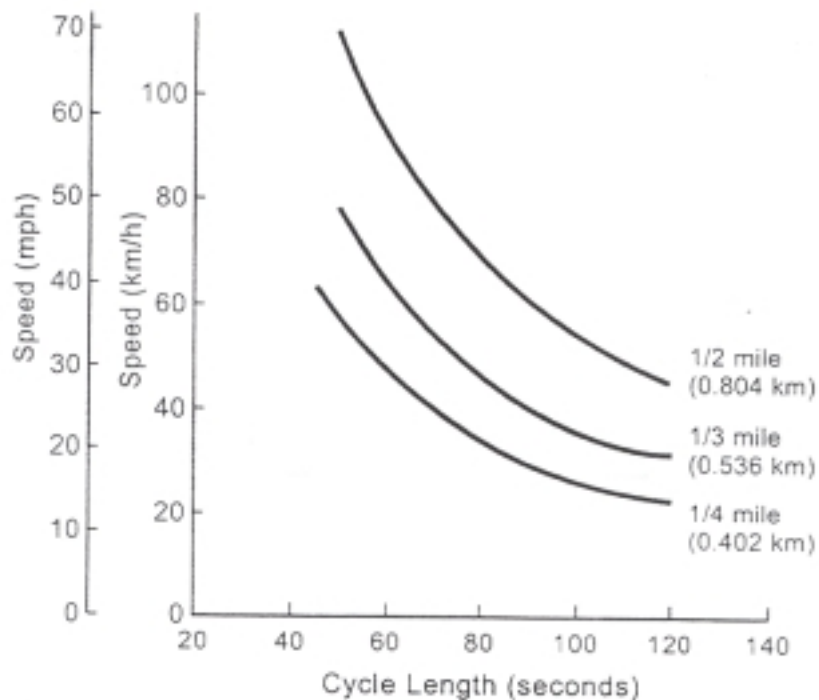
b. Recommendation

To help ensure efficient traffic flow, new signals should be limited to locations where the progressive movement of traffic will not be significantly impeded. The recommended signal spacing criteria for consideration by SDDOT are shown in Exhibit III-2. The signal spacing on principal and minor arterials would range from ¼-mile to ½-mile depending upon the area type. There would be greater latitude on minor arterials in terms of bandwidth, with a lower efficiency acceptable than for principal arterials. There is signal spacing shown, for discussion purposes, for collectors in urban areas that serve primarily through traffic. This spacing would be the least stringent by allowing for the narrowest bandwidth.

a. Background

The optimal spacing of signals depends on the cycle length and the progression speed. Long cycle lengths combined with high speeds require long distances between signals. Shorter cycle lengths and lower speeds enable closer spacing between signals. Exhibit III-3 shows these relationships.

Exhibit III-2: Signal Spacing as a Function of Speed and Cycle Length



Source: NHI, Access Management, Location, and Design. NHI Course No. 15255, 1998

The choice of cycle length depends on the capacity needed to pass traffic through critical intersections, to clear pedestrians across wide streets, and to achieve efficient signal coordination at desired speeds. The cycle lengths selected may not always be ideal from a coordination standpoint.

Cycle lengths should be as short as possible (i.e., 60 to 70 sec.) and cycle lengths of more than 120 sec. should be avoided. Excessively long cycle lengths (i.e., more than 120 sec.) result in long overall intersection delay.

Exhibit III-3 shows the optimum signal spacing as a function of speed and cycle length, assuming an alternating pattern of successive signals. Exhibit III-4 shows the progression speed in mph as a function of signal spacing and cycle length.

Exhibit III-3: Optimum Signalized Intersection Spacing in Feet Needed to Achieve Efficient Traffic Progression at Various Speeds and Cycle Lengths

Cycle Length (sec)	(i) Speed in mph						
	25	30	35	40	45	50	55
	(ii) Distance in Feet						
60	1,100	1,320	1,540	1,760	1,980	2,200	2,430
70	1,280	1,540	1,800	2,050	2,310	2,500	2,820
80	1,470	1,760	2,050	2,350	2,640	2,930	3,220
90	1,630	1,980	2,310	2,640	2,970	3,300	3,630
120	2,200	2,640	3,080	3,520	3,960	4,400	4,840
150*	2,750	3,300	3,850	4,400	4,950	5,500	6,050

*Represents maximum cycle length for actuated signal if all phases are fully used.
 One-half mile (2,640 ft.) spacing applies where optimum spacing exceeds one-half mile.

Source: National Highway Institute, *Access Management, Location, and Design*, NHI Course No. 15255, 1991.

Exhibit III-4: Progression Speed in mph as a Function of Signal Spacing and Cycle Length

Cycle Length (sec)	Spacing in Miles (Feet)			
	One Eighth (660 ft.)	One Fourth (1,320 ft.)	One Third (1,760 ft.)	One Half (2,640 ft.)
	(iii) Speed in mph			
60	15	30	40	60
70	13	26	34	51
80	11	22	30	45
90	10	20	27	40
100	9	18	24	36
110	8	16	22	33
120	7.5	15	20	30

Source: National Highway Institute, *Access Management, Location, and Design*, NHI Course No. 15255, 1991.

Time-space analysis clearly indicates the desirability of long and uniform signal spacing to achieve efficient traffic signal progression at desired travel speeds. The effects of signal cycle length and spacing on progressive speeds in both directions of travel have been well established. Speeds increase directly as signal spacing increases and inversely with cycle length. Longer spacing between signals allows for

higher speeds for any given cycle length. Similarly, for any given signal spacing, the shorter the cycle length, the higher the speeds.

Signal systems on urban or suburban arterials must respond to two different conditions. During peak traffic periods when volumes are high, operating speeds are usually slower and longer cycles, up to 120 seconds, are common. During off-peak traffic periods when traffic volumes are lower, speeds increase and cycle lengths can be decreased to range from 60 to 80 seconds.

The cycle length does not have to be the same for the entire day. At least two and maybe three different cycle lengths throughout the day will more efficiently respond to the varying traffic conditions.

Uniform or nearly uniform spacing is essential. When signal spacing deviates from uniform spacing, the green time for the major arterial must be increased to maintain progression efficiency. Studies by Stover, Demosthenes, and Weesner⁴ show that for short cycles (i.e., 60 sec.) a deviation of one percent from optimum spacing will reduce the progression band by one percent. For longer cycle lengths (i.e., 120 sec.) a one-percent deviation will reduce the through band by two percent.

Where signals must be provided at locations that do not conform to the time-space pattern, the green time for arterial traffic will be detrimentally affected. This effect may be offset by accepting a narrower green band or, as is more commonly done, by reducing the green time given the intersecting roadway. Signals also may be set to favor one direction of travel—but this usually reduces the through band in the other direction of travel.

Key issues to consider are as follows:

- Long, uniform spacing of traffic signals is desirable to allow effective progression of traffic in both directions of travel. During off-peak periods, arterial roadways should operate at speeds of 25 to 35 mph in urban environments and 35 to 45 mph in suburban settings. During peak conditions, roadways should operate at speeds in the range of 20 to 25 mph. Throughput is maximized, and fuel consumption and emissions are minimized at speeds of 35 to 45 mph.
- The green time per cycle for arterial roadway traffic should be maximized. This requires minimizing the time needed for left turns by prohibiting and redirecting the turns or by providing single or multiple left-turn lanes. Where left-turn phases are provided, cycle lengths may have to be increased to ensure sufficient green time and traffic progression efficiency (through bandwidth divided by the cycle length).
- Major urban and suburban arterials experience high travel demands, especially during the morning and evening peak periods. Therefore, capacity is critical. This may require longer cycle lengths to minimize the “lost” time that occurs each time the traffic signal indication is changed and to provide special phases

⁴ Stover, Demosthenes, and Weesner, *Signalized Intersection Spacing: An Element of Access Management*.

for left turns. Cycle lengths during peak periods normally range from 80 to 120 seconds as compared with 60 to 80 seconds at other times.

- Cycle lengths that preclude achieving desired speeds for any given signal spacing should be avoided. For example, with ½-mile signal spacing along a suburban roadway and 30 mph travel speeds, cycle lengths should not exceed 120 seconds.
- Where signals must be provided at locations that do not “fit” in the time-space pattern, additional arterial green is necessary to ensure adequate through bandwidth. This results in less green time for the intersecting street or driveway.

3. Median Openings

c. Overview

Median openings on divided roadways should be provided at all signalized at-grade intersections. They also are generally provided at unsignalized junctions of arterials and collector streets. They may be provided at driveways, where they will have minimum impact on roadway flow.

d. Recommendation

The access criteria shown in Exhibit III-1 recommend median opening spacing. These criteria apply to principal arterials that have a divided cross section. The criteria in non-urban areas would require a spacing of ½-mile for full median openings and ¼-mile for directional median openings. On principal arterials in urban areas, there would be greater flexibility with shorter spacing allowable for roadways with lower posted speeds (less than 45 mph).⁵

The following general guidelines are suggested for implementing the criteria for median openings on divided roadways:

- The spacing of median openings for signalized intersections should reflect traffic signal coordination requirements and the storage space needed for left turns.
- Ideally, spacing of openings should be conducive to future signalization, if it is ultimately needed.
- Median openings for left-turn entrances (where there is no left-turn exit from the driveway) should be spaced to allow sufficient storage for left-turning vehicles.

⁵ The “Median Handbook,” prepared by the District Median Task Team at Florida Department of Transportation, January 10, 1997, is one of the best resources on median openings.

- Median openings should be set far enough back from nearby signalized intersections to avoid possible interference with intersection queues.
- In all cases, storage for left turns and the necessary deceleration distance must be adequate.

4. Unsignalized Access (Driveways and Intersections)

e. Overview

Unsignalized access, whether at a public street or a private driveway, is far more common than signalized intersections. They affect and serve all kinds of activity from residential areas to large activity centers. It must be remembered a driveway is an intersection and should be designed as such.

AASHTO defines intersection as the general area where two or more roadways join or cross. With respect to access management, AASHTO specifically states: "Driveways should not be situated within the functional boundary of at-grade intersections. This boundary would include the longitudinal limits of auxiliary lanes." While AASHTO does not present guidelines as to the size of the functional area of an intersection, logic indicates that it must be much larger than the physical area.

f. Recommendation

The recommended access criteria for unsignalized access spacing is shown in Exhibit III-1; on expressways it is ½ mile, on principal and minor arterials it ranges from 660 feet in non-urban areas to 200 feet in urban areas on minor arterials with a speed limit of less than 45 mph. On principal arterials in urban areas with a speed limit of greater than 45 mph, there is greater flexibility in unsignalized access spacing on divided facilities; the minimum spacing is 500 feet compared to 660 feet on a roadway with no median. This takes into account that on a divided facility, an unsignalized access would be limited to right turns in and out, unless other, more stringent criteria were satisfied (i.e., median opening and signal spacing). For discussion purposes, on urban collectors that serve primarily through traffic a spacing of 150 feet is shown for lower posted speeds and 350 feet for higher posted speeds.

g. Background

Various conditions may be considered in the location of unsignalized access. These include sight distance, conflict overlap, and maneuvering or deceleration distance.

Stopping sight distance must be maintained in all situations, including driveways. The conflict of turning vehicles entering the major roadway should be limited to one conflict (driveway) at a time. In addition, the deceleration distance (functional area) should be long enough to limit speed differentials to

no more than 10 mph. Exhibit III-5 presents both suggested minimum and preferred minimum distances that were considered in selecting the draft South Dakota access criteria for discussion.

Exhibit III-5: Driveway Spacing (Feet)

Speed (mph)	Stopping Sight Distance		Driveway Spacing ¹		Functional Area ^{1,2}
	Minimum	Preferred	Minimum	Preferred	
30	200	200	100	185	200
35	225	250	160	250	225
40	275	325	210	300	250
45	325	400	300	350	280
50	400	475	---	---	350
55	450	550	---	---	425

¹ Adapted from: National Highway Institute, *Access Management, Location, and Design*, NHI Course No. 15255, 1998.

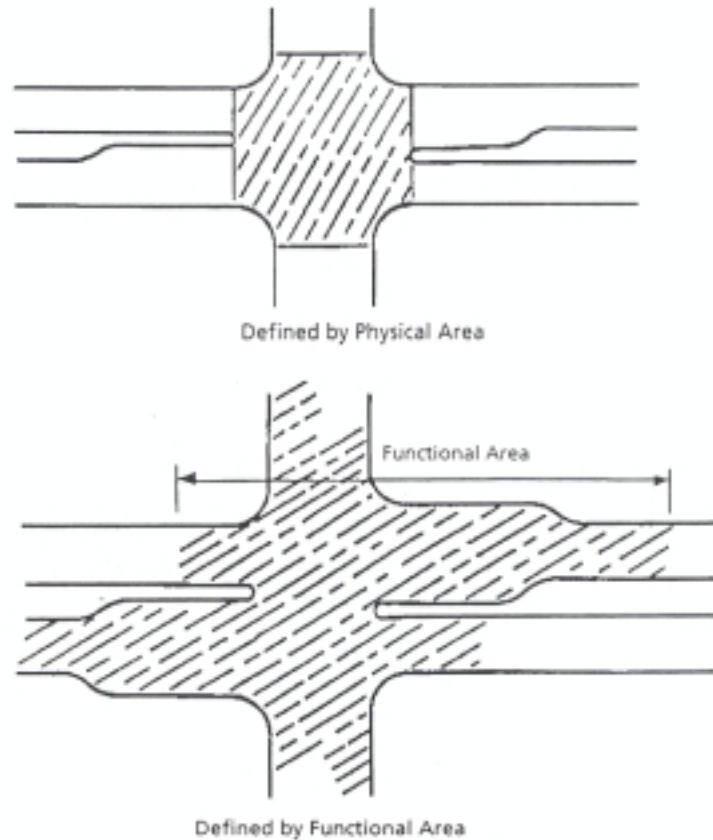
² 50 ft. of storage has been added to the deceleration length.

The following discussion of the functional boundary of intersections and stopping sight distance further explains the need for adequate spacing.

(1) Functional Boundary of Intersections

- The functional boundary of an intersection should include all required storage lengths for separate turn lanes and for through traffic, plus any maneuvering distance for separate turn lanes. The minimum maneuvering distance assumes that the driver is in the proper lane and only needs to move laterally into an adjacent right or left-turn lane (see Exhibit III-6).

Exhibit III-6: Intersection Area



Traffic operational factors leading toward longer spacing of driveways (especially medium and higher-volume driveways) include weaving and merging distances, stopping sight distance, acceleration and deceleration rates, and storage distance for back-to-back left turns.

Spacing standards for unsignalized driveways should complement those for signalized driveways. Ideally, potentially high volume unsignalized access points should be located where they conform with signal spacing. However, this is frequently impractical. Unsignalized access spacing should be established to preserve highway function and maintain safe operations.

Strict application of traffic engineering criteria may place desirable spacing requirements at 500 feet or more. However, such spacing may be unacceptable for economic development in many suburban and urban environments, where development pressures result in a typical 100 to 200 foot spacing. This increase in access density can almost double the crash rates, thereby making the longest possible spacing desirable. These crash rates vary by cross section and by urban/rural. As an approximate indicator of the order of magnitude for undivided facilities in urban/suburban areas, the accident rate for 60 total access points per mile (about 180 foot spacing) is 10 accidents per million vehicle

miles, as compared to 5.6 for 20 total access points per mile (about 500 foot spacing).⁶

(2) Stopping Sight Distance

- Stopping sight distance is the minimum that should be provided at any access point. This will allow a driver in the through lane to bring a vehicle to a safe stop in the event a vehicle enters the through lane from an access drive. Intersection sight distance is intended to allow a vehicle to enter the roadway without requiring undue deceleration of vehicles in the through traffic lanes. Intersection sight distances that require no reduction in speed or a reduction of no more than 10 mph are substantial and can constitute the most severe limitation on minimum access spacing. Individual sight distances can be obtained from the South Dakota Road Design Manual.

3. Corner Clearance

a. Overview

Corner clearance is the distance between a private access drive and the nearest crossroad intersection. It should provide drivers with adequate perception-reaction time to assess potential downstream conflicts and is aimed at preventing the location of driveways within the functional area of an intersection.

a. Recommendation

To maintain simplicity, it is recommended that the unsignalized access spacing be used as the basis for corner clearance. This is the approach that has been taken by Colorado Department of Transportation (Colorado DOT). Note that situations where property frontage does not allow for the criteria to be met, and where there is no alternative access must be accommodated as part of the access permit process.

b. Background

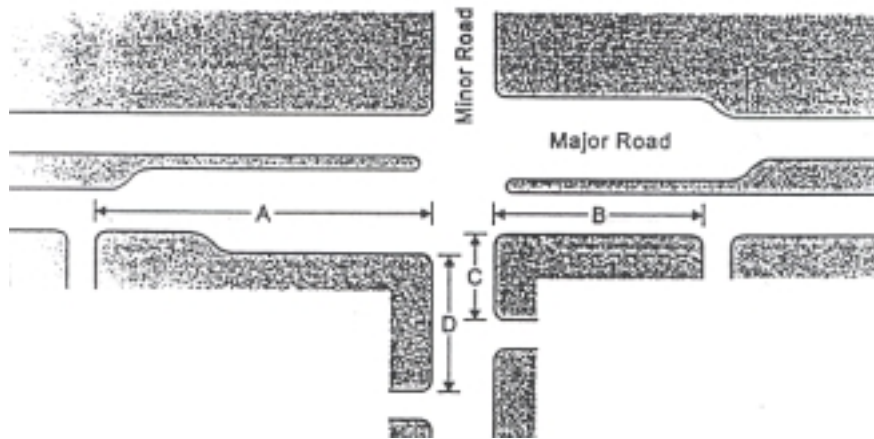
Corner clearance will also minimize driveway/intersection conflicts by preventing blockage of driveways upstream of an intersection due to standing traffic queues. Minimum driveway setback distances should take into consideration typical traffic queue lengths while permitting sufficient movement to driveway vehicles. Corner clearances are applicable to all categories of roadways. The unsignalized access spacing may be used as the corner clearance criteria, or a separate set of criteria established.

The amount of clearance could vary depending on the classification of the intersecting streets and whether the clearance is upstream or downstream from

⁶ See NCHRP Report 420, Figure 24, pp. 57.

the intersection. Exhibit III-7 is a schematic of an intersection that indicates the various clearances.

Exhibit III-7: Corner Clearance



Clearance upstream on the major road (A) equals the upstream area of influence (see Exhibit III-6). The area of influence includes necessary storage for left or right-turning vehicles, whichever is the larger, plus a perception-reaction distance and a deceleration distance. Exhibit III-8 presents both desirable minimum and acceptable minimum upstream distances.

Exhibit III-8: Upstream Intersection Area¹, Excluding Storage, in Feet

Speed (mph)	Desirable Conditions ²		Limiting Conditions ³	
	Deceleration ⁴	PIEV Plus Deceleration ⁵	Deceleration ⁴	PIEV Plus Deceleration ⁵
30	225	315	170	215
35	295	370	220	270
40	375	490	275	335
45	465	595	340	405
50	565	710	410	485
55	675	835	485	565
60	785	960	565	650

¹ All distances rounded to 5 ft.

² 2.0 second perception-reaction time; 3.5 fps² average deceleration while moving laterally into turn lane, 6.0 fps² average deceleration thereafter; speed differential < 10 mph.

³ 1.0 second perception-reaction time; 4.5 fps² average deceleration while moving laterally into turn lane, 9.0 fps² average deceleration thereafter; speed differential < 10 mph.

⁴ Distance to decelerate from through traffic speed to a stop while moving laterally into a left-turn or right-turn lane.

⁵ Distance traveled during perception-reaction time (PIEV—Perception Identification Evaluation Volition) plus deceleration distance.

Source: National Highway Institute, *Access Management, Location, and Design*, NHI Course No. 15255, 1991.

Downstream corner clearance on the major road (B) is a function of speed and should conform to the unsignalized access spacing criteria that are established.

Upstream corner clearance on a minor road (C) should be of sufficient length to minimize the possibility that the driveway will be blocked by the minor road queue. Although blockage of the egress movement may be bad for driveway traffic, it does not present a traffic problem. However, blockage of an ingress maneuver presents a serious operational problem. When there are numerous turns from the minor street to the driveway, traffic backups may extend into the intersection and seriously interfere with traffic movement on the major street. A queuing or storage analysis should be performed to determine the necessary distance.

Downstream corner clearance on a minor road (D) becomes a safety issue. The proximity of a downstream point of access may require speed changes by the driver on the road. If the intersection with the major road is unchannelized, the minimum corner clearance should be 120 feet. If the intersection is channelized, the radius of the curb return affects the turning speed, thereby affecting the clearance distance. For radii of 50, 75, and 100 feet, respectively, the downstream corner clearance should be 200, 230, and 275 feet.

4. Continuous Two-Way Left-turn Lane

c. Overview

A two-way left-turn lane (TWLTL) removes left-turning vehicles from the through lanes and stores those vehicles in a median area until an acceptable gap in opposing traffic appears. The two-way left-turn lane completely shadows turning vehicles from both directions of through lane traffic streams.

d. Recommendation

Two-way left-turn lanes should be considered on roadways where numerous, closely spaced, low-volume access connections already exist. Projected major road volumes should be up to 24,000 vehicles per day and/or access density should be at least 60 driveways and/or local streets per mile. Two moderate to high volume access points should not be located in close proximity to each other. The preferred lane width in South Dakota is typically 12 feet but can range from 11 to 16 feet. The width should not exceed 16 feet, thereby precluding the possibility of side-by-side left turns.

When considering whether to convert two-way left-turn lanes to raised medians and when to convert from an undivided cross section to a median we refer the reader to NCHRP 395 for guidance (NCHRP 395, Capacity and Operational Effects of Midblock Left-Turn Lanes, 1997). Variables that are considered in NCHRP 395 include number of through lanes, ADT, type of land use, access point density, and left-turn percent per ¼ mile.

C. Access Design Criteria

The design of an access drive should permit the safe and efficient processing of all types of vehicles from public roadways onto access drives and into parking areas. This involves establishing adequate length and taper of auxiliary turning lanes; driveway turning radii, width, and storage; and the appropriate traffic controls. Therefore, the following design criteria are addressed by these recommendations:

- Turn lane warrants.
- Turn lane design.
- Driveway design.
- Driveway profiles.
- Frontage roads.
- Two-lane roadways, alternative turning improvements.

The following objectives guide the recommended access design criteria:

- Preserve the traffic carrying integrity of roadway being accessed.
- Minimize the speed differential between through vehicles and those using the driveway.
- Minimize the number of conflict points, especially those associated with more severe accidents or greater accident frequency.
- Eliminate the encroachment of turning vehicles on to adjacent lanes.
- Provide adequate sight distance for vehicles entering and exiting the driveway.
- Provide sufficient storage within the driveway to prevent spillback onto public streets or into site parking areas.

Research has shown that crash potential increases as the difference in speeds between vehicles in a traffic stream increases. Other research has shown that common driveway geometrics result in high-speed differentials between turning vehicles and following through traffic.

All reasonable combinations of driveway curb return radii and throat width have been found to produce a speed differential which is essentially equal to the speed of traffic in the through lanes. Approximately 65 percent of the vehicles involved in rear-end accidents were traveling at a difference in speed of over 10 mph. Thus, it must be concluded that auxiliary left-turn and right-turn lanes (bays) are the only means of effectively controlling the speed differential between turning vehicles and other traffic on major roadways.

2. Turn Lane Warrants

Auxiliary lanes for left and right turns allow turning vehicles to leave the through traffic lanes while minimizing interference with through traffic and also provide storage for vehicles waiting to complete the turn maneuver.

AASHTO states: “Deceleration lanes always are advantageous, particularly on high speed roads, because the driver of a vehicle leaving the highway has no choice but to slow down on the through traffic lane if a deceleration lane is not provided. The failure to brake by the following drivers because of a lack of alertness causes many rear-end collisions.”⁷

The following provides recommendations for:

- Left-turn bays, and
- Right-turn bays.

a. Left-turn Bays

(1) Overview

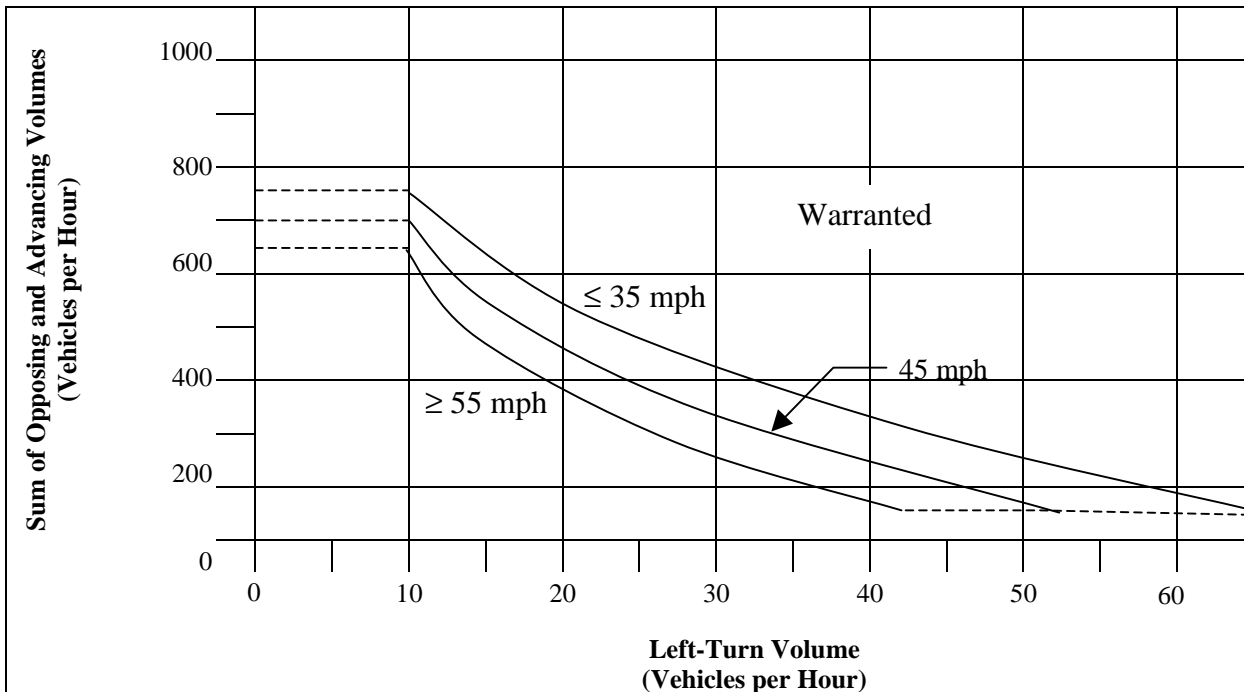
- Left-turn bays should be provided on two lane and undivided roadways where through and turning volumes create an operational or a potential accident problem. The Exhibit III-9 provides a recommended warrant for left-turn bays.

(1) Recommendation

- The volume warrant recommended for consideration is based on the experience of Oregon Department of Transportation (Oregon DOT). This is preferred over other states’ practices (such as Colorado) because more parameters than volume are considered. It considers speed, the total volume (the sum of advancing and opposing) on the road, and the left-turn volume.
- Exhibit III-9 presents a nomograph of the volume warrant. This warrant includes more operational factors than the left-turn volume criteria currently in the South Dakota Road Design Manual.

⁷ AASHTO, *A Policy on Geometric Design of Highways and Streets*, 1994, p. 750.

Exhibit III-9: Warrants for Left Turn Bays



Source Oregon DOT Policy Manual 1999

- It should be noted that we recommend that a separate left-turn bay is not required on roadways that have a peak hour volume that is less than 150. It should also be noted that, depending on speed, the recommended warrant requires a left-turn bay on roadways that exceed the indicated volumes.
- A separate left-turn bay may be warranted if five or more reported intersection related accidents have occurred within a 12-month period.

(2) Background

- AASHTO provides tabular guidelines for left-turn lanes on two-lane highways that consider speed, the opposing volume, the advancing volume, and what percent of left turns are in the advancing volume.⁸
- Colorado DOT requires a separate left-turn lane on NHS routes, if the projected peak hour left turning volume from the arterial is greater than 10 vehicles per hour. On non-rural principal highways, the Colorado DOT requirement is to install a separate left-turn lane if left-turn volumes are greater than 10 vehicles per hour. For an urban minor arterial, Colorado's requirement is left-turn volumes greater than 25 vehicles per hour. If the posted speed limit is greater than 40 mph, the left-turn volume requirement drops to greater than 10 vehicles per hour.

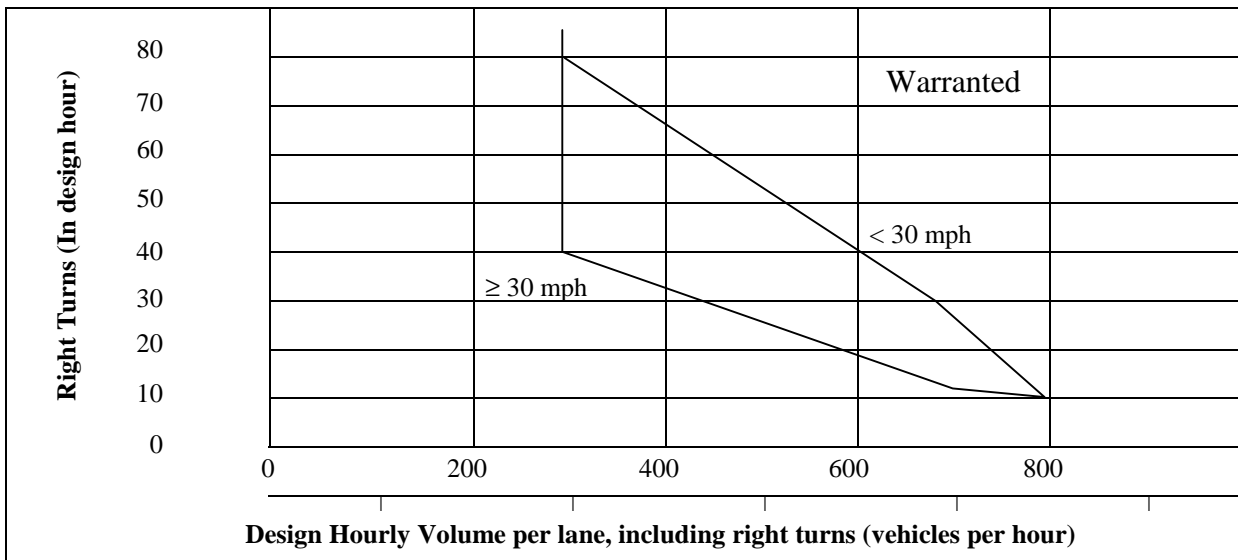
⁸ AASHTO, *A Policy on Geometric Design of Highways and Streets*, 1994, p. 743.

b. Right-turn Bays

(3) Overview

- Warrants for right-turn bays are not as universally adopted as for left-turn bays. Colorado DOT and Oregon DOT are two agencies that have adopted right-turn bay warrants. However, many states follow a practice of striping right-turn bays where wide shoulders are already present. Oregon DOT, as shown in Exhibit III-10, considers in its right-turn bay warrant the speed, right-turn volume, and the approaching per lane design hourly volume. The Oregon warrant also indicates that “The addition of a right-turn lane may be considered anywhere adequate pavement width is available.”

Exhibit III-10: Warrants for Right Turn Bays



Source: Oregon DOT Policy Manual 1999

- For arterial type roadways, Colorado warrants the installation of a separate right-turn bay if the projected right-turn volume from the arterial exceeds 25 vph.

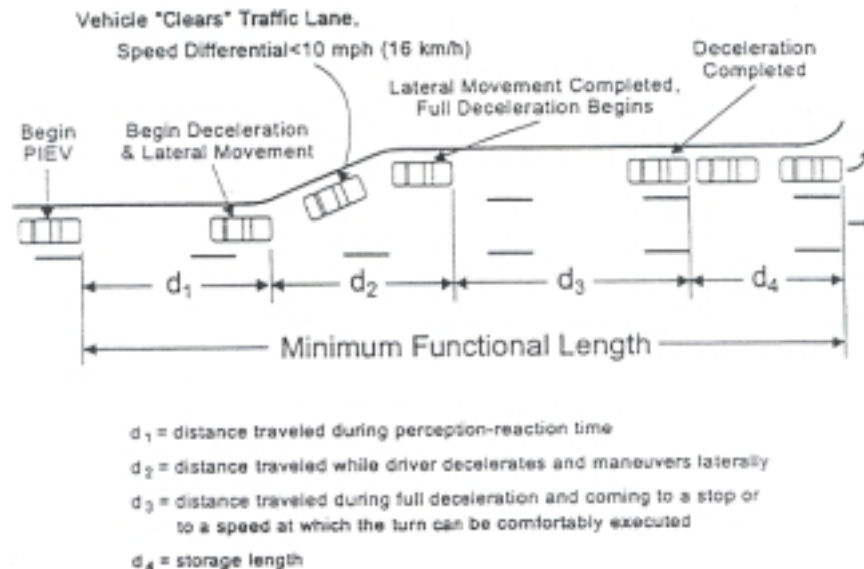
(4) Recommendation

- Consideration should be given to adopting Oregon’s right-turn bay warrant. A separate right-turn bay may be warranted if five or more reported accidents, of the type susceptible to correction by a right-turn bay, have occurred within a 12-month period.
- Similar to the left-turn bay warrants, the procedure includes additional factors to those currently contained in the South Dakota Road Design Manual.

3. Turn Lane Design

Once it has been determined that a turn bay is warranted, or should be provided, the question becomes: "How long should it be?" The elements of a left-turn bay, and thereby the functional area of the intersection approach, are the same as for right-turn bays and are shown in Exhibit III-11.

Exhibit III-11: Upstream Functional Area



Source: NHI, *Access Management, Location, and Design*, NHI Course No. 15255, 1998.

The physical length of the turn bay excludes the distance traveled during perception-reaction time. The following considerations should guide the design:

- It should be designed so that a turning vehicle will develop a speed differential of 10 mph or less at the point it clears the through traffic lane.
- The length of the bay should allow the vehicle to come to a comfortable braking stop prior to reaching the end of the expected queue in the turn bay.
- The deceleration/maneuver distance is $d_2 + d_3$ in Exhibit III-11. The queue storage length can be found using the procedures described later.
- Other conditions that may influence the length of a left-turn bay are the queue length in the through lane and vertical or horizontal alignment. The left-turn bay should be longer than the queue in the adjacent through lane so that entry is not blocked—especially if there is a leading green left-turn arrow.
- The beginning of the left-turn lane should not be obscured by a vertical or horizontal curve. In some cases it may be necessary to extend the turn bay so that it is visible to drivers before they need to begin their lateral movement.

- Taper distance, d_2 in Exhibit III-11, is 10:1 for single turn lanes and 7.5:1 for dual turn lanes.

PIEV in Exhibit III-11, which stands for perception, identification, evaluation and volition, is the perception-reaction distance.

The following recommendations are made for storage length and lane width for turn lane design.

a. Storage Length

(5) Overview

- The required length of vehicle storage for turning lanes depends on several factors. These include:

Whether the lane is for left or right-turning vehicles.

The type of traffic control.

If signalized, the signal timing and cycle length.

The number of turning vehicles.

- The number of other vehicles on the approach.
- Where traffic is to be controlled by a traffic signal, the auxiliary lane ideally should be of sufficient length to (1) store turning vehicles or (2) clear the equivalent lane volume of all other traffic on the approach, whichever is the longest. An equivalent lane volume can be obtained by dividing the sum of other vehicles on the approach by the number of available lanes. If separate turn lanes are to be provided, the turning volume is assigned to the separate lane and the remaining through or through and right or left-turning volume is divided by the number of through lanes. This length is necessary to ensure that full use of the separate turn lane will be achieved and that the queue of other vehicles on the approach will not block vehicles from the turn lane.

(6) Recommendation

(a) Signalized

- The storage requirements for left-turn lanes should be based upon peak 15-minute flow rates. The average number of left turns per cycle can then be multiplied by a factor to account for random variations in arrivals. The length of the lane can be estimated, based on the length of cars, the mix of cars and other vehicles, and arrival rate. A commonly accepted procedure for calculating left-turn queue storage, recommended for consideration, is the following:

$$L = VK 25(1 + p)/N$$

- Where:

L = the design length for turn lane storage in feet.

V = the estimated left-turn volume in vehicles per hour (the 15 minute flow rate x 4).

K = a random arrival constant, generally assumed to be 2.0. It implies a failure rate of only 5 percent.

p = percent of trucks or buses.

N = the number of cycles per hour (V/N is the average number of turn vehicles per cycle).

25 = the length in feet per vehicle.

A random arrival factor (K) of 2.0 should be used for left turns and where right turn on red is not permitted. Where right turn on red is allowed, a factor of 1.5 could be used to determine the length of storage for right-turning vehicles. The formula can be used to estimate the storage length (excluding taper) of a double left-turn bay by dividing the volume by 2.0.

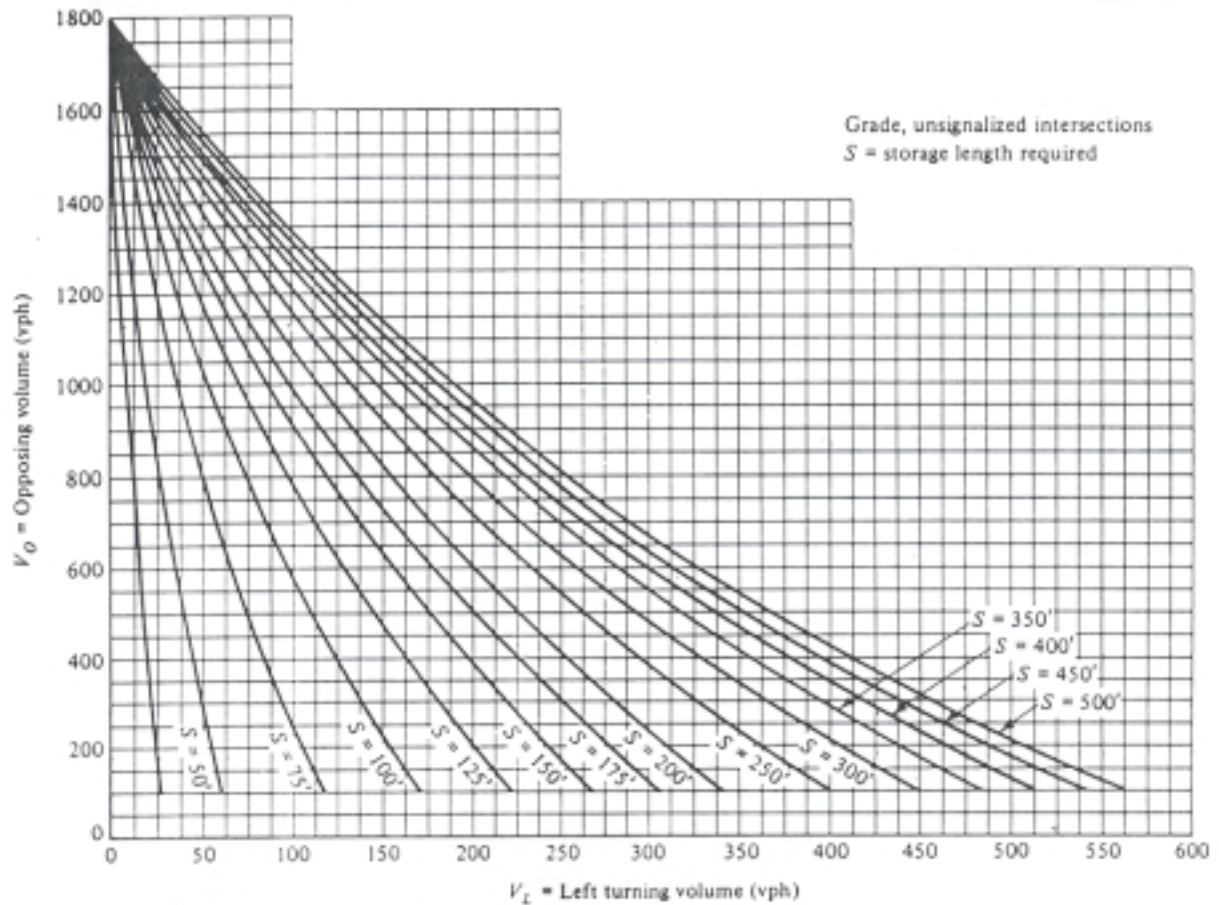
(b) Unsignalized

If the intersection is unsignalized, it is recommended that the nomograph shown in Exhibit III-12 be used. As a practical matter SDDOT will generally provide a minimum storage length of 100 feet.

A separate turning lane consists of a taper plus a full width auxiliary lane. Although vehicular storage is a principal factor used to establish the full length of the separate turn lane, it may not be the actual determining factor. During off-peak traffic periods on higher speed roads, the lane will function as a deceleration lane.

It is recommended that only the desirable length be used for left-turn lanes and that either the desirable or minimum length be used for right-turn lanes. The total length of the separate turning lane and taper should be determined by the combination of turn lane or through lane queue storage plus the distance necessary to decelerate.

It is recommended that a 10:1 bay taper be used to provide a full width separate turning lane for all posted speed limits. If a double right or left-turn lane is to be provided, it is recommended that a 7.5:1 bay taper be used to develop the dual lanes. The short bay taper will allow for additional storage during short duration surges in traffic volumes.



Source: M.D. Harmelink, "Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersection," Highway Research Record 211, 1967

Exhibit III-12: Left Turn Storage at Unsignalized Intersections

b. Lane Width

(7) Recommendation

- The width of auxiliary lanes normally varies between 11 and 12 feet, with a minimum width of 10 feet. Dual left-turn lanes, where provided, will normally require a minimum median width of 26 to 30 feet with minimum lane widths of 11 feet. There should be 28 to 30 feet of road space available to receive the turning vehicles after they pass through the intersection.

5. Driveway Design

a. Overview

Driveways vary widely in their design requirements. A driveway leading to a single residence is usually a simple curb cut that is limited in size. Conversely,

a driveway leading to a major activity center, a shopping center, or a corporate office park is really an arterial street and must be designed as such. All of the principles of good intersection and roadway design should also apply to driveways.

The first step in designing a driveway is the identification of the critical “design vehicle” expected to be accommodated by the facility. It is suggested that the “design vehicle” be the largest vehicle that can be expected to use the facility at least once per day. Not all driveways need to be designed for large semi-trailers. However, the smallest “design vehicle” should be the single unit truck (SU). For residential driveway design the design vehicle should be the passenger car (P). Critical dimensions for various design vehicles have been compiled by AASHTO.

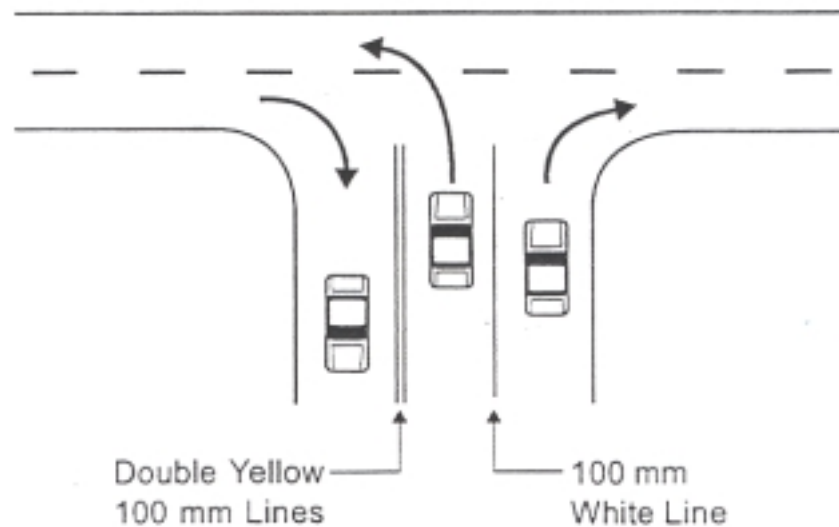
b. Recommendations

The width of driveways should permit vehicles to enter and exit with a minimum of interference to through traffic. Driveway widths and flare or curb radii will be based primarily on the speeds of traffic on the roadway and the volumes and types of vehicles using the access facilities. The width should be restrictive enough to discourage maneuvers that would cause conflicts. On the other hand, driveways must be wide enough so that vehicular conflicts do not occur in the driveway or on the roadway. Access widths in South Dakota range from 24 feet to 40 feet where there are higher turning volumes or a significant number of trucks. Sixteen-foot widths may be used on narrow existing driveways or alleys. The SDDOT Standard Plates should be consulted for specific details.

If a vehicle is stopped in a driveway while waiting for a gap in traffic on the major road, a large curb return radius will minimize encroachment onto other lanes. This is true for vehicles exiting and entering the driveway. At driveways with a curb return radius of less than 10 feet, drivers tend to make a wider turn using the roadway and the available throat width to compensate for the smaller radius. A radius of 15 feet, with 25 feet desirable, will minimize lane encroachment. This is especially important at commercial driveways.

Where left turns are permitted from commercial driveways, separate left-turn and right-turn lanes should be considered. Even a small number of left turns will cause substantial delay to right turns when the access drive has a single exit lane. Left-turn capacity is low even with moderate volumes (300 to 600 vph) on the abutting roadway. Customer convenience is enhanced if left-turning vehicles are able to utilize all suitable gaps in the traffic streams and right turns do not have to wait for a preceding left turn to clear the driveway. Exhibit III-13 illustrates a desirable 3-lane driveway. The inbound lane should be at least 14 feet wide and the two outbound lanes should be 11 or 12 feet wide.

Exhibit III-13: Three-Lane Driveway Cross-Section



Inadequate throat length results in poor traffic operation in the vicinity of the access drive. This produces congestion and high crash rates on the abutting street as well as on-site. The driveway throat must be of sufficient length to enable the intersection at the access connection and abutting roadway, and the intersection of the access road and the on-site circulation road to function without interference with each other. Drivers entering the site should first clear the intersection of the roadway and access connection before encountering the intersection of the access connection and on-site circulation.

The exit side of an access connection should be designed to enable traffic leaving the site to do so efficiently. Stop controlled commercial connections should be of sufficient length to store a minimum of two passenger cars. This will greatly reduce move up time and allow two cars to exit using a gap that would otherwise accommodate a single car. Signalized connections should be of sufficient length so that exiting vehicles operate at a constant minimum headway when crossing the curb lane.

The following general guidelines are suggested:

- Storage distances of at least 50 feet should be provided for “minor driveways” serving developments that are estimated to generate between 50 and 400 vehicle trips per day. Development that will generate predominantly truck traffic should be subject to additional queuing storage analysis.
- Storage distances of at least 150 feet with at least two exit lanes should be provided for developments that generate over 400 vehicle trips per day or over 40 vehicle trips during the roadway’s peak traffic hour. Large developments should require a queuing or storage analysis to determine necessary storage lengths.

6. Driveway Profiles

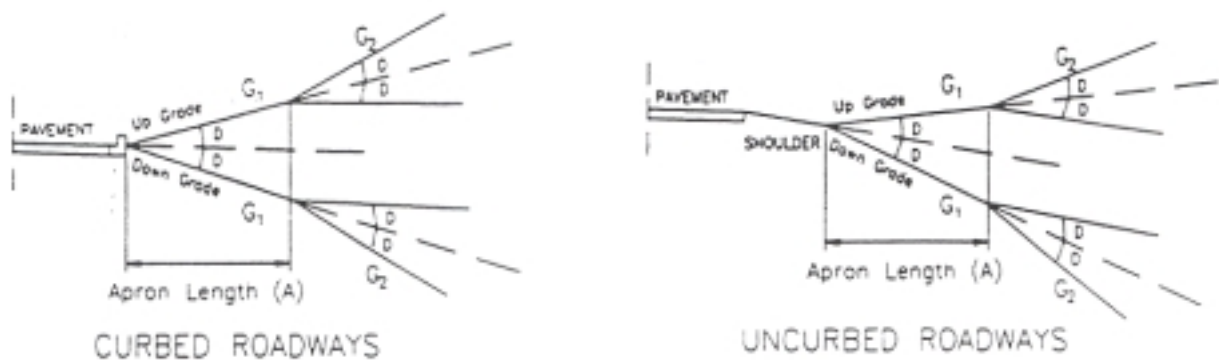
a. Overview

The vertical alignment of a driveway must provide a smooth transition between the driveway and the roadway to which access is provided—especially in the absence of a right-turn bay. In all cases, the profile must provide sufficient vertical clearance between the surface and the vehicle. Access drives on major streets should permit the driveway maneuver to be made smoothly and comfortably at a forward speed of at least 10 mph.

c. Recommendation

A long-standing criterion, which is recommended for consideration, has been that the maximum change in grade without a vertical curve should be three percent (see Exhibit III-14). With the apron lengths shown in Exhibit III-14, normal construction practice will provide an appropriate profile. The apron length should be increased where steep grades (G_2) are encountered. Maximum driveway grades (G_2) within a distance of twice the apron length or edge of pavement on uncurbed roadways should not exceed 5 percent on driveways intersecting major or minor arterials, 6 percent on collectors, and 8 percent on local roads. The 8 percent maximum could also apply to very low volume approaches. However, 10 percent would be the maximum grade for farm and field entrances. The absolute minimum grade should be at least 0.5 percent for low volume driveways and a desirable minimum should be one percent for all driveways.

Exhibit III-14: Vertical Geometrics for Driveways



(ii) Recommended Design Values			
Roadway Classification	Apron Length ¹ (A)	Grade Change (D)	
		Desirable	Maximum ²
Major Arterial	≥ 25 ft.	≤ 3 %	5 %
Minor Arterial	≥ 20 ft.	≤ 4 %	5 %
Collector	≥ 15 ft.	≤ 5 %	6 %
Local	≥ 10 ft.	≤ 6 %	8 %

Source: NHI, *Access Management, Location, and Design*, NHI Course No. 15255, 1998.

¹On curbed roadways a concrete approach pavement of ≥ 5 feet should be used. (See SDDOT Standard Plates).

²Ten percent maximum for farm and field entrances.

7. Frontage Roads

a. Overview

Frontage or service roads provide increased access to developments and reduce marginal conflicts along roads where access is not fully controlled. However, they complicate intersections along arterial streets and, unless carefully designed and selectively applied in both new designs and in retrofit situations, they may prove counterproductive.

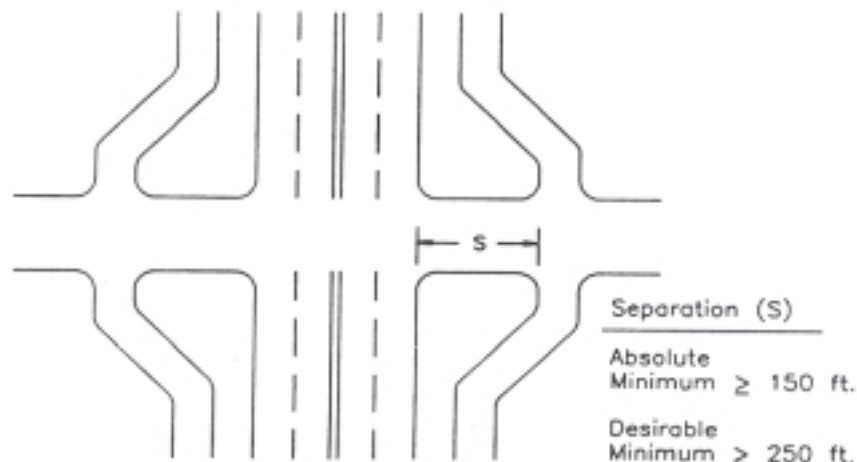
As an access control measure, frontage roads provide two main functions:

- They segregate the local traffic from the high speed through lanes. Traffic can circulate between the various commercial establishments without interfering with through traffic.
- They intercept the access drives serving the roadside properties and thereby reduce the number of conflict points on the main roadway. The resulting spacing between the intersections with the main roadway facilitates the design of auxiliary lanes for deceleration and acceleration.
- However, severe traffic problems can still be encountered, even with moderate frontage road and crossroad volumes. These problems can be minimized by incorporation of horizontal curves in the frontage road design to increase the separation between the intersections of the crossroad-frontage road and crossroad-main roadway as illustrated in Exhibit III-15.

b. Recommendations

As indicated in the South Dakota Road Design Manual, a separation of at least 150 feet is necessary to reduce the interference of the frontage road intersections on the crossroad-main highway intersection. A more desirable separation of 250 feet or greater creates a “buildable” site suitable for a service station, fast food restaurant, or convenience store. These land uses should have access only to the frontage road.

Exhibit III-15: Frontage Road Alignment



The following guidelines should be considered in installing arterial frontage roads for both new developments and retrofit situations.

- The separation of frontage roads at cross streets should be maximized to ensure sufficient storage for crossroad traffic between the frontage roads and the arterial. The desirable minimum separation should be 250 feet. This dimension is about the shortest acceptable length needed for placing signs and other traffic control devices.
- A minimum outer separation of 20 feet should be used to provide space for pedestrian refuge and safe placement of traffic control devices and landscaping.
- Where major activity centers front along an arterial roadway, frontage roads should be incorporated into the site's internal circulation system or otherwise eliminated.
- Pedestrian and bicycle movements should use the frontage roads. Parking may be permitted where the frontage roads traverse residential areas.

An alternate to an adjacent frontage road is a reverse frontage road. This technique locates the frontage, or service road, one land parcel away from the

arterial. All land access is provided by the service road. The reverse frontage road concept can be applied in newly developing areas to create a network of controlled access arterials. Access along arterial streets is limited to specifically designated locations that fit the traffic signal progression pattern. Arterial road intersections would be located at intervals of 0.5 to 1.0 miles or be part of the local street system. Land uses between the arterial and the “reverse frontage road” can range from residential to office to retail. Residential properties can be buffered from arterial traffic, and parking for office or retail developments can be located behind the buildings.

8. Sight Distance

a. Overview

Sight distances greater than the safe stopping sight distance must be maintained on all roadways and access drives. Intersection sight distance should be provided at all signalized and unsignalized intersections, including driveways.

d. Recommendation

The guidance in the South Dakota Road Design Manual for both stopping and intersection sight distance should continue to be applied. A sight triangle which is sufficient to provide adequate intersection sight distance must be kept free of all obstructions that could interfere with the line of sight. The best way to ensure this is to require a dedication of the sight triangle as part of the right-of-way. However, the more common practice is to attempt to keep the sight triangle free of obstructions through regulation.

Access drives should not be permitted where the sight distance is inadequate to allow an approaching motorist to come to a safe stop if needed.

9. Two-Lane Roadways—Shoulder Bypass Lanes

e. Overview

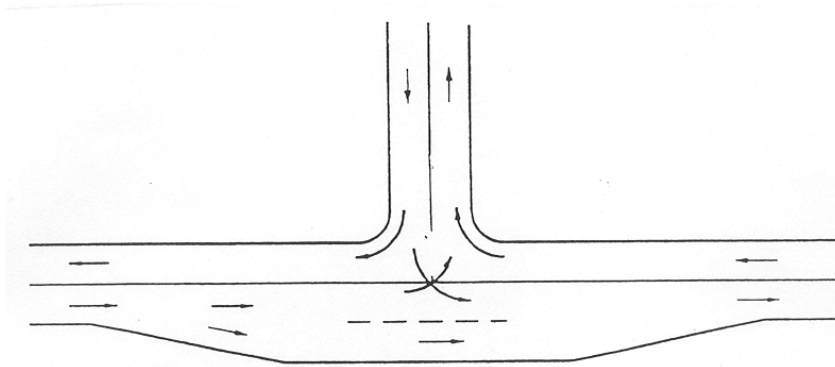
Shoulder bypass lanes are a low cost alternative to intersection turn lanes for reducing delays to through traffic caused by left-turning vehicles. Where a side road intersects a two-lane highway at a three-leg or T-intersection, a portion of the paved shoulder opposite the intersection may be marked as a lane for through traffic to bypass vehicles making left turns. This technique is applicable to locations with physical constraints and to intersections with left-turn volumes that do not quite meet the volume warrants presented in Exhibit III-9. While used most commonly at unsignalized public road intersections, shoulder bypass lanes may also be used at major driveways. Where an adequate paved shoulder is already available, installation of a shoulder bypass lane may be as simple as remarking the roadway edge line. Marking a bypass lane

encourages drivers to avoid unnecessary delay and assures that the maneuver is legal by designating a portion of the paved shoulder as part of the traveled way.

f. Recommendation

Exhibit III-16 provides a schematic of a typical shoulder bypass lane.

Exhibit III-16: Typical Shoulder Bypass Lane



The minimum width of the bypass lane should be 10 feet with a desirable width of 12 feet. Taper lengths, both approach and departure, should vary by the speed of the road. For speeds of 30, 40, and 50 mph, respectively, the taper lengths should be 100, 150, and 200 feet. The length of the full width section should be 150, 200, and 250 feet, respectively, for 30, 40, and 50 mph roads.

D. Consolidated Access

Adjacent properties abutting major roadways should be encouraged to share a common approach road connection. This will reduce the number of conflict points and separate the conflict areas. The longer spacing between approach road connections will also facilitate the provision of right-turn deceleration bays. The smoother traffic flow on the abutting street will help reduce vehicular crashes and increase egress capacity.

Joint access and interparcel circulation (cross easements) can be readily implemented in the subdivision approval process. Close cooperation between SDDOT and local agencies is needed in developing these joint access requirements as well as in their implementation.

Once subdivision has already occurred, adjacent property owners may be encouraged to share a common access where it can be shown that customer convenience and safety can be improved. Reconstruction, which adds a nontraversable median, or median opening modifications, offers opportunities for encouraging joint access agreements.

Interparcel circulation (cross easements) that permit on-site circulation between adjacent properties decreases the number of vehicle trips that would normally use the abutting roadway. Providing for interparcel trips can reduce traffic volumes on the main roadway and, as important, reduce turning volumes.

Property owners unable to meet driveway spacing standards should be required to provide for joint and cross access easements, wherever feasible. Abutting properties under different ownership are encouraged to comply but generally not required until they redevelop or expand. In the meantime, the applicant should be allowed a temporary driveway.

Flexibility is needed on an administrative level to work with the unique circumstances of each development site. Communities could relax driveway spacing standards for properties that agree to consolidate access, and provide for variances where compliance proves impractical. Some ordinances provide incentives, such as density bonuses, for combining access points, or relax parking and dimensional requirements where necessary to achieve shared access.

The interparcel circulation benefits the public and patrons by providing safer circulation. It benefits the private development by making it more convenient to attract patrons. This convenience and safety helps to attract more business to the area and hence, to each individual business.

E. Access Permits

The access permit application and review process is one of the principal means for the SDDOT to implement the recommended access policy and manage access on the state highway system. Recommended actions for new procedures are presented in Chapter IV of this report.

1. Access Application Procedure

It is recommended that the access application procedure be modified to reflect the importance of access spacing. A comprehensive procedure should consider:

- The classification of the roadway to which access is requested.
- The type of access requested relative to the allowable levels and types of use.
- Relevant spacing criteria.
- Highway and intersection capacity.
- Geometric design considerations.
- The type of proposed traffic control.
- The need, if required, for any variances to permit criteria.

The permit process should include criteria for access denial where alternative access is available, and the alternative is better for overall traffic safety and operation. These criteria would be those shown in Exhibit III-1. Variances may be necessary for exceptions to turning restrictions or spacing criteria where it can be demonstrated that no other reasonable options are available.

The access policy recommends undertaking a traffic impact analysis for access that will generate 100 or more peak hour trips. This will require a two-track procedure. For access permits that do not require a traffic impact analysis the recommended access criteria and design guidelines would apply. Where a traffic impact analysis is required the process would require a different procedure. This will involve applying procedures governing traffic impact analysis.

2. Site Access Design

Poor site access and circulation design is detrimental to both the public investment in the roadway system and the private investment in the developed property adjacent to the roadway. Site plan review by an experienced traffic engineer competent in site access and circulation design can uncover problems in the planning stage when they can more easily be resolved. Problems discovered after the development has occurred may be mitigated only at considerable cost.

Access, site circulation, service vehicle access, parking and building footprint and location are all closely related. Failure to recognize these interrelationships results in poor site circulation, improperly located parking, and access location and design that interfere with safe traffic movement on the public street system in the development's vicinity.

Improved access design results when the access location and design do not interfere with the movement function of the arterial or other street. The design process needs to incorporate access and on-site circulation considerations at an earlier stage and in a more comprehensive manner than is common at present. Many times access location and design, not site traffic volume, create the traffic problem.

Access drives located within the functional area of a nearby intersection will interfere with the operation of the intersection and will create safety and congestion problems. The complexity of overlapping conflict areas will also interfere with site traffic. Customers attempting to exit the driveways will experience difficulty and inconvenience that will discourage their return to the site, especially if they have the opportunity to satisfy their desires at a more convenient location.

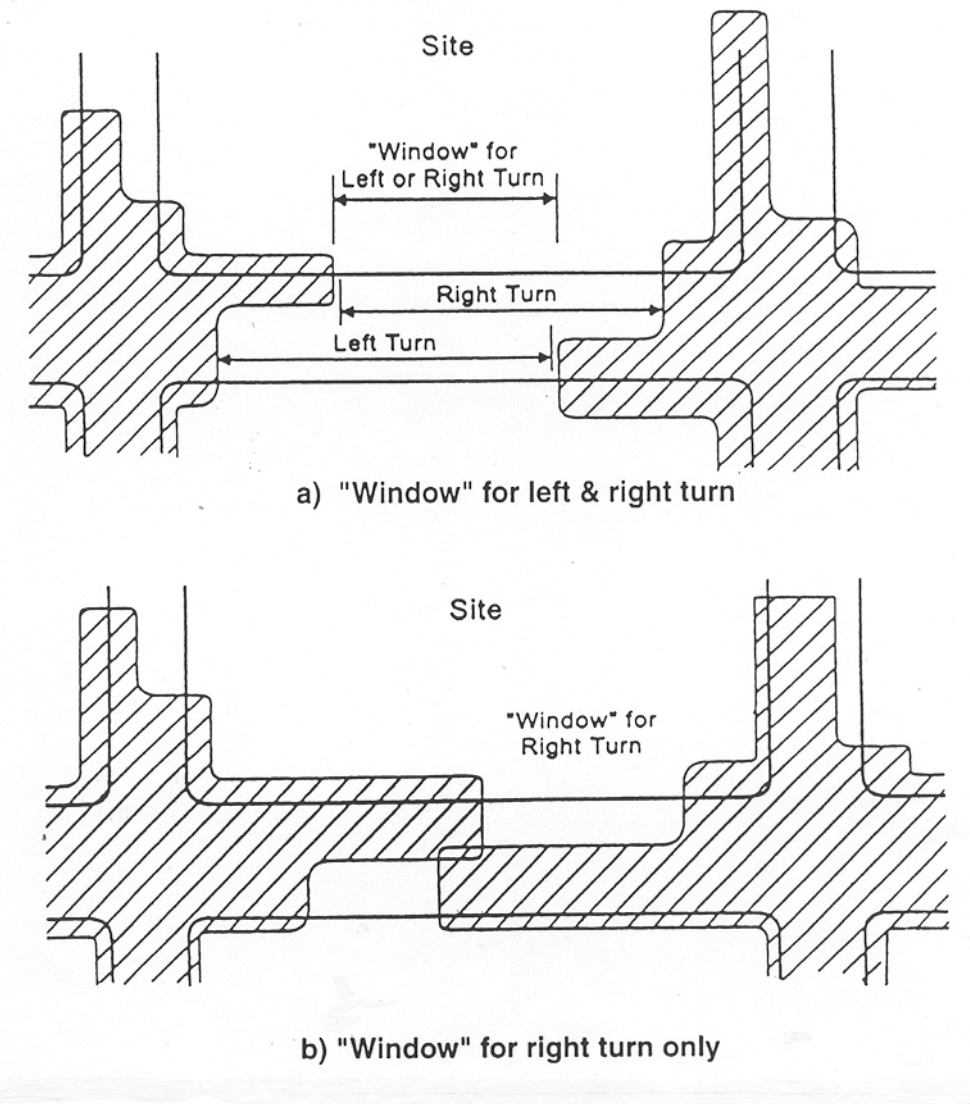
It is recommended that the evaluation of potential site access proceed through the following steps:

- Locate nearby intersections of public streets and private access drives.
- Arrange these intersections in descending order of importance: i.e., arterial-to-arterial being the most important, arterial-collector next in importance, etc.
- Assess the upstream (deceleration plus storage) and the downstream functional areas of each intersection.
- Identify the "window" in which direct access can be provided. The larger the "window" the greater the flexibility in the site design. Keeping in mind traffic queue lengths and upstream functional areas, "windows" are sensitive to changing traffic volumes and intersection traffic control.

Exhibit III-17a illustrates an available "window" for left and right turns.

As the intersection functional areas become closer, direct access should be limited to right-turn in and out only (see Exhibit III-17b). For roadways with ADT exceeding 20,000 or with six or more lanes, installation of a median should be considered. This enforces any desired left turn restrictions. If left-turn to the site is allowed, a separate left-turn lane should be provided to clear the queue of traffic upstream of the nearby intersection. Left-turn from the site should be prohibited because it will be blocked by traffic in the queue. If no access "window" is available, site access should only be provided to secondary roads. If suitable alternative access is not available, the site should be used for activities that will generate less traffic or generate traffic during off-peak periods.

Exhibit III-17: Access "Windows" for Direct Access



Source: NHI, *Access Management, Location, and Design*, NHI Course No. 15255, 1998.

F. Retrofit Techniques

Access management improves traffic safety and protects the public's investment in the road system by preserving its functional integrity. Its focus is to minimize disruptions to the through traffic that would reduce the highway's safety and efficiency. It is best implemented by applying criteria based on established traffic engineering and roadway design principles. However, there may be constraints in built-up areas that would limit the application of the access management criteria. This section provides guidance on access management techniques that can be used in situations where it is not possible to achieve the access criteria. We refer to these as retrofit situations.

2. When and where retrofit should apply

The recommended access location and design criteria describe the desired outcome for access connections. In many locations that are fully developed it may not be possible to achieve these desired conditions. For example, block widths and mid-block alleys in some urban areas may rule out achieving the spacing standards. Elsewhere, there may be many preexisting driveways and patterns of land ownership that make it difficult to achieve the desired access location criteria. In these cases retrofit techniques should be used to the maximum extent feasible to accomplish the access policy goals.

3. General principles for improving access management in retrofit projects

There are a number of principles that can be applied to retrofit situations to support the access policy goals. Access management principles include:

- Limit the number of conflicts.
- Separate basic conflict areas.
- Reduce interference with through traffic due to turns into or out of a site.
- Provide sufficient spacing between at-grade intersections.
- Maintain progressive speeds along arterials.
- Provide adequate on-site storage areas.
- Encourage access to street with the lowest functional classification where an option exists.

Their aim is to reduce the number of access connections (conflict points) and reduce their adverse effects by applying a variety of techniques; in this way the current undesirable situation can be improved. These techniques are divided into two categories—roadway design and access/driveway location and operation—and are discussed below. As feasible, these techniques should be applied both during permit review and as part of retrofit during reconstruction projects.

G. Retrofit Techniques—Access/Driveway Location and Operation

The following retrofit techniques are described below:

- Consolidate and/or relocate driveways.
- Encourage adjacent properties to share access.
- Coordinate driveway locations on both sides of the roadway.
- Maximize corner clearance by locating access as far from the intersection as possible (i.e. near the property line).
- Provide separate left-turn entrances and exits at major traffic generators.
- Install barrier to prevent uncontrolled access along property frontage.
- Install driveway channelizing island to discourage left-turn maneuvers.

1. Consolidate and/or relocate driveways

a. Description

Access connections are eliminated or relocated to reduce the number of conflict points and increase the spacing between conflict points.

Locate access connections on lower-function roadways when conditions allow.

Application

Site specific, on roadways, intended to serve through travel, where there is a large number of access connections per mile.

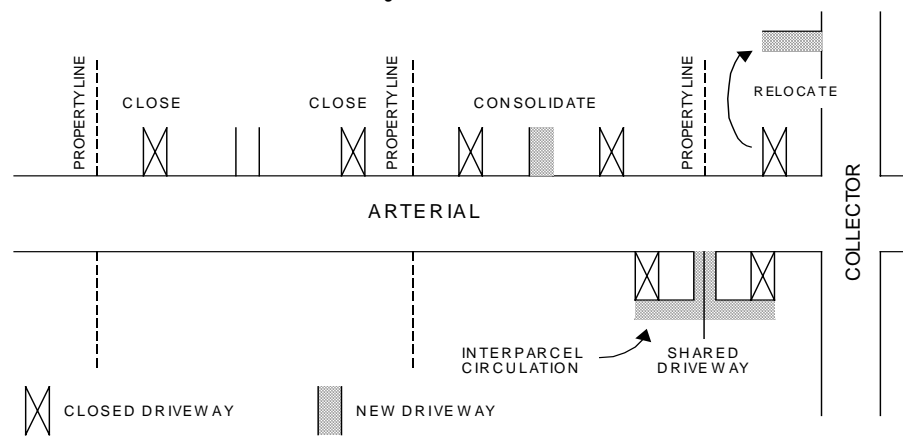
The traffic related to access connections has a significant adverse impact on roadway safety and operations.

Implications

Less driver confusion.

Improved safety.

Exhibit III-18: Driveway Consolidation and/or Relocation



2. Encourage adjacent properties to share access

Description

The provision of a shared or joint use access connection onto a roadway to minimize the number of conflict points.

Application

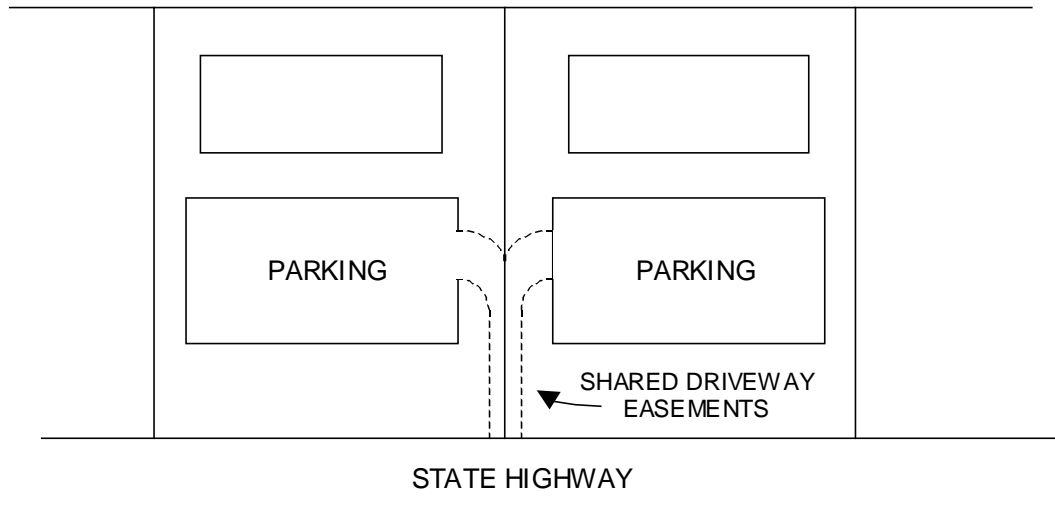
Site specific, where the elevations and nature of the land uses are compatible and local conditions warrant.

Implications

Adjacent land uses should not require separate access connections.

Reduces roadway conflicts and improves safety.

Exhibit III-19: Shared Driveways



3. Coordinate driveway locations on both sides of the roadway

Description

Aligning access connections on opposite sides of a roadway to create a single four-leg intersection or providing a sufficient offset distance between driveways to avoid problems with spillback.

Application

On roadways where there is an excessive number of closely spaced access connections on both sides of the roadway and, as a result, there are safety and operational problems, such as inadequate storage distances for turning traffic.

Increasing offsets applies to low-volume and low-speed roadways.

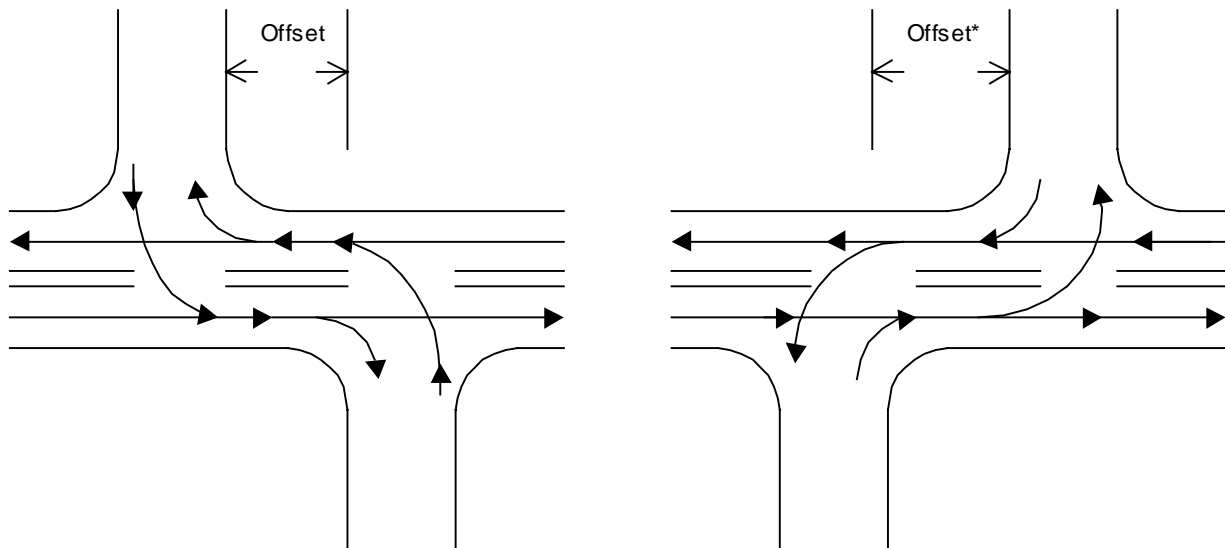
Implications

Reduces conflicting movements along a roadway and improves safety.

Simplifies signalization where traffic signals are involved.

Increases available storage distances.

Exhibit III-20: Driveway Location Coordination



Align driveways or, as shown above, provide sufficient offset distance.

* sum of storage requirements for both left-turn maneuvers on arterial.

4. Maximize corner clearance by locating access as far from the intersection as possible (i.e. near the property line)

Description

Move or locate an access connection and its associated conflict area as far from an intersection as possible.

Application

On the approaches to an intersection where the frontage of the abutting properties would allow the relocation of the access connection to be shifted away from the intersection.

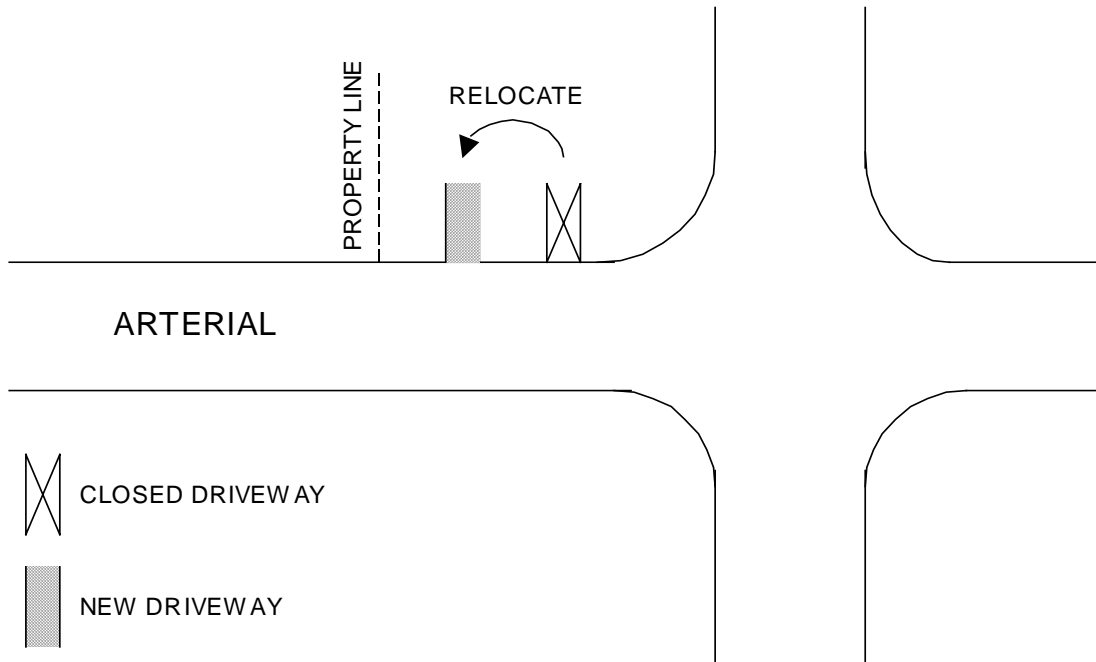
Where there is an access connection upstream of an intersection that is blocked by standing queues that extend from the intersection.

Implications

Reduces driver confusion.

Separates conflicts and improves safety.

Exhibit III-21: Corner Clearance Retrofit



5. Provide separate left-turn entrances and exits at major traffic generators

Description

Replaces either one or two full-movement access connections with two limited-turn connections to separate the left-turn movements to and from the site.

Application

Mainly applicable on divided roadways at regional shopping centers or major traffic-generators with significant left-turn volumes and sufficient frontage to provide for adequate separation distances between the two connections.

Where there is insufficient storage distance for the turning movements at the two or more existing full-movement driveways.

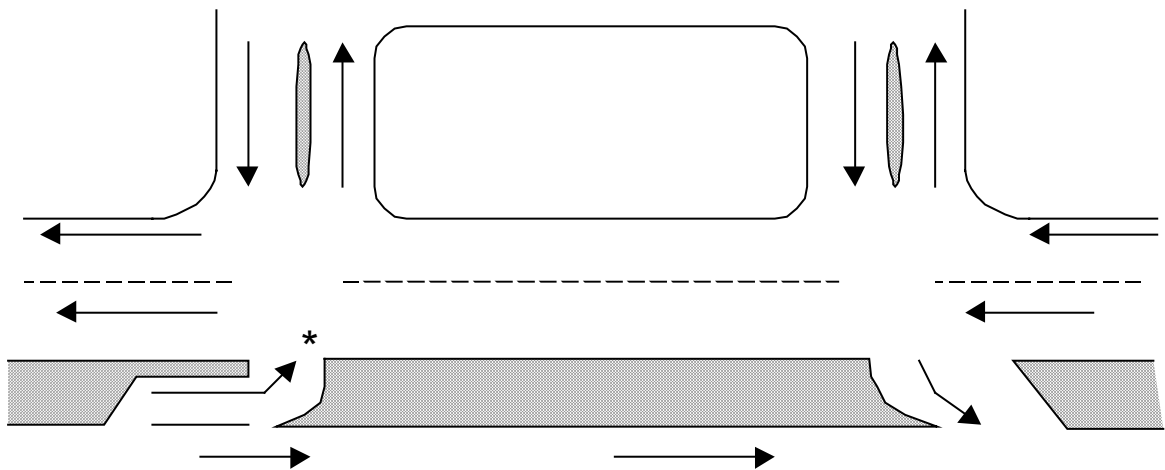
Implications

Reduces conflicts at each location.

Where driveways are signalized, allows for two-phase signal operation.

Disperses entering and exiting traffic within the development site.

Exhibit III-22: Left-turn Entrances and Exits at Major Traffic Generators



* Median opening should be designed to physically prohibit the left turn exit from the development.

6. Install barriers to prevent uncontrolled access along property frontage

Description

The installation of a barrier (i.e. guide rail or curbing) between the edge of a roadway and the parking area to narrow the access connection and reduce the conflict area.

Application

Strip commercial developments where the parking areas are not physically separated from the adjacent roadway and, as a result, the driveway openings are not defined.

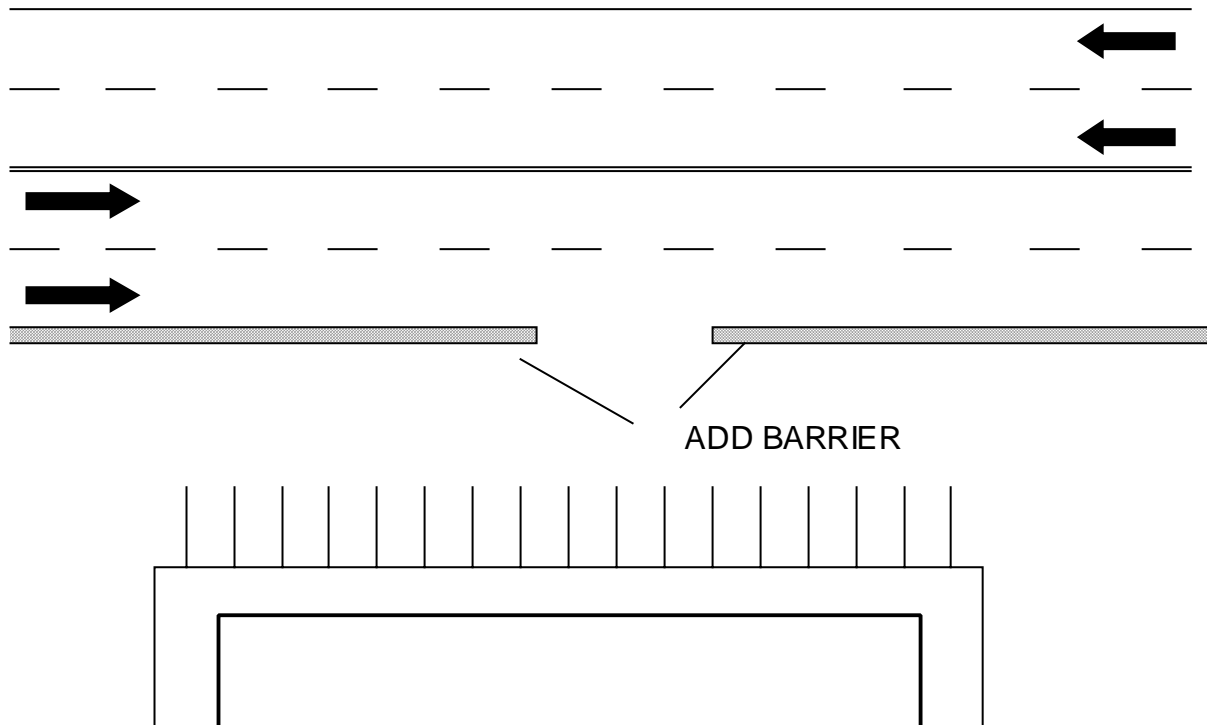
Implications

Defines driveways and improves driveway visibility.

Reduces number of conflicting movement locations and improves safety.

Makes walking easier and safer for pedestrians, and allows for sidewalks.

Exhibit III-23: Installation of Barriers



7. Install driveway channelizing island to discourage left-turn maneuvers

Description

A channelizing island is used in a driveway throat at its intersection with a roadway to restrict selected left-turn movements and limit the basic crossing conflicts.

Application

Where left turns are undesirable and there is a need to restrict driveway movements to right-in/right-out on undivided roadways.

Where there is a high accident rate or frequency related to left-turn movements.

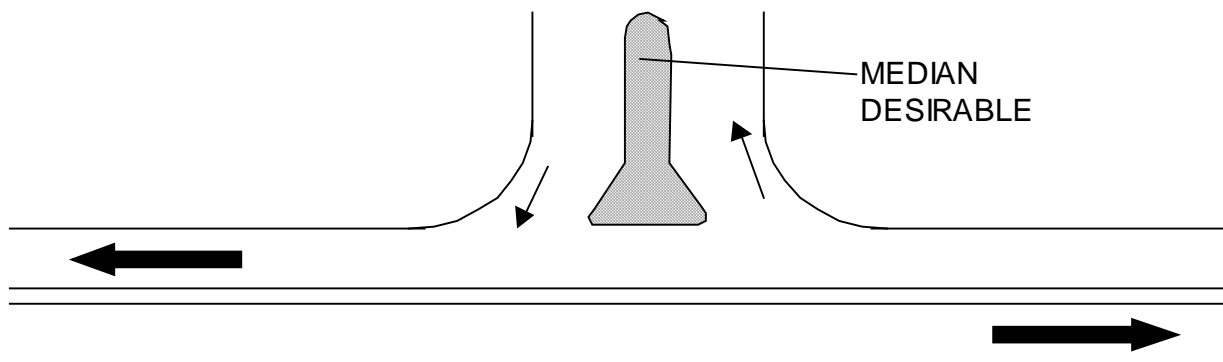
Implications

Eliminates left-turn conflicts where these movements are problems.

Provides pedestrian refuge at high-volume driveways.

May need enforcement to prevent wrong-way moves.

Exhibit III-24: Driveway Channelizing to Restrict Left-turns



H. Retrofit Techniques—Roadway Design

The following techniques are considered:

- Construct or modify median to allow only left turns from a major roadway.
- Install two-way left-turn lane.
- Provide left-turn deceleration lane.
- Provide right-turn deceleration lane.
- Install right-turn deceleration lane to serve several driveways.
- Install non-traversable median with left-turn deceleration lane.

1. Construct or modify median to allow only left turns from a major roadway

b. Description

A median opening is reconfigured to eliminate the left-turn movement from an abutting property onto the roadway.

Application

Where there are safety or operational problems caused by the left-turn egress movement from a development and the rerouting that would occur due to the left-turn restriction could be satisfactorily accommodated.

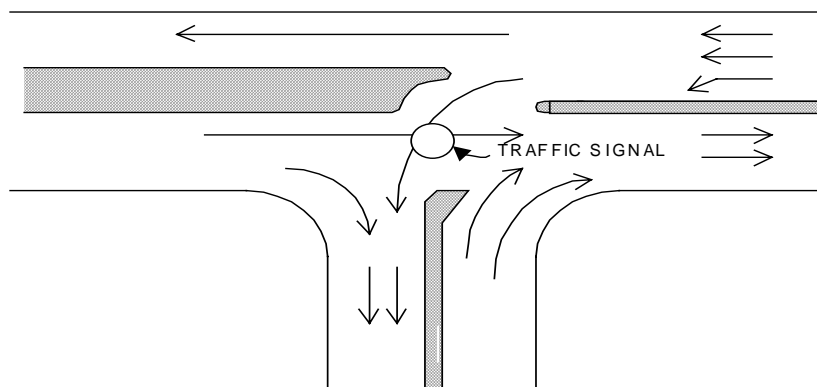
Implications

Reduces conflicts and delays.

Where only one direction of travel is signalized, signals can be installed without adversely affecting progression.

Adequate provisions are needed for the U-turns that will be made instead of direct left-turn exits.

Exhibit III-25: Median Modification



2. Install two-way left-turn lane

Description

A flush painted median lane for making left turns from a roadway.

Application

Roadway sections where numerous, closely-spaced, low-volume access connections exist and projected traffic volume is less than 24,000 vehicles per day.

Minor urban roadways that are intended to provide access to small commercial parcels.

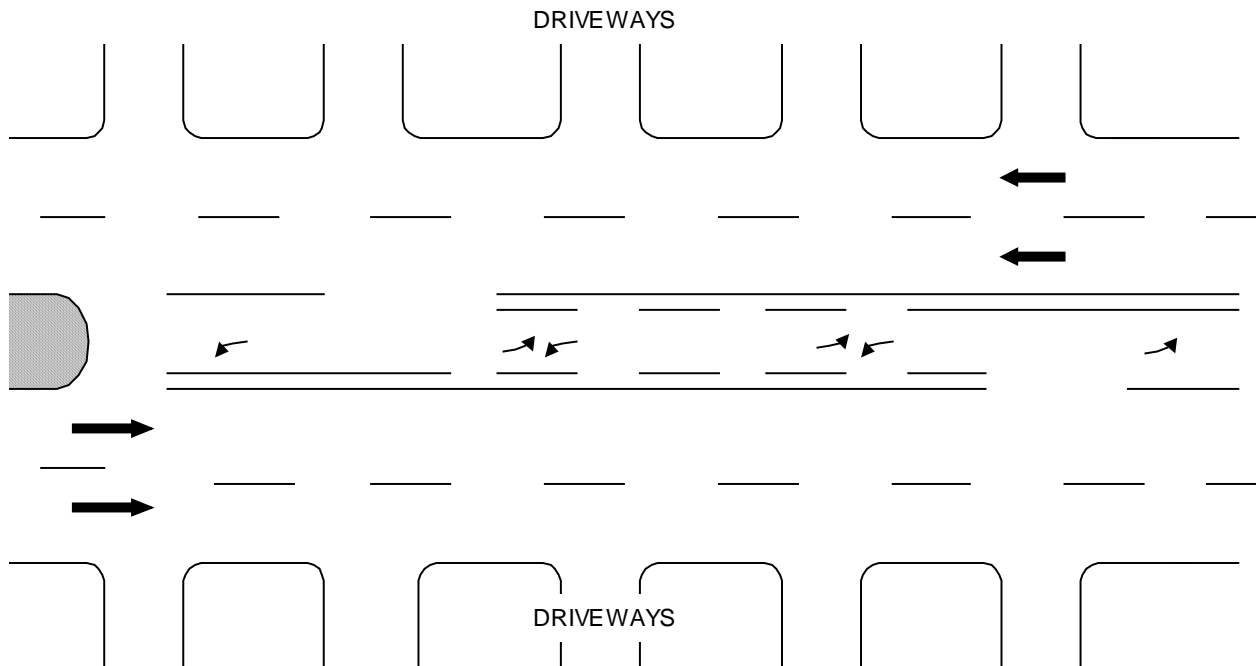
Implications

Removes left turns from through travel lanes.

Reduces accident rates relative to undivided cross-section.

Permits use of center lane for left turns exiting from abutting property.

Exhibit III-26: Installation of Two-way Left-turn Lane



3. Provide left-turn deceleration lane

c. Description

An auxiliary left-turn lane on the roadway to remove the left-turning vehicles from the through travel lanes.

Application

Where it is desirable to provide a protected area for left-turning vehicles.

To improve traffic safety where there is a pattern of rear-end collisions or collisions involving left turns.

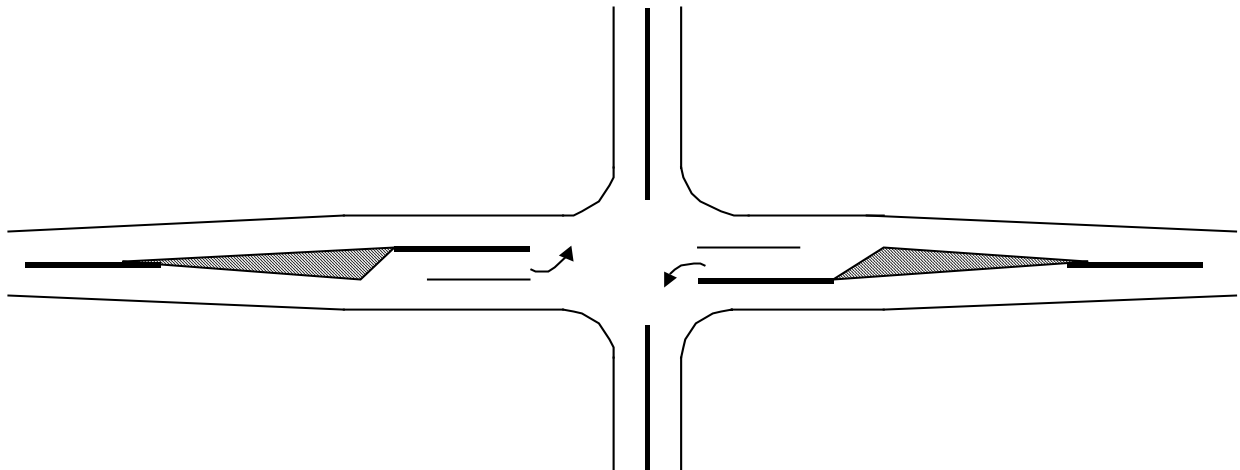
Implications

Lanes may be provided by widening roadway, by placing lane within a median, or by restriping roadway with narrower lanes, depending upon physical conditions.

Improves traffic operations and safety by removing turning vehicles from through lane.

Increases capacity at signalized intersections.

Exhibit III-27: Left-turn Deceleration Lane



4. Provide right-turn deceleration lane

d. Description

An auxiliary right-turn lane on the roadway to remove the right-turning vehicles from the through travel lanes.

Application

Where it is desirable to provide a protected area for right-turning vehicles.

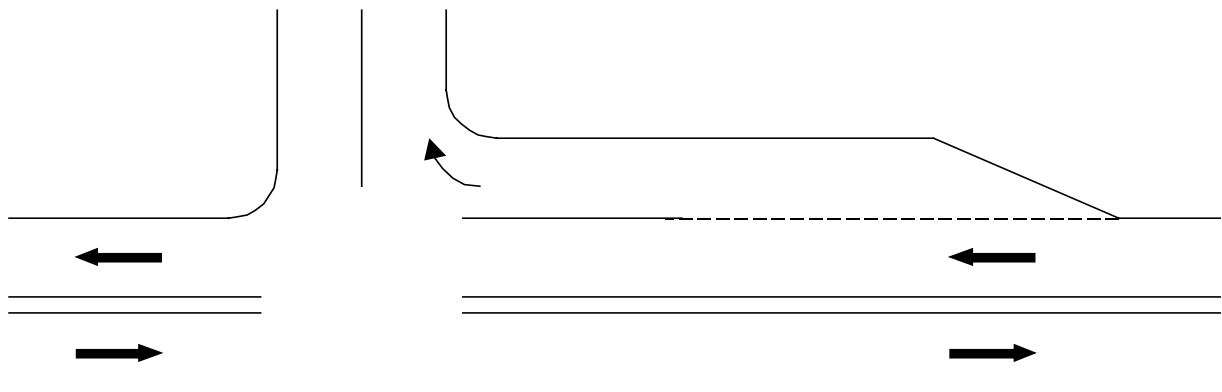
To improve traffic safety where there is a pattern of rear-end collisions or collisions involving right turns.

Implications

Increases capacity at signalized intersections.

May not be desirable along multi-lane roads where a high volume of pedestrians are present (i.e. to avoid excessive width).

Exhibit III-28: Right-turn Deceleration Lane



5. Install right-turn deceleration lane to serve several driveways

e. Description

An auxiliary lane that removes right-turning vehicles for a series of driveways from the through travel lanes.

f. Application

Sections of roadway where the spacing of direct access connections makes the construction of separate right-turn lanes impractical.

Where it is desirable to remove the right-turn movements from the through travel lane to reduce delays to the through traffic.

Where there has been a problem with rear-end conflicts caused by right-turning vehicles along a roadway section with numerous access connections.

Implications

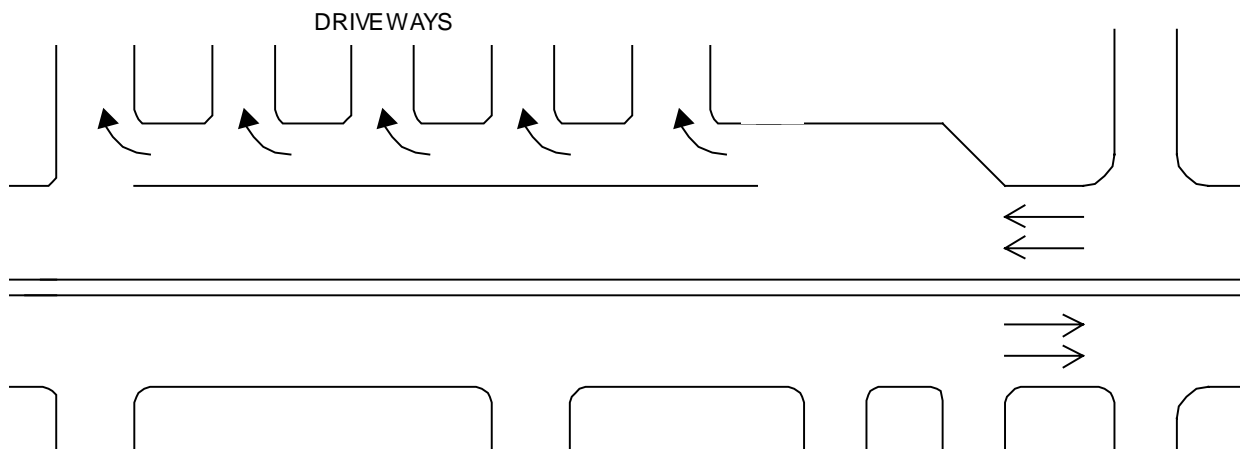
Reduces speed differential between through and right-turning vehicles.

Reduces delay to through vehicles.

Length should be limited to discourage use by through traffic.

Allows for right-in and right-out.

Exhibit III-29: Right-turn Deceleration Lane Servicing Several Driveways



6. Install non-traversable median with left-turn deceleration lane

g. Description

The installation of a nontraversable median on multilane roadways prevents left turns and U-turns across the median except at a few designated locations.

h. Application

Where there are safety and operational problems caused by left-turn movements at minor access connections that are located near major intersections.

Where there is a need to allow for the deceleration and storage of left-turning vehicles outside of the through travel lanes.

High-accident experience associated with mid-block, left-turning vehicles.

Implications

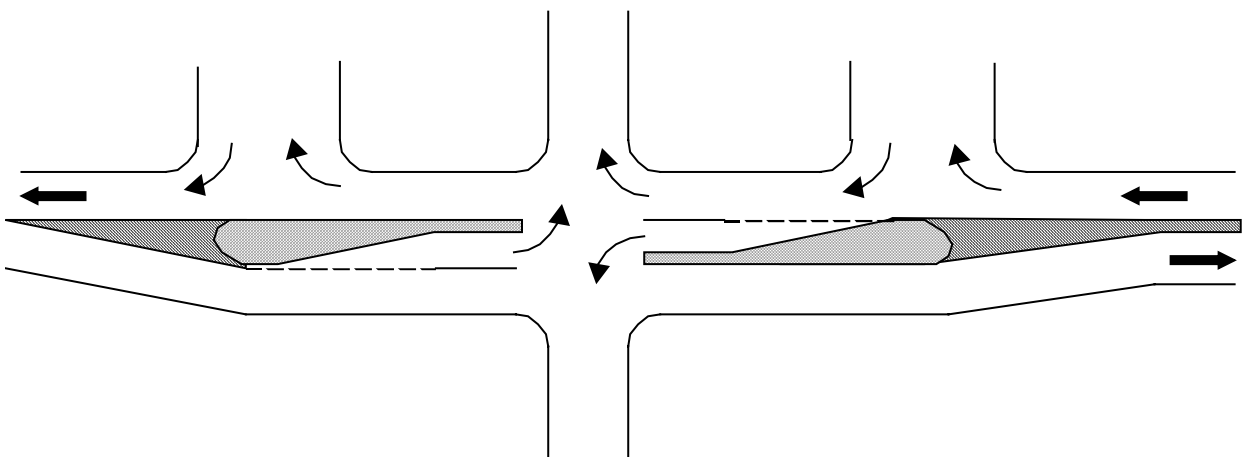
Reduces head-on conflicts.

Reduces accident rate as compared to an undivided roadway section.

May limit access to some developments to right-turns only.

Where a continuous median is installed, property owners may express concern over possible loss in business. Generally, effects are greatest on drive-by activities. Economic impacts tend to decrease as traffic volumes increase because safe access is enabled by medium openings.

Exhibit III-30: Installation of Non-traversable Median



IV. Permit Process Recommendations



A. Introduction

This chapter presents recommendations for improving SDDOT's access permitting procedures and practices. The recommendations are based on input received during group interviews involving process participants in each of SDDOT's regions and a review of current documented policies, procedures, and business practices. The recommended new procedures can be used regardless of progress made to implement the access policy and standards recommended through this project.

To implement these permit process recommendations will require careful planning and additional effort by SDDOT. A high-level work plan is provided in the Chapter VIII Implementation Plan. This additional effort is recommended for the following reasons:

- An access permit is a state level license that is a legal agreement between the issuing agency and the individual or corporate citizen.
- Each permit has long term implications and obligations.
- Each permit issued has direct and long-term impacts on the safety and operation of the highway.
- A poorly issued permit may be an unnecessary contributor to an accident, and therefore a liability to the agency and an unnecessary danger to the public.
- Proper processes, reviews and decision making reduces this risk and helps achieve consistency and equality.

B. Current Procedures and Practices

The current 1979 "Highway Approach Policy and Regulations" provides guidance and standards for access permitting. It provides few procedures and two forms—a combination application/permit and a sample worksheet to sketch a proposed approach layout.

From the meetings, discussions, and November workshops conducted in the course of the study, we can draw the following conclusions regarding existing access permitting practices:

- **There is a high degree of variability in process and decision making across South Dakota.**

The variation is due to many, mostly pragmatic, needs and circumstances. In the most rural SDDOT Regions, the demand for access is low and the requests for busy access

points is lower. SDDOT staff therefore has less experience, but there is a less critical need for experience due to the lower impacts of new access points. In developing areas there appears to be a mix of SDDOT expertise and the level of SDDOT sophistication in handling the requests. In more urbanized areas, access decisions are more critical both in terms of the volume of traffic on the highway impacted, and the volume and safer operation of the proposed access points. In some cities, local staff may be more or less experienced than SDDOT staff, and local access standards may even be more or less strict than SDDOT standards.

These variables are not uncommon or unexpected. But to the degree they exist, they create increasing likelihood of inconsistent access decisions regarding both location and design and create increased risk that impacts from new access points may not be mitigated as well as possible. This inconsistency is not viewed as desirable. Lack of training, and lack of consistently applied processes, values, and standards can result in poor (design and safety) decisions, or overzealous and perhaps overly strict application of policy.

- **There is often limited early involvement in the development review process.**

One of the most effective ways to improve access decision making is early participation in land use decisions. SDDOT involvement at the most desirable points in the development review process varies across the state. Providing reviews and recommendation to local government is not a defined SDDOT task, but it does occur to some degree in several regions.

- **SDDOT employees identified the need for strengthened procedures.**

Roundtable discussions in each of the regions identified from the perspective of SDDOT process participants the following needs for process improvement.

- Increased statewide consistency.
- A more coordinated decision-making involving local government interests.
- More and earlier SDDOT participation in development, land use and division review.
- More accurate and thorough access decisions (improved quality).
- Procedures that are functional in both urban and very rural SDDOT areas.
- Need to incorporate modern access standards into SDDOT decisions.
- Need for mechanism to ensure consistency with local decision making.
- Training in access management, both local and SDDOT.
- Need for an access management brochure to explain issues to customers.

C. Recommendations for Improved Access Permitting Procedures

2. Background

An organized and standardized access permit application, review, and decision process is one of the principal means for SDDOT to implement any recommended access policy and standards in a consistent and accurate manner at all SDDOT locations. The recommendations for improved procedures do not provide standards, but provide the process and decision framework to implement the access policy classification system, and criteria recommended in Chapters II and III.

The recommended access permitting procedure improvements can be implemented now. This will allow the time necessary to organize work processes, task assignments, and training, and to develop a background of experience prior to adoption of new criteria and standards.

The recommendations create a standardized process, provide a structured sequence of events, and include forms and task descriptions that will help maintain a consistent and more accurate decision making process. An important process control mechanism is to compartmentalize the process by establishing forms and worksheets for the key tasks. These tasks are then accomplished by trained staff. This standardization also helps maintain consistency between Region offices and between decision-makers, and helps preserve decision records.

3. Making an Application

The process for obtaining a highway access permit begins with the applicant. A person interested in creating a new access point, or reconstructing an old one needs to know that permission is necessary, and how to proceed to obtain permission. The following documents should be available to help this occur:

- Overview. This could be a tri-fold of access management issues and the permit process (distributed widely).
- Application forms, with instruction sheet(s) for applicant. These would specify what to do, who to contact and what to expect in the application process.
- List of possible application attachments.
- Listing of SDDOT application locations with phone numbers.
- Collection of typical access designs and construction plans for simple access approaches.

4. Processing an Application

An application once received requires a standard series of Department actions. Regular training is important. The following steps should form the basis of the review of an application:

a. Initial DOT application review

To perform the initial review involves that employees:

- Have an application tracking system (either paper or computer system).
- Create a file for each application and establish a record.
- Determine the scale of the type and volume proposed (determine level of review needed) (need 20-year projected highway volume and build-out estimate of property).
- Determine whether the application is complete—does it provide enough information so that SDDOT can make a decision, or is more information required?
- If necessary, request additional information (make a record of what is requested).
- Determine whether the local government knows about the access request.
- Talk to the applicant. This involves making a personal contact to review findings so far, but making no commitments.

b. Investigation and Field Review

This involves the designated employee performing the following tasks:

- File review.
- Field review (with worksheet).
- Collect local government comments.
- Review the highway as-constructed and right of way plans.
- Run a three-year accident review history for the vicinity.
- Use internal application process review worksheet.
- Determine potential alternative access availability and potential feasibility.
- Determine if an access, as applied for or suggested alternative, could be approved (or denied).
- Make an initial and early determination if the proposal appears to be a denial or likely to be permitted.
- Get a traffic engineer's review (investigation) if access is an intersection, or has greater than 100 trips per day, and central office review if it has greater than 100 trips per hour (for site).

c. Location and Design Review Process

This involves the designated employee performing the following tasks:

- Review spacing of nearby accesses and any turning movement conflicts.
- Review both access/highway circulation and site circulation.
- Determine access turning volumes and vehicle types (for design).
- Assess turning restriction controls.
- Determine if turning restrictions are necessary.
- Review proximity to major features—signals, ramps, traffic controls, drainage structures.
- Compare applicant's design to SDDOT design requirements.

SDDOT should establish a turn around standard to provide predictability to applicants.

5. Implementation Permit Decision

Based on the prior steps, a decision is made. The following work is then performed:

a. Prepare a permit, prepare denial, or prepare proposed alternative concept

This includes the designated employee preparing a permit form that:

- Sets any volume limits and states what the permit will provide service to.
- Specifies standard terms and conditions.
- Specifies any special conditions for site specific issues.
- Includes standard specifications.
- Includes drainage controls.
- Specifies any requirements for additional actions and documents prior to construction: final construction plans, traffic control plans, bonds, liability insurance, etc.

b. Offer Permit to Applicant

- Send permit for signature.
- Provide limited time to accept offer. (We recommend 60 days.)
- Return form and any required final documents before beginning construction.
- Notify SDDOT office so construction inspection may occur.
- Notify local government.

6. Objection and Appeal Process

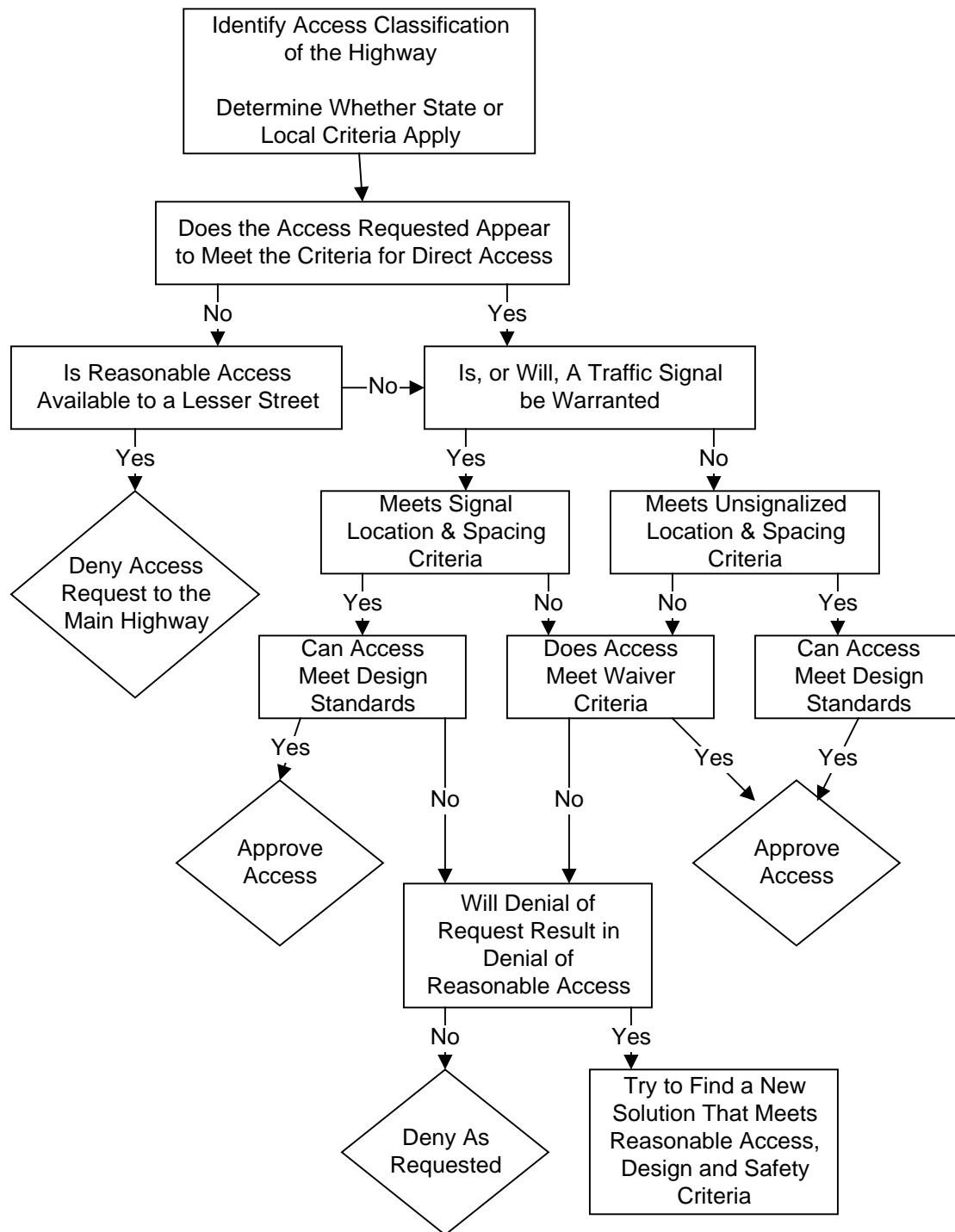
Some objections can be more easily accommodated and an initial reconsideration should be available to the permittee/applicant from the permit writer (Area Engineer). The first level of formal appeal should be handled by an administrative review at the Region level with appeal to the Region Engineer. Applicant/permittee complaints must be in writing.

In those cases where the applicant is not satisfied by the Region re-consideration, there should be a next level of appeal to the Director of the Division of Operations. Objections may be in the form of complaints regarding permit terms, or objections to a denial or restrictions.

D. Making the Permit Decision

Making the permit decision is part of the application and field review. We recommend that it is this point at which SDDOT's access policies criteria and standards are used to provide the guidance for the decision. The application process collects the information for the decision, and makes sure it is accurate and complete. Exhibit IV-1 illustrates a recommended decision flow diagram to organize and sequence the analysis necessary to arrive at a permitting decision.

Exhibit IV-1: Recommended Access Decision Flow



The first question is to determine the necessity of the access. Without a permit will the owners have reasonable access? For some highway types (major arterials), when alternative reasonable access is available and the new application is not a necessity, there may be sufficient reason to consider denial. Necessity is a reasonable test to consider. Every new access degrades the operation and safety of the public highway to some degree.

Before a professional engineer or public agency allows a reduction of safety, necessity should be considered. Another good test is analysis of alternatives. Will the new access improve operation overall by “fixing” a current problem or preventing a new problem, or will an alternative achieve reasonable access with fewer safety impacts?

Once a decision is made to allow the access, the design and specifications (terms and conditions) must be determined and attached. In some instances, suitable standards of design may not be possible. Certain critical design failures, such as stopping sight distance can be grounds for denial.

It is very important that the forms and the field review include sufficient information so the decision-maker can make the most accurate and reasonable decision available.

E. Coordination During Development and Subdivision Decision Process

Many of the most important decisions that determine access needs and desires occur during the approval of subdivision or development plans by a local government. Except for already subdivided or platted lands, working with the developer and local government at this stage, and coming to an agreement, makes the access permitting procedures very easy when an application is received. The Regions should maintain good communication with local governments. Both developers and consultants need to know about this coordination so a joint effort can be achieved. The area offices of SDDOT need to give local land use reviews a priority in processing. A circulation form for land use reviews may be helpful. People assigned to process access approaches should coordinate these land-use reviews. Developments that appear to exceed the 100 peak hour trips may require review by SDDOT's Office of Roadway Design.

F. Recommended Application Forms

Forms help maintain consistency, accuracy, and good records. While care should be taken to keep forms to a minimum, too few forms make decision making less organized and more risky. There also may be a failure to determine key information and all necessary terms and conditions of the permit. To develop the draft form, SDDOT field personnel reviewed earlier drafts. This input was then used to develop a recommended new permit form.

Draft forms are included at the end of this Chapter.

Exhibit IV-2: Draft Highway Access Permit Form

South Dakota Department of Transportation		Application for Highway Access Permit
Permit Application (to be completed by Applicant)	Instructions: Please contact the South Dakota Department of Transportation office named at the bottom of this form to determine what supporting documents must accompany this application. Please submit a separate application and supporting documentation for each access requested. Attach additional sheets as necessary. Please print or type.	
	Property Owner Name(s): Mailing Address: City, State, Zip Daytime Phone:	Applicant (if different from Property Owner) Name(s): Mailing Address: City, State, Zip Daytime Phone:
	Property to be Served by Approach County: _____ Section: _____ Township: _____ Range: _____ Or Subdivision: _____ Block/Lot: _____ Street Address: _____ City: _____	State Highway to be Accessed by Approach State Highway Number: _____ Access would be _____ feet (north, south, east or west) from _____ (nearest cross street or road)
	Land Use of Property to be Served (check one) <input type="checkbox"/> Agricultural: acres served: _____ <input type="checkbox"/> Business: type _____ total square footage of buildings: _____ square feet number of employees: _____ <input type="checkbox"/> Residential: number of single-family dwellings _____ number of multiple-family dwellings _____ <input type="checkbox"/> Other: describe _____	Type of Permit Requested (check one) <input type="checkbox"/> New approach <input type="checkbox"/> Improve existing access <input type="checkbox"/> Change in use <input type="checkbox"/> Relocate existing access <input type="checkbox"/> Temporary access <input type="checkbox"/> Remove existing access
	Estimated Daily Traffic Volumes To & From Property Cars & Pickups: _____ Heavy Trucks: _____	Estimated Daily Traffic Volumes To & From Approach Cars & Pickups: _____ Heavy Trucks: _____
	Sketch of Proposed Approach or Approach Change: 	
	I, the undersigned, request permission to construct or modify an access approach subject to the rules and regulations set forth in the current <u>Highway Approach Policy and Regulations</u> of the South Dakota Department of Transportation.	
	Signature of Applicant: _____ Date: ____/____/____	
	Permit Decision (to be completed by SDDOT)	Supporting Materials Required for Application (Required) (Received) <input type="checkbox"/> Proposed Access Approach Design <input type="checkbox"/> <input type="checkbox"/> Vicinity Map Indicating Access Location <input type="checkbox"/> <input type="checkbox"/> Proof of Liability Insurance <input type="checkbox"/> <input type="checkbox"/> Detailed Development Plan <input type="checkbox"/> <input type="checkbox"/> Drainage Plan <input type="checkbox"/> <input type="checkbox"/> Traffic Impact Study <input type="checkbox"/> <input type="checkbox"/> Revegetation Plan <input type="checkbox"/> <input type="checkbox"/> Construction Traffic Control Plan <input type="checkbox"/>
Terms and Conditions of Approval (or Reason for Denial) 		
Permit Expiration Date: ____/____/____		
SDDOT Area Engineer Signature: _____ Date: ____/____/____	South Dakota Department of Transportation Winner Area PO Box 771 Winner, SD 57580-0771 Phone: (605) 842-0810 Fax: (605) 842-0611	

SDDOT Highway Access Permit Application Review Sheet (to be completed by SDDOT)																													
<p>Highway Access Classification (check one)</p> <table style="width:100%; border: none;"> <tr> <td style="width: 30%;">Expressway</td> <td><input type="checkbox"/> Controlled Access</td> <td><input type="checkbox"/> Rural</td> <td><input type="checkbox"/> Urban</td> <td style="width: 20%; text-align: right;">Highway: _____</td> </tr> <tr> <td>Principal Arterial Divided</td> <td><input type="checkbox"/> Rural Low Volume</td> <td><input type="checkbox"/> Rural</td> <td><input type="checkbox"/> Urban</td> <td style="text-align: right;">MRM+Displacement: _____ + _____</td> </tr> <tr> <td>Principal Arterial Undivided</td> <td><input type="checkbox"/> Rural Low Volume</td> <td><input type="checkbox"/> Rural</td> <td><input type="checkbox"/> Urban</td> <td style="text-align: right;">Average Daily Traffic (ADT): _____</td> </tr> <tr> <td>Minor Arterial</td> <td><input type="checkbox"/> Rural Low Volume</td> <td><input type="checkbox"/> Rural</td> <td><input type="checkbox"/> Urban</td> <td></td> </tr> <tr> <td>Collector</td> <td><input type="checkbox"/> Rural Low Volume</td> <td><input type="checkbox"/> Rural</td> <td><input type="checkbox"/> Urban (through traffic) <input type="checkbox"/> Urban (local traffic)</td> <td></td> </tr> </table>		Expressway	<input type="checkbox"/> Controlled Access	<input type="checkbox"/> Rural	<input type="checkbox"/> Urban	Highway: _____	Principal Arterial Divided	<input type="checkbox"/> Rural Low Volume	<input type="checkbox"/> Rural	<input type="checkbox"/> Urban	MRM+Displacement: _____ + _____	Principal Arterial Undivided	<input type="checkbox"/> Rural Low Volume	<input type="checkbox"/> Rural	<input type="checkbox"/> Urban	Average Daily Traffic (ADT): _____	Minor Arterial	<input type="checkbox"/> Rural Low Volume	<input type="checkbox"/> Rural	<input type="checkbox"/> Urban		Collector	<input type="checkbox"/> Rural Low Volume	<input type="checkbox"/> Rural	<input type="checkbox"/> Urban (through traffic) <input type="checkbox"/> Urban (local traffic)				
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<input type="checkbox"/> slopes up	<input type="checkbox"/> 3-5% grade																												
<input type="checkbox"/> slopes down	<input type="checkbox"/> >5% grade																												
<p>Significant Design & Potential Impact Considerations (check all that apply and explain checked items):</p> <table style="width:100%; border: none;"> <tr> <td><input type="checkbox"/> Sidewalks or Bike Paths</td> <td><input type="checkbox"/> Surface Drainage</td> <td><input type="checkbox"/> Distance to Nearby Streets, Both Directions</td> </tr> <tr> <td><input type="checkbox"/> Curb & Gutter</td> <td><input type="checkbox"/> Drainage Structures</td> <td><input type="checkbox"/> Distance to Nearby Driveways, Both Directions</td> </tr> <tr> <td><input type="checkbox"/> On-Street Parking</td> <td><input type="checkbox"/> Major Structures</td> <td><input type="checkbox"/> Other Streets with Access or Available Access</td> </tr> <tr> <td><input type="checkbox"/> Shoulder Width</td> <td><input type="checkbox"/> Guard Rail</td> <td><input type="checkbox"/> Traffic Control Devices or Relocation Needed</td> </tr> <tr> <td><input type="checkbox"/> Historical Resources</td> <td><input type="checkbox"/> Above-Ground Utilities</td> <td><input type="checkbox"/> Median Crossovers</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Railroad Tracks</td> <td></td> </tr> </table> <p>Explain impact on design:</p>		<input type="checkbox"/> Sidewalks or Bike Paths	<input type="checkbox"/> Surface Drainage	<input type="checkbox"/> Distance to Nearby Streets, Both Directions	<input type="checkbox"/> Curb & Gutter	<input type="checkbox"/> Drainage Structures	<input type="checkbox"/> Distance to Nearby Driveways, Both Directions	<input type="checkbox"/> On-Street Parking	<input type="checkbox"/> Major Structures	<input type="checkbox"/> Other Streets with Access or Available Access	<input type="checkbox"/> Shoulder Width	<input type="checkbox"/> Guard Rail	<input type="checkbox"/> Traffic Control Devices or Relocation Needed	<input type="checkbox"/> Historical Resources	<input type="checkbox"/> Above-Ground Utilities	<input type="checkbox"/> Median Crossovers		<input type="checkbox"/> Railroad Tracks											
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<input type="checkbox"/> Historical Resources	<input type="checkbox"/> Above-Ground Utilities	<input type="checkbox"/> Median Crossovers																											
	<input type="checkbox"/> Railroad Tracks																												
<p>Local Government (_____) Review Comments:</p> <p>Signature: _____ Date: ___/___/___</p>	<p>SDDOT Region Traffic Engineer Review Comments:</p> <p>Signature: _____ Date: ___/___/___</p>																												
<p>SDDOT Roadway Design Review Comments:</p> <p>Signature: _____ Date: ___/___/___</p>																													
<p>APPROACH DESIGN Scale: ___ inches vertical, ___ feet horizontal</p> <div style="border: 1px solid black; height: 200px; width: 100%; background-color: #e0e0e0;"></div>																													
<p>Approach Plan View</p>	<p>Approach X-Section</p>																												
<p>SDDOT Review Performed by: _____ Date: ___/___/___</p>																													

Exhibit IV-3: Draft Approach Permit Standard Conditions

DRAFT CONCEPT

State Highway Access Approach Permit Standard Conditions This Form Is Attached to Each Access Permit Issued Beginning January 16, 2000

When this permit was issued, the Department made its decision based in part on information submitted by the applicant, what alternative access to other public roads and streets was available, the operation of the highway and safety and design standards. Changes in access approach use or design not approved by the permit or the Department may cause the revocation or suspension of the permit. The permittee is responsible for the costs of construction, maintenance, and removal (if necessary) of the approach.

PERMIT EXPIRATION

1. A permit shall be considered expired if the access is not under construction within one year of the permit issue date or before the expiration of any authorized extension. When the permittee is unable to commence construction within one year after the permit issue date, the permittee may request a one-year extension from the Department. Only one extension may be granted. Any request for an extension must be in writing and submitted to the Department before the permit expires. The request should state the reasons why the extension is necessary, when construction is anticipated, and include a copy of page 1 (face of permit) of the access permit. Extension approvals shall be in writing. Any person wishing to reestablish an access permit that has expired may begin again with the application procedures.

CONSTRUCTION

1. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee. All materials used in the construction of the access within the highway right-of-way or on permanent easements, become public property. Any materials removed from the highway right-of-way will be disposed of only as directed by the Department.

2. The permittee shall notify the individual or the office specified on the permit at least two working days prior to any construction within state highway right-of-way. Construction of the access shall not proceed until the access permit

is issued. The access shall be completed in an expeditious and safe manner and shall be finished within 45 days from initiation of construction within the highway right-of-way. A construction time extension not to exceed 30 working days may be requested from the individual or office specified on the permit.

3. A utility permit shall be obtained for any utility work within highway right-of-way. Where necessary to remove, relocate, or repair a traffic control device or public or private utilities for the construction of a permitted access, the relocation, removal or repair shall be accomplished by the permittee without cost to the Department, and at the direction of the Department or utility company. Any damage to the state highway or other public right-of-way beyond that which is allowed in the permit shall be repaired immediately. The permittee is responsible for the repair of any utility damaged in the course of access construction, reconstruction or repair.

4. The Department and the local government may inspect the access during construction and upon completion of the access to ensure that all terms and conditions of the permit are met. Inspectors are authorized to enforce the conditions of the permit during construction and to halt any activities within state right-of-way that do not comply with the provisions of the permit, that conflict with concurrent highway construction or maintenance work, that endanger highway property, natural or cultural resources protected by law, or the health and safety of workers or the public.

5. Prior to using the access, the permittee is required to complete the construction according to the terms and conditions of the permit. Failure by the permittee to abide by all permit terms and conditions shall be sufficient cause for the Department to initiate action to suspend or revoke the permit and close the access. If in the determination of the Department the failure to comply with or complete the construction requirements of the permit create a highway safety hazard, such shall be sufficient cause for the summary suspension of the permit. If the permittee wishes to use the access prior to completion, arrangements must be approved by the Department and included in the permit. The Department may order a halt to any unauthorized use of the access pursuant to statutory and regulatory powers. Reconstruction or

improvement of the access may be required when the permittee has failed to meet required specifications of design or materials. If any construction element fails within two years due to improper construction or material specifications, the permittee shall be responsible for all repairs. Failure to make such repairs may result in suspension of the permit and closure of the access.

6. The permittee shall provide construction traffic control devices at all times during access construction, in conformance with the Manual of Uniform Traffic Control Devices as required by state statute.

7. In the event it becomes necessary to remove any right-of-way fence, the posts on either side of the access shall be securely braced with an approved end post before the fence is cut to prevent any slacking of the remaining fence.

8. The permittee shall ensure that a copy of the permit is available for review at the construction site at all times. The permit may require the contractor to notify the individual or office specified on the permit at any specified phases in construction to allow the field inspector to inspect various aspects of construction such as concrete forms, subbase, base course compaction, and materials specifications. Minor changes and additions may be ordered by the Department or local authority field inspector to meet unanticipated site conditions.

9. Each access shall be constructed in a manner that shall not cause water to enter onto the roadway or shoulder, and shall not interfere with the existing drainage system on the right-of-way or any adopted municipal system and drainage plan.

10. By accepting the permit, permittee agrees to save, indemnify, and hold harmless to the extent allowed by law, the Department, its officers, and employees from suits, actions, claims of any type or character brought because of injuries or damage sustained by any person resulting from the permittee's use of the access permit during the construction of the access.

CHANGES IN ACCESS USE AND PERMIT VIOLATIONS

1. It is the responsibility of the property owner and permittee to ensure that the use of the access to the property is not in violation of the permit terms and conditions. The terms and conditions of any permit are binding upon all

assigns, successors-in-interest, heirs and occupants. If any significant changes are made or will be made in the use of the property that will affect access operation, traffic volume and or vehicle type, the permittee or property owner shall contact the Department to determine if a new access permit and modifications to the access are required.

2. When an access is constructed or used in violation of the permit, the Department may summarily suspend an access permit and immediately order closure of the access.

MAINTENANCE

1. The permittee, his or her heirs, successors-in-interest, assigns, and occupants of the property serviced by the access shall be responsible for meeting the terms and conditions of the permit, the repair and maintenance of the access beyond the edge of the roadway including any cattle guard and gate, and the removal or clearance of snow or ice upon the access even though deposited on the access in the course of Department snow removal operations. Within unincorporated areas the Department will keep access culverts clean as part of maintenance of the highway drainage system. However, the permittee is responsible for the repair and replacement of any access-related culverts within the right-of-way. Within incorporated areas, drainage responsibilities for municipalities are determined by statute and local ordinance. The Department will maintain the roadway including auxiliary lanes and shoulders, except in those cases where the access installation has failed due to improper access construction and/or failure to follow permit requirements and specifications in which case the permittee shall be responsible for such repair. Any significant repairs such as culvert replacement, resurfacing, or changes in design or specifications, require authorization from the Department.

THIS FORM WAS PREPARED AS AN EXAMPLE. IT WAS NOT REVIEWED FOR COMPLIANCE WITH SOUTH DAKOTA POLICIES.

IN ACTUAL USE, THIS FORM WOULD BE ATTACHED TO EACH PERMIT ISSUED.

IN ADDITION, ANY NECESSARY SITE SPECIFIC TERMS AND CONDITIONS WOULD BE ATTACHED TO THE PERMIT.

Exhibit IV-4: Construction Inspection Form

South Dakota Department of Transportation Access Approach Construction Inspection Form	
To: (person who would field inspect access construction)	After completion, return form to the Region Office: (return address stamp here with phone number)
address	
address	
address/zip	
The assigned field inspector is to complete this form for each newly completed access and return the form as noted in the upper right. This form is to confirm installation of access. If during construction, the inspector should determine problems, such as poor traffic control, materials, or failure to adhere to permit, they are to order the problems corrected, work may be shut down if necessary, and/or region office contacted for direction.	
Permittee name and phone (attach application?)	
Access location	Permit number
Local jurisdiction	Permit Issue date (valid for one year)
SDDOT Region/Patrol	Permit construction began: _____ Permit construction ended: _____ Once construction begins, all work must be completed within 45 days.
This Access has been constructed in reasonable conformance with the issued access permit	
This access has NOT been constructed in reasonable conformance with the issued access permit. Please explain below. Call Region office for assistance.	
Any Comments Or note the terms on the permit that the permittee failed to adhere to.	
By	Inspection Date
Please return this form to the above address as soon as completed.	

V. Access Management Authority in South Dakota



A. Introduction

This chapter presents the results of a review of the legal framework that currently governs access management in South Dakota. The consultant team has investigated the relevant statutes, rule authority, and case law. This material represents the understanding of the reviewers concerning the laws of South Dakota but does not represent a legal opinion.

The consultant team provides recommendations and alternatives which may be considered to modernize existing laws, and related procedures to achieve improved highway system performance in terms of both public safety and operational improvements.

A. Legal Basis for Access Management

2. Eminent Domain

- Full access control is usually implemented through the acquisition of access rights resulting in the state's ownership of those access rights and recorded by deed or court rule and order as real property rights. Eminent domain (condemnation) is the legal authority used. This power is held by the state and is normally delegated to the Department of Transportation by legislative action. Eminent domain authority is for the acquisition of real property as necessary for the construction and maintenance of the state highway system.

1. Police Power

- Police power is the ability of the state to control activities and property for the public health, welfare, and safety. The state acts to prevent activities that are determined to be detrimental to the general public. Police power actions by the state are numerous and diverse. They range from enforcement of driving laws, to banking, to public health at restaurants, and many more. Some police power actions come directly from statute, while others come from rule and regulation.
- A key aspect of police power is that it does not require the payment of compensation to regulated parties when used in a reasonable manner. A simple example would be speed laws. While it may be more efficient for a motorist to drive very fast without stopping or slowing, government may require speed limits and stop signs which a police officer may enforce, without compensation to the motorist even though the delay in travel may come at an increased cost to the motorist. State and local governments may set building standards, fire codes and other controlling regulations, which while impacting the value of property and business expenses, are not compensable to the persons who incur the costs

of obeying the requirements. Land-use zoning is a police power established in the early part of this century. A local government uses police power when it prevents a hog-farm from locating in a residential neighborhood on the basis that the overall public good, the right to be protected from nuisances, is superior to the rights of the owner to have a hog-farm within the residential area.

- Statutes rarely have the level of detail necessary to carry out the police power details of the legislative intent. So agencies can properly develop the details of implementation, rule-making authority is usually specifically authorized by the legislature. Agencies then have a time period to develop procedures and standards to achieve the necessary detail. These rules are updated and improved as necessary without further legislative action. Sometimes the legislature provides the agency with a significant level of detail for the rules, or might simply direct the agency to establish standards and provide no further criteria.
- When an agency needs to establish procedures and standards that may be controlling of people's rights, specific legislative authorization is normally necessary. When internal standards, procedures or policies are not meant to be binding on persons as rules, such as agency organization and internal operations, rule-making authority is not required. Rules are state laws that are below the authority of statutes. Their development and approval is governed by the enabling legislation and by the state's administrative procedure act. (1-25 SDCL)
- The public's rights of due process are retained in both statutes and rules. Claims filed against government allow the courts to oversee the nature and scope of South Dakota Department of Transportation (SDDOT) exercise of eminent domain and police power.

2. Reasonable Access/Property Rights

- Property rights are mentioned in South Dakota's constitution at §13 of Article VI, (bill of rights). The right to access the property you own is generally recognized as one of the bundle of property rights that come with ownership and is protected by the constitution. For if you could not get to the property, how would you be able to use it and the benefits of ownership?
- However, the nature of property access as a property right has many components. Not all of them simply fall under constitutional protection as a black and white issue. Access rights are not explicitly mentioned in the constitution - they are assumed. So the courts often are called on to decide at what point or level is the right of access a property right protected by the constitution? A good typical concept of access rights can be seen in this example. A residence sits on a two-acre square parcel. The parcel is within a town and has a public street on each side. The property has a driveway to one of the streets. Does the property, in addition to the one access, have constitutional right to have driveways to all four abutting streets? And if the town denies the request to build another access, are the constitutional rights of the owner denied? Is the property value substantially damaged thereby requiring

compensation to the owner? Is any level of damage compensable no matter how small even when an exercise of police power? This is a matter for the courts to decide to some degree and a matter that the legislature may also choose to define.

a. Compensable damage/takings

In regards to access matters, what constitutes a taking or a damage of property is often in dispute and is not necessarily easy to define. Usually when talking about a taking or damage, its in reference to real property as when SDDOT takes a strip of private property to widen a highway. However, when a driveway transitions from the private property line, crosses over the publicly owned roadside, to connect to the paved roadway, is it “private property”? When the portion of the driveway in the public right-of-way is removed, was real property taken? Does the abutting property owner ‘own’ the driveway? The abutting private property is not touched during removal. The property does not own the driveway in the right-of-way. The real question is ‘was a right of access’ taken? If the property retains access to another street or driveway - then perhaps the owner retains the access rights and there has been no taking.

Once a driveway is taken, and if the remaining access to the property is not as easy and convenient, is the private property ‘damaged’, and in whose opinion? If there is an opinion that the property has less value, must government pay the loss in value? But police powers, acting to protect public safety and to prevent a nuisance, are not compensable. Was driveway removal a taking with damage? Or was it the removal of a highway appurtenance and any property value lost (damage) to the remaining property due to the prevention of a nuisance?

b. Other states’ experience

The nature of the right of access varies among the states. However, most states have concluded in case law decisions that the property has reasonable (constitutional) access when the owner and their customers have ability to go to and from the property from a public street and the owner has achieved a reasonable use of the property for private benefit and purposes.

Some states (North Carolina) have gone further by adopting laws that hold that the property owner has the statutory right of access to each and every abutting public way (called ‘abutters rights’). But this is more the exception in modern America. Modern, is mentioned because some states, while having 19th century case law upholding abutters rights, have more recently determined that the abutting owner has no inviolable right of access, rather only a right of reasonable access. As with many state police powers, as the country has increased in population, density and complexity, the need to address public health, safety and welfare at a much higher and definitive level has become necessary. As the country grows, we all live closer together on smaller properties, with more activities, machines and larger businesses. The possibility that our private actions may create a nuisance for someone else is increasingly apparent.

(1) Reasonable access

Part of the concept of access control by police power is the question, why or when is it necessary for the public to buy their public safety, to pay for the removal or prevention of a nuisance. Must a state buy access rights from an abutting property owner when the reasonable rights of access to the property have already been met? What is a reasonable right of access, above which compensation is not necessary? It is unlikely that these questions will ever be definitely answered. But by reading a collection of case decisions an understanding of the division between reasonable police powers and a taking of a property right is generally achieved. The facts of each case are always different. When there is a dispute, the courts are called upon to determine the outcome.

One of the reasons that states have been able to limit access to the level of reasonableness including denial of direct arterial access, is the recognition that access movements have a negative impact on the safety, operation, and public costs of owning and operating public roadways. State laws and court decisions have deliberated extensively on trying to maintain an appropriate balance between the rights of property owners and the rights of the public to safe and efficient travel. While property owners do have rights of access - there is no right to create a 'nuisance' and a private right of access should not unduly interfere with the public's right of safe travel.

So many courts and legislatures have determined that access to a public facility can be regulated to prevent a nuisance as long as the government does not go so far as to "take" a property right. In the areas of zoning and other land use controls, compensation is required only when the property is substantially limited in its development potential by the government's regulations.

In states where the property owner has a right of reasonable access but not the right of all access (no abutter's rights), the issue becomes the definition of reasonableness. In Colorado, a police power may not be exercised to the point where the limitation of access would "substantially interfere" with ingress and egress from the property. At that level of substantial interference, the action becomes a taking and only the powers of eminent domain with appropriate compensation for taking and damaging may be used.

Access rights are argued in state courts. A 1906 U.S. Supreme Court decision made it clear that the management of access rights was within the sovereign powers of the state, not at the federal level. With little federal guidance, the states have varied significantly in their definitions of access rights. The issues discussed in state courts, usually stemming from claims of property owners for damage payments, include in part: the loss of left turns due to the construction of a center raised median, the reduction of the number of driveways, the denial of direct access to a major arterial when the property retains access to a lesser arterial, the placement of a frontage

road between the property and the main roadway, elevating the main roadway to viaduct level and leaving the driveway connected to the original street, placing the driveways on a new frontage road and increasing the circuitry of travel to the major road, demanding compensation for business revenue losses due to changes in access and abutting traffic volumes, the right of direct access to a new highway on newly acquired right of way which did not previously exist, and other variations.

B. Current Legal Policies and Authorities Available to SDDOT

In addition to the State Constitution, the Legislature has approved statutes over the years that they believed to be reasonable and in the public's best interest. These laws direct the formation of SDDOT, its duties and authorities. These laws direct SDDOT to take certain actions that the legislature believes to be necessary to protect the public welfare. Dealing with issues of access to highways is one of them.

2. Laws That Pertain to the Authority to Manage Access

- The laws pertaining to access management authority and significant case law that were reviewed are listed below:
- The State Constitution, §13 of Article VI
- Statutes: (title-chapter)
 - Title 1 - State Affairs and Government
 - 1-26 The South Dakota Administrative Procedures Act
 - 1-44 Department of Transportation
 - Title 31 - Highways and Bridges
 - 31-07 Interstate Highway System
 - 31-08 Controlled-Access Facilities
 - 31-24 Highway Intersections and Private Entrances
 - Title 32 - Motor Vehicles
- Case Law, State Supreme Court
 - State v. Henrikson (1996)
 - Hurley v State (1966)
 - Darnall v State (1961)

a. Article VI, Section 13 of the Constitution

Private property shall not be taken for public use, or damaged, without just compensation. As discussed earlier, the right of access is not an absolute right. The degree as to what constitutes access rights is a matter for the legislature and courts to decide.

b. Statutes

There are three statutes discussing access to state highways. Each addresses a different type of highway. Chapter 31-07 discusses the Interstate Highway System, 31-08 discusses controlled-access facilities, and 31-24 discusses all the other highways.

(1) Chapter 31-24

Chapter 31-24 appears to require SDDOT to provide direct access whenever there is new or reconstruction of the roadway changing the character of the roadside. Said access shall be easy and convenient. Section 31-24-2 follows up by requiring SDDOT to maintain those access points.

31-24-1. “In the construction, improvement, and repair of any public highway by the state, or by any county or township, where the work of construction or repair shall be of such character as to leave a ditch or elevation along the roadside and thereby to deprive any abutting landowner of easy and convenient access from his land to such highway, it shall be the duty of the highway authorities, except as provided by chapters 31-7 and 31-8, to provide the owner of such abutting tract or farm, as well as each church, school, park, playground, or other public building or ground, with one point of easy and convenient access to a public highway by constructing at the public expense, such grades, approaches, bridges, culverts, or other structures as may be necessary for that purpose. The provision herein contained authorizing construction of entrances at the expense of the authority having charge of the maintenance shall only apply to new construction.”

While it has been assumed that this section meant providing direct access to SDDOT highway, the phrase “to a public highway” might be interpreted to mean to any highway including a lesser highway - as long as the criteria of “easy and convenient” was achieved

- **31-24-2.** “Approaches necessitated by highway construction—Duty of county or township charged with maintenance. Approaches required by § 31-24-1 shall be built by the proper authorities constructing the highway in all cases where the building of such approach becomes necessary as a result of highway construction, and such approaches shall be built by the county, or township charged with the maintenance of such highway in other cases. In all cases any such structure, culvert, bridge, or approach so constructed shall thereafter be maintained and kept in repair by the highway authorities who are charged with the maintenance of such highway.”
- **31-24-3.** This section requires a written permit for any additional access beyond the responsibility of SDDOT in sections 1 and 2. The section provides that the location and design of the access will be designated by SDDOT.

- **31-24-4.** This section goes a little further, directing SDDOT to replace up to two established entrances per continuous half-mile, provided there is no hazard in doing so.
- **31-24-6.** This section requires a permit if the property owner wishes to have a new access to an established highway, and that SDDOT can determine the location and design.
- **31-24-9.** This section requires SDDOT to provide the appropriate grade and construction (access) for any highway intersecting the new construction.

Generally, this chapter requires the government (tax dollars) to provide for the construction and maintenance of certain access, and the private property owner to provide for certain additional accesses at private expense.

Conclusions

There are two main problems with this legislation.

Section 31-24-1 does not appear to allow SDDOT to deny the required access for any reason. There is no provision for specific public safety or the use of engineering practices in the location selection or design. While SDDOT could presume that certainly the legislature did not mean to deny the use of proper engineering practices, because the legislature did mention SDDOT control of location, design and safety at 31-24-3 and 31-24-6, the legislature perhaps choose not to have such considerations under 31-24-1.

The section requires that the access provided is easy and convenient. It is not clear whose opinion determines “easy” and “convenient”. It would appear that SDDOT must provide the access to the satisfaction of the owner, or acquire the access rights. Would the owner agree that a new (replacement) access to a lesser highway (side street) is easy and convenient?

(2) Chapters 31-7 and 31-8

While chapter 31-24 covers the majority of the state system, the legislature enacted 31-7 and 31-8 to address controlled-access facilities. Chapter 31-8 was apparently enacted in 1953 and 31-7 in 1955. Chapter 31-8 is based on a model law that was circulated to all states in the late 1930s and early 1940s, probably by AASHO. It appears that South Dakota initially adopted chapter 31-8 in 1953. This law, adopted by over two-thirds of the states, was the forerunner to interstate freeway law. In the 1930s and 40s, the concept of the interstate was not known. “Freeway law” as it was often called, was an early attempt at the state level to allow state highway departments to establish major arterials of state interest, connecting communities with higher quality and safer roads, providing better farm to market facilities, and encouraging efficient trade between communities

and other states. In many western states, freeway designation was given to two-lane highways in rural areas, and two- and four-lane highways in urban areas. Section 31-8-10 allows the highway authority to designate controlled-access highways. Freeways need not have grade separations.

Chapter 31-7 is for the interstate highway system. It is relatively straightforward and allows SDDOT to acquire right-of-way for the interstate highway. Section 31-7-6 clearly authorizes SDDOT to control the access to and operation of the interstate highways.

While chapter 31-7 does not specifically mention access rights, section 31-8-7 does allow the acquisition of private and public property rights. Since all interstate highways are also controlled-access highways, access rights can be obtained for interstate highways using chapter 31-8.

Chapter 31-7 can apply to more than just interstate highways. It can apply to any highway if the highway is designated as a controlled-access highway pursuant to 31-8-3.

Section 31-8-3 allows SDDOT to regulate the controlled-access facilities. Section 31-8-5 allows SDDOT to “so regulate, restrict or prohibit access”. While the establishment of “rules” is not explicitly mentioned, this section does state that SDDOT can regulate under this chapter. In modern legislation the phrase “promulgate rules” or “adopt rules” is usually seen, as can now be seen in modern South Dakota statutes.

Conclusion

It appears that SDDOT can use Chapter 31-8-6 to a greater extent to establish standards for controlled-access highways, and that controlled-access designations are not limited to fully controlled facilities.

- It is also important that 31-8 empowers not only SDDOT, but also provides that counties and municipalities may also designate controlled-access facilities under their jurisdiction.

C. Establishing Controlled Access Routes

Our analysis indicates that SDDOT has authority under chapter 31-8 for the Commission to designate long sections (corridors) of state highway as controlled-access without proceeding to the acquisition of all access rights as has been the procedure in the past.

Experience in Colorado is that the designation of a state highway to controlled-access status does not require immediate action and access rights acquisition. While the South Dakota law is different to some degree from Colorado, both states used the same national model laws available in the 1940s. The consultant team believes that controlled access designation under section 31-8-3 authorizes the SDDOT to use the powers of 31-8, without a specific time-line. This is how Colorado has proceeded since the early 1940s.

Section 31-8-1, provides the initial definition.

*For the purposes of this chapter, a controlled-access facility is defined as a highway or street especially designed for through traffic, and over, from, or to which owners or occupants of abutting land or other persons **have no right or easement or only a controlled right or easement of access**, light, air, or view by reason of the fact that their property abuts upon such controlled-access facility or for any other reason.*

This definition does not exclude some forms of allowable access “*only a controlled right or easement of access.*” The right can be controlled (regulated) - not a requirement to prohibit or a complete loss of access rights. Colorado has about 2400 miles of designated controlled-access. Of this only about 1000 miles is fully controlled, the remaining is partially controlled with the majority of mileage being two lane rural highways with some private direct access and at-grade public intersections.

Section 31-8-3.

The highway authorities of the state, counties, municipalities, acting alone or in cooperation with each other or with any federal, state, or local agency or any other state having authority to participate in the construction and maintenance of highways, are hereby authorized to plan, designate, establish, regulate, vacate, alter, improve, maintain, and provide controlled-access facilities for public use wherever such authority or authorities are of the opinion that traffic conditions, present or future, will justify such special facilities, provided, that within municipalities such authority shall be subject to such municipal consent as may be provided by law.

This indicates that the DOT can establish procedures and standards to determine if and when direct private access could be allowed to a controlled access facility. This assumes that at the time of controlled-access designation, all abutting property would currently enjoy and retain reasonable access. The key would be that upon controlled-access designation, these access locations would not be immediately closed or declared illegal. They would continue to provide reasonable access and the controlled access designation would not cause an immediate claim for loss of reasonable access. This issue could be incorporated into the designation resolution to help reduce concerns and set the intention of the resolution.

After designation, the DOT would make all permit related access decisions consistent with a new SDDOT policy/regulation regarding access to controlled-access routes. Using the police power of such regulations, the decision would not deny reasonable access to property, but would control the location, design and operation of the allowed access points. If it were necessary to go so far as to deny reasonable access, (thereby cause substantial impairment of access) such action would probably require an eminent-domain procedure.

Project related access decisions could be more aggressive since project funds would be available. Within a project, the DOT could relocate, consolidate, close or redesign existing access for safety and operational reasons. In Colorado, the establishment of the State Access Code (1981) has greatly helped in defining reasonable access and as to when a project change in access might cause a claim for a taking or damages.

Under 31-8-5, the DOT has the option to regulate, restrict OR prohibit access.

“The highway authorities of the state, counties, and municipalities are authorized to so design any controlled-access facility and to so regulate, restrict or prohibit access as to best serve the traffic for which such facility is intended.”

To “prohibit” is only one option. To “regulate” allows establishing a significant range of standards and procedures. To “restrict” is also flexible and can be interpreted as restricting turning movements by building medians, one-way couplets, and restricting to exits or entrances only (ramp style). The phrase “best serve... intended” appears to acknowledge the possibility of a range of control based on the purpose of the facility.

Section 31-8-6 expands on the concept that some access is allowable.

“Ingress and egress restricted to designated points. No person shall have any rights of ingress or egress to, from or across controlled-access facilities to or from abutting lands, except at such designated points at which access may be permitted, upon such terms and conditions as may be specified from time to time.”

By this the DOT may designate the points of access and set the terms and conditions of the access. This would be a good section to use to test the police powers of 31-8. It appears that once so designated, persons have very limited rights of access to the controlled-access highway. This would be the legal section used when the DOT denies a new request for direct access when the property has reasonable access available to a lesser street.

Section 31-8-6 can also tie into the initial designation resolution. The resolution can allow existing accesses to continue as designated points of access subject to change under the new regulations which would further address the issues. The designation resolution would not be an administrative ‘taking’ of existing access without due process.

Section 31-8-7 states:

“For the purposes of this chapter, the highway authorities of the state, counties, or municipalities may acquire private or public property rights for controlled-access facilities and service roads, including rights of access, air, view, and light, by gift, devise, purchase, or condemnation in the same manner as such units are now or hereafter may be authorized by law to acquire such property or property rights in connection with highways and streets within their respective jurisdictions.”

By this section, the acquisition of access rights is not mandatory, but is an allowable option. The section also allows acquisition of the rights of air, view and light. Acquisition of air/view/water rights is not normally necessary to protect the safety and operation of a controlled access facility and are further examples of the optional nature of this section.

Section 31-8-10, allows controlled-access designation for either new or existing highways.

“The highway authority of the state, county, or municipality, or town may designate and establish controlled-access highways as new and additional facilities or may designate and establish an existing street or highway as included within a controlled-access facility.”

2. Establish Police Power Standards for Controlled-Access Decision Making

- The consultant team believes that SDDOT can establish procedures, criteria and standards to “regulate and restrict” (31-8-3) access to controlled-access designated facilities. The acquisition of access rights by deed is not necessary unless the DOT wishes to guarantee that direct access denial is permanent. It is thought that the regulation of access to the controlled-access facility could include restrictions where direct access from private property was denied if the property enjoyed access to a lesser street which in the determination of traffic and design experts, was reasonable and sufficient to provide vehicular access to the property. The local authority responsible for the lesser street should be in agreement with this determination. In time, perhaps the denial of direct access might be challenged in the courts with the claim of abutter’s rights. Then the DOT would find out from the courts if abutters rights or reasonable access rights was the opinion of SD courts. Given court references to “the proper exercise of police power” in some case law, it is likely that the courts would support the DOT if the decision was consistent with published DOT access standards and the standards were reasonable and applied consistently.

3. DOT Projects on Controlled-Access Facilities

- The range of access control on controlled-access facilities can certainly vary according to the nature of surrounding lands, the anticipated traffic volumes, and the availability of local streets to provide access to property when direct access is denied. In urban areas with a supporting system of lesser streets, denial of direct private access should be the standard for designated routes. An access plan to determine the location of at-grade intersections to the controlled-access facility could be developed in cooperation with the local authority. Controlled-access facilities would include interstate, expressways, parkways and boulevards. At-grade access could be allowed according to the function. While these lesser controlled-access roads with at-grade access will have a higher accident rate than full interstate standards, these major arterials will still provide the public with smoother traffic flows, good speeds and capacity, and greatly improved safety compared to lower function roads, and certainly be less expensive to provide.

D. Case Law Discussion

In writing their decision in 1996, the South Dakota Supreme Court included a summary of access law as the 1996 court saw it - the balance of police power access control and property compensation. The court decision did not center around loss of access to the interstate highway, but rather the access that was to be allowed to a remaining private property that abutted the local highway south of an interchange. The issue overall being when does the State Constitution, §13 Art VI, require the payment of damages due to the “taking” of access rights. The decision, referring to earlier SC decisions, includes:

- “If the consequential injury is peculiar to the owner’s land and not of a kind suffered by the public as a whole” then damages and compensation are considered. (1966)
- “Control of access and roadside development have been found to be necessary for safety and efficiency on modern highways...” The right of ingress and egress has been held to be subject to reasonable regulations in the public interest and for the promotion of public convenience and necessity” (1961)
- “While they may adversely affect an established business, relocations of a highway, prohibitions against crossing it or against left and U turns, the designation of one-way streets and other similar restrictions and regulations have been upheld as proper exercises of the police power of the state and not of the power of eminent domain. As such they are not compensable”
- “Curbs or median strips dividing a street or highway which prevent motorists from crossing it to reach a motel or garage, except by a more circuitous route, have been approved and held not to be basis for an award of damages”

A Supreme Court decision in 1966 stated,

- “It is universally recognized that an owner of land abutting on a conventional street or highway has certain private rights in the street or highway distinct from that of the general public.”

But the same 1966 decision stated that the landowner’s right of access,

- “Is not absolute, but is subject to reasonable regulation and restriction by the state under its police power in the public interest.

Conclusions

- It appears that the courts recognize the state can use police powers to regulate access without compensation provided the regulation and its application is reasonable, equitable and within the boundaries of statutory authority and previous case law decisions. This points out the important advantage of establishing regulations to make fair, reasonable and technically supportable access decisions.
- South Dakota law appears to give more support to the payment of property damages due to access changes than some states even though many state constitutions have the similar provisions regarding “takings” or “damages”. But perhaps this is because other states with larger populations, extensive urban development, high traffic volumes on both urban and rural highways, have arrived earlier at the necessity to be more restrictive in controlling access for reasons of public safety and protection of the highway performance. Perhaps the establishment of access rules will help the courts find a dividing point between regulations and takings that is more favorable to regulatory control.

E. Recommendations for Access Management in South Dakota

There are both short-term and long-term procedural and policy alternatives to increase the level of access management for state highways. Based on our analysis we recommend that:

- In the short-term, SDDOT uses current authority to a greater degree.
- In the longer term, SDDOT seeks to modernize legislative authority. It could take two to three years to develop the legislation and implement the regulations.

3. Use Current Authority to a Greater Degree by Designating Controlled- Access Facilities

- If legal counsel for the Department feels that it is appropriate, SDDOT can proceed to revitalize its non-interstate, controlled-access program, thereby at least improving the management of access to important primary routes. Using the current state highway functional map, which includes the NHS system, and other principal arterials of state significance, SDDOT could designate all such routes as controlled-access facilities according to 31-8-3. This could be used to implement higher level elements of the recommended access classification system and access criteria. Implementation would take some degree of planning, route and impact assessments, evaluation, and public process. But it would move all the vital state travel and trade routes connecting population centers and farm to market routes into a controlled-access category where SDDOT could better manage access pursuant to section 31-8-3.
- SDDOT could design controlled-access sections on a project by project basis. Each time the state proposed to make major improvements on a highway, such as widening a two-lane to a four-lane on a principal route, a part of the project approval process would be a request for controlled-access designation within the project limits. This would allow the design of the project and the right-of-way acquisition to determine the location of selected access points, both private and public, and allow some at-grade access.
- The recommended access criteria could be established as standards to regulate access points to and from these controlled-access highways. The regulation need not deny private access, but would set standards as to when it might occur and the design necessary. Given the legal issues mentioned earlier, the establishment of such regulations would place SDDOT in the best legal position to make access decisions under its police powers for controlled-access facilities.
- Internally, SDDOT would need to revise its roadway design manual. As regulations are developed, it is necessary to update all internal manuals. The SDDOT project access decisions and designs should not be dissimilar from what standards are required of permit applicants.

4. Use Current Authority to Establish New Access Standards and Guidelines Applicable To Non-Access Controlled Facilities

- While it does not appear that SDDOT has clear authority to establish regulations by rule-making for non-access controlled facilities, SDDOT can establish standards, procedures and related guidelines to assist SDDOT in making decisions for the issuance of permits and other access decisions under 31-24. Since these would not be adopted as formal rules, they would not carry a lot of legal strength and would not constitute regulatory law. But if the standards and procedures were reasonable, equitable, and consistently applied, they would get some legal support from the courts. Each challenged decision would require SDDOT to defend the standard and the specific application of the standard as a reasonable exercise of police power for public safety purposes. While with an adopted regulation, you need only to refer to the paragraph stating the requirement, and not provide the justification for the standard, except to educate the court.

2. Move Forward with New Legislation and Regulations

- South Dakota statutory authority provides a weak foundation for modern access management. The statutes are old and need modernizing to incorporate advances in roadway engineering and safety. A long-term and comprehensive strategy would be to seek new legislative authority. SDDOT could suggest an appropriate draft bill to the legislature, or whatever process is appropriate when the Executive Branch is requesting legislative action.
- The scope of the legislation could be a small paragraph simply empowering SDDOT to establish rules to regulate the granting, location, and design of all access points; or the legislation could be more explicit, providing direction on several issues of legislative concern, as well as some limitations regarding the power and scope of the rules. Besides seeking rule authority, portions of 31-24 would need modification.
- Colorado, New Jersey, and Florida, the only states with total system-wide modern access regulations, have statutes spanning several pages covering several related issues. In Colorado, the legislature declared all state highways to be controlled-access highway. This simply meant that access to the highway could not be obtained without authorization by the Colorado Department of Transportation (CDOT). Then the legislature directed the Transportation Commission (appointed by the Governor) to adopt access regulations to be sure the access decisions were reasonable, appropriate, consistent, and fair.
- In South Dakota, some statutes direct the promulgation of rules by a single paragraph.

“§12-5-3.15. State board to adopt rules. The state board of elections may adopt rules pursuant to chapter 1-26 to implement § 12-5-3.6 to 12-5-3.14, inclusive.”

- Or, like the statutes regarding aeronautics, the enabling legislation can identify the scope of the rules in more detail.

“§ 50-2-2.1. Adoption of rules. The aeronautics commission may adopt rules pursuant to chapter 1-26 regarding: (1) The design, layout, location, construction, operation, equipping and use of all airports, landing fields or landing strips; (2) The curriculum, equipment, personnel qualifications, operation and management of all air instruction; (3) The establishment, location, maintenance and operation of all air markings, air beacons and other navigation facilities; (4) Common carriers of persons and property in scheduled operations by aircraft in purely intrastate commerce, including definitions, exemptions, certificates and permits, and application therefor, issuance thereof, modification, suspension or revocation of permits, tariffs, rates and service, penalties; and (5) The operation of aerial applicators or operators including minimum standards, class definitions and safety requirements.

- The experience of several states in proposing legislation has been that the departments of transportation must be prepared to discuss and defend the need for the legislation, showing the safety problems and the public benefits of improved access management, and the anticipated outcomes of proposed access regulation. Laws affecting property rights frequently generate strong discussion and interest. As with the management of any constitutional right, agencies of government must proceed carefully and deliberately before arriving at any regulatory standards.
- When developing new access legislation, access rights need to be defined to some degree. The legislature will need to decide either to define access rights as abutter's rights to each and every abutting public road, or determine that “reasonable” access to the general street system is the standard measure. If “reasonable” access is used as the measure, the legislature can define the term initially, and then let the courts refine the issues based on factual claims; or the legislature can leave the definition entirely to the courts.
- Some of the issues that should be considered for legislative action include:

- SDDOT shall establish (promulgate) access regulations.
- The regulations apply to all (or not) state highways.
- Authorizing local government to establish access standards in their communities.
- Persons obtaining access shall mitigate their direct impacts caused by their traffic by providing appropriate roadway improvements.
- Mitigation shall be in proportion to their impacts with the property owner responsible for the costs of all improvements.
- Applicants for access permits have the rights of due process (APA).
- Address when an access is illegal and what action may be taken.
- Changes in access, needed by the owner due to redevelopment.
- Changes in the access necessitated by the changes in the highway or traffic volumes.
- Provide for a classification of roads relative to access control, high to low standards.

- Coordination between local land use decisions and SDDOT relative to access permits.
- All access constructed to any public highway requires a permit from the authority having jurisdiction over the highway.
 - If some of these issues are not directly answered by new legislation, SDDOT will need to address them in the regulation.

a. Advantages of police power—regulatory standards vs. guidelines

The recommended legislative change will enable SDDOT to adopt regulatory standards for issuing access permits. Such regulations, properly adopted, are rules and carry the weight of law. Guidelines are recommended practices. The South Dakota courts have placed considerable weight on the “proper exercise of the police power” and that the exercise of police power does not require compensation. Going through the adoption of regulations, following the provisions of the administrative procedure act, chapter 1-26, places SDDOT in a very good legal position to manage access in a reasonable and fair manner, and thereby benefit from these formal and therefore proper, police powers. From time to time the regulations may be challenged in the courts. If the regulations are carefully written, fair and reasonable, and SDDOT is prepared to defend its decisions, the courts should uphold SDDOT decision and regulations.

Guidelines are a general guide and not meant to be enforceable as law. They are generally sufficient to improve access spacing and design but are usually not strong enough to win over a strong legal complaint filed by an unhappy property owner. They lack the legal strength to deny access when the claim for direct access is a property right. Rights cannot be controlled by general policy guides. Nationally, experience has shown that guidelines are considered insufficient to achieve the level of access management needed on modern high volume arterials.

F. Statutory Language Recommendations

2. Recommended Legislation

- The following recommends language for modernizing current statute.

(1) Regulation of access to public highways; legislative findings, policy, and purpose.

(a) Regulation of access to the public system of highways, roads and streets is necessary in order to protect the public health, safety, and welfare, to preserve the functional integrity of the public roadways, and to promote the safe and efficient movement of people and goods within the state.

(b) The department of transportation and local governments are authorized to regulate vehicular access to or from any public way under their respective

jurisdiction from or to property adjoining a public way in order to protect the public health, safety, and welfare, to maintain smooth traffic flow, to maintain highway right-of-way drainage, to maintain the public way and its appurtenances and to protect the functional level of public ways. Every owner of property which abuts a public road has a right of reasonable access to the general system of streets, roads, and highways in the State, but not to a particular means or location of access. The access rights of an owner of property abutting a State highways must be held subordinate to the public's right and interest in a safe and efficient highway.

(c) After the effective date of this legislation, no person may submit or local authority approve, an application for subdivision of property abutting a state highway unless the subdivision plan or plat provides that all lots and parcels created by the subdivision will have access to the general street system in conformance with the state highway access code. (This section also placed in subdivision law)

3. Adopted Legislation

To address the recommendations detailed above, legislation was introduced and adopted. The following provides the statutory litigation.

State of South Dakota

SEVENTY-FIFTH SESSION
LEGISLATIVE ASSEMBLY, 2000

SENATE BILL NO. 44

Introduced by: The Committee on Transportation at the request of the Department of Transportation

FOR AN ACT ENTITLED, An Act to authorize the Transportation Commission to promulgate administrative rules regarding access to state highways.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. That chapter 11-3 be amended by adding thereto a NEW SECTION to read as follows:

The Transportation Commission may adopt rules, pursuant to chapter 1-26, governing the following elements in granting written approval for access to state highways as provided for in §§ 11-3-12.1 and 31-24-6:

- (1) Access location, width, and spacing;
- (2) Signal spacing;
- (3) Median design;
- (4) Access application process;
- (5) Access construction standards; and
- (6) Safety.

Nothing in the rules promulgated pursuant to this section supersedes county or municipal planning and zoning authority.

VI. Benefits of Improved Access Management in South Dakota



A. Introduction

This chapter outlines the benefits of improving access management policy and practices in South Dakota. The benefits are documented in the following sections:

- **National Research and Experience from Other States.** There is a considerable body of literature and research experience from other states that demonstrates the safety, system preservation, and other benefits of improved access management. This section describes the results of this research that are most important for South Dakota.
- **Potential Statewide Benefits to South Dakota.** This section draws conclusions from South Dakota's statewide accident data to indicate the importance of improved access management for the state.
- **Case Study Examples Documenting Benefits.** This section provides case study examples of the negative consequences when access management is not addressed and shows where real benefits have been achieved through applying access management principles in South Dakota.

B. National Research and Experience From Other States

This section draws upon the national research, the available literature, and the research presented in NCHRP Report 420—Impacts of Access Management Techniques to describe the evidence and quantify the various, priority access management techniques recommended for South Dakota.

Evidence is presented on the benefits of the following access management techniques:

- Traffic Signal Spacing
- Unsignalized Access Spacing
- Median Techniques
- Left-Turn Lanes

2. Technique: Traffic Signal Spacing

The spacing of traffic signals, in terms of their frequency and uniformity, governs the performance of urban and suburban highways. It is one of the most important access management techniques. This is why Colorado, Florida, and New Jersey require long

signal spacings (e.g. ½ mile) or minimum through bandwidths (e.g. 50 percent) along principal arterial roads.

Safety Benefits

Accident rates (i.e. accidents per million vehicle miles) increase as traffic signal density increases. The actual increase in accident rates documented in the literature varies among the individual studies. NCHRP Report 420 indicates the following general relationship between accident rates and traffic signal density for urban and suburban areas. However, the safety impacts may be obscured in part by differing traffic volumes on intersecting roadways and by the use of vehicle-miles of travel for computing rates, rather than the accidents per million entering vehicles.

Exhibit VI-1: Accident Rates and Traffic Signal Density (NCHRP Report 420)

<u>Signals Per Mile</u>	<u>Accident Rate (Accidents Per Million Vehicle Miles)</u>	<u>Ratio of Accident Rate Compared to Less Than 2.0 Signals Per Mile</u>
Less than 2.0	3.1	1.0
Between 2.1 and 6.0	7.0	2.3
More than 6.0	8.9	2.9

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999.
Derived from Table 5, page 4.

Implications for South Dakota

Traffic signals account for most of the delay that motorists experience on arterials and may also contribute to accidents. The planning, design, and operation of traffic signals in South Dakota need to achieve a balance between capacity and progression requirements. Restricting signals to those locations where effective progression can be achieved will result in both safety and operational benefits to the users of the South Dakota roadway system.

Travel Time Benefits

Each traffic signal per mile added to a roadway reduces speed about 2 to 3 mph. Using two traffic signals per mile as a base results in the following percentage increases in travel times as signal density increases. For example, travel time on a segment with four signals per mile would be about 16 percent greater than on a segment with two signals per mile.

Exhibit VI-2: Increased Travel Time Due to Increased Number of Signals

<u>Signals Per Mile</u>	<u>Percent Increase in Travel Times (Compared to 2 Signals Per Mile)</u>
2.0	0
3.0	9
4.0	16
5.0	23
6.0	29
7.0	34
8.0	39

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Derived from Table 3, page 3.

Chapter 3 (Application Guidelines section) of NCHRP Report 420 should be consulted for a more detailed approach for calculating the effects of traffic signal spacing on roadway operations.

3. Technique: Unsignalized Access Spacing

Access points introduce conflicts and friction into the traffic stream. As stated in the 1994 AASHTO *Policy on Geometric Design of Highways and Streets*, “Driveways are, in effect, at-grade intersections... The number of accidents is disproportionately higher at driveways than at other intersections; thus, their design and location merit special consideration.”

Safety Benefits

Studies over the past 40 years have shown that accident rates rise with greater frequency of driveways and intersections. Each additional driveway increases accident potential.

The relationship between access density and accident rates was confirmed in NCHRP Report 420 by a comprehensive safety analysis of accident information obtained from Delaware, Illinois, Michigan, New Jersey, Oregon, Texas, Virginia, and Wisconsin. Accident rates were computed for various spacings and median types for about 240 roadway segments, involving more than 37,500 accidents. The accident rate indices shown below were derived using ten access points per mile as a base. (Access density is a measure of the total number of access points in both travel directions.) For example, a segment with 60 access points per mile would be expected to have an accident rate that is three times higher than a segment with ten access points per mile. In general, each additional access point per mile increases the accident rate by about four percent.

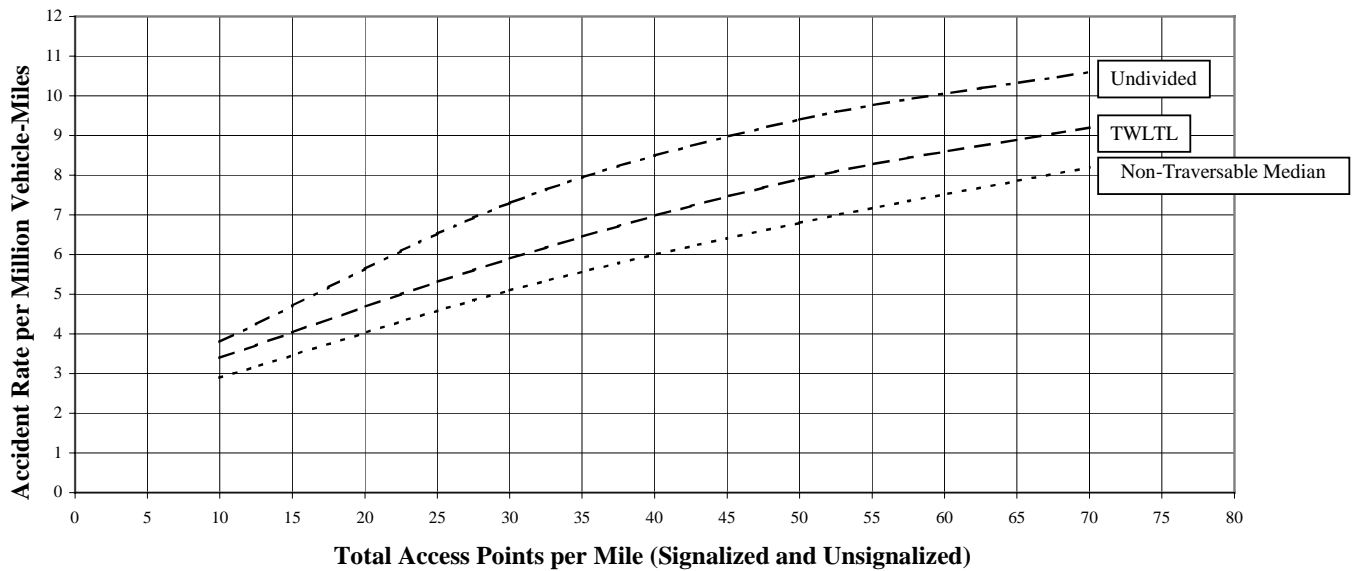
Exhibit VI-3: Accident Rates by Total Access Points Per Mile

<u>Total Access Points Per Mile (Both Directions)</u>	<u>Accident Rate Index</u>
10	1.0
20	1.4
30	1.8
40	2.1
50	2.5
60	3.0
70	3.5

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Derived from Table 4, page 4.

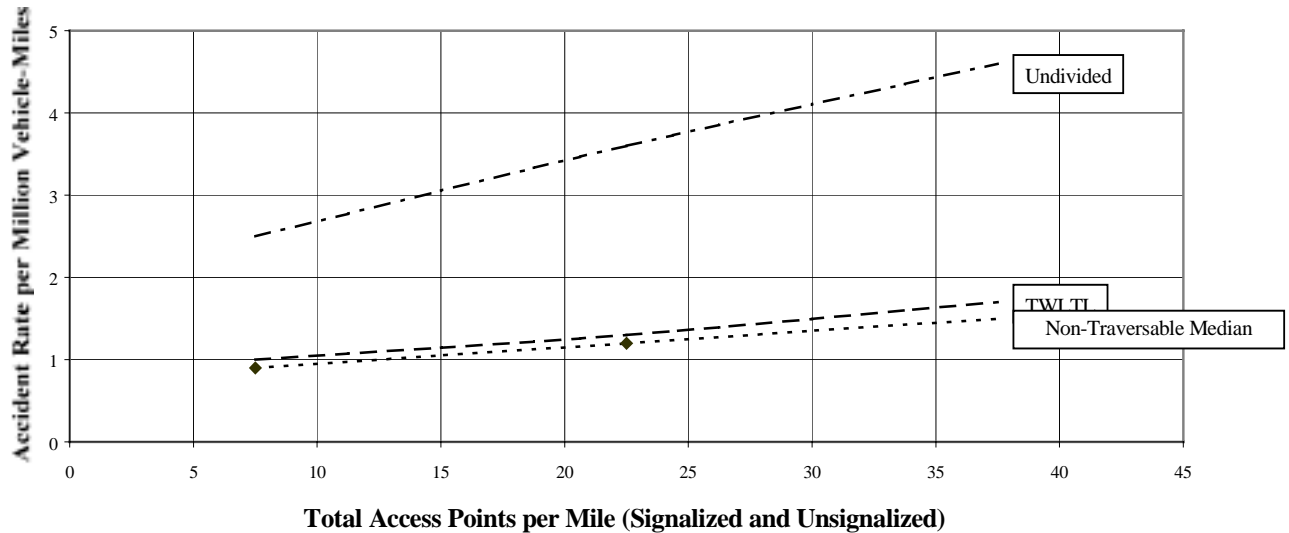
Exhibits VI-4 and 5 present accident rates by median type and total access density (both directions) for urban-suburban and rural roadways, respectively. These are shown for the midpoints of the unsignalized access spacing groups and reflect adjustments to eliminate apparent inconsistencies in the reported data.

Exhibit VI-4: Estimated Accident Rates by Type of Median; Urban and Suburban Areas



Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Figure 24, Page 57.

Exhibit VI-5: Estimated Accident Rates by Type of Median; Rural Areas



Source: NCHRP Report 420, Impacts of Access Management Techniques, 1999. Figure 25, Page 57.

- In urban and suburban areas, each access point (or driveway) added would increase the annual accident rate by 0.11 to 0.18 accidents per million vehicle-miles traveled (VMT) on undivided highways and by 0.09 to 0.13 accidents per million VMT on highways with TWLTLs or non-traversable medians.
- In rural areas, each access point (or driveway) added would increase the annual accident rate by 0.07 accidents per million VMT on undivided highways and 0.02 accidents per million VMT on highways with two-way left-turn lanes (TWLTLs) or non-traversable medians.

Representative accident rates by signalized and unsignalized access density are shown in Exhibit VI-6 for urban and suburban areas. These rates contain adjustments to account for apparent inconsistencies in the source data. Each unsignalized driveway may add about 0.02 accidents per million VMT to the accident rate at low signal densities, and from 0.06 to 0.11 accidents per million VMT at higher signal densities.

The rates in Exhibit VI-6 may be used to estimate the changes associated with increasing unsignalized access density at any given signal density (driveways to single-family residences should be excluded). However, the exhibit should not be used to estimate the effects of adding signals. This is because in deriving the rates, signal density served as a surrogate for cross street traffic.

States may underestimate accidents along sections of roadway with both heavy ADTs and driveway traffic since there is a greater proportion of non-reportable

accidents. Therefore, care should be exercised when these rates are applied along heavily traveled roadways in metropolitan areas. In such cases, local accident rates should be obtained; the values in the exhibit should be used to assess the differential cumulative impact of adding driveways.

The following procedure may be used to estimate the cumulative impacts of changing unsignalized access spacing along a section of road.

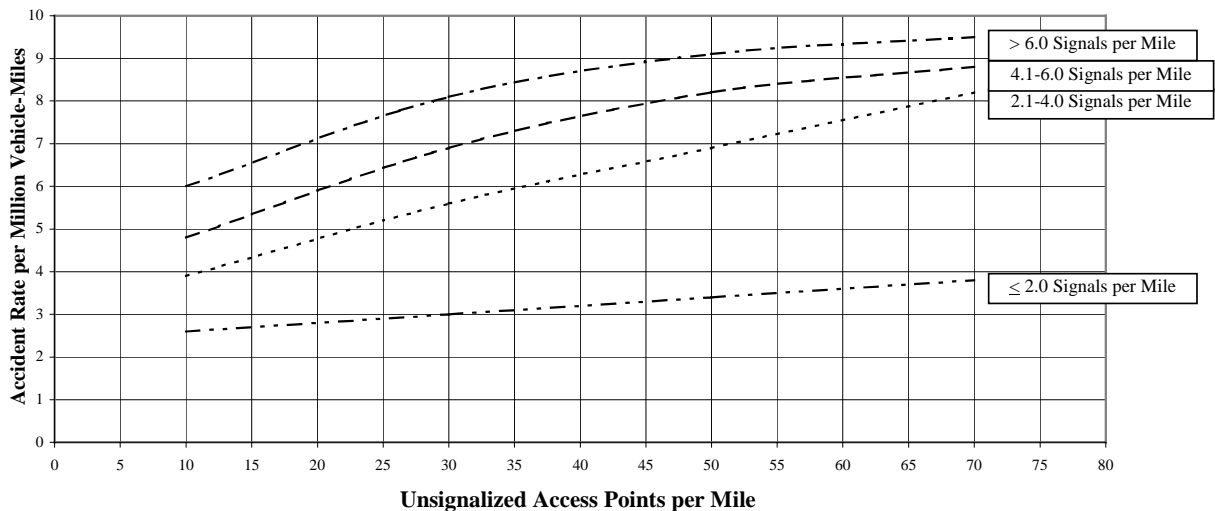
- 1) Given: Actual Accident Rate (accidents per million VMT) = A
 Existing Driveways Per Mile = D_1
 Existing Signals/Mile = S_1
 Proposed Driveways Per Mile = d_2
- 2) Obtain: Estimated existing and future rates (R_1 and R_2) from Exhibit VI-3.
- 3) Apply: The ratio of R_2 / R_1 to the actual rate A.

The following example will help to illustrate the application of this procedure.

The actual accident rate on a roadway with three signals per mile and 18 driveways per mile is 7.0 accidents per million VMT. Twelve additional driveways are planned, resulting in a total of 30 driveways per mile.

The projected accident rate is calculated as follows using Exhibit VI-6 to estimate R_1 and R_2 .

Exhibit VI-6: Estimated Accident Rates by Access Density; Urban and Suburban Areas



Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Figure 26, Page 58.

$$\begin{aligned} \text{Projected Rate} &= \text{Actual Rate} \times \frac{R_2}{R_1} = 7.0 \times \frac{5.6}{4.5} \\ &= 8.7 \text{ accidents/million VMT} \end{aligned}$$

Travel Time Benefits

Travel times along unsignalized multi-lane divided highways can be estimated using procedures set forth in the *1994 Highway Capacity Manual* (HCM). Speeds are estimated to be reduced by 0.25 mph for every access point up to a 10 mph reduction for 40 access points per mile. The HCM procedure is keyed to access points on one side of a highway, but access points on the opposite side of a highway may be included where they have a significant effect on traffic flow.

More detailed analysis for the development of the HCM (NCHRP Project 3-33, Capacity and Service Procedures for Multi-Lane Rural and Suburban Highways) showed a speed reduction of 0.15 mph per access point and 0.005 mph per right-turning movement per mile of road (see Exhibit VI-7). Thus, for 40 access points per mile and 400 right turns per mile, the speed reduction would be 8.0 mph. When the right-turn volume increases to 600, the speed reduction becomes 9 mph. The HCM value in both cases is 10 mph.

Exhibit VI-7: Speed Reductions for Uninterrupted Multi-Lane Arterials

Access Points / Mile	Speed Loss Per Access Point (mph)	Right-Turn Volume Per Mile (Per Hour)							HCM @ .25 Speed Loss Per Access
		100	200	300	400	500	600	900	
		Speed Loss (mph)							
		0.5 ^(b)	1.0	1.5	2.0	2.5	3.0	4.5	
		Combined Speed Loss (mph)							
1	0.15 ^(a)	0.65 ^(c)	1.15	1.65	2.15	2.65	3.15	4.65	1.25
5	0.75	1.25	1.75	2.25	2.75	3.25	3.75	5.25	1.25
10	1.50	2.00	2.50	3.00	3.50	4.00	4.50	6.00	2.50
15	2.25	2.75	3.25	3.75	4.25	4.75	5.25	6.75	3.75
20	3.00	3.50	4.00	4.50	5.00	5.50	6.00	7.50	5.00
30	4.50	5.00	5.50	6.00	6.50	7.00	7.50	9.00	7.50
40	6.00	6.50	7.00	7.50	8.00	8.50	9.00	10.50	10.00

Note: Numbers within box represent sum of marginal totals (i.e. (c) = (a) + (b)).

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 42, Page 59 (Summary of results in Final Report of NCHRP Project 3-33: *Capacity and Level of Service Procedures for Multilane Rural and Suburban Highways*).

Benefit: Impacts of Curb Lane Turns on Through Traffic

Detailed analyses were made to estimate impacts on through traffic in the curb lane resulting from cars turning right into driveways at 22 unsignalized locations in Connecticut, Illinois, New Jersey, and New York. As a measure of the number of impacts, the incidents of brake lights being activated or evasive maneuvers by a following through vehicle were counted.

Impacted Vehicles

The percentage of through vehicles in the right (curb) lane that would be impacted at a single driveway increases as right-turn volumes increase as shown in Exhibit VI-8.

Exhibit VI-8: Percent of Through Vehicles Impacted as Right-Turn Volume Increases

Right-Turn Volume Entering Driveway (Vehicles Per Hour)	Percent of Through Vehicles Impacted
Less than or equal to 30	2.4
31 to 60	7.5
61 to 90	12.2
Over 90	21.8

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 8, Page 5.

The percentage of right-lane through vehicles that would be impacted at least once per quarter-mile, based on a right-turn volume at each driveway of less than or equal to 30 vehicles per hour, was as shown in Exhibit VI-9.

Exhibit VI-9: Percentage of Through Vehicles Impacted Based on Right-Turn Volume

Unsignalized Access Spacing (Feet)	Percent of Through Vehicles Impacted
100	27.3
200	14.7
300	10.0
400	7.6
500	6.2

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 9, Page 5.

Implications for South Dakota

The research clearly indicates that increasing the spacing between access points in South Dakota improves roadway flow and safety. There are benefits that will be

experienced by South Dakota motorists and roadway agencies by providing greater distance between access points to allow more time for anticipating and recovering from turning traffic and by providing opportunities for installation of turn lanes.

4. Technique: Median Alternatives

The basic choices for designing the roadway median are whether to install a continuous two-way left-turn lane or a non-traversable median on an undivided roadway, or to replace a two-way left-turn lane with a non-traversable median. (A non-traversable medial design involves the provision of either a raised or depressed median that cannot be crossed or discourages crossing.) These treatments improve traffic safety and operations by removing left turns from through travel lanes. Two-way left-turn lanes provide more ubiquitous access and maximize operational flexibility. Medians physically separate opposing traffic, limit access, clearly define conflicts, and provide better pedestrian refuge; their design requires adequate provision for left and U-turns to avoid concentrating movements at signalized intersections.

An extensive review of safety and operational experience and models provided guidelines for impact assessment.

Safety Benefits

The safety benefits reported in studies conducted since 1970 were as follows:

- Highway facilities with two-way left-turn lanes had accident rates that were overall about 38 percent less than experienced on undivided facilities.
- Highway facilities with non-traversable medians had an overall accident rate of 3.3 per million VMT compared to about 5.6 per million VMT on undivided facilities.
- Highway facilities with non-traversable medians had an overall accident rate of 5.2 per million VMT compared to 7.3 per million VMT on facilities with two-way left-turn lanes.

The estimated total accidents per mile per year—based on an average of seven accident prediction models—are shown in Exhibit VI-10.

Exhibit VI-10: Accidents Per Mile Per Year

ADT	Accidents Per Mile Per Year		
	Undivided Highway	Two-Way Left-Turn Lane	Non-traversable Median
10,000	48	39	32
20,000	126	60	55
30,000	190	92	78
40,000	253	112	85

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 13, Page 8.

Exhibit VI-11 indicates that in urban areas, undivided highways had 9.0 accidents per million vehicle miles as compared with 6.9 for TWLTLs and 5.6 for non-traversable medians. Exhibit VI-12 indicates that in rural areas, undivided highways had 3.0 accidents per million vehicle miles as compared with 1.4 for TWLTLs and 1.2 for non-traversable medians.

Exhibit VI-11: Representative Accident Rates (Accidents Per Million VMT) By Type of Median—Urban and Suburban Areas

Total Access Points Per Million ⁽¹⁾	Median Type		
	Undivided	Two-Way Left Turn Lane	Non Traversable Median
≤ 20	3.8	3.4	2.9
20.01-40	7.3	5.9	5.1
40.01-60	9.4	7.9	6.8
>60	10.6	9.2	8.2
All	9.0	6.9	5.6

⁽¹⁾ Includes both signalized and unsignalized access points.

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 6, Page 4.

Exhibit VI-12: Representative Accident Rates (Accidents Per Million VMT) By Type of Median—Rural Areas

Total Access Points Per Million ⁽¹⁾	Median Type		
	Undivided	Two-Way Left Turn Lane	Non Traversable Median
≤ 15	2.5	1.0	0.9
15.01-30	3.6	1.3	1.2
>30	4.6	1.7	1.5
All	3.0	1.4	1.2

⁽¹⁾ Includes both signalized and unsignalized access points.

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 7, Page 4.

Operations Benefits

Several operations studies have indicated that removing left-turning vehicles from the through traffic lanes reduces delays whenever the number of through travel lanes is not reduced. Some 11 operations models developed over the past 15 years confirmed these findings.

Implications for South Dakota

Selecting a median alternative—retaining an undivided cross section, installing a two-way left turn lane, or providing a non-transversable barrier—is a major decision that will influence the operational and safety characteristics of a roadway. Roadway agencies in South Dakota must consider the following in deciding the best median type or if medians are the correct method of access management: roadway function; adjacent land use, supporting street system; existing access spacing, design, and traffic control features; traffic columns, speeds, and accidents; and costs.

5. Technique: Left-Turn Lanes

The treatment of left turns is a major access management concern. Left turns at driveways and street intersections may be accommodated, prohibited, diverted, or separated depending upon specific circumstances.

Safety Benefits

A synthesis of safety experience indicates that the removal of left turns from through traffic lanes reduced accident rates about 50 percent (range was 18 to 77 percent). The higher end of this range would be more applicable to South Dakota.

Operations Benefits

Left turns in shared lanes may block through vehicles. The proportion of through vehicles blocked on approaches to signalized intersections is a function of the number of left turns per traffic signal cycle as shown in Exhibit VI-13.

Exhibit VI-13: Proportion of Through Vehicles Blocked/Left Turns Per Cycle

<u>Left Turns Per Cycle</u>	<u>Proportion of Through Vehicles Blocked</u>
1	0.25
2	0.40
3	0.60

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 14, Page 10.

The capacity of a shared lane might be 40 to 60 percent of that for a through lane under typical urban and suburban conditions. Thus, provision of left-turn lanes along a four-lane arterial would increase the number of effective travel lanes from about 1.5 to 2.0 lanes in each direction—a 33 percent gain in capacity.

Application of the *1994 Highway Capacity Manual* gives the following illustrative capacities for two- and four-lane roads at signalized intersections.

Exhibit VI-14: Capacities of Two- and Four-Lane Roads at Signalized Intersections

Condition	Capacity—Vehicles Per Hour Per Approach	
	Two-Lane Road	Four-Lane Road
Shared Lane (50 to 150 Left Turns/Hour)	425-650	900-1,000
Exclusive Left-Turn Lanes	750-960	1,100-1,460

Source: NCHRP Report 420, *Impacts of Access Management Techniques*, 1999. Table 15, Page 10.

The capacity increase on the approach that would result from the addition of a left-turn lane would range from about 50 to 75 percent on two-lane roadways and from about 20 to 50 percent on four-lane roadways.

Implications for South Dakota

Due to the operational and safety implications of allowing left turns for through lanes, left turns should be removed from the through travel lanes whenever possible by providing left-turn lane. Therefore, provisions for left turns have widespread

implications in South Dakota along arterials and collector roads. This is essential to improve safety and preserve capacity.

C. Potential Statewide Benefits to South Dakota

The research conducted in other states and at the national level, discussed in the preceding section, clearly demonstrates the safety benefits from improved access management. This section draws conclusions where possible from the available data about the magnitude of the potential benefits and the extent of the problems in South Dakota that improving access management could address.

2. Benefits from better unsignalized access spacing

Driveway-access accident data from South Dakota Department of Transportation (SDDOT) for 1995, 1996, and 1997 is summarized in Exhibit VI-15. In the three-year period, there were more than 5,300 accidents that were specifically identified as driveway accidents. This does not include other accidents that may have been driveway related but coded otherwise due to their proximity to intersections. These accidents included 13 that involved fatalities, more than 1,300 that involved injuries, and nearly 4,000 that involved property damage.

Exhibit VI-15: Driveway-Access Accidents on SDDOT Highways

YEAR	TOTAL ACCIDENTS	ACCIDENT SEVERITY			NO. KILLED	NO. INJURED
		PROPERTY DAMAGE ONLY	FATAL ACCIDENTS	INJURY ACCIDENTS		
1995	1,530	1,107	2	421	2	637
1996	1,912	1,454	2	456	2	716
1997	1,871	1,437	9	425	11	661
TOTAL	5,313	3,998	13	1,302	15	2,014
AVG./YR.	1,771	1,333	4	434	5	671

Source: Based on the analysis of the crash data provided by the SDDOT Accident Records Section and referenced cost factors from National Safety Council.

a. Annual Cost of Driveway Accidents

To compute the annual costs associated with these driveway-access accidents, the three years of data were averaged to compute the number of accidents on an annual basis. Exhibit VI-16 indicates the annual economic loss related to these accidents using 1997 unit costs obtained from the National Safety Council. The

driveway-access accidents cost South Dakota about \$36,500,000 per year due to the related economic losses.

Exhibit VI-16: Estimated Annual Economic Loss from Driveway-Access Accidents on SDDOT Highways

	FREQUENCY	UNIT COST ¹	ROUNDED COST
NO. KILLED	5	\$980,000	\$5,000,000
NO. INJURED	671	\$34,100	\$23,000,000
PROPERTY DAMAGE ONLY	1,333	\$6,400	\$8,500,000
TOTAL			\$36,500,000

Source: National Safety Council-Estimating the Cost of Unintentional Injuries—1997.

¹ 1997 Dollar.

Based on the analysis of the crash data provided by the SDDOT Accident Records Section and referenced cost factors from National Safety Council.

It is increasingly recognized that spacing standards for unsignalized access points should complement those for signalized access. Potentially high-volume unsignalized access points should be placed where they conform to traffic signal progression requirements. On strategic and primary arterials, there is a basic decision of whether access should be provided entirely from other roads.

b. Safety Benefits

The case study done for the Russell Street corridor in Sioux Falls confirms the safety benefits that may be achieved with the implementation of access management techniques. In the case study, access-controlled Russell Street was compared to non-access-controlled Minnesota Avenue. Both routes are approximately the same length. However, there are differences in cross section and the signalized and unsignalized access density on these sections. In addition, Russell Street and Minnesota have different adjacent land uses, which affects the safety statistics.

Russell Street is a divided facility with two lanes in each direction and turning lanes. Along the study section, Russell Street has five signalized intersections, one unsignalized intersection, and five access/egress points. In comparison, Minnesota Avenue is undivided with five lanes, including a center turning lane. Minnesota Avenue has 11 signalized intersections, 13 unsignalized intersection, and 160 access/egress points. The ADT on Russell Street is 32,000 vehicles per day, as compared to 50,500 vehicles per day on Minnesota Avenue.

Russell Street had 110 accidents in the past three years. Minnesota Avenue had almost five times as many accidents, 513 accidents in the three-year period. The

accident rate of 9.41 accidents per million vehicle miles on Minnesota Avenue is nearly three times the accident rate of 3.15 on Russell Avenue. Although the difference in accident frequency and rate between the two routes cannot be associated with any one access management technique, the overall benefit is significant with lessons to be applied elsewhere in the state.

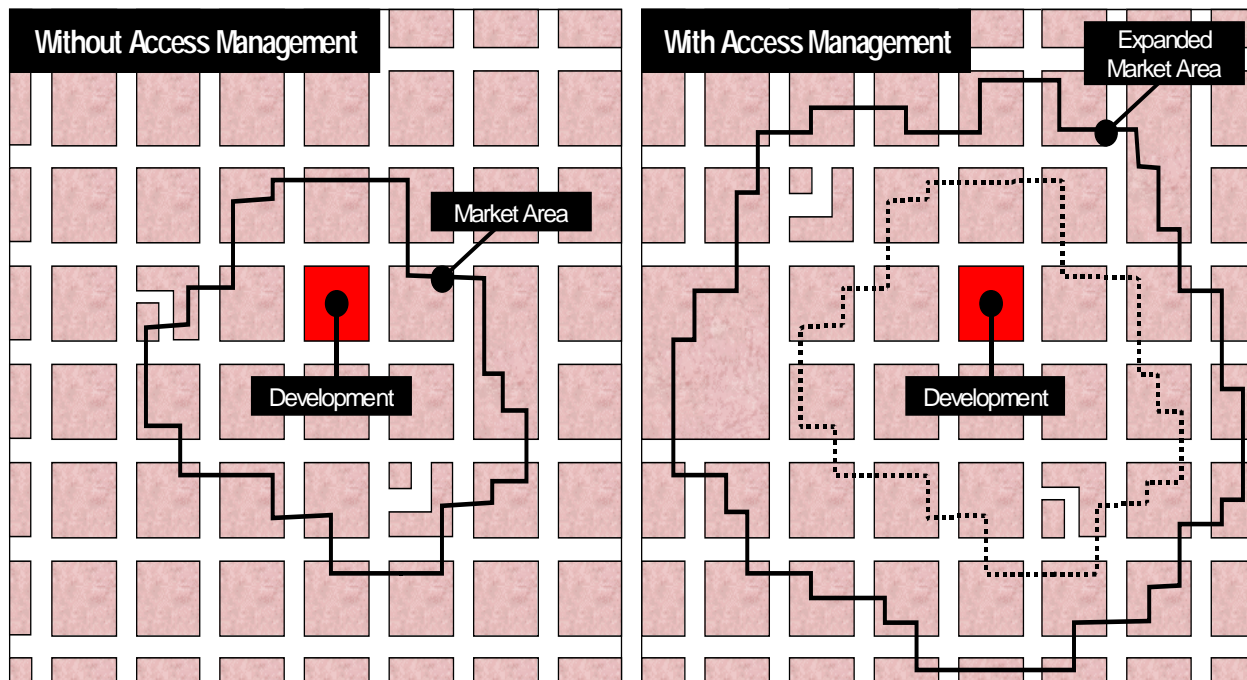
3. Economic Benefits

There are widespread benefits to be achieved by having a good access management program that provides uniform criteria and procedures, and promotes their fair and equal application. Motorists benefit from access management due to the associated reduction in traffic accidents and congestion. In addition, landowners, developers, and the general public are beneficiaries. Landowners benefit from the increased economic development potential of land associated with an efficient transportation system, and enhanced property values by decreasing travel time that extends market areas.

Exhibit VI-17 illustrates this concept. It demonstrates the economic benefit to a retail development from the expanded market area that arises from an effective access management plan. By establishing access design criteria in advance, developers benefit by fewer delays and less required redesign. In addition, businesses with safe and easy access are more inviting to shoppers and visitors and are the scenes of fewer traffic accidents. The public, in general, benefits from the prolonged functional life of existing roads. By preserving a road's design capacity, funds that might otherwise have to be spent on expensive road widening can be spent on road maintenance and operations.

The quality of site access and the protection of private investments are more than a function of the number of driveways. They also depend on the design and spacing of driveways, the ease and safety of pulling off or onto a road, the distance from intersections, and traffic signal sequencing. Highly managed site access results in a carefully designed and safe means of access to each property. In some cases this may not be direct access from a major arterial, but from a side street or frontage road.

Exhibit VI-17: Economic Benefit From Expanded Market Area



Source: Presentation by Urbitran Associates to Association of Consulting Engineers on Benefits of Access Management.

D. Case Study Examples

2. Introduction and Approach

The purpose of the case studies is to develop some illustrative examples, specific to South Dakota, that examine benefits such as safety, preserving public investment, community preservation, and benefits to property owners. Examples were developed that highlight the corridor preservation benefits or illustrate problem areas for specific South Dakota facilities that are experiencing growth. Similar examples to illustrate safety benefits were also developed.

a. Case Study Selection

The technical panel for this study provided guidance in the nomination of potential case studies. Some of these were undertaken directly through SDDOT staff. Additionally, case study nomination forms were sent out to SDDOT, county highway departments, and city public works and street departments.

Through this process 16 example locations were nominated. The team followed up on all of these potential sites and, with assistance from local agencies, developed 11 case study examples in detail.

b. Summary of Locations Studied

The locations studied, the type of case study, and what the case study illustrates is summarized in Exhibit VI-18.

Exhibit VI-18: Case Studies

Case Study Location	Type of Case Study	Illustrates
Louise Avenue and 26 th Street Corridor, Sioux Falls, SD	Example of good practice	Median treatment, New construction with access mgmt.
Russell Street Corridor from I-29 to Minnesota Avenue Sioux Falls, SD	Example of good practice	Good urban arterial
Pierre's Hwy 14 truck bypass along the eastern edge of the City of Pierre, SD	Problem location, Corridor where service will degrade	Strip development with frequent access drives, Median treatment, High accident locations
West 12 th Street from I-29 to Kiwanis Avenue	Example of good practice	Median treatment, Additional lanes
41 st Street and Shirley Avenue, City of Sioux Falls, SD	Problem location	Left turns from through travel lanes, High accident locations
41 st Street and Carolyn Avenue, City of Sioux Falls, SD	Problem location	Left turns from through travel lanes, High accident locations
Intersection of West Main Street and Sheridan Lake Road., City of Rapid City, SD	Problem location	Left turns from through travel lanes, High accident locations
Burr Street (SD37) and Norway Avenue, City of Mitchell, SD Burr Street (SD37) and Kay Street, City of Mitchell, SD	Example of good practice	Left turns from through travel lanes, High accident locations
US 212 in Watertown from 19 th Street East 2.4 miles to 1.0 miles east of I-29	Example of good practice	Left turns from through travel lanes
County Highway #2 North of State Highway 10 along Lake Traverse in Roberts County	Problem location	Strip development with frequent access drives
County Road 366 east of Yankton, Yankton County, SD	Example of good practice	Left turns from through travel lanes

c. Summary of Findings

The case study examples validate the benefits of and/or need for access management at specific locations around South Dakota. They illustrate the following benefits of effective access management:

- Improved traffic flow.
- Reduction in congestion and delays.
- Safe access to highways and preservation of the highway corridor.
- Increased desirability in doing business along corridors.
- Reduction in conflict points and corresponding reduction in the quantity and severity of accidents.
- Maintenance of the character of the area.

The 11 case study details are presented on the following pages.

City of Sioux Falls, South Dakota

Access Management Case Study 1 Louise Avenue and 26th Street Corridor
Sioux Falls, South Dakota

Category: Example of good practice.

Example: Median treatment. New construction with access management.

Prepared By: Kevin Smith, Assistant Director of Public Works and Staff
City of Sioux Falls, South Dakota

Benefits of Access Management:

- By meeting with developers and landowners and presenting the plan for the street pattern, city and state officials experienced fewer problems when reviewing development plans and negotiating access points.
- By planning for limited access, the city and state were able to maintain a high level of service on the new 26th Street interchange and adjacent roadways.
- Increased building setbacks along the corridor have resulted in fewer visibility problems for motorists.
- The integration of land use and transportation planning provided access standards as part of the zoning approvals.

Location Description: The Louise Avenue and 26th Street Corridor is located in the southwestern quadrant in the city of Sioux Falls. The project area has experienced rapid growth, particularly since the completion of the 26th Street/Interstate 29 interchange. Additionally, the project area is located directly north of the Empire Mall, which is the destination of over two million shoppers annually.

The corridor includes existing signalized intersections at 41st Street, 37th Street (Wal-Mart entrance), Shirley Avenue, the interstate interchange ramps, and Marion Road. Future signals are planned for 34th Street and Street Michael's Avenue.

Geometry/Classification: A major section of the corridor was constructed in conjunction with the 26th Street/Interstate 29 interchange in 1996. Previously, Louise Avenue had been constructed from 41st Street north to 34th Street and primarily served the Sam's Club/Wal-Mart area west of Louise Avenue, and a mix of apartments and light commercial development east of Louise Avenue.

The corridor is classified as a principal arterial on the city's Major Street Plan. A raised median begins at the 26th Street intersection and extends east to the Shirley Avenue/Louise Avenue intersection. Where the median exists, the corridor is a four-lane roadway with turning lanes at signalized intersections. South of the Shirley Avenue intersection, Louise Avenue is a five-lane road, which allows access to the existing development to the east. The posted speed limit varies from 30 mph to 45 mph.



This photo was taken facing north on Louise, close to 41st Street.
Source: City of Sioux Falls, Planning Department.

Intersection Spacing Standard: The City of Sioux Falls generally limits the spacing of driveways on arterial streets to one per 300 feet of frontage. The city also attempts to limit the spacing of signalized intersections to one every quarter mile. This case study includes examples of where these standards were met, along with a small section of Louise Avenue near 41st Street where the city is attempting to relocate and realign driveways to minimize traffic conflicts.

Case Study Details: The study site is an arterial corridor that was essentially undeveloped. An Interstate interchange was approved by the Federal Highway Administration and was scheduled for construction in 1996. Previous access permitted on Louise Avenue near 41st Street served commercial development and does not meet current standards for driveway spacing.

The challenge for city staff was to develop an overall access plan for the corridor that complied with South Dakota Department of Transportation access control policies near Interstate interchanges, while giving consideration to future commercial and residential development. Because the interchange configuration was dictated partially by the Big Sioux River and Skunk Creek, a typical diamond design was not possible. This non-typical design also required city and state staff to utilize an internal pattern of streets and intersections that were both safe and evenly spaced. The resulting pattern has worked well and has provided added opportunities for motorists to enter and exit this growing commercial area while avoiding 41st Street, which experiences congestion difficulties in this area.

Because there were several property owners and developers with interest in the study area, staff developed a proposed street pattern and presented the layout at a series of neighborhood meetings. City planning staff encouraged developers to work together to develop Planned Development zoning districts for the area in order to take a more comprehensive approach to land use planning and access locations. During the rezoning process two Planned Development districts were formed—Meadows on the River, and Marion Place.

Both development districts included negotiated access points, land uses, signage, landscape requirements, and building setback requirements that differ from traditional zoning regulations. In addition, city staff has worked with developers to promote access from internal streets (to reduce traffic on Louise Avenue). Likewise, developers are encouraged to provide internal access through shared parking areas.

Traffic Volumes: The ADT totaled approximately 3,000 vehicles per day prior to development of the area in the late 1980s. Generally speaking, the study area has experienced tremendous commercial growth since the opening of the 26th Street/Interstate 29 interchange in 1996, as can be seen by the increasing daily traffic volumes.

Accident Data: Forty-eight vehicular accidents have been recorded along the corridor since opening of the 26th Street interchange in 1996. Exhibit VI-19 presents the data by year and type of accident.

Exhibit VI-19: Accidents on Louise Avenue and 26th Street Corridor

Type of Accident	Number of Accidents, by year				
	1996	1997	1998	1999	TOTAL
Turning Movements	5	10	13	6	34
Rear-Ends		5	1	2	8
Sideswipes			1	1	2
Other	1		2	1	4
TOTAL	6	15	17	10	48

Accident probability information is a reliable indicator of the relative safety of a roadway. The segment with the highest probability was near Jeanne Drive (north of 34th Street) with a .357 accident probability factor. For comparative purposes, the 41st Street and Western Avenue area has a 1.32 accident probability factor. Although the historic accident data is limited because of the age of the corridor, the city considers the low accident rate a positive result of the access management measures that are in place.

Investigation/Relevant Factors: The City of Sioux Falls, through the redevelopment of the property at the northwest corner of Louise Avenue and 41st Street, was able to relocate an access point onto Louise Avenue further north of the intersection. Likewise, the city was able to realign a driveway access for an apartment complex on the east side of Louise Avenue to a

traffic signal. As the property at the northeast corner of Louise Avenue and 41st Street redevelops staff will continue to consolidate access points where possible.

In the year 2000 Capital Improvements Program (CIP), the city has programmed \$122,000 to install a dedicated right-hand turn lane from 41st Street onto Louise Avenue. That intersection is considered to be the busiest in the State of South Dakota in terms of daily traffic, which recently led the city to install dual left-hand turn lanes in all directions.

A new grocery store is currently under construction at the intersection of 26th Street and Marion Road. At that location the developers agreed to right-in, right-out only driveways onto 26th Street and were not granted approval to cross the median. On the west side of the interchange along 26th Street developers have designed site plans around a single access point which has worked well for ingress and egress.

Owner/Tenant Attitudes: The city has worked with developers and land owners to construct an arterial roadway that is safe, has adequate capacity, and provides access to the adjacent properties. Where necessary, the city and state have negotiated with developers to realign or relocate access points to signalized intersections to reduce turning movement conflicts and create a better flow of traffic. The results of these negotiations has been a “win-win” scenario where the properties are more accessible for motorists and business owners, while traffic flow is enhanced and congestion is reduced.

Access Management Implications: The “before” conditions primarily consisted of the existence of Louise Avenue between 34th Street and 41st Street. Driveways for the land uses in the area were very close to the 41st Street intersection and posed increasing access problems as volumes increased. Since construction of the 26th Street intersection it has become necessary for the city to relocate or remove driveways where possible.

With the fast-paced retail development along the corridor the city has benefited by planning for and adhering to access management principles. As was noted earlier, landowners were strongly encouraged to develop Planned Development districts that would include identification of major access points. This allowed the city and the landowners to agree upon signal locations and median cuts.

The “after” conditions are still occurring. The corridor has become the fastest growing are in Sioux Falls for commercial development, with more than 750,000 square feet of building area being added since 1990. As future development occurs along the corridor, the city is confident that a high level of service can be maintained for Louise Avenue and 26th Street.

City of Sioux Falls, South Dakota

Access Management Case Study 2 Russell Street Corridor from I-29 to Minnesota Avenue
Sioux Falls, South Dakota

Category: Example of good practice.

Example: Good urban arterial.

Prepared By: David Voeltz, Transportation Planning Specialist
South Dakota Department of Transportation, Pierre, SD

Benefits of Access Management:

- Effective access management has helped this highway successfully fulfill its mission of providing a safe route and promoting through traffic movements.
- Property owners and businesses located along this corridor are provided the necessary access required by an adequate number of service roads adjacent to this route.
- The integrity of the route has been maintained and intersection modifications have been made to improve opposing traffic movements.

Location Description: This corridor is located within the city limits of the largest city in South Dakota. This east/west route serves as a connector from Interstate Highway 29 to South Dakota Highway 115 (Minnesota Avenue), which is a principal north/south arterial.

The corridor is a divided principal arterial highway with a grass median and was built to insure continuing free flow of travel along this route. There are five signalized intersections within the route excluding the interstate interchange, or Minnesota Avenue, terminus points. Much of the adjacent land is accessed via service roads. There are also points of access and egress specific to direction of travel. This is the best (and only) example of a limited access urban arterial route in South Dakota that has a heavy saturation of adjacent businesses.

This corridor is slightly over two miles in length and passes over the Big Sioux River. There are approximately a dozen motels/hotels located adjacent to this route. There are also greenways, residential housing, retail businesses, convention centers, sports arenas and facilities, gas stations/convenience stores, commercial offices, a golf course, manufacturing facilities, restaurants/food establishments, and other similar concerns located within the corridor.

There are five traffic signal controlled intersections within the route. These include Maple Street, Kiwanis Avenue, Western Avenue, West Avenue, and Prairie Avenue/Cherokee Street. There is an interchange with I-29 on the west end of the route. There is a traffic signal controlled intersection at the east terminus of the route at Minnesota Avenue.

There is one uncontrolled intersection that accesses Louise Avenue. It serves more as a crossover, since this access road to Louise Avenue only exists on the south side of the route.

Garfield Avenue can only be accessed from the eastbound portion of the route. There is one eastbound only access/egress point to a cluster of businesses near Kiwanis Avenue. Westbound travelers can access these businesses via Kiwanis Avenue. A specific eastbound access only and an egress only were constructed at Sioux Falls Arena/Howard Wood Field to facilitate access at this site.

An eastbound access only from a frontage road to Russell Street and a westbound egress only from Russell Street to a frontage road are located near Minnesota Avenue. The Sioux Falls Regional Airport is north of this route and the flight path of the main runway passes directly over the route.

Geometry/Classification: This route is functionally classified as a Principal Arterial. There is a 45-mph speed limit on the majority of this route. The speed limit is reduced to 35 mph for the final four blocks prior to reaching Minnesota Avenue. The width of the route from outer shoulder to outer shoulder varies from 118 feet near the west end of the route to 82 feet near the east end.

The majority of the route is curb and gutter. The grass median varies in width from 30 to 40 feet. The majority of the mainline surface is 24 feet wide while the shoulders vary in widths from three feet to ten feet. There is one interstate highway interchange/intersection on the west end of the route. This interchange uses a left-turn movement to exit the interstate and will be reconstructed to a more traditional design in the near future. There is one uncontrolled crossover/intersection near Louise Avenue. The remainder of the intersections are traffic signal controlled.

Case Study Details: A portion of this route (from I-29 east to West Avenue) was part of the state highway system at the time of construction. The remainder of the route is a city street. This facility was constructed in the early 1960s and has received periodic maintenance since that time.

This was a state/city project. Since records are purged on an ongoing basis, little information remains concerning the details of the project. Due to the well thought-out design of the route and the use of service roads to preserve access to adjacent property, it is speculated that government agencies and private landowners worked closely together to insure mutual goals were met.

Accident/Traffic Data: For study purposes, the controlled access route (Russell Street) will be compared to a non-access controlled principal arterial route (Minnesota Avenue) that is located on the east terminus of Russell Street. Both routes are approximately the same length.

The controlled access route is divided, has four lanes (two lanes in each direction), and has turning lanes at intersections. There are five signalized intersections, one unsignalized intersection, and five access/egress points on the controlled access route. The non-access-controlled route is undivided. It is five lanes wide with the middle lane being used as a turning lane. There are 11 signalized intersections, 13 unsignalized intersections, and 160 access/egress points on this route.

The ADT for the controlled access route is 32,000 vehicles per day based on the previous three-year traffic counts. Daily traffic on the non-access-controlled route averaged 50,500 vehicles per day. The controlled access route has an accident rate of 31.5 accidents per ten million

vehicle miles traveled (VMT). This compares favorably to the 94.1 accidents per ten million VMT for the non-access-controlled route.

Of the 110 accidents that occurred on the controlled access route in the past three years, 44% resulted from rear-end collisions, 38% resulted from turning movements, 9% resulted from non-collision occurrences, and the remainder resulted from angle collisions, sideswipes, and a head-on collision. The non-access-controlled route had 513 accidents in the past three years. Of these, 41% resulted from rear-end collisions, 25% resulted from turning movements, 22% resulted from angle related accidents, 5% from sideswipes, and the remainder from backing and head-on related collisions.

Eighty-five percent (85%) of the accidents occurred at or near intersections on the controlled access route while 75% occurred at those same locations on the non-access controlled route. There were no fatal accidents on either of these routes in the three-year reporting period. Twenty-six percent (26%) of the accidents involved injuries and 74% involved property damage on the controlled access route. This compares to 35% of accidents involving injuries and 65% involving property damage on the non-controlled access route in spite of the lower speed limit on this route (45 mph for most of the route verses 30 mph).

The 85th percentile speed is between 46 to 48 mph for the controlled access route. The average speed for the non-controlled access route is 30 mph. Peak traffic occurs between 7:00 and 8:00 a.m. and 4:00 and 6:00 p.m. for both routes.

Access Management Implications: This limited access highway has successfully fulfilled its mission of providing a safe route and promoting through traffic movements. An adequate number of service roads adjacent to this route provide the necessary access required by property owners and businesses located along this corridor. The integrity of the route has been maintained and intersection modifications have been made (enhanced turn lane signals and increased turn lane capacity) to improve opposing traffic movements.

City of Pierre, South Dakota

Access Management Case Study 3 Pierre's Hwy 14 truck bypass along the eastern edge of the City of Pierre, SD

Category: Problem location. Corridor where service will degrade.

Example: Strip development with frequent access drives. Median treatment. High accident locations.

Prepared By: Sharon Pruess, City Planner, City of Pierre, SD
Attachments and data by Cliff Reuer, South Dakota Department of Transportation

Problems Due to Lack of Access Management:

- This strip of Pierre's highway system has become very attractive for major commercial establishments due to the high traffic volume.
- New businesses demand individual curb cuts which increase the congestion and the number and frequency of conflict points.
- Major truck/auto/pedestrian conflicts will continue to occur and will increase in frequency as development on the north end of the bypass continues and as traffic volumes increase.

Location Description: The truck bypass runs north and south along the eastern edge of the city, providing a primarily uninterrupted route across the city for truck traffic. This section of the highway is approximately three miles long, is a four-lane undivided highway and is classified as a major street. The bypass currently includes 13 intersections. Three major streets, four collector streets, and six local streets currently intersect it.

There are adjacent residential areas and major commercial establishments, such as the Pierre Mall, Wal-Mart, and Econofoods on both sides of this street. An implement dealer is also located along this street. Individual curb cuts for almost every business line the highway. People find it difficult to enter homes or businesses along this street. The north half of the bypass remains undeveloped; however, utilities continue to be extended northward and the area continues to be Pierre's fastest growing commercial development area. Businesses that locate here request individual access approaches to improve marketability. Although businesses have this right under state law, the city would like to impose restrictions on how this is done.

Geometry/Classification: The bypass is classified as a major street and is intersected by three major streets, four collector streets, six local streets and numerous individual driveways. Of the 13 street intersections, three are T-intersections and nine are three-legged intersections. The major conflict point is located at the bypass' intersection with Elizabeth Street. Wal-Mart customers and other residents cut across five lanes of traffic to get to Econofoods on the opposite side of the highway, or vice versa. The Wal-Mart entrance was moved, costing the city and state \$130,000. The two approaches are not aligned and sight distances along this steeply graded section of highway further compromise safety. A secondary conflict point is the bypass' intersection with Fourth Street and Airport Road. The speed limit along the bypass is 45 mph north

of Harrison Avenue, the undeveloped section of the highway, and 35 mph south of Harrison Avenue, the developed section of the highway.



Photo of the Pierre Truck Bypass—State Highway 14 - taken by the South Dakota Department of Transportation.

Case Study Details: Authorities and other parties involved include the South Dakota Department of Transportation, Regional/Local Department of Transportation Office, Pierre Police Department, Pierre City Commission, City Planning Commission and city staff. Anyone traveling along this highway and residents, businesses and landowners along the bypass have all been affected by the growth in traffic. The city is currently negotiating with Wal-Mart to relocate their southerly approach.

Possible solutions include an access management plan that limits access to approximately one quarter mile intervals, establishes minimum distances between curb cuts and street intersections, aligns new or relocated driveways opposite each other or offset at least 125 feet from each other, relates driveway design to travel speed and traffic volumes, and development plans that include shared access, side streets, frontage roads and/or backage roads.

Traffic/Accident Data: The truck bypass has had 40 traffic accidents over a three-year period from January 1, 1996 to December 31, 1998. The accidents involved 21 violations for failure to yield and seven violations for speed related problems. Over 60% of the accidents involved a dry roadway surface, daylight hours, clear weather conditions, and an intersection related accident. The highest accident probability occurred with passenger cars, on Tuesday, during the month of December, at 3 p.m. The 40 accidents resulted in three fatalities, 24 reported injuries and estimated property damage of \$250,200.

Access Management Implications: If current practices are continued the truck bypass will experience increased traffic, congestion and delays. Access to the highway will become increasingly unsafe and there will be an increase in quantity and severity of traffic accidents. Resident, business and landowner dissatisfaction will likely increase leading to a decreased desirability of doing business along this highway. This will result in a decline of the character and functionality of this corridor if action is not taken.

City of Sioux Falls, South Dakota

Access Management Case Study 4 12th Street from Interstate 29 to Kiwanis Avenue

Category: Example of good practice.

Example: Median treatment. Additional lanes.

Benefits of Access Management:

- Effective access management, through the use of median treatments, has helped this arterial successfully fulfill its mission of providing a safe route and promoting through traffic movements.
- By working with property owners before and during modifications along the arterial, buy-in to the treatments was generally achieved and the overall outcome positive.
- Property owners and businesses located along this corridor are provided the necessary access either directly or by consolidated accesses adjacent to this route.
- The integrity of the route has been maintained and intersection modifications have been made to improve opposing traffic movements.

Location Description: The study corridor is 12th Street in Sioux Falls from the Interstate 29 interchange east to Kiwanis Avenue. This is a busy corridor, as it is one of three main east-west corridors in Sioux Falls (the other two major east-west corridors are 41st Street and Russell Street). The study corridor crosses over the Big Sioux River. There are four intersections at Carolyn Avenue, N. Lyons Blvd., Westport Avenue, and Kiwanis Avenue. All intersections are now signalized except for Carolyn Avenue.

Property along the study corridor is for the most part zoned commercial, the area is well developed, and there is some limited room for further commercial development in the future. There is one apartment complex in the study area. The types of businesses along the corridor are car dealerships (Saturn and Chevrolet dealerships), restaurants (including a recently opened Taco Bell), small manufacturing/sales businesses, a rental business, a K-Mart, a Ramada Limited Inn, a mini mall, and so on. The Sioux River Amusement Park, Sherman Park, and Battleship Memorial are located adjacent to 12th Street. Lyons Blvd. serves as the main entrance for the Sioux Empire Fairgrounds and is therefore very busy during many events held there.

Geometry/Classification: In the “before” condition there were two lanes in either direction from the I-29 interchange to Westport Avenue with a center turn lane. There were no raised medians in the before condition. There were some small left turn islands but they were not well designed. For the most part, the before condition was characterized by uncontrolled left turns. The Westport Avenue intersection was not signalized in the before condition.

In the “after” condition (after construction in 1997 and 1998) lanes were added making for three lanes in either direction from the I-29 interchange to Westport Avenue, with turn lanes at specific locations. A free right-hand turn was created from the northbound I-29 off ramp onto 12th Street. A 20-foot wide raised median was constructed from the I-29 interchange through to Westport Avenue. Long left turning bays were integrated into the median at Carolyn Avenue, Lyons Blvd., and Westport Avenue. The Westport Avenue intersection was signalized in the after condition and various turn signal phasing improvements have also been made.

Case Study Details: Right-of-way and negotiations for the project began in 1995. Public meetings were held prior to and during the construction along 12th Street. For the most part business owners attended and were supportive of the upgrades to 12th Street. SDDOT worked with property owners to develop shared access or move to more desirable access locations. Trees were planted on the medians for aesthetics. Several business owners were to be faced with right-in-right-out only access following the treatments. In general, however, these business owners were cooperative with the improvements, as they were largely destination businesses. Property owners from the Sherman Park Apartments expressed concern since residents travelling west have to make a U-turn at Lyons Avenue to get to the building. The convenience store owners at the AMOCO also expressed concern over right-in-right-out only access.

Traffic/Accident Data: The ADT on 12th Street is approximately 40,000 vehicles. Peak hour directional volumes just east of the I-29 interchange are approximately 3,000 in the morning and 4,100 in the evening. Recent average speed calculations indicate that traffic flow is good, with average speeds slightly above the posted 35 mph. While there is insufficient data for a before-after comparison, all indications are that the access management treatments have contributed significantly to the functional integrity of the corridor.

From August 1996 to August 1999 there were a total of 275 accidents along the study corridor. The breakdown by type of collision is as follows: 30.2% turning accidents, 50.9% rear end accidents, 8.0% angle accidents, and 10.9% other accidents. While there is insufficient data for a before-after comparison, anecdotal information suggests that the number of accidents has decreased since the access management treatments were implemented.

Access Management Implications: The 12th Street case study demonstrates the effectiveness of access management in terms of improving traffic flow and safety. Also, this example shows that early and continuing public consultation can result in a successful outcome in which most, if not all, parties have buy-in to access treatments.

It is likely that future changes will be required to the I-29 interchange at 12th Street. Traffic lights at the end of the off ramps are causing excessive stacking of vehicles at times, which could potentially interfere with the interstate. If the interchange were changed to a single point diamond, the existing access management improvements east of the interchange would coordinate well with the improved flow of traffic associated with the interchange upgrade.

City of Sioux Falls, South Dakota

**Access Management
Case Study 5**

41st Street and Shirley Avenue, City of Sioux Falls, SD

Category: Problem location.

Example: Left turns from through travel lanes. High accident locations.

Prepared By: Cliff Reuer, Traffic and Safety Engineer, South Dakota Department of Transportation, Pierre, SD.

Problems Due to Lack of Access Management:

- The problem at this location involves the need to prevent rear-end and left-turn accidents, and maintain capacity of the intersection.
- If no action is taken, the accidents will continue or increase in number.

Location Description: This intersection is in the middle of a commercial area. The south leg of this intersection is a driveway to the Empire Mall, which contains more than 100 stores. The north leg of the intersection serves a rapidly growing commercial area.

Geometry/Classification: This is a high volume intersection with the east/west (41st Street) legs of the intersection being seven lanes, the north leg (Shirley Avenue) being four lanes, and the south leg (Empire PI.) being two lanes. The two center lanes of the north leg are dual-left-turn lanes. The left-turn lane on the east leg has been painted out to prohibit left turns. The south leg has been signed to prohibit left turns. The north and south legs are offset from each other.

Case Study Details: It has been observed that drivers are not obeying the traffic controls to prohibit left turns from the south and east legs of the intersection. The turning movement studies support the observations that traffic is still making these left-turn movements. A possible solution is to close the south leg of the intersection. This is feasible because two other driveways on the south side of 41st Street serve the mall area.

Other solutions may be to install a physical barrier to prohibit the westbound left turns from 41st Street or design an island on the south leg of the intersection to create a right-in and right-out onto 41st Street. These solutions may be hard to sell to the management of the mall and other local businesses in the area, as they may view it as limiting access to their businesses.

Traffic/Accident Data: From January 1, 1996 through December 31, 1998, 71 accidents occurred at this location with no fatalities, 24 injuries, and 47 instances of property damage, totaling \$341,000, excluding injury costs.



This photo was taken at the northwest corner of the intersection of 41st & Shirley, looking southeast across 41st Street.

Source: City of Sioux Falls, Planning Department.

Traffic counts taken on the eastbound and westbound lanes of 41st Street show that 36,918 vehicles passed through the intersection during a 24-hour period on August 3 and 4, 1999. These mid-week counts would be lower than the weekend counts due to the traffic generated by the Empire Mall on weekends.

Access Management Implications: If no action is taken, the accident numbers will continue to increase due to the increase in traffic volume expected in this area. With the increase in commercial activity in the area, the traffic volumes will increase and capacity problems can be expected. Without access management in the area, businesses may be forced to move away from busy intersections because easy and safe access will no longer exist for their customers.

City of Sioux Falls, South Dakota

Access Management Case Study 6

41st Street and Carolyn Avenue, City of Sioux Falls, SD

Category: Problem location.

Example: Left turns from through travel lanes. High accident locations.

Prepared By: Cliff Reuer, Traffic and Safety Engineer, South Dakota Department of Transportation, Pierre, SD

Problems Due to Lack of Access Management:

- Traffic cannot exit Carolyn Avenue on to 41st Street and there are inadequate gaps in traffic to allow eastbound left-turning traffic on 41st Street access to Carolyn Avenue. Also, when the signal at the intersection at 41st Street and I-29 ramps is red, traffic backs up through this intersection.
- This traffic backup blocks the Carolyn Avenue entrance preventing eastbound traffic from entering Carolyn Avenue and preventing southbound traffic from exiting Carolyn Avenue.
- The rear-end accidents involving westbound traffic are probably the result of the traffic signal at 41st Street and I-29 ramps, rather than being related to the 41st Street and Carolyn traffic.
- If no action is taken, the accidents will continue to be a problem and traffic may tend to avoid this intersection adding volumes to other intersections in the area.

Location Description: This intersection is located a short distance east of the I-29 northbound entrance/exit ramps. Carolyn Avenue serves as access to motels as well as a growing commercial area north of this location. The ADT near Louise Avenue is 50,000.

Geometry/Classification: This is a T-intersection with the east/west (41st Street) legs of the intersection being seven lanes and the north leg (Carolyn Avenue) being three lanes. The center lane of the north leg is a left-turn lane.

Case Study Details: This location has been considered for the installation of a signal to allow traffic to enter and exit the Carolyn Avenue leg of the intersection. A signal at this location would not function properly because it would be too close to the signal at the intersection of 41st Street and I-29 entrance/exit ramps. Closing the street is not an option due to the commercial development present.



This photo was taken at the intersection of 41st & Carolyn, looking west toward I-29.
Source: City of Sioux Falls, Planning Department.

Making the intersection a right-in and right-out to and from Carolyn Avenue may be an option to consider. Closing the intersection is probably not an option because of the commercial development in the area.

Traffic/Accident Data: From January 1, 1996 through December 31, 1998, 29 accidents occurred at this location with no fatalities, 13 injuries, and 16 instances of property damage.

Traffic counts taken on the eastbound and westbound lanes of 41st Street show that 36,471 vehicles passed through the intersection during a 24-hour period on August 3 and 4, 1999.

Access Management Implications: If no action is taken, the accident numbers will continue to increase due to the increase in traffic volume expected in this area. The traffic may be starting to avoid this intersection, adding traffic at 41st Street and Shirley Avenue and at 41st Street and Louise Avenue. A greater distance from the I-29 ramps to the Carolyn intersection should have been required at the time the intersection was constructed. This would have provided more options for traffic control at this location. At this point, the traffic control options are very limited.

Rapid City, South Dakota

Access Management Case Study 7 Intersection of West Main Street and Sheridan Lake Road, City of Rapid City, SD

Category: Problem location.

Example: Left turns from through travel lanes. High accident locations.

Prepared By: Cliff Reuer, Traffic and Safety Engineer, South Dakota Department of Transportation, Pierre, SD

Problems Due to Lack of Access Management:

- Accidents occur a short distance east of the intersection.
- The access to a business is too close to the intersection. The intersection cannot function to provide proper access to the business and interferes with the traffic flow of the intersection.

Location Description: West Main Street is commercially developed on both sides in the west central area of Rapid City. West Main Street makes up the east and west legs of the intersection and Sheridan Lake Road makes up the north and south legs. The south leg of Sheridan Lake Road runs through a residential area with some commercial development and turns into a county road on the south edge of Rapid City. The north leg has a low volume, and is not as improved as the other three legs.

Geometry/Classification: This location is a four-leg intersection with the east, west, and south legs carrying the majority of the traffic. West Main Street is a five-lane street and Sheridan Lake Road is a two-lane street with a left-turn lane at the intersection.

Case Study Details: There is a driveway to a restaurant a short distance east of the intersection. Rear-end accidents are occurring while the eastbound traffic is stopped waiting to make a left turn to enter the driveway. The center-turn lane, which at this point is the left-turn lane for the westbound traffic, is occupied by westbound traffic when rear-end accidents occur. This is typically called a corner-clearance problem. Motorists almost have to come to a dead stop on West Main to access the parking lot due to congestion within the lot. The resulting rear-end accidents increase traffic congestion on the arterial.

Traffic/Accident Data: From January 1, 1996 through December 31, 1998, 20 accidents occurred at this location with no fatalities, seven injuries, and 13 instances of property damage.

Traffic counts taken on the east, west and south legs of the intersection show that 31,100 vehicles per day passed through the intersection in 1998.



Photo of West Main Street in Rapid City taken by the City of Rapid City.

Access Management Implications: The intersection cannot function to provide proper access to the business and interferes with the traffic flow of the intersection. If no action is taken, the number of accidents will continue to increase due to higher traffic volume expected in this area.

City of Mitchell, South Dakota

Access Management Case Study 8	Burr Street (SD37) and Norway Avenue, City of Mitchell, SD Burr Street (SD37) and Kay Street, City of Mitchell, SD
Category:	Example of good practice.
Example:	Left turns from through travel lanes. High accident locations.
Prepared By:	Cliff Reuer, Traffic and Safety Engineer, South Dakota Department of Transportation, Pierre, SD
Benefits of Access Management:	<ul style="list-style-type: none">• The addition of the left-turn signal phase as a result of the increase in traffic volume has decreased the number of rear-end accidents.

Location Description: The intersection of Burr and Norway is located approximately 0.316 miles north of I-90. The intersection of Burr and Kay is located approximately 0.327 miles north of I-90.

Geometry/Classification: The north and south legs of the intersections are divided, four-lane sections of SD 37. The east and west legs of the intersection are two-way city streets. There are service roads running parallel to the north/south legs.

Case Study Details: These locations were experiencing a problem with angle-intersection accidents. The area was gaining in commercial development east and west of the intersections, causing traffic volume to increase. The service roads adjacent to the divided highway made the intersections a wide area for traffic to cross. The service roads were located close to the main line of Burr Street which created little storage room for east/west traffic to wait next to Burr Street. During peak periods, the east/west traffic was forced to wait on far sides of the service roads.

The storage area between Burr and the service roads is too short to allow more than one or two vehicles to queue at the stop sign. This caused the vehicles to queue on the far side of the service roads, which increased the distance for them to access the northbound or southbound lanes of Burr Street. Drivers misjudged this distance and had angle-intersection accidents at the Burr Street intersections. The short distance between the service roads and Burr Street also allowed the northbound and southbound traffic to “weave” from Burr Street onto the service road.

Signals were installed in the fall of 1995 to control the traffic and allow time for the Norway and Kay traffic to enter the intersection. Offset left-turn lanes were also installed on the northbound and southbound lanes of Burr Street. After the signals were in operation, it was discovered that the angle-intersection accidents decreased, but there was an increase in left-turn accidents. A left-turn phase is being added to the signal in an effort to correct this problem.

Traffic/Accident Data: Accident summaries for a three-year period from July 1, 1992 through June 30, 1995 (before signal and turn lane improvements) and for a three-year period from November 1, 1995 through October 31, 1998 (after signal and turn lane improvements) were analyzed. While the number of accidents has increased at both locations due to the increase in traffic, the number of rear-end accidents has fallen.

The summaries indicate that there was a decrease in angle-intersection accidents and an increase in left-turn accidents. This accident pattern prompted the installation of a left-turn phase to the signal system.

Traffic counts taken in 1998 show the following: on Burr Street, north of the intersection of Kay Street and Burr Street—12,740 ADT; on Burr Street, south of the intersection of Norway Avenue and Burr Street—8,650 ADT; on Norway Avenue west of the intersection of Burr Street and Norway Avenue—2,305 ADT.

Access Management Implications: One of the most difficult aspects of these locations was the short distance between the service roads and Burr Street. Once the development was in place the service could not be moved. Closing the service roads was not acceptable to the managers of the area's commercial operations. If service roads are used as part of an access plan to property, adequate space should be allowed between the main line and the service roads for vehicle storage.

The need for the addition of the left-turn signal phase was a result of the increase in traffic volume. This increase in volume resulted in a quick change in traffic pattern, accompanied by the change in accident pattern and accident type.

Watertown, South Dakota

Access Management Case Study 9	US 212 in Watertown from 19 th Street East 2.4 miles to 1.0 miles east of I-29
Category:	Example of good practice.
Example:	Left turns from through travel lanes.
Prepared By:	Larry Afdahl, Region Engineer, Aberdeen Region Office, South Dakota Department of Transportation, Aberdeen, SD
Benefits of Access Management:	<ul style="list-style-type: none">• Construction of a left-turn lane at a truck stop has resulted in better traffic flow and fewer accidents.

Location Description: The study segment is on US 212 and begins at 19th Street East, 1.4 miles west of Interstate 29, and continues east 2.4 miles, ending 1.0 mile east of Interstate 29. The first quarter mile is an undivided four-lane highway with a center turn lane. A cemetery with no access is on the left and commercial development served by a frontage road is on the right. Access points to the commercial development, such as Menard's and Target, are located off the two ends of the service road. The road then transitions into four-lane highway divided with turning lanes and acceleration/deceleration lanes, and with limited access points for significant traffic generators.

Stone's Truck Stop, located on the north side of Highway 212 and immediately adjacent to the east side of the interstate, was a major traffic generator and safety problem: Motorists trying to turn into the truck stop exceeded the length of the left-turn bay. Reconfiguring and reconstructing the left-turn bay to make it continuous has remedied this problem. A lot of traffic got in the left-turn bay to go to the truck stop, then ran out of lane and tried to move back into the main lane. Now, the lane is continuous, which enhances traffic movement.

There is a series of six entrances for individual homes in the next three-quarters of a mile. Then the road becomes a four-lane divided highway with turning lanes and acceleration/deceleration lanes, and frontage roads on both sides for the next three-quarters of a mile and four-lane divided highway with limited access points the last quarter mile. Beginning one-quarter mile into the project and continuing for one and three-quarters miles to one-half mile from the end of project is an industrial/commercial development area.

Geometry/Classification: Speed limits are 30 mph for the first eighth of a mile and 55 mph for the remainder of the project. The project is located within the city of Watertown with development controlled by city of Watertown, zoning additional access controlled by both city and Department of Transportation, and law enforcement provided by both state and city.

Case Study Details: This project was originally constructed in 1971 and resurfaced in 1998 without changing geometry, turning lanes or acceleration/deceleration lanes, with one exception. A major truck stop is located on the north side of US 212 just east of Interstate 29. A left-turn lane for the truck stop and access to northbound Interstate 29 were made continuous.



Photo of US 212 in Watertown taken by the South Dakota Department of Transportation.

Traffic/Accident Data: East and west of the interstate varies from 5,000 to 10,000 ADT each direction with about 20% trucks and projected to almost double in the next 20 years. Accident data shows that there have been no fatalities, 20 injury accidents, and 32 property damage accidents in the last three years on the study segment.

Access Management Implications: The lefts turn lane for the truck stop has improved traffic flow and increased safety.

Roberts County, South Dakota

Access Management Case Study 10 County Highway #2 north of State Highway 10 along Lake Traverse in Roberts County

Category: Problem location.

Example: Strip development with frequent access drives.

Prepared By: Roger George, Highway Superintendent, Roberts County Highway Department, Sisseton, SD

Problems Due to Lack of Access Management:

- Properties on this segment of County Highway #2 have limited sight distance as they access the highway because of a steep grade.
- The trees and the winding pattern of the highway causes some safety problems, especially if drivers do not stop when leaving their property, as sight distance is limited in some areas.
- One solution to the problem would be to build a service road at a lower elevation.

Location Description: The road located along Lake Traverse crosses rolling terrain. Access in and out of property is made directly onto the county highway. The highway is approximately 600 to 800 feet running adjacent to the lake, with the development of home sites between the lake and the highway.

Geometry/Classification: County Highway #2 is two-lane undivided and has a winding pattern throughout the case study segment. The speed limit is presently 55 mph. The county has considered lowering it, but rural lowered speed limits are difficult to enforce.

Case Study Details: The elevation from the highway to the lake varies from 50 to 100 feet. Because of the elevation, it is nearly impossible to make a safe landing at the highway entrance. Some of the lots are sufficiently wide to allow entrances to wind up the incline in a diagonal pattern and reduce the steepness. A few of the property owners have asphalted their drives so that they can stop and start again without spinning their wheels in gravel. During the winter months, the asphalt driveway does create additional problems, however, because of snow and ice. Some property owners have built landings to park their vehicles during the winter months. These landings are located alongside the county highway and cause additional problems for the highway department, along with more unsafe conditions.

Traffic/Accident Data: Daily traffic from the most recent count is approximately 250 ADT. Peak traffic is either early morning (7:00 to 8:00 a.m.) or late afternoon (5:00 to 6:00 p.m.) with mainly through traffic and local residents.



Photo of County Highway #2 by Lake Traverse taken by the Roberts County Highway Department.

Access Management Implications: One solution to the problem would be building a service road at a lower elevation. This would in turn lower the number of entrances onto the county highway. However, this would be difficult to accomplish without reducing lot sizes. With more lots being developed, the safety concern seems to be increasing.

Yankton County, South Dakota

**Access Management
Case Study 11**

County Road 366 east of Yankton, Yankton County, SD

Category: Example of good practice.

Example: Left turns from through travel lanes.

Prepared By: Alan Sorenson, Highway Superintendent, Yankton County Highway Department, Yankton, SD

Benefits of Access Management:

- Curve widening and two left-turn lanes have resulted in better traffic flow and fewer accidents.

Location Description: The study segment is County Road 366 that runs from Yankton east approximately three and one-half miles to County Road 369. This segment is one of the most heavily traveled roads in Yankton County, providing a main highway for commuters between the surrounding rural area and Yankton. There are three major intersections and one small business. The area can be considered a moderate growth area. This road contained a dangerous curve, and it also had no turning lanes. Additionally, at one site there was a bad snow trap.

Geometry/Classification: County Road 366 is two-lane undivided. It has a 40 mph speed limit for approximately seven-tenths of a mile from city limits east, a 55 mph speed limit for approximately two miles, and a 40 mph speed limit for approximately one-quarter mile through the bridge over James River. The speed limit is 55 mph on the remainder of the road.

Case Study Details: Prior to the upgrades there was a high risk of accidents due to curve geometry and lack of turning lanes. Winter road blockage also occurred due to snow accumulation. The project to realign the curve and add two left-turn lanes began in the fall of 1997. It was completed with Yankton County, state and federal funds.

The road and curve were re-graded, widened and hard-surfaced with six-foot shoulders added. Curbs and gutter and storm sewer were installed to seven-tenths of a mile east of the city limits. Two left-turn lanes were added at two busy intersecting county roads. New striping was completed, indicating no-passing and turning lanes. Township roads intersecting with the highway were redesigned to come in at a 90-degree angle to enhance visibility for merging traffic.

Adjoining landowners and a restaurant were affected during the construction, but were generally cooperative. The road was maintained daily until the hard surface was completed. The road was not closed to traffic during the construction period.

The upgrades have improved traffic flow and increased safety. Additionally, there is no more snow accumulation problem.

Traffic/Accident Data: County Road 366 is the most traveled road in Yankton County. Some accidents have occurred due to the narrowness of the road and curve. There have been two

fatalities on the study segment in the past five years. Snow accumulation has caused several hour blockages in the winter.

Access Management Implications: The realignment and widening, and the addition of two left-turn lanes, has resulted in better traffic flow and fewer accidents. The snow accumulation problem has also been rectified, helping to reduce wintertime delays.

VII. Tools for Local Government



A. Introduction

This chapter presents the tools that can be used to assist local jurisdictions and SDDOT to improve the coordination between the development review process and land use planning and access management. The chapter identifies mechanisms for improved coordination in the following areas:

- Access permitting.
- Land development.
- Major traffic generators.
- Access management plans.

Local access management ordinance should contain definitions of terminology used. An example definition listing is also provided to assist cities and counties in developing their local code.

B. Local Access Ordinances

Local ordinances are the city or county level rules and regulations that govern the local area. Ordinances cover a wide range of regulations such as zoning, parking and traffic laws, business incorporation, and so on. Local authority to engage in access control is implied under the general police power, unless expressly provided through statute. This study recommends that the South Dakota Department of Transportation (SDDOT) consider legislative action allowing it to establish (promulgate) access regulations to apply to state highways.

Local government land use decisions have major impacts on access conditions. Every time the local unit of government approves a land subdivision, a new bundle of access rights is endowed on each newly created lot. If the subdivision has been well designed, these lots will be accessed via internal streets connected to the local street network or state highway at properly spaced intersections, and not by individual, direct driveways. Cities and counties have broad authority to plan and regulate land use through zoning and subdivision controls and thereby manage access, if they choose to do so.

Successful access management policies and guidelines will be implemented through coordination between SDDOT and local units of government. This includes joint planning for protecting critical corridors, adoption of development review practices that consider access criteria, and support for enacting ordinances and other actions favorable to SDDOT's access policy and guidelines. Strengthening the partnership among SDDOT, counties and cities is a key to implementing access policy.

The cities of Sioux Falls and Rapid City address access through their street design manuals. Many smaller cities and counties in South Dakota will not have the resources or expertise to develop such manuals. For this reason, this chapter provides model ordinance language that can be used as a basis for implementing city and county access-related ordinances. As a model, it addresses the most important access-related issues that affect South Dakota communities, both urban and rural. These ordinances will preserve public investment in the transportation infrastructure.

The model ordinances should not necessarily be adopted verbatim; rather local governments are encouraged to apply elements that fit local conditions and administrative practices. Text in parentheses and italics within the body of the regulatory language should be replaced with the appropriate information (i.e., name of jurisdiction, appropriate reviewing official, numerical citation of plan policies, and so on).

While the model ordinance language may not always be entirely applicable in each jurisdiction or may need to be modified, it provides a basis cities and counties can use to draft their ordinances. The model ordinances are drawn from examples from other states, with the technical specifics developed on this project applied (for example driveway spacing and corner clearance). Comprehensive work undertaken recently in Oregon, Kansas, Iowa, Florida, Minnesota, and other states provided input to drafting of model ordinances for South Dakota.

C. Access Permitting

Proper access location and design is paramount for preserving the functional integrity of city or county streets, providing for smooth and safe flow, and affording abutting properties an appropriate degree of access. This will protect the public's investment in the transportation system. This section presents a suggested access ordinance in areas that are most important for cities and counties. These may include unsignalized access (driveways and intersections), signal spacing, corner clearance, sight distance, and nonconforming access features.

The access permitting model ordinance covers the major elements of classification system and standards, unsignalized access, corner clearance, sight distance, and nonconforming access features. These elements can be considered minimum level access permitting ordinances—ones that each city or county should implement.

Model Access Permitting Ordinance

2. Intent and Purpose

Major thoroughfares, including highways and other arterials, serve as the primary network for moving people and goods. If access locations are not properly designed, these thoroughfares will be unable to accommodate the access needs of development and retain their primary transportation function. This ordinance balances the right of reasonable access to private property, with the right of the citizens of the (*city/county*) and the State of South Dakota to safe and efficient travel, and provides a framework for future land development.

To achieve this policy intent, state and local thoroughfares have been categorized for access purposes based upon their level of importance. Standards relating to the management of access are to be applied to these thoroughfares for the purpose of reducing traffic accidents, personal injury, and property damage frequently attributable to poorly located and designed access; and to thereby improve the safety and operation of the roadway network. This will protect the substantial public investment in the existing transportation system and reduce the need for expensive remedial measures. It will ensure the orderly development of land through the consistent application of rules to the benefit of commerce and economic development.

3. Applicability

This ordinance shall apply to all arterials and selected collectors within (*city/county*) and to all properties that abut these roadways. On the state system SDDOT standards shall apply unless more restrictive standards are established by cooperative agreement between the city/county and SDDOT.

This ordinance is intended to protect the public's investment in the road system by preserving its functional integrity through the use of modern access management practices. This policy is best implemented using established traffic engineering and roadway design principles to minimize disruptions to the through traffic that would reduce the highway's safety and efficiency. The principles established by this policy include:

- Limit the number of conflicts.
- Separate basic conflict areas.
- Reduce interference with through traffic due to turns into or out of a site.
- Provide sufficient spacing between at-grade intersections.
- Maintain progressive speeds along arterials.
- Provide adequate on-site storage areas.
- Encourage access to the street with the lowest functional classification where an option exists.

4. Access Management Classification System and Location/Spacing Standards

3.1 This ordinance adopts for (*city/county*) the access classification system and location criteria adopted by SDDOT for facilities as functionally classified or that will be classified as minor arterial and above. The ordinance further establishes access location standards for current and planned urban collectors with primarily through traffic. This shall be consistent with (*city/county street/road plans*).

Current and Planned Function	Signal Spacing (mile)	Bandwidth*	Median Opening Spacing (mile) ¹	Minimum Unsignalized Access Spacing (feet) ²	Denial of Direct Access When Other Available
Urban - Primarily through traffic	1/4 - 1/2 ³	(35-40%) ³	N/A	150 - 350 ³	Y ⁴

¹ N/A = Not Applicable; F = Full Movement; D = Directional Only.

² Stricter Standards could apply if set by other jurisdictions.

³ Where a range of spacing is shown, the greater distance or bandwidth would apply to posted speeds of 45 mph or higher.

⁴ If so conference among the governing authorities.

* Bandwidth measures how large a platoon of vehicles can pass through a series of signals without stopping for a red traffic light. It represents a “window of green” in which motorists travelling along a roadway will encounter a series of green lights as they proceed. For example, a bandwidth of 45 percent indicates that, if a traffic signal has a 100-second cycle length, there is a 45-second band in which a platoon of vehicles will encounter green lights as they travel along a roadway.

In some cases (*city/county department*) may choose to adopt stricter or less restrictive standards than the state access criteria based on specific requirements as a result of existing development, block spacing, and other factors.

5. Unsignalized Access (Driveways and Intersections)

4.1 Driveway and intersection design shall conform to SDDOT standards and practices as set out in SDDOT Access Policy and Access Management Criteria for Unsignalized Access.

4.2 Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes and tapers is prohibited due to the potential for vehicular weaving conflicts, unless there is no alternative.

4.3 Driveway width and flare shall be adequate to serve the volume of traffic and provide for smooth movement of vehicles from the major thoroughfare, but shall not exceed 40 feet for a commercial or 24 feet for a residential driveway. This is to prevent safety hazards for pedestrians, bicycles, or other vehicles.

6. Corner Clearance

- 5.1 Corner clearance for connections shall conform to SDDOT standards and practices as set out in SDDOT Access Policy and Access Management Criteria.
- 5.2 New connections shall not be permitted within the functional area of an intersection unless:
- a) No other reasonable access to the property is available, and
 - b) The (*permitting department*) determines that the connection does not create a safety or operational problem upon review of a site-specific design and operation study of the proposed connection prepared by a registered engineer and submitted by the applicant.
- 5.3 Where no other alternatives exist, the (*permitting department*) may allow construction of an access connection along the property line furthest from the intersection. In such cases, directional restrictions (i.e., right in/out, right-in-only, or right-out-only) may be required.
- 5.4 In addition to the required minimum lot size, all corner lots shall be of adequate size to provide for required frontyard setbacks and corner clearance on street frontage.

7. Sight Distance

The guidance in the South Dakota Road Design Manual for both stopping and intersection sight distance shall be applied. Access drives shall not be permitted where the sight distance is inadequate to allow an approaching motorist to come to a safe stop if needed.

8. Nonconforming Access Features⁹

- 7.1 Permitted access connections in place as of (*date of adoption*) that do not conform with the standards herein shall be designated as nonconforming features and shall be brought into compliance with applicable standards under the following conditions:

⁹ Nonconforming access features may continue in the same manner after adoption of land development regulations – a process known as “grandfathering”. This protects the substantial investment of property owners and recognizes the expense of bringing those properties into conformance. Yet the negative impacts of nonconforming properties may be substantial, depending on the degree of nonconformity. Nonconforming properties may pose safety hazards, increase traffic congestion, reduce property values, and undermine community character. To address the public interest in these matters, land development regulations include conditions or circumstances where nonconforming features must be brought into conformance. Opportunities to bring nonconforming features into compliance typically occur after a change of ownership when the costs of required improvements may be amortized in the business loan or mortgage, thereby minimizing financial hardship.

- a) When new access connection permits are requested;
- b) When substantial enlargements or improvements are made to the property;
- c) When there is a significant change in trip generation; or
- d) As roadway improvements allow.

7.2 If the principal activity on a property with nonconforming access features is discontinued for a consecutive period of *(180 or 365)* days, or discontinued for any period of time without a present intention of resuming that activity, then that property must thereafter be brought into conformity with all applicable connection spacing and design requirements, unless otherwise exempted by the permitting authority. For uses that are vacant or discontinued upon the effective date of this code, the *(180 or 365)* day period begins on the effective date of this code.

D. Land Development Ordinance

The interdependence of land development and access controls is another important dimension of regulating access. Subdivision regulations, lot-split requirements, and development review provide an opportunity to assure proper access and street layout in relation to existing or planned roadways. Attention to lot width, depth, and size in zoning helps ensure adequate dimensions for on-site circulation, parking, driveway spacing, driveway throat length, corner clearance, and service drives. Setbacks affect the ability to achieve adequate sight distance and avoid placement of structures within future rights-of-way.

General principles for ensuring proper access management through land development regulations include:

- Shared access should be encouraged wherever possible.
- If a property abuts two streets, it is always desirable that access be to the street with a lower functional classification.
- Fewer rather than more driveways are preferable and shared access should be encouraged wherever possible.
- Driveways on opposite sides of a street should be lined up wherever possible.
- Provision of frontage and rear access roads where appropriate.

This section presents elements for inclusion in model city/county ordinances to promote effective access management.

The land use coordination model ordinance presents site plan review procedures—perhaps the most important element for ensuring that access management principles are incorporated with land development decisions. Other land development elements covered in the land use coordination code are reverse frontage, lot width-to-depth ratios, shared access, connectivity, and variance standards.

2. Site Plan Review

The most important element of land development code is site plan review procedures. The subdivision and site plan review process provides local governments with the most effective opportunity for addressing access considerations and preventing access problems before they occur. Cities and counties should adopt site plan review procedures related to access management, if they adopt nothing else.

Model Site Plan Review Ordinance

a. Intent and purpose

The intent of this ordinance is to provide and manage access to land development, while preserving the regional flow of traffic in terms of safety, capacity, and speed. These regulations ensure the orderly layout and use of land, protect community character, and conserve natural, public and private resources by promoting well-designed road and access locations and discouraging the unplanned subdivision of land. The ordinance provides for orderly and predictable land development that will preserve private and public investments

b. Site plan review procedures

Applicants shall submit a preliminary site plan for review by *(name of department responsible for conducting review)*. At a minimum, the site plan shall show:

- i. Location of current and proposed access point(s) on both sides of the road where applicable;
- ii. Distances to existing access points, median openings, traffic signals, intersections, and other transportation features on both sides of the property;
- iii. Number and direction of lanes to be constructed on the driveway plus striping plans;
- iv. Distances to planned access points, median openings, traffic signals, intersections, and other transportation features on both sides of the property;
- v. Trip generation data or appropriate traffic studies;
- vi. Parking and internal circulation plans;
- vii. Plat map showing property lines, right-of-way, and ownership of abutting properties; and
- viii. A detailed description of any requested exception from the SDDOT Access Policy and Access Management Criteria and/or the *(city/county)* Access Permitting Ordinance and the reason the exception is requested.

- c. Any application that involves access to the State Highway System shall be reviewed by SDDOT for conformance with state access management standards. Where the applicant seeks access to the State Highway System and a zoning change, or subdivision or site plan review is also required, development review shall be coordinated with SDDOT. Written approval and/or concurrence are required from SDDOT prior to approval.

The (city/county) reserves the right to require traffic and safety analysis where safety is an issue or where significant problems already exist.

3. Other Elements for Inclusion in Site Plan Review Ordinances

Other additional and desirable topics related to land use development include reverse frontage, lot width-to-depth ratios, shared access, and connectivity. Model ordinance language for these elements is also presented in this section.

a. Reverse frontage

Access to double frontage lots (lots that abut two streets) shall be required on the street with the lower functional classification.

When a residential subdivision is proposed that would abut an arterial, it shall be designed to provide through lots along the arterial with access from a frontage road or interior local road. Access rights of these lots to the arterial shall be dedicated to the (city/county) and recorded with the deed or in the subdivision map.

b. Shared access

Subdivisions with frontage on the State Highway System which require direct access shall be designed into shared access points to and from the highway. Direct access to individual one and two family dwellings shall be discouraged wherever possible on South Dakota highways.

c. Connectivity

The street system of a proposed subdivision shall be designed to coordinate with existing, proposed, and planned streets outside of the subdivision as provided in this Chapter.

Wherever a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided as deemed necessary by the (city/county) to provide access to abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with temporary turn-around or cul-de-sacs unless specifically exempted by the Public Works Director, and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.

Subcollector and local residential access streets shall connect with surrounding streets to permit the convenient movement of traffic between residential neighborhoods or facilitate emergency access and evacuation, but such connections shall not be permitted where the effect would be to encourage the use of such streets by substantial through traffic.

d. Regulatory flexibility

The (*city or county planning commission*) may permit departure from dimensional lot, yard, and bulk requirements of the zoning district where a subdivision or other development plan is proposed to encourage creativity in site design, protect natural resources, and advance the access objectives of this code. Such regulatory modifications under this section are not subject to variance approval.

e. Exceptions

The granting of the exception shall be consistent with the purpose and intent of these regulations and shall not be considered until every feasible option for meeting access standards is explored.

Applicants for an exception from these standards must provide proof of unique or special conditions that make strict application of the provisions impractical. This shall include proof that:

- i. Indirect or restricted access cannot be obtained;
- ii. No engineering or construction solutions can be applied to mitigate the condition; and
- iii. No alternative access is available from a street with a lower functional classification than the primary roadway.

Under no circumstances shall an exception be granted, unless not granting the exception would deny all reasonable access; endanger public health, welfare or safety; or cause an exceptional and undue hardship on the applicant. No exception shall be granted where such hardship is self-created.

E. Major Traffic Generators

Major traffic generator ordinances may have limited applicability for some cities and counties in South Dakota. However, model ordinance code is presented in this section for those situations where it does apply.

The recommended policy developed for this project is that developments that generate 100 or more peak hour in plus out trips are considered to be major traffic generators. Adjacent major traffic generators abutting local streets should be encouraged to share a common approach road connection. This will reduce the number of conflict points and separate the conflict areas. The longer spacing between approach road connections will also facilitate the

provision of right turn deceleration bays. The smoother traffic flow on the abutting street will help reduce vehicular crashes and increase egress capacity.

Major Traffic Generator Ordinance

2. Applicability

- 1.1 Developments that generate 100 or more peak hour in plus out trips are considered to be major traffic generators.
- 1.2 The major traffic generators ordinance shall conform to the access permitting and land development ordinances adopted by (*city/county*).

3. Traffic Impact Study

- 2.1 A traffic impact study shall be undertaken for developments classified as major traffic generators.
- 2.2 The analysis will use accepted traffic engineering practices to determine landowner responsibilities for signals, turning bays, and other design features that are required for safe, efficient access that accommodates the forecast volume of traffic.
- 2.3 Provision shall be made for current or future public transit requirements at major traffic generator developments.

4. Access Consolidation

- 3.1 Adjacent commercial or office properties classified as major traffic generators shall provide a cross access drive and pedestrian access to allow circulation between sites.
- 3.2 A system of joint use driveways and cross access easements shall be established wherever feasible along (*name affected corridors*) and the building site shall incorporate the following:
 - a) A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards;
 - b) Within the site a design speed of 10 mph and sufficient width to accommodate two-way travel aisles designed to accommodate automobiles, service vehicles, and loading vehicles;
 - c) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross access via a service drive;

- d) A unified access and circulation system plan that includes coordinated or shared parking areas, wherever feasible.

3.3 Pursuant to this section, property owners shall:

- a) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;
- b) Record an agreement with the deed that remaining access rights along the thoroughfare will be dedicated to the (*city/county*) and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;
- c) Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners.

3.4 The (*permitting department*) may modify or waive the requirements of this section where the characteristics or layout of abutting properties would make development of a unified or shared access and circulation system impractical or undesirable.

F. Access Management Plans

Access management plans are intended to facilitate coordination of access between public roads and surrounding developments. These plans delineate current and future access points on the highway as well as lay out a means for achieving the plan, including the elimination of non-conforming access. They take the form of an interagency agreement and provide the framework for access decisions by various public agencies and the private sector. They are especially helpful where there are jurisdictional overlaps such as a state highway agency and a local government land-use authority. Such plans are important to local interests because they lay out a projected future course of action that can provide a stable base for future land-use decisions. In addition, developers adjacent to a facility that is included in an access management plan will know what access configuration to use, making the negotiation, design and approval processes easier at both the state and local levels.

Illustrative sample maps from Oregon are shown in NCHRP Report 348¹⁰ on 27, 28 and 29 that demonstrate the staged implementation of an access management plan. Figure 3-2 on page 27 contains the access management plan that outlines a set of tasks to be accomplished. Figure 3-3 on page 28 simulates the area 5-years later, showing the incremental changes that have been made. Some driveways have been closed and a street widened. Figure 3-4 on page 29 simulates the same area 15-years later. Additional street work has been done, driveways and even buildings removed, and new circulation plans developed.

2. Objectives for Plan

Access management plans should be implemented with the following objectives.

¹⁰ NCHRP Report 348, *Access Management Guidelines for Activity Centers* (Washington, D.C., 1992), pp. 27-29.

- **Achieve better long-range planning in South Dakota for highway access.**

Access management plans will enable the specification, in advance, of where access in a given area or along a specific stretch of highway will be located. It also allows the identification of existing access problems and the steps toward their alleviation.

- **Provide a coherent frame of reference in South Dakota for developers and local governments.**

Access management plans can help to establish a predictable and consistent basis by which to plan and locate access points, thereby introducing access considerations into the local planning process.

- **Target corridors as high priority for access management.**

Access management plans can be implemented as a joint state/local government initiative in corridors that are high priorities.

- **Preserve a highway's function, or even to permit a higher density of development as a result of the improved roadway capacity.**

Access management plans can help achieve higher density and may translate into higher land values.

- **Facilitate administering access regulations and issuing approach permits in South Dakota.**

Access management plans will assist government agencies and developers by defining the conditions under which approach permits will be issued. A developer may use the plan to establish permissible access points, and can be assured that access permits will be forthcoming where access conforms to the plan.

3. Contents of Access Management Plans

An access management plan should include a map and an accompanying report. It should be a clear and concise document that shows where and how access should be allowed. It should include:

- a. Responsibilities of each participant for the improvements to be implemented as part of the plan.
- b. The manner in which the timing and staging of construction of the improvements are to be determined.
- c. Provisions for temporary access, if necessary, pending completion of the improvements.
- d. Expected future mitigation measures as development occurs.

The map should clearly delineate the study area and jurisdictional boundaries, existing traffic controls and access points, land use and zoning, lot ownership, building outlines, and other factors that influence driveway locations and access control. The report should identify participants in the plan, planned uses of for study lots, conditions for implementing the plan, and other supporting information.

4. Implementation of Access Plans

An access management plan could be initiated by a state agency or municipality, and preferably both. It may be desirable for South Dakota DOT to provide incentives that encourage local governments to initiate and develop access management plans. Incentives could include state and local sharing of costs and facilitation of the permit review process. A plan, when adopted, should become a legal document. It could be used as the basis for state financial participation in municipal road improvements.

The process in South Dakota could work as follows. The involved parties attend a preliminary meeting. If they agree to participate, the counties and municipalities must pass resolutions to enter into the preparation of an access management plan for a specific highway segment of interest. All participating entities select primary South Dakota contact persons to represent them, on a working committee, comprised of the people responsible for developing a draft plan within a specified timeframe. After receiving the draft plan, the DOT schedules a public hearing. The comments received during the hearing and public comment period undergo review by the working committee. Any necessary revisions are incorporated. The final plan is incorporated into any municipal master plans and land use ordinances. A plan may be abandoned only with the joint agreement of all parties.

G. Definitions

Local access management ordinance should contain definitions of terminology used. An example definition listing for access ordinance is presented below.

Example Definition Listing for Access Ordinance

Access—A way or means to provide vehicular or pedestrian entrance or exit to a property.

Access Classification—A ranking system for roadways used to determine the appropriate degree of access management. Factors considered include functional classification, the appropriate local government's adopted plan for the roadway, subdivision of abutting properties, and existing level of access control.

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

Access Location Spacing—The distance between locations, measured from the closest edge of pavement of the first location to the closest edge of pavement of the second location along the edge of the traveled way.

Access Management—The process of providing and managing access to land development while preserving the regional flow of traffic in terms of safety, capacity, and speed.

Access Management Plan (Corridor)—A plan illustrating the location and design of access for lots on a highway segment or an interchange area that is developed jointly by the state and the affected jurisdiction(s).

Corner Clearance—The distance from an intersection of a public or private road to the nearest access location, measured from the closest edge of the pavement of the intersecting road to the closest edge of the pavement of the location along the traveled way.

Cross Access—A service drive providing vehicular access between two or more contiguous sites so the driver need not enter the public street system.

Deed—A legal document conveying ownership of real property.

Double Frontage—A property that abuts two different roads.

Easement—A grant of one or more property rights by a property owner to or for use by the public, or another person or entity.

Expressway—Controlled access facilities (highways) designated by SDDOT. These are typically facilities for which SDDOT has purchased the access rights.

Frontage Road—A public or private drive that generally parallels a public street between the right-of-way and the front building setback line. The frontage road provides access to private properties while separating them from the arterial street. (*see also Service Road*)

Functional Area (Intersection)—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 driveway connection spacing standards.

Functional Classification—A system used to group public roadways into classes according to their purpose in moving vehicles and providing access.

Joint Access (or Shared Access)—A driveway connecting two or more contiguous sites to the public street system.

Lot—A parcel, tract, or area of land whose boundaries have been established by some legal instrument, which is recognized as a separate legal entity for purposes of transfer of title.

Lot, Corner—Any lot having at least two (2) contiguous sides abutting upon one or more streets.

Lot Depth—The average distance from the front lot line to the rear lot line.

Lot, Nonconforming—A lot that does not meet the dimensional requirements of the district in which it is located and that existed before these requirements became effective.

Lot, Through (also called a double frontage lot)—A lot that fronts upon two parallel streets or that fronts upon two streets that do not intersect at the boundaries of the lot.

Lot Frontage—That portion of a lot extending along a street right-of-way line.

Lot of Record—A lot or parcel that exists as shown or described on a plat or deed in the records of the City/County department.

Lot Width—The horizontal distance between side lot lines measured parallel to the front lot line at the minimum required front setback line.

Minor Subdivision—A subdivision of land into not more than two (2) lots where there are no roadways, drainage, or other required improvements.

Nonconforming Access Features—Features of the access system of a property that existed prior to the date of ordinance adoption.

Outparcel—A parcel of land abutting and external to the larger, main parcel, which is under separate ownership and has roadway frontage.

Parcel—A division of land comprised of one or more lots in contiguous ownership.

Plat—An exact and detailed map of the subdivision of land.

Private Road—Any road or thoroughfare for vehicular travel which is privately owned and maintained and which provides the principal means of access to abutting properties.

Public Road—A road under the jurisdiction of a public body that provides the principal means of access to an abutting property.

Rear Access Road—A public or private drive that provides access to the rear set back line of property adjacent to an arterial road.

Right-of-Way—Land reserved, used, or to be used for a highway, street, alley, walkway, drainage facility, or other public purpose.

Service Road—A public or private street or road, auxiliary to and normally located parallel to a controlled access facility, that maintains local road continuity and provides access to parcels adjacent to the controlled access facility. This can be synonymous with a frontage or rear access road.

State Highway System (SHS)—The network of limited access and controlled access highways that have been functionally classified and are under the jurisdiction of the State of South Dakota.

Stub-out (Stub-street)—A portion of a street or cross access drive used as an extension to an abutting property that may be developed in the future.

Subdivision—The process and the result of any of the following: (a) The platting of land into lots, building sites, blocks, open space, public areas, or any other division of land; (b)

Establishment or dedication of a road, highway, street or alley through a tract of land, by the owner thereof, regardless of area; (c) The re-subdivision of land heretofore subdivided (however, the sale or exchange of small parcels of land to or between adjoining property owners, where such sale or exchange does not create additional lots and does not result in a nonconforming lot, building, structure or landscape area, shall not be considered a subdivision of land); (d) The platting of the boundaries of a previously unplatted parcel or parcels.

VIII. Recommendations and Implementation Plan



A. Introduction

This chapter provides a plan for implementing the recommendations and work products from SDDOT's access policy review project. The implementation plan is summarized in Exhibit VIII-1 on the pages 4—7.

The implementation plan is outlined in the following sections:

- Recommendations.
- Work elements.
- Implementation roles and responsibilities.

B. Recommendations

The following lists, in summary form, the recommendations that are detailed in the prior chapters.

Recommendation #1: Adopt the following policies for providing safe, efficient access to the highway system.

- Protect the public's investment in the highway system by preserving its functional integrity.
- Use police powers and existing statutory authority, and promote the modernization of South Dakota Codified Law to ensure the safe and efficient management of access.
- Establish and maintain an access classification system that defines the planned level of access for different highways in the state.
- Provide a consistent statewide approach to the management of access to the state highway system.
- Maintain and apply access criteria based upon best engineering practices to guide driveway location and design, to implement the access classification system.
- Coordinate with local jurisdictions to ensure that South Dakota's access policy and criteria are addressed early in decisions affecting land use.
- Provide advocacy, educational, and technical assistance to promote access management practices among local jurisdictions.

- Undertake proactive corridor preservation through coordination with local units of government on corridor management, the purchase of access rights, and other investments.
- Require traffic impact analysis for developments that impact the safety and capacity of the highway system.

Recommendation #2: Adopt the recommended access classification system based on the level of importance/functional role of South Dakota's highways, the area served (rural or urban) and the volume of traffic.

Recommendation #3: Adopt access location criteria for signal spacing bandwidth and distance, median opening and access spacing that will be used to evaluate access permit applications and guide project design.

Recommendation #4: Adopt recommended retrofit techniques for driveway consolidation/relocation, corner clearance and left-turn entrances and exits.

Recommendation #5: Implement improvements to the permit process to standardize South Dakota's access permitting application, decision and coordination procedures.

Recommendation #6: Strengthen access management authority in South Dakota through modernizing current statutes.

Recommendation #7: Assist local governments in the development of local ordinances for access permitting, land development, major traffic generators and access management plans to help support SDDOT's policies and criteria.

Recommendation #8: Adopt the recommended implementation plan for addressing project recommendations.

C. Work Elements

Each work element necessary to implement the recommendations is described in turn. This description outlines the intended outcome from the work element and provides a general approach for performing the work. A high-level plan, comprising a listing of the major work steps, for each work element is described. An estimated duration (elapsed time) and budget (labor hours) is provided where possible at this point. The SDDOT manager responsible for implementing particular work elements should develop a more detailed work breakdown structure, schedule and budget to manage their work.

2. Adopt Recommended Access Policy and Establish Implementation Responsibilities

This work element involves SDDOT management adopting the access policy project recommendations. These would be adopted by SDDOT as draft policy recommendations that are then subject to public review and comment as part of implementation.

Successful implementation will require executive commitment to resource implementation and establishing responsibilities and accountability for implementation. This implementation plan provides recommendations on accountability and responsibilities for implementation. Accountability should be considered in two stages. First, accountability for implementing the recommendations and ensuring that they are institutionalized needs to be established. Second, on-going responsibility for ensuring that SDDOT's new access policy and procedures are effectively implemented will need to be assigned.

This involves the following steps:

- 1.1 Adoption of recommendations by SDDOT management as draft policy recommendations.
- 1.2 Executive commitment to resource the implementation.
- 1.3 Establish responsibilities and accountability for implementation.

South Dakota Department of Transportation
Exhibit VIII-1: Implementation Plan Summary

Work Elements	2000												2001					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1. Adopt Recommended Access Policy and Establish Implementation Responsibilities																		
1.1 Adopt draft access policy		■																
1.2 Obtain executive commitment to resource implementation plan			■															
1.3 Establish implementation accountability			■															
2. Adopt Policy, Statewide Access Classification, and Administrative Rule																		
2.1 Classify roadways			■	■	■	■	■											
2.2 Review classification with field offices and local units of government						■	■	■	■									
2.3 Establish public review draft access classification and administrative rules								■	■									
2.4 Obtain public and stakeholder input on policy, classification, and rules									■	■								
2.5 Refine and finalize policy, access classification and rules											■	■						
2.6 Adopt classification, policy and rules													■					
2.7 Establish procedure for maintaining and updating classification												■	■	■				

Work Elements	2000												2001					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
3. Incorporate Access Design Criteria into Roadway Design Manual																		
3.1 Adopt recommendations	■	■																
3.2 Incorporate			■															
3.3 Communicate			■															
4. Strengthen Statutory Authority																		
4.1 Secure executive sponsorship	■																	
4.2 Prepare proposed legislation																		
4.3 Prepare and implement legislative strategy		■	----->															
5. Prepare Access Permit Procedures Manual																		
5.1 Devise and implement new procedures, prepare manual				■	■	■	■											
5.2 Prototype and refine new access permit application form						■	■	■										
5.3 Prepare explanatory guide for customers and partners								■	■	■								
5.4 Provide training to field staff											■	■	■					

Work Elements	2000												2001						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
6. Provide Education, Training, and Tools to Local Government																			
6.1 Provide training sessions and education to local governments				████████████████████															
6.2 Provide training to local government on new rules and procedures							██████████████			██████████									
6.3 Prepare and disseminate a "resource kit" on how to better coordinate access location with the development review process						██████████████													
6.4 Provide education to key publics on the benefits and purpose of SDDOT's access management program					██████████████████									██████████████████					

7. Prepare Access Plans for Selected High Priority Segments and Identify Access Management-related Improvements Eligible for Project Funding																		
Work Elements	2000												2001					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
7.1 Partner with local units of government and identify candidate corridors									█	█								
7.2 Nominate pilot plans										█								
7.3 Prepare pilot access plans										█	█	█						
7.4 Refine approach														█				
7.5 Prepare access location plans															█	█	█	█
8. Implementation Management and Communication																		
8.1 Establish responsibilities for implementation			█															
8.2 Communicate new access policy, program, and responsibilities to SDDOT employees and partners			█															
8.3 Manage and report implementation progress.				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

3. Adopt Policy, Statewide Access Classification, and Administrative Rules

This work element involves undertaking a public planning process through which the draft access policy, the proposed access classification system, and administrative rules for their implementation is subject to public and stakeholder input. This requires applying the recommended classification criteria to establish a proposed classification for the state highway system.

The Access Classification System will set system-level facility objectives for the location, frequency, and spacing of approaches to the highway system by functional classification and use of approach. This will provide the basis from which to communicate a consistent clear message to SDDOT employees, counties, cities, and the public on the planned level of access for different state facilities. The objectives can also be applied to county roads and city streets.

Many incremental decisions are made that directly and indirectly impact access. A clear statement of objectives will provide employees in the different regions, areas, and functional units of SDDOT information that they can use as they make decisions regarding project design, approach permit review, and other activities that impact access. Similarly counties and cities need to know “what the plan is” for the desired level of access for state facilities so that this can be addressed as they: work with SDDOT on projects in the urban areas; address access on the county roads; and undertake subdivision review, plat review, and other development review.

In the absence of a classification system, there is no plan from which to guide day-to-day decision-making regarding access. With many different SDDOT, county, and city employees involved in the decision making, this makes it difficult to ensure common purpose, provide consistency, and accomplish the existing access management objectives

The work element involves the following steps:

- 2.1 Apply the recommended criteria to highways in the State to establish a proposed classification.
- 2.2 Review proposed classification with SDDOT field offices and local units of government and other participants.
- 2.3 Establish public review draft access classification and administrative rules for its application.
- 2.4 Obtain public and stakeholder review and input on draft access policy, proposed access classification, and administrative rules.
- 2.5 Refine and finalize policy, access classification, and administrative rules.
- 2.6 Adopt classification and incorporate into SDDOT business procedures. Conduct public hearing as required in the rule making process.

- 2.7 Establish procedure for maintaining and periodically updating classification.

Responsibility and Resource Estimate

(1) Responsibility

- Recommend that Planning and Programming is responsible for:
 - Applying and maintaining the classification.
 - Managing the process for review and adoption of the access policy and classification.

(2) Resource estimate (Planning labor)

- Preliminary classification and mapping 160 hours.
- Process for review, refinement, and adoption 1040 hours.
- Depending on extent of public process other resources such as publicity, meeting rooms, etc. will be required.
- On-going maintenance of classification 160 hours per annum.

4. Incorporate Access Design Criteria into Roadway Design Manual

This work element involves incorporating the access design recommendations into the roadway design manual. This will ensure that project design decisions are based on the standards required of permit applications.

The appropriate standards committee should consider the project recommendations for adoption. The recommendations can be incorporated into the roadway design manual by reference to the project recommendations.

This involves the following steps:

- 3.1 Adoption of recommendations by appropriate standards committee.
- 3.2 Incorporation into roadway design manual and other applicable documents.
- 3.3 Communication of revisions to appropriate employees and design consultants.

Responsibility and Resource Estimate

(1) Responsibility

- Recommend that Roadway Design is responsible for incorporation and communication

(2) Resource estimate

- 120 hours

5. Strengthen Statutory Authority

Statutory change is required to strengthen the authority for access management. New legislation is recommended to modernize the current statutes to provide authority for SDDOT, counties, and cities to manage the provision of safe reasonable access to the highway system.

Absent new legislation, SDDOT should use the existing access control laws to designate access controlled facilities. These would most likely be tied to the process through which the classification system is developed.

Strengthening statutory authority involves the following steps:

- 4.1 Secure SDDOT executive support.
- 4.2 Prepare proposed legislation.
- 4.3 Develop and implement a legislative strategy to support proposed legislation.

Responsibility and Resource Estimate

(1) Responsibility

- SDDOT legislative affairs in conjunction with Technical Panel members

(2) Resource estimate

Part of on-going administrative responsibilities.

6. Prepare Access Permit Procedures Manual

The prior work elements will change the policies, criteria, and authority governing the review and administration of access permits. This work element will use the recommended procedures and changes to the access permit application process to develop a manual and guidance for SDDOT employees and permit applicants. This will take as its starting point the recommendations from the access policy project.

The work element will be best accomplished by establishing a review team to further develop the recommendations from this project into a procedures manual that meets the needs of the field and customers for information. In addition to a procedures manual, the explanatory guide should also provide information for SDDOT's customers on who to contact and what is required to obtain an access permit. This

could be in the form of an informational brochure. Both the brochure and the manual should reflect the results from implementing work element 2.

Preparing the access permit procedures manual involves the following steps:

- 5.1 Devise and implement new procedures and prepare manual.
- 5.2 Involve appropriate region staff in the prototyping and refinement of permits and procedures for access location decisions.
- 5.3 Prepare explanatory guide for customers and partners. (This should include the results from prior work elements to show categorization and standards).
- 5.4 Develop training curriculum/requirements for field staff and provide initial training for field.

Responsibility and Resource Estimate

(1) Responsibility

- Recommended Implementation Project Manager supported by a field office review team.

(2) Resource estimate

520 hours to develop procedures manual, prototype permit application, and finalize.

- 100 hours for initial training

7. Provide Education, Training, and Tools to Local Government

This implementation element involves using the communications information produced through this project to make the case for access management. The information will be used as part of the communications effort used to support the implementation of work element 2.0 Adopt Policy and Statewide Access Classification. This includes developing and implementing a program of technical assistance to local officials and city and county employees about the different implementation elements described above.

Technical assistance is required to explain the concepts, procedures, and actions required to address access management. This is particularly important given that many jurisdictions do not have staff with a background or knowledge of access management. This will ensure that there is understanding of access management, the procedures, and access plans implemented through the other work elements. It will disseminate tools and resources that counties and cities can use including the model ordinances developed through this project.

This implementation task involves the following steps:

- 6.1 Provide education sessions and education to local government on access management policy, techniques, the proposed access classification, and administrative rules procedures. Provide training in workshops and also as special sessions at statewide meetings.
- 6.2 Provide training on the adopted classification system and administrative rules.
- 6.3 Prepare and disseminate a “resource kit” on how to better coordinate access location with the development review process.
- 6.4 Provide education to key publics on the benefits and purpose of SDDOT’s access management programs. This will include using the access management brochure produced through this project and other communications materials.

Responsibility and Resource Estimate

(1) Responsibility

Recommended Implementation Project Manager.

(1) Resource estimate

- Prepare training session materials 160 hours.
- Organize logistics and conduct training sessions—64 hours each.
- Prepare resource kit 120 hours.
- Provide education to key publics (to be determined).

8. Prepare Access Plans for Selected High Priority Segments and Identify Access Management-related Improvements Eligible for Project Funding

This work element will focus effort most directly on the problem areas and secure real benefits. The program would focus on corridors that the state, counties, and cities view as the highest priority and where the jurisdictions can work jointly on corridor preservation/management. This implementation element would enable SDDOT Regions to develop “access management projects” eligible for project funding and that would compete with construction projects for funding. When nominating the projects the Regions (or local units of government for Surface Transportation Program funding) would define the scope of the proposed access plan. For example, an access management plan for Aberdeen may be quite different to one for Rapid City. Chapter VII.F of this report provides guidance on provides discussion and guidance on preparing access plans.

The implementation would require close collaboration with counties and cities in the affected corridors. One approach would be to establish a corridor management plan that identified access purchase, retrofit and other project priorities. This could include joint project planning where the state and local jurisdictions' project improvement roles and responsibilities are jointly planned. Ideally, the program would reserve funds for purchasing access rights, driveway consolidation and other activities.

This work element involves the following steps:

- 7.1 Partner with local units of government and identify candidate corridors and projects for pilot plan.
- 7.2 Nominate pilot access management plans/projects.
- 7.3 Prepare plans.
- 7.4 Assess success of pilots and prepare guidance on "how to prepare access plans".
- 7.5 Prepare plans as part of on-going project development and planning work.

Responsibility and Resource Estimate

(1) Responsibility

- Planning and Programming to undertake pilot plans in partnership with local jurisdictions and SDDOT Regions.

(2) Resource estimate

- Variable depending on the scope of plan range from 480 hours up to 2,000 hours.
- Includes funding for purchase of access rights, driveway consolidation and other improvements.

D. Implementation Management and Communications

This implementation plan involves considerable change in the work performed across SDDOT's functions and regions. Successful implementation will require a large number of employees being educated about SDDOT's access management objectives, the new access management procedures, and their application. Change of this type needs very careful management.

Prior to implementation SDDOT should clearly define roles, responsibility, and accountability for implementation. This involves establishing the internal management structure for addressing issues such as exceptions, disputes regarding access and other matters.

The consultant team was asked to make recommendations on organizational roles and responsibilities. We suggest the following approach:

- Assign responsibilities for initial implementation based on existing responsibilities
- Establish an access management committee to oversee implementation
- Appoint an SDDOT access management implementation project manager responsible for initial implementation. We recommend establishing a dedicated full-time implementation manager reporting to the access management committee for one year.
- The implementation project manager should report implementation progress periodically to executive management. Success should be measured as progress against the implementation plan.
- Following implementation, SDDOT will require an on-going focal point for maintaining and disseminating SDDOT's body of knowledge for access management. We do not have a direct recommendation for where this on-going responsibility should reside. However, we believe that it should not reside within Planning and Programming. This because access management principals and techniques are generally applied as part of roadway design or permit review. On-going responsibility need not be a full-time responsibility, the work required will be to provide over the shoulder advice, coaching, and quality assurance guidance regarding access management.
- Prepare and implement an internal communications and change management plan so employees know what is new, what is required of them, and how they can do what is required.

Implementation management and communication will require the following work steps:

- 1.1 Establish responsibilities and accountability for implementation.
- 1.2 Communicate implementation plan, recommendations, and responsibilities to SDDOT employees and partners.
- 1.3 Manage and report implementation progress.

E. Access Management Performance Measures

Recommended performance measures for access management are described in this section. The purpose of the performance measures is to provide data that indicate the extent to which SDDOT's access management objectives are being met.

The approach taken to performance measurement is as follows:

- Specify the objectives for access management in SDDOT.
- Specify the desired outcomes from a strengthened access policy and program.

- Define the indicators and the specific measures that will determine the extent to which the desired access management outcomes are being met. These will provide the access management performance measures.

For the recommended performance measures to have value to SDDOT the following conditions should be met:

- A targeted number of measures are used to manage the access management program.
- Measurement targets those drivers of the desired access management outcomes over which SDDOT has direct influence. For example the number and location of driveways.
- Measurement does not require burdensome data collection and reporting.
- Measurement provides information that monitors the benefits of effective access management.

2. Access Management Objectives

- The objectives from SDDOT's improved access management policy and criteria fall into the following categories.
 - Safe transportation system.
 - Efficient traffic operations.
 - Preservation of investment in the highway infrastructure.
 - Support for attainment of energy and environmental policy goals.
- The objectives for administration of the access policy and permitting process include:
 - Customer-service oriented process.
 - Consistent and predictable process.
 - Efficient and effective business procedures.
 - Increased understanding of access policy objectives and local government capacity.
- Performance measurement can provide a framework for measuring the extent to which SDDOT is achieving the objectives established for access management.

3. Performance Measurement Approach

- There are a number of methodological issues to consider in measuring the performance benefits of implementing the access management policy and criteria recommendations. These arise for two reasons. First, to measure the benefits in terms of the outcomes listed above would require a major on-going research project. This would involve establishing an analysis baseline and conducting research overtime to quantify the safety, system preservation, and other benefits. This type of approach would require a quasi-experimental research design and the results would not be available for some time. Second, it would also be difficult to isolate cause and effect.
- Given these issues, we recommend that any performance measurement focus on measuring SDDOT's success in achieving the outcomes over which it has direct control. This should be thought of as performance in achieving the outcomes that are drivers of the objectives listed above. For example, we know through national research that implementation of the access location criteria will result in the accomplishment of SDDOT's overall access management objectives. Therefore measuring access location decisions will provide an indicator of the accomplishment of overall access management objectives.
- Safe and efficient traffic movement has always been a fundamental goal of access management. Other performance measures may consider the economic impacts on the business community and how well access management is helping to preserve the functional integrity of the highway system and the major investments made in the system. In addition, the effects of access management on energy consumption and the environment may also be concerns.

4. Candidate Performance Measures

- The identification of candidate performance measures is based on the recognition that the quantification of the benefits and other outcomes from implementing an improved access management policy and criteria can only be identified through undertaking case study research. Evaluation is often difficult due to the potential "clouded" relationship between cause and effect due to the existence of other variables involved that may influence the results. In addition, the lag time may be significant between the implementation of an improvement and the time it takes for the resultant patterns to emerge. Crash analysis is one example where a three-year period is desired, after an improvement is implemented, to compare before and after patterns.
- The performance measures address those outcomes and actions by SDDOT which, based on the results of engineering research, will result in access decisions that will support SDDOT's access policy objectives.
- Candidate performance measures for desired outcomes are identified in Exhibit VIII-2.

Exhibit VIII-2: Candidate Access Management Performance Measures

Candidate Performance Measures	Objectives			
	Safe transportation system	Efficient traffic operations	Preservation of investment in the highway infrastructure	Energy and Environmental Policy Goals
Total accident rate in accidents per million vehicle miles.				
Number of rear-end or other types of collisions per million vehicle miles or per mile as a function of access density.				
Number of conflicts (i.e. evidenced by braking or evasive maneuvers) or conflict points (i.e. movements crossing, merging, or diverging).				
Number and type of exceptions to the adopted access criteria.				
Average number of approaches approved per application (involving developments that exceed a threshold to be established).				
System-wide travel speed, delays, and/or signal progression efficiency.				
Number of driveways consolidated as part of retrofit activity.				
Local jurisdictions with ordinances that support access policy objectives.				
Dollars spent annually on retrofit projects.				
Gallons of motor vehicle fuel saved through improved system operations.				
Emissions reduced through improved traffic operations by type of emission.				
Road user benefits dollar value through reduced delay.				

Candidate performance measures for management and implementation are presented in Exhibit VIII-3.

**Exhibit VIII-3: Candidate Performance Measures
 for Management and Implementation**

Performance Measures	Objectives			
	Customer-service oriented process	Consistent and predictable process.	Efficient and effective business procedures.	Increased understanding of access objectives and local government capacity
Average number/percent of permit requests processed within established turnaround time.				
Customer service rating for permit process.				
Applications processed per employee.				
Number of individuals participating in training and other on-going activities.				
Miles of state highway system with access plans.				

5. Recommended Performance Measures

There are practical considerations that should influence the selection of performance measures. For example, a survey of customer service will involve the preparation, distribution, tabulation, and analysis of a survey form. In addition to the expense associated with the necessary staff time, there would be expenses related to printing and postage.

The quantification of the safety effects will require analyses of accident data from two to three years before an improvement and two to three years after an improvement. Less data-intensive methods may often be used. However, their use generally would involve sacrificing the level of confidence or detail that may be desirable. As a result, decisions of which measures to apply need to reflect the tradeoffs that are involved.

The candidate performance measures were evaluated for short-term application in South Dakota based on considerations that focus on what is measurable, reportable, and reasonable (e.g. effort and cost required). In short, the following criteria for recommending a subset of the candidate performance measures was used:

- Build on existing data collection and reporting procedures and avoid initiating an entirely new data collection process.
- Target what is most important.
- Avoid having too many measures.

The recommended measures are included in Exhibit VIII-4. The recommended measures can most readily be developed and reported. Other measures would require research studies to determine cause and effect.

Exhibit VIII-4: Recommended Performance Measures

Performance Measures	Objectives						
	Safe transportation system	Efficient traffic operations	Preservation of investment in the highway infrastructure	Increased understanding of access objectives and local government capacity	Customer-service oriented process	Consistent and predictable process	Efficient and effective business procedures
Number and type of exceptions to the adopted access criteria.							
Number of driveways consolidated as part of retrofit activity.							
Local jurisdictions with ordinances that support access policy objectives.							
Dollars spent annually on retrofit projects.							
Road user benefits dollar value through reduced delay.							
Average number/percent of permit requests processed within established turnaround time.							
Customer service rating for permit process.							
Number of individuals participating in training and other on-going activities.							
Miles of state highway system with access plans.							

Appendix A: Workshops Results



A. Introduction

In order to incorporate input from the public and SDDOT region staff, four workshops were held around the state in November 1999. Separate meetings were held for SDDOT staff and the public, although many staff also attended the public meetings.

The public meetings included city and county superintendents, planners, commissioners and engineers, as well as public works staff, property owners and local politicians. The meetings were held in the following locations:

Pierre	November 9, 1999	10am—Noon 1pm—3:30pm	SDDOT Staff Public
Rapid City	November 10, 1999	10am—Noon 1pm—3:30pm	Public SDDOT Staff
Aberdeen	November 17, 1999	10am—Noon 1pm—3:30pm	SDDOT Staff Public
Mitchell	November 18, 1999	10am—Noon 1pm—3:30pm	SDDOT Staff Public

B. Meetings with Region Employees, November 1999

1. Number in Attendance

Pierre—25
Rapid City—11
Aberdeen—9
Mitchell—8

2. SDDOT Region Employees' Assessment of Current Situation (Issues and Practices)

- Current policy is “antiquated,” “lenient,” “outdated”.
- Obligated by state law to provide each landowner access.
- Difficult to deny access permit requests due to: weak standards, inconsistent responses within SDDOT, perceived and real risks of lawsuits, and difficulty in denying access where a neighbor was granted access.

- Permits applied for late in the land use planning and site development process.
- Need for improved coordination between SDDOT and local governments. SDDOT often asked for input on access location late in the development process.
- Lack of knowledge about access management and the permit process by local governments.
- Property owners build access without a permit, or fail to build an access or build it improperly.
- Same criteria and standards apply to rural and urban access applications.
- Permit procedures not standardized, always consistently administered, and the permit application form has important limitations.
- No training for SDDOT and government staff making and justifying access decisions.
- Public, other agencies, and many SDDOT employees not aware of SDDOT's access management policies and procedures.

3. Employees' Input on Improvement Opportunities

- Educate the first contact person, SDDOT staff, maintenance supervisor, local governments, planning commissions, consulting engineers, developers, real estate agents, land buyers, and Municipal League on access management goals and procedures.
- Provide training for all levels of staff in access management and negotiating skills with abutting landowners.
- SDDOT should be proactive, objective, and consistent.
- Improve the permit form (recognize that this needs to be based on new policies and procedures).
- Provide informational literature to customers, show video to meetings and groups.
- Maybe charge a permit application fee.
- Consistent policies will level the economic development playing field.
- Different criteria and standards for rural and urban access applications.
- Make available case studies and statistics about the benefits of access management for use in negotiating. Input on Project and Recommendations
- Good recommendations—SDDOT should seek authority to implement them.
- SDDOT management must uphold standards if they are to be successfully implemented.
- Put implementation effort into education local officials about the importance of involving SDDOT to review access location early in the development review/approval process.
- Provide maps detailing road classification system.
- Address change in access use.
- Distinguish between developed and undeveloped, rural and urban in the criteria and how they are applied.

- Provide guidance to the field on application of criteria in urban areas that are developed. Make it clear what the standards mean in urban areas and the approach to applying them.
- Recognize the commitment that will be required for education, communication, and training as part of implementation.

C. Meetings with Stakeholders, November 1999

1. Number in attendance, shown as *non-DOT (DOT)*

Pierre—12 (9)
Rapid City—29 (2)
Aberdeen—12 (3)
Mitchell—22 (5)

- Non-SDDOT participants included city and county professional staff, local and state elected officials, regional planning organization staff, economic development interests, some developers, and other interested parties.

2. Current situation

- SDDOT and local governments do not always provide consistent information or answers when pressured for access permits.
- Mentality exists that business will fail without access, every house must have its own driveway.
- Landowners and realtors believe more accesses are better. There is considerable misunderstanding about the impacts of multiple curb cuts.
- Speed limits are problematic—too fast or slow.
- Many counties have no zoning or comprehensive planning.
- Local jurisdictions are aware of the problem and want to do more.

3. Participants Input on Improvement Opportunities and Priorities

- Safety should be first consideration.
- SDDOT must work in conjunction with local governments to develop standards and be consistent.
- Need strong planning and zoning commissions.
- Educate the public, elected officials, and people at conventions, meetings, conferences, and government offices.
- Remove pressure from planning officials by providing regulations and leadership.
- Need funding to accomplish access management goals.
- Landowners may be willing to pay a permit fee.

- Provide information to landowners and developers, but not too much or too technical.
- State regulations take effect in areas without zoning or comprehensive plans.

4. Input on Project and Recommendations

- Very worthwhile, timely, important.
- Education is important.
- State must take the lead yet have flexibility.
- Not every city has a planning boundary, or usable one, and it may not be a good means of determining classifications.
- Will need to communicate new standards, policies, and procedures.
- SDDOT should advance legislation and secure the support of local government for it.
- Need local flexibility and room for common sense.
- Should develop an “access plan” for certain corridors as part of joint effort with cities, counties, and planning organizations.

D. Survey Results Summary

1. Written Responses

- **Were you familiar with the concepts of access management prior to this workshop?**
- Of the 57 survey respondents, 23% said no, 7% said “yes-somewhat,” and 70% answered yes. Representatives in Pierre were most familiar with access management prior to the workshop (one “no”), while the other regions were equal with four “no” and one “yes-somewhat” each. Three participants stated the workshop was their first training in access management principles.
- **Do you understand access management better having attended the workshop?**
- All representatives answered yes, except for a city official attending the Aberdeen workshop. Participants noted the video and following discussion as being especially helpful.
- **Is there any other information on access management that would be useful to you?**
- Nineteen percent of representatives said no, 14% said yes, and 54% answered yes and gave the following specific suggestions:
 - Provide a video and simplified materials (visuals, brochures, and booklets) for general, planning, and development audiences.
 - Investigate what other rural state are doing; review court cases and statutory authority.

- Provide before and after economic impact analysis of retrofitting.
- Provide model ordinances, minimum criteria, guidelines, updates, case studies, more examples, specific examples, sample rules, planning standards, city regulations, designs, spacing standards, etc.
- Provide a decision-makers' tool box to educate the public and elected officials.
- Continue the dialogue and work with jurisdictions.
- Show how principles apply to rural county situations and costs.
- Look on the Internet for information.
 - **Do you think that SDDOT should work to improve safety and highway preservation through access management?**
 - All representatives stated yes. Participants noted that it should be done in cooperation with local governments and planning districts.
 - **Can you think of any barriers to improving access management?**
 - One survey respondent in Mitchell said “none,” and 63% of representatives cited the following barriers:
 - Education of/misconceptions by/lack of knowledge by developers, private property owners, general public, planners, elected officials, etc.
 - Property and land use rights versus access management planning; individualistic nature of South Dakotans.
 - Lack of statutory authority; ability of local governments to implement new policies.
 - Wide difference in expertise at local level; exceptions made in some cases will hurt others.
 - Too aggressive of an approach or insufficient input; need support of local officials.
 - Lack of funding or planning and zoning in some areas.
 - Non-respect for engineers, distrust of government regulation, locals who view safeguards as unnecessary, resistance to change.
 - Political pressure, economic pressure, weak leadership, poor communication, and fairness issues.
 - **What benefits of access management are the most important?**
 - Over half of respondents stated safety as the most important benefit. Other benefits cited were increased access, coordination with local governments, economic development, improved flow of traffic, reduced costs, maximization of infrastructure, and improved service.
 - **Other comments**
 - Participants noted the need for education, sample ordinances, flexibility, common sense, local government involvement, and more detailed classification system definitions. Seven respondents commented that the workshop was

“good” or “great,” one from Pierre and six from Mitchell. Attendees also asked to be provided updates and kept informed. No participant from Rapid City had additional comments.

2. Statement Ranking

- **Composite Results**
- Local representatives felt strongest that SDDOT coordinate with local jurisdictions to address access management concerns early in the development process, with 80% ranking it very important. Locals then felt most strongly that SDDOT provide access management advocacy, education, and assistance to jurisdictions, with 68% ranking it very important.
- Local representatives felt least strongly that SDDOT require traffic impact analyses for developments impacting the highway system, with 22% ranking it somewhat or not important (30% said very important). Locals then felt least strongly that SDDOT establish an access classification system, with 13% ranking it somewhat important (39% said very important).
- **Regional Results**
- Representatives in Aberdeen agreed most strongly with the survey statements, with the “very important” ranking ranging from 100% to 46% of respondents. Representatives in Rapid City felt least strongly about the survey items, with the “very important” ranking ranging from 71% to 0% of respondents. Rapid City surveys had votes for three statements as “not important,” Pierre had two, Aberdeen had one, and Mitchell none.
- Pierre attendees felt strongest that SDDOT establish new access standards (75% very important) and advance legislation to strengthen authority (70% very important). Pierre attendees felt least strongly that SDDOT should require traffic impact analyses (40% somewhat important) and establish an access classification system (25% somewhat important).
- Rapid City attendees felt strongest that SDDOT should provide advocacy, education, and assistance (71% very important) and coordinate with local jurisdictions to address concerns early in the process (62% very important). Rapid City attendees felt least strongly that SDDOT should advance legislation to strengthen authority (46% somewhat or not important) and use police powers to enforce codified law (36% somewhat or not important).
- Aberdeen attendees felt strongest that SDDOT should coordinate with local jurisdictions (100% very important) and apply access criteria based on best engineering practices (77% very important). Aberdeen attendees felt least strongly that SDDOT should provide a consistent statewide approach (16% somewhat important) and establish corridor-level access management plans (15% somewhat important).
- Mitchell attendees felt strongest that SDDOT should coordinate with local jurisdictions (88% very important) and provide tools and assistance to local governments (82% very important). Mitchell attendees felt least strongly that SDDOT should require traffic impact

analyses (18% somewhat important) and undertake proactive corridor preservation through coordination (17% somewhat important).

- Numerical results, all surveys (57 completed, some partially). The chart appears on the following page.

Table 1: Survey Results

	Very important	Important	Somewhat important	Not important	Don't know
Advance legislation to strengthen authority.	54%	30%	11%	5%	
Adopt stronger policies.	38%	52%	5%	5%	
Protect the public investment in the highway system by preserving its functional integrity.	45%	49%	6%		
Use police powers and existing statutory authority, and promote the modernization of SD Codified Law to ensure the safe and efficient management of access.	49%	44%	7%		
Establish and maintain an access classification system that defines the planned level of access for different highways in the state.	39%	46%	13%		2%
Provide a consistent statewide approach to the management of access to the state highway system.	46%	47%	7%		
Maintain and apply access criteria based upon best engineering practices to guide driveway location and design, to implement the access classification system.	56%	40%	4%		
Coordinate with local jurisdictions to ensure that SD's access policy and criteria are addressed early in decisions affecting the development process.	80%	20%			
Provide advocacy, education, and technical assistance to promote access management practices among local jurisdictions.	68%	29%	3%		
Undertake proactive corridor preservation through coordination with local units of government on corridor management, the purchase of access rights, and other investments.	50%	39%	9%		2%
Require traffic impact analysis for developments that impact the safety and capacity of the highway system.	30%	46%	20%	2%	2%
Establish new access standards	60%	32%	8%		
Provide tools and assistance to local governments to provide access management.	59%	39%	2%		
Establish corridor-level access management plans working with local units of government.	48%	45%	5%		2%

Appendix B: Draft Access Management Brochure



New Access Policy

This publication explains the importance for improving SDDOT's current access policy. It provides SDDOT employees, local governments, investors, business owners and the general public with information about SDDOT's improved approach to managing access to the state's highways. A community that is educated on the benefits of access management practices is expected to incite increased public involvement and promotion among local jurisdictions.

uncoordinated. If the driveway or arterial is too close to an another access point motorists traffic congestion and number of conflicts increase.

Goal of Access Management:

Provide access to land development while preserving safety, capacity and speed of traffic on state highways.

Why is Access Management Important?

Access management is important to investors and motorists who benefit from improved safety, mobility and investment of public dollars. Without planning and management of access areas, traffic congestion and points of conflict increases.

What is Access Management?

Access management is defined as the process of providing access to developed land located adjacent to the State highway system. SDDOT and local agencies manages the design, location and supporting facilities of access points. Access management contributes to how well vehicles, bicycles and pedestrians can enter and exit commercial and residential areas adjacent to freeways.

Access management improves safety and mobility. Good access management is a balance of providing property owners access to streets and highways, fulfilling motorists need for safe and efficient mobility and ensuring effective use of public dollars. Planning offers a means to achieve this balance for present and future communities. Since poorly planned access points are often politically difficult and costly to improve after construction, planning and developing access must begin from the onset of a project.

Good access is a function of the design and location of driveways and arterials. Improved access is dependent on: the location of the driveway/arterial with reference to other access points, the motorists' ability to easily access the property or road, and the placement of traffic signals. Poorly designed and located driveways and arterials can severely affect traffic safety, road capacity and traffic speed. Points of conflict also increase if traffic signals are too close together or are

The need for improved access management is apparent on busy commercial strips. Driveways located within a few feet of each

other slow traffic and increase the number of conflict points. Likewise, motorists turning left on a highway without turn lanes, or making right handed turns onto driveways every few feet can cause accidents and increase congestion.

Access management increase property values. Land without access to a road is considered landlocked and is difficult for the public to access. Thus, property retains a higher land value if it abuts a street or highway. However, if access points are located close to intersections or one another, traffic may block access to businesses and cause delays.

Access management is attractive to business owners and potential customers. Good access management benefits customers by providing improved safe access and minimize traffic congestion. These attributes are attractive to business owners because efficient and safe travel improves their location's marketability.

Balance Between Access and Mobility:

Good access management is a balance of providing property owners access to streets and highways, fulfilling motorists need for safe and efficient mobility and ensuring effective use of public dollars.

What are the Benefits of Access Management?

Three main benefits support managing access to the state's highways. Access management:

- Minimizes access-related accidents.
- Preserves our mobility and investment.

- Preserves and plans for healthy economic development.

Minimizes access-related accidents.

Points of conflict increase as areas along the highway become more commercialized and densely populated. Each new access point added to an undivided highway in an urban and suburban area increases the annual accident rate by 11 to 18 percent on that highway segment. In rural areas, each access point added increases the annual accident rate by seven percent.

Well-managed access points can improve user safety by reducing the number, severity and cost of access-related accidents. For example, increased spacing between driveways minimizes conflict by allowing motorists more time to anticipate and recover from turning traffic. Minimizing the speed differences between turning cars and through traffic reduces conflicts between cars, pedestrians and bicycles.

Access Management Minimizes Costs:

Driveway-access accidents alone cost South Dakota approximately \$36.5 million dollars each year.

Preserves Our Mobility and Investment.

South Dakota's highways and roads represent a major public investment. The federal government, the state and the general public have invested millions of dollars in statewide highway resources to move trucks and vehicles efficiently. Poorly designed access points increase congestion and the number of accidents that reduce speeds. Good access management preserves

capacity by moving motorists out of lanes efficiently to increase continuous traffic flows and reduce conflict points.

Managing access not only increases regional mobility but also extends the life of existing roads. Public investment is best preserved by maximizing the use of existing facilities. If more vehicles can be moved on existing roads, construction costs can be minimized on unnecessary facilities. Arterial roads can carry many more vehicles each day using good access management processes.

Also, planning and designing access areas early in the project improves the allocation of scarce resources. As communities grow, it becomes increasingly expensive to redesign poorly planned access points. Funds that would otherwise be spent on maintenance or operation of existing roadways are spent on curbside and driveway construction and widening roads.

Access Management Extends Public Investment:

Managing access not only increases regional mobility but also prolongs the life of existing roads.

Preserves and Plans For Healthy Economic Development.

A consistent statewide access management approach best protects the functional integrity of the state highway system. This approach, based upon best engineering practices and coordinated local participation, provides improved driveway location and design for growing communities. Central to this approach is a core access classification system that defines the desired level and location of access for communities adjacent to the highway system. Standardized policies and

procedures also help to ensure government decisions are consistent and fair across the state. Developers, investors and the general public benefit from this increased predictability for the development process. Uniform access design standards minimize costs associated with redesign and promote fair method to manage new development. SDDOT will work with decision-makers to receive legal authority to develop standards and procedures to ensure safe and efficient access to the state highway system.

Managed access is most successful when the state, local decision-makers and residents support and coordinate actions. The state and local governments invite investors and the general public to become involved in access management decisions and in promoting and developing strong access management practices.

These practices include identifying when and where developers should be responsible for the payment of access improvements that address safety and capacity issues. For example, implementing specific procedures for conducting a traffic impact analysis would determine land owner responsibilities for signals, turning bays, and other design features that provide safe and efficient access. Provisions could be established for waiving the cost or need for such studies.

Management Access Preserves Functional Integrity:

A consistent statewide access management approach best protects the functional integrity of the state highway system.

SDDOT's New Access Policy:

- Protect the public's investment in the highway system by preserving its functional integrity through the use of modern access management practices.

- Coordinate with local jurisdictions to ensure that the state's access policy and criteria are addressed early in decisions affecting land use.
- Provide advocacy, educational, and technical assistance to promote access management practices among local jurisdictions.
- Undertake proactive corridor preservation through coordination with local units of government in corridor management the selective purchase of access rights, and other investments.
- Provide a consistent statewide approach to the management to the state highway system.
- Maintain and apply access criteria based upon best engineering practices to guide driveway location and design to implement the access classification system.
- Establish and maintain an access classification system that defines the planned level of access for different highways in the state.
- Establish procedures for determining developer responsibilities for paying for improvements that address the safety and capacity impacts for major development.
- Enhance existing police powers and statutory authority to ensure safe and efficient access.
- Use police powers and existing statutory authority, and promote the modernization of South Dakota Codified Law to ensure the safe and efficient management of access.

- Permit exceptions to the SDDOT's access criteria only where retrofit techniques have been applied.

What we are doing to implement this policy:

- Explaining why access management is important to us all.
- Classifying roads.
- New permit procedures and rules for locating driveways.
- Working with local government.
- Planning ahead.

For more information contact: