Section IX. System Improvement Proposals

A primary objective of the Major Street Plan is to allow crosstown traffic movement with a system of major streets through the growth areas.

Sioux Falls 2015 VI-3

A. Major Street Plan

"…[LRTP] and includes the Major Street Plan which is incorporated as part of the Comprehensive Plan by reference." VI-1

The Major Street Plan is comprised of existing and proposed street facilities that are required to accommodate traffic to the year 2025. Appendix 2 shows the Major Street Plan as determined based on recommended improvements. The alignments shown for the proposed new facilities are approximate and, along with right-of-way requirements, are subject to final engineering studies. Future special studies of transportation corridors will continue to develop proposed improvements. The Major Street Plan requires separate approval from the Long-Range Plan. The Major Street Plan is included here for reference and as an outgrowth of the long-range planning process.

B. Proposing Improvements

Throughout the Long-Range Plan, the various sections have been leading up to this section—System Improvements. The Long-Range Plan is a document that sets the transportation planning process. It also attempts to identify and coordinate future needs within transportation corridors.

In order for a specific improvement to be implemented, a detailed assessment needs to be completed, including problem statement, goals and objectives, scope of services, preliminary analysis, final analysis, public involvement, funding allocation. Because of the varied and changeable needs and priorities of local governments, the long-range plan works to identify a 25-year "investment portfolio" for regional projects. The goal of the Long-Range Plan is to set the guidelines for making these decisions.

The MPO needs to evaluate all proposed improvements to the transportation system against the goal of developing a system that offers multiple modal choices for citizens of all social, economic, and demographic groups. The multimodal aspect is more than just a stated goal. Our citizenry will always be dependent upon their vehicles; however, alternative modes of transportation improve the health of our community (preserves limited natural resources, reduces pollution, creates well-being). A multimodal system will hopefully instill a sense of "community" to this area that says: "We care about everyone; and everyone should have the opportunity to transport themselves, their goods, and their ideas."

Over the next 25 years, proposals to improve the transportation system will come before the public and the MPO. Land use proposals can be replicated into the MPO's Traffic Forecasting model to simulate impacts. The traveling public will have demands, and the

MPO will need to consider when and where improvements could be made to meet these demands. Each project should be evaluated based on its purpose and need. The MPO should use LOS as a characteristic for when a roadway needs to be included in the TIP; also, accident rates, roadway conditions, geometric design, volume/capacity ratios, socioeconomic and environmental factors, and projected costs.

C. Traffic Forecasting

One transportation decision-making tool is the traffic forecasting computer software program. Traffic forecasting is a three-step process of inputting known information (including land uses and/or socioeconomic information) and having the software generate a gravity model of the volumes of traffic on the underlying street network.

The forecasting program begins with a base model of existing traffic counts, land use inventories, Traffic Analysis Zone (TAZ) boundaries, and census data to make determinations on how this community tends to travel from location to location. Through the data, the model interprets where people live, work, and shop, and can therefore forecast future year travel patterns between TAZs based on additional land uses or roadway improvements.

The three-step process consists of:

- Trip Generation—the number of vehicle trips generated by land uses.
- Trip Distribution—the distribution of the trips between the TAZs.
- Trip Assignment—the route the trip takes.

Sophisticated models contain a fourth step called Trip Mode which models which type of transportation mode is used for the trip—vehicle, bus, bike, pedestrian.

D. Level of Service

In order to determine the capacity of a street to handle the proposed land uses, the Highway Capacity Manual stipulates a Level of Service system, which takes into consideration “speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.” Level of service on a particular roadway is “graded” from an “A” to an “F” with the “grades” representing the same scale as the grades used in the education system.

Chart 11

Level of Service

Description of Levels of Service	
Level of Service	Description
A	LOS A generally describes free-flow operations. Average operating speeds at the free-flow level generally prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents are easily absorbed.
B	LOS B also represents reasonable free flow, and speeds at the free-flow level are generally maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. The effects of minor incidents are still easily absorbed, although local deterioration in service may be more severe than for LOS A.
C	LOS C provides for flow with speeds still at or near the free-flow speed of the freeway. Freedom to maneuver within the traffic stream is noticeably restricted at LOS C. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. The driver experiences a noticeable increase in tension.
D	LOS D is the level at which speeds begin to decline slightly with increasing flows. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing.
E	LOS E describes operation at or near capacity. Operations are volatile, because there are virtually no usable gaps in the traffic stream. Any disruption can cause the following vehicles to give way, which can establish a disruption wave that propagates throughout the upstream traffic flow. The traffic stream has no ability to dissipate even the most minor disruptions, and any incident can be expected to produce a serious breakdown with extensive queuing. The level of physical and psychological comfort afforded the driver is extremely poor.
F	LOS F describes breakdowns in vehicular flow. Such conditions generally exist with queues forming breakdown points. Such breakdowns occur because of traffic incidents, recurring points of congestion, or peak-hour flow demand exceeding the capacity of the location.

Source: Highway Capacity Manual, 1994

LOS A

Optimally, level of service "A" would be found on all roadways at all times. However, as a practical matter this is simply too costly to produce. Therefore, the Engineering Design Standards has set up the following target levels:

LOS F

Chart 12

Level of Service in MPO Area

Roadway	Level of Service
Interstate Highways	C
Arterial Streets	D (This is an acceptable level of service, as determined by the Congestion Management System Committee)
Collector Streets	B (Dependent upon number of access points, target level of service may be C)
Local Streets	B

E. Hazardous Locations/Traffic Accidents

Improving safety throughout the transportation system is an objective of the Long-Range Plan. To meet this objective, we need to work toward decreasing the number of hazardous locations and minimizing accidents and fatalities. The value of this objective goes beyond the obvious health and safety concerns and will add the following benefits: cost savings of damaged vehicles and timesavings due to congestion.

The South Dakota Safety Council states that 90 percent of traffic accidents could have been prevented and are therefore considered crashes. Numerous programs and improved technologies have helped to decrease the number of fatalities in crashes. Vehicles have become safer through crash testing, seatbelts, and airbags. Awareness of drinking and driving has increased through public education. Increased enforcement efforts have helped implement the National Highway Safety Program. The State also adopted a seatbelt law.

Transportation planning and safety professionals, including the Sioux Falls Engineering Department, analyze and evaluate accident data to improve the safety and efficiency of city streets and highways. The information is stored in a database and an annual Safety Management System Report is generated to monitor accidents within city limits. The Engineering Department uses a statistical method to determine high accident areas and a field study is performed by personnel to investigate an evident problem. Different

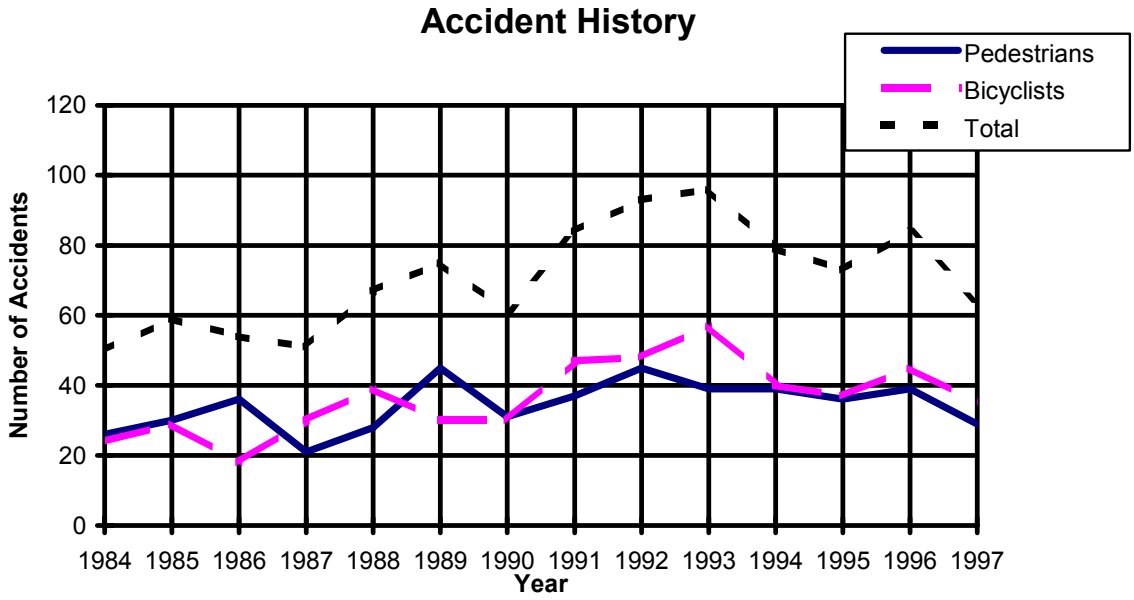
alternatives are reviewed and the most logical, cost-effective solution is chosen and implemented.

F. Pedestrian and Bicycle Accidents

Citizens and City officials are always concerned when an accident occurs in Sioux Falls. However, when an accident involving a pedestrian or bicycle happens, people show particular attention, largely because the incidents frequently involve activities that the majority of us partake in on a day-to-day basis. The Sioux Falls Engineering Department monitors the frequency of bicycle and pedestrian accidents each year. The data is compiled by the South Dakota Department of Transportation and then analyzed thoroughly by Engineering personnel prior to system improvements being implemented to correct a problem.

Along with Sioux Falls' population growth comes an increase in the number of available recreational areas, bike paths, and sidewalks. In correlation with this increase, an upward trend in bicycle and pedestrian accidents has occurred, as indicated by the chart below (1998 Safety Management System Report). However, safety on and off the streets still remains one of the main goals the City of Sioux Falls strives to achieve.

Chart 13



In 1994, seventy percent (70%) of the bicyclists involved in accidents were children under thirteen (13) years of age. In 1995, this decreased to forty-three percent (43%) and continuing on into 1996 to 40 percent (40%). In 1994, six children in the age range of 14-15 were in accidents, compared to only two children in 1995; however, the number rose again to 9 in 1996. In the pedestrian category, the accidents involving people under 20 years old varied slightly, in 1994 with forty-seven percent (47%) of the accidents compared to sixty-six percent (66%) in 1995. Finally in 1996, fifty-one percent (51%) were involved with people under 20 years old.

The numbers of bicyclist and pedestrian injuries have not escalated over previous years. The reasons behind this fact could be the continued education of safe travel procedures, becoming more visible on the streets, and taking every precaution to ensure safer travel.

During the project design phase of all new and reconstructed transportation projects, bicycle and pedestrian issues should be considered. The consideration should take into account: safety, efficiency, public need, and the ability to diminish single-occupancy vehicle trips.

G. Roadway Conditions

The MPO area has a considerable amount of resources invested in the current transportation system. The rehabilitation and maintenance of this system in the future will require a significant portion of the region's transportation resources. The goals and objectives previously stated this factor as a priority. The conditions of the system within a given area should be evaluated for safety and cost to travelers when making decisions.

H. Geometric Design

As technology changes, so do the types of vehicles and roadways change. The way transportation projects were designed and constructed in the past may also have changed now to better address these changing conditions. The geometric design of a roadway should be considered to address safety and efficiency of the traveling public.

I. Socioeconomic Factors

Environmental Justice is the process to address disproportionately high and adverse human health and environmental effects of federal government programs, policies, and activities on minority populations and low-income populations.

J. Environmental Considerations

Impacts that proposed transportation improvement projects may have on the environment need to be evaluated and mitigated based upon the National Environmental Policy Act of 1969 (NEPA).

> "It is the policy of the FHWA/ FTA that the NEPA process be the means of bringing together all legal responsibilities, issues, and interests relevant to the transportation decision in a logical way to evaluate alternative courses of action (such as, location, major design features, mitigation measures, and environmental enhancements). This decision shall be made in the best overall public interest based on a balanced consideration of the need for safe and efficient transportation; the social, economic, and environmental benefits and impacts of the proposed action; and the attainment of national, state, tribal, and local environmental protection goals." *§1420.109 (a)*

Federally funded capital improvement projects included in the Transportation Improvement Program are reviewed by the SD Department of Environment and Natural Resources (DENR) for compliance with the state implementation plan for air quality and various environmental protection agency guidelines [Map 10].

The Sioux Falls metropolitan area is classified as an attainment area for pollutants pursuant to National Ambient Air Quality Standards and the Clean Air Act Amendments of 1990. The Sioux Falls MPO is committed to the implementation of measures that reduce transportation-related emissions in the MPO area, such as optimizing traffic signal timing and emphasizing transportation demand management measures. Attainment information is included in the TIP on an annual basis.

K. Projected Costs

Through the project justification and the environmental assessment process the costs of the project are evaluated against the benefits. The costs and benefits of a specific project are not simply monetary. On typical benefit/cost evaluations, the life cycle of an improvement is evaluated as is the ongoing maintenance of the improvement. Benefits are considered by looking at improvements in travel time, fuel usage, and safety.

See Map 10 Environmental Constraints

L. Special Studies

Once a problem has been stated, the MPO can allocate funds to complete an analysis of the problem [area] and determine if there is an appropriate solution. These analyses are entitled special studies. Since the adoption of the last Long-Range Plan, numerous studies have been completed regarding transportation improvements in and around Sioux Falls, including but not limited to:

- Sioux Falls Regional Transportation Study.
- Regional Arterial Corridor Analysis.
- 41st Street Corridor Analysis.
- Interstate Corridor Study.
- 10th /11th /12th Street Feasibility Assessment.
- Comprehensive Operations Analysis.
- Bicycle Master Plan.

Each one of the special studies goes through its own public involvement process and approval process. After special studies have been approved, additional technical analysis may be required prior to any implementation of suggested improvements.

The following is a summary of the Sioux Falls Regional Transportation Study and the Regional Arterial Corridor Analysis.

♦ Regional Arterial Corridor

In August 1995, the Sioux Falls MPO hired a consulting team which completed the **Sioux Falls Regional Transportation Study.** The primary purpose of this study was to determine if a future outer beltway around the city of Sioux Falls was needed. The study was an evaluation process only and did not assure the implementation or construction of any beltway alternatives examined during the study. The study examined future land use needs along with future transportation facility needs and various modes of transportation.

In the study, the consultants analyzed the roadway efficiency and traffic projections against the purpose and need for a safe and efficient transportation system. The study's recommendation was to "Develop a system of high-speed, limited access arterial roadways to serve new development outside of the existing interstate corridors. This will allow the City of Sioux Falls and the affected counties to preserve right-of-way, provide for increased building setbacks, and limit access within the subject corridors."

The entire system of limited access arterial roadways was separated at Minnesota Avenue into an east corridor and a west corridor. Based on proposed growth to the year 2015, it was determined that the analysis on the east corridor should occur first.

In December 1997, the east corridor began the first phase of a more detailed analysis. The **Regional Arterial Corridor Analysis–East Side Corridor** was

completed in April 1999 and four more phases still need to be completed (environmental, design, funding, construction) [Map 11].

The objectives of the analysis were to develop and evaluate alternative roadway design and location scenarios for further project development consistent with City, State, and Federal procedures. The alternatives were evaluated on consistency with design guidelines, minimizing environmental impacts, minimizing right-of-way impacts, and minimum implementation costs. Traffic forecasts were prepared and adjustments made for updated levels of development, the higher expected operating speeds associated with a multilane urban arterial, and the expected new connections to the regional road system. By conducting the analysis and acquiring right-of-way prior to the development of the area through which the east corridor would likely be constructed, the right-of-way requirements and cost of acquisition can be minimized.

The MPO will proceed with the environmental review process with the Federal Highway Administration as the lead agency. Using the **Regional Arterial Corridor Analysis—East Side Corridor** as the preliminary base study, staff will develop the purpose and need for improvements, the scope of the review, a request for proposal for a consultant to complete an Environmental Assessment, and a Public Involvement Plan. The purpose of the review is to identify potential alternatives, evaluate each alternative, and approve a preferred alternative.

When the environmental review is completed, it will recommend to the MPO a preferred alternative, which may be the No-Build Alternative, improving existing roads, and/or constructing a new divided arterial. An Environment Assessment will be prepared that will document the evaluation process and the impacts of the Preferred Alternative.

- **FHWA Corridor Preservation Studies**

FHWA has completed corridor preservation strategies, project development guides, and Right-of-Way Program Administration law which sets the process for making decisions in regards to long-range transportation planning. These are based upon the basic goal of transportation planning which is to address overall social, economic, and environmental effects of transportation decisions. Proper planning can mitigate and address impacts well in advance of construction by reviewing the Major Street Plan and proposed corridor preservation projects.

See Map 11—Regional Arterial Corridor

- Comprehensive Operations Analysis for Public Transportation

  The 2000 Transit Comprehensive Operational Plan outlines proposed improvements. Several route and schedule modifications to the existing Sioux Falls Transit system incorporate the best qualities of the transit components and route structures. The study has suggested several improvements that are shown on Map 12.

  Transit capital expenditures are based on the following vehicle replacement schedule:

  Replacement of 25 fixed-route buses (12-year life) twice during the 25-year period.

  Replacement of 17 paratransit buses (6-year life) four times in the 25-year period.

- **Bicycle Master Plan**

  When considering the multimodal transportation system for the study area, funding for any type bicycle improvements will be critical. Bicycle usage in the Sioux Falls area will never outnumber single-occupancy vehicle usage. So funds for improvements may be scarce. However, with ISTEA and now with TEA-21, more money has been allocated for bicycle and pedestrian-related projects. TEA-21 also recommends MPOs to include bicycle and pedestrian improvements within other transportation projects.

  The State's Intermodal Long-Range Plan states, "DOT will ensure that any transportation improvements along a corridor will not make bicycle or pedestrian access more difficult or impossible." In regard to funding resources, "Ten percent of the Surface Transportation Program funds given to South Dakota fund enhancements and beautification of the transportation system. Enhancements include historical sites, environmental landscaping, bicycle routes, and trails." The State Department of Game, Fish and Parks also has funds through the Land and Water Conservation Fund to be used for any outdoor recreation plans which would include hiking and biking trails. Under this federal program, the LWCF will match 50 percent of the cost of developing approved projects.

  After bicycle improvements are completed, it becomes critical to maintain these surfaces. Persons riding bicycles are more sensitive to variations in surface conditions than persons in motor vehicles; debris, standing water, and paving cracks become obstacles. These conditions can lead to either losing control of the bicycle or swerving into the motor vehicle travel lanes.

See Map 12—Transit Route Improvements

M. Future Special Study Areas and Corridors

The Sioux Falls MPO has identified several future study areas and corridors based upon the needs of the 2025 growth area. The location of the future special study areas and corridors are shown on Map 13.

- **41st Street Corridor**

  An analysis was recently completed between Cliff Avenue and Sertoma Avenue. An implementation plan with specific projects will be developed along this corridor. The main objective is to preserve access across the city of Sioux Falls. Some of the projects that will be considered are:

  a. 49th Street extension to Minnesota Avenue.
  b. 49th Street half-diamond I-29 interchange.
  c. Access management projects.
  d. 41st Street I-29 interchange redesign.
  e. I-29 and I-229 full interchange.

- **Southwest Area Transportation Study**

  A future study is planned to determine the needs of the southwest growth area. The main emphasis of the study will be the development of a cohesive transportation network that effectively links Minnehaha and Lincoln Counties. In addition, the study will build off some of the results of the 41st Street study. Some projects to consider include:

  a. 69th Street arterial development and access management.
  b. Louise Avenue and Tallgrass Avenue north-south flow.
  c. Efficient collector links included in the developing Golden Triangle development area.
  d. Access Management coordination and implementation on South Louise Avenue.

- **Northeast Growth Area Transportation Study**

  A study is planned for the future to determine the arterial and collector extensions required in east Sioux Falls and the Brandon growth area. The study will need to emphasize the acquisition of right-of-way and the development of new transportation corridors in future growth areas. Some projects to consider are:

  a. Rice Street, Benson Road, and Holly Street.
  b. Interchange at I-90 between the EROS and Brandon exits including accompanying arterial links.
  c. Arterial and collector street links.

See Map 13—Special Studies

- **West 12th Street Corridor Study**

  A study should be completed to determine how best to maintain the level of service along West 12th Street. An enormous amount of development will be occurring in western Sioux Falls and West 12th Street will handle much of that new traffic generated from the growth. Some of the specific projects may include:

  a. Access management projects.
  b. Development of north-south arterial and collector connections including the LaMesa Drive and Sertoma Avenue arterial connections.
  c. Alternative east-west arterial improvements between Sertoma Avenue and the Tea-Ellis Road (including the 26th Street and 22nd Street corridor area).

- **I-229 Interchange Studies (Minnesota Avenue and 26th Street)**

  Improvements to these interchanges will be necessary to maintain or improve the level of service and traffic safety.

- **Southeast Area Transportation Study**

  An emerging growth area in the 2025 study period is located in the southeast. The focus of the study will include an arterial and collector system to complement a street system with or without the eastside corridor and creating a continuous transportation system between Lincoln and Minnehaha Counties.

- **Access Management Plan**

  The need for access management will assist in maximizing the capacity of existing road corridors. A plan will be developed to determine what techniques and guidelines that the City of Sioux Falls will utilize within its subdivision and zoning review process.

- **Freight Plan**

  The City of Sioux Falls will review the future transportation needs of the freight industry and determine to what extent new transportation corridors or mode improvements are required to adequately service the industry. Some specific projects may include improved access to the interstate system from the industrial park.

- **57th Street Corridor Study**

  The corridor would facilitate better east-west traffic flow across the city. Two projects would include:

  a. Extension of the East 57th Street corridor into Iowa.
  b. Extension of the West 57th Street corridor to SD 17 (referenced in 41st Street Study).

- **SD 115 Access Management Plan**

  On both the north and south sides of Sioux Falls, SD Highway 115 has become a major commuter road into the city. As growth occurs into these areas, access management will be an important tool to maximize the capacity of the existing corridor.

- **Pedestrian Plan**

  To develop a more walkable city, a plan will be completed to suggest projects that will allow citizens to safely walk between destinations.

- **Miscellaneous Corridor Studies**

  Complete a study of US 18, from I-29 to SD 11, for capacity improvements into Canton.
  Complete a study of SD 38, from I-90 to Hartford, for capacity improvements.
  Complete a study to improve the intersection of SD 42 and SD 11.

N. Conclusion

Through further planning and detailed studies, proposed project improvements will be coordinated and implemented in subsequent Unified Planning Work Programs, Transportation Improvement Programs, Statewide Transportation Improvement Programs, and Capital Improvement Programs. Each one of these documents has its own public involvement opportunities and approval process.

The following is a list of regionally significant improvements to the area's transportation system. These projects should be considered for additional evaluation over 25 years for potential inclusion in the previously mentioned programs, if the evaluations indicate the projects are feasible.

Chart 14

Regionally Significant Projects

ID	Project Location	Improvement	Est. Cost	Status	Comments
91-4	Russell St. and Interstate 29	New interchange	$24,600,000	1-5 years	Project scheduled in 2002 *94-71
91-6	12th St. and Interstate 29	Reconstruct interchange	$11,500,000	1-5 years	Project scheduled in 2004
91-8	Madison St. and Interstate 29	New interchange	$11,500,000	1-5 years	Project scheduled in 2004
91-9	57th St. and Interstate 29	New overpass	$2,000,000	1-5 years	Design underway; scheduled for 2001
91-10	Interstates 229 and 29	Additional lanes to increase capacity	$13,000,000 $15,667,000	1-5 years	Construction of I-229 in 2000-2001, I-29 in 2002
91L-18	Regional Transportation Study SD 11–(Minnesota Ave. and CO 106 to I-90)	Four-lane divided arterial, limited access.	$25,000,000	16-25 years	Environmental Analysis in 2001 "East Side Corridor Route Analysis"
94-57	Regional Transportation Study Tea/Ellis Road—(Minnesota Ave. and CO 106 to I-90)	Four-lane divided arterial, limited access with interchange at I-90	$40,000,000	16-25 years	West Corridor Study in 2002
94-66	Interstate 229–I-29 to Sertoma Ave. or at Ellis Rd. (either tie into 69th St.)	Extend I-229 to the west with new full movement interchange	$30,000,000	6-15 years	Study in 2001
94-71	Benson Rd. and Interstate 29	New interchange, extend from Marion Rd. to Kiwanis Ave.	*Costs included with Russell 91-4	1-5 years	Justification in 2000
00-01	Marion Rd. and Interstate 90	New interchange	$7,000,000	1-5 years	Justification completed; scheduled for 2004

00-02	CO 106 and Interstate 29	Reconstruct interchange	$10,484,000	1-5 years	Tea Exit 73; scheduled for 2003
00-06	Township Road (two miles west of Brandon) and Interstate 90	New interchange, river/rail crossing	$12,000,000	16-25 years	Serve the growth area between Sioux Falls and Brandon
00-28	SD 115 Harrisburg to SF	3 miles of capacity improvements	$8,500,000	6-15 years	
00-29	CO 110 and Interstate 29	Reconstruct interchange	$3,200,000	6-15 years	Harrisburg Exit 71 correct an interchange deficiency
00-30	SD 38 from 1.4 mile west of I-29 to I-90	Capacity improvements	$9,300,000	6-15 years	
00-31	Minnesota Ave. and Interstate 90	New interchange	$12,000,000	16-25 years	
00-32	Interstate 29—between 26th Street and I-229	Construct and/or reconstruct interchanges to increase capacity of existing system	$10,000,000	6-15 years	Commuter growth in the region may require this addition
	Total Estimated Expenditures		**$244,951,000**		