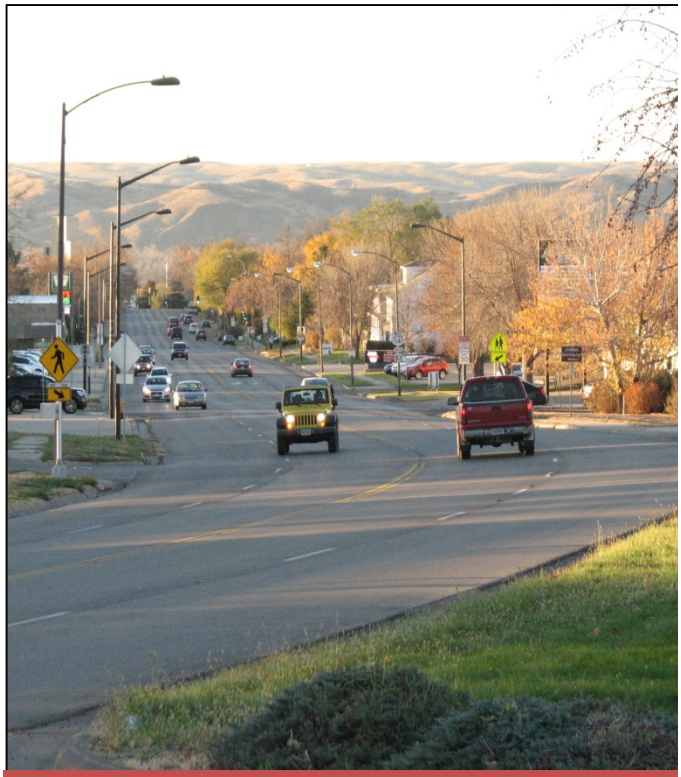

Northeast Pierre Transportation Plan

HP5510(19)3616P

Pierre, SD

December 22, 2017

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

CITY OF PIERRE

HUGHES COUNTY

FEDERAL HIGHWAY ADMINISTRATION

Northeast Pierre Transportation Plan

Project HP 5510(19) 3616P

Prepared for:
South Dakota Department of Transportation
City of Pierre
Hughes County
Federal Highway Administration

Prepared by:
HDR Engineering, Inc.

Version 4 – December, 2017

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Study Advisory Team

Steve Gramm	SDDOT	Stacy Bartlett	SDDOT
John Forman	SDDOT	Neil Schochenmaier	SDDOT
Laurie Schultz	SDDOT	Dean VanDeWiele	SDDOT
Sharon Johnson	FHWA	Leon Schochenmaier	City of Pierre
John Childs	City of Pierre	Sharon Pruess	City of Pierre
Kevin Hipple	Hughes County	Rick Laughlin	HDR
Jason Kjenstad	HDR		

Executive Summary

This transportation plan has been prepared as part of the larger community planning effort conducted for the Pierre area. The plan focuses on the area planned for future development, north and east of the existing developed area of the City of Pierre, as shown in **Figure 1**. It has been conducted under the supervision and funding of the South Dakota Department of Transportation and the Federal Highway Administration, with cooperation and participation of the City of Pierre and Hughes County. It uses the general transportation goals and objectives identified in the Pierre Comprehensive Plan and reflects other state and local planning studies. The plan is comprised of the following components:

Current conditions assessment

Data were gathered concerning current traffic volumes, traffic origins and destinations, crashes, and public perceptions regarding the transportation system. The data were analyzed to determine where improvements may be needed.

Future conditions assessment

A traffic forecasting model was built and traffic volumes were forecast for 2045. Traffic operations were analyzed to determine future transportation needs. The transportation needs were assembled into a list of potential projects.

Public involvement

The public was involved in the planning process through a website, and public meetings. Public input was sought on transportation needs early in the process and on the list of potential transportation projects later in the study.

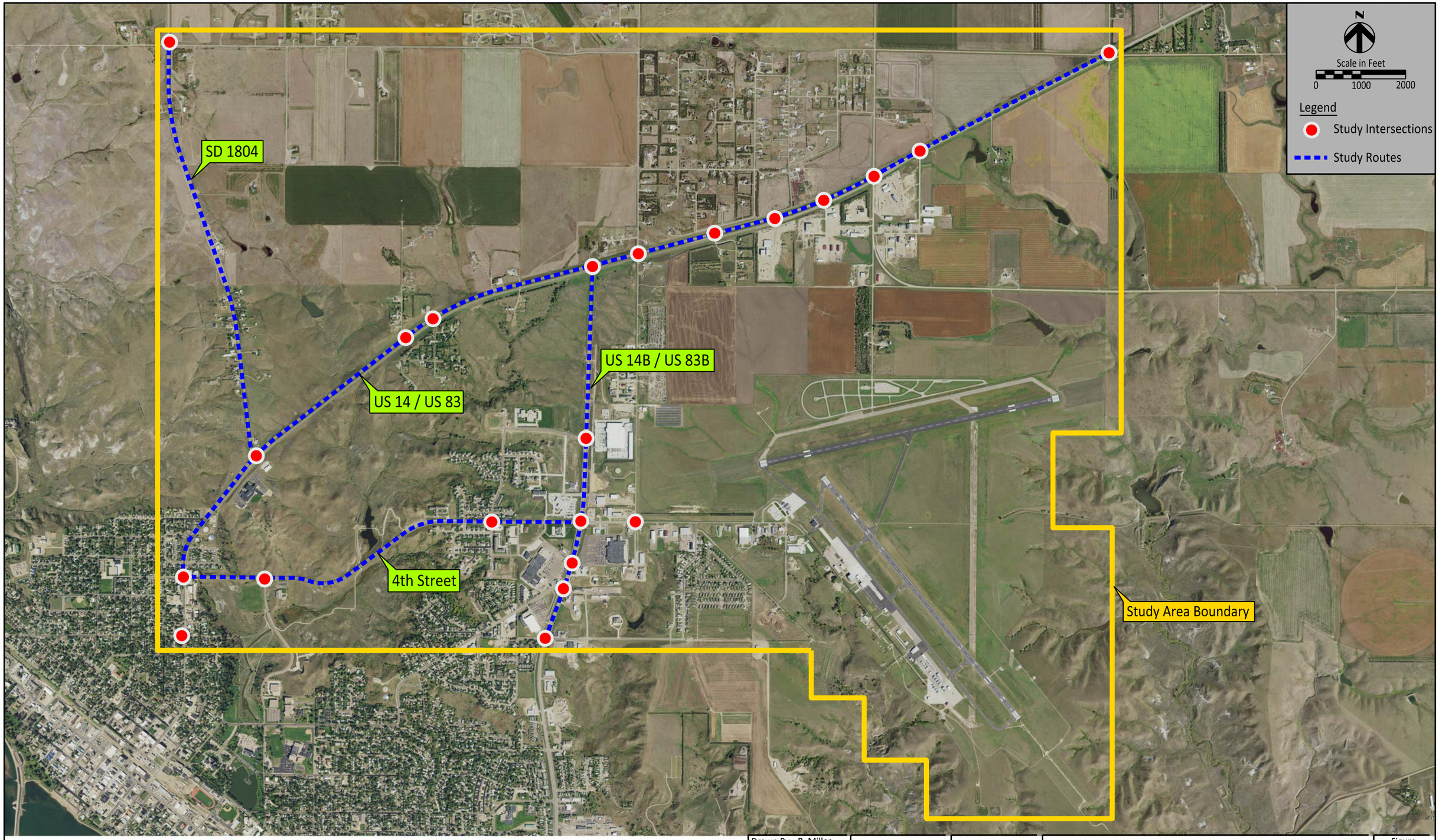
Prepare design standards and other support documents

Current regulations and guidance for design of transportation improvements were reviewed and updated documents were provided for consideration.

Prepare project program and study document

The final project program was prepared based on input from the public, elected officials, transportation professionals, and the Study Team. The study process was documented in this report. The project program can be found in **Table 3**.

Graphical representations of the future additions to the street network are shown in **Appendix part 7**.



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Date: 6/7/2017
Revisions:

Study Area

Northeast Pierre Transportation Plan — Pierre, SD

Figure 1

Chapter 1 - Goals and Objectives

This Master Transportation Plan for the Pierre Area exists within the larger framework of past comprehensive community planning efforts undertaken by the City of Pierre and other local governments. The City of Pierre has created a statement of the planned community vision contained in the City of Pierre Comprehensive Plan, December, 2008.

Strategies for implementing the community's transportation vision are contained in the goals and objectives stated in the Comprehensive Plan and reproduced below:

Transportation Goal:

The City of Pierre will have a safe and efficient multi-modal transportation system that meets the mobility needs of the traveling public, is cost effective, and minimizes negative impacts on adjacent land uses.

Transportation Objectives:

- Establish and maintain access management standards which meet or exceed the SDDOT guidelines for urban arterial and collector roadways.
- Complete access management plans along State Highways 34 and 1804, and US Hwy 14/83, and encourage Hughes County to do so also.
- Preserve right-of-way for all arterial and collector roadways by establishing appropriate minimum standards within the City's subdivision regulations.
- Provide multi-use paths as part of greenway or open space corridors wherever feasible and consistent with ongoing parks and recreation planning efforts.
- Encourage street layouts which minimize overall street length while reducing site grading, drainage and storm sewer requirements to the greatest extent possible.
- Maintain the effectiveness of truck routes.
- Provide traffic control measures consistent with standard traffic engineering practice.
- Establish collector and arterial roadways in subdivisions in a manner which is consistent with the roadway layouts proposed in the comprehensive plan.
- Require road grades and drainage of proposed subdivisions be designed with consideration for continuity with surrounding and future developments.
- Design residential street layouts to minimize overall street lengths and the quantity of site grading required.
- Avoid cul-de-sacs in new developments to minimize street maintenance challenges and costs.
- Prevent heavy traffic on minor residential streets by requiring a system of collector streets between adjacent subdivisions.
- Secure sufficient rights-of-way with development to accommodate the City's major street system, including a perimeter system of arterial streets.
- Discourage driveway entrances onto highways and other major roads where locations may result in traffic hazards or impede traffic flow.
- Establish and protect major transportation corridors and systems, such as the airport, from encroachment by incompatible land uses.
- Promote, improve and protect the aesthetic value of highway entrances and the airport entrance/exit to the City of Pierre.

The guidance provided by these statements of community vision has been used throughout the preparation of this transportation plan.

Chapter 2 - Procedures

Preparation of this transportation plan followed a dual-track process. As shown in Figure 2, assembly and analysis of data provided input to the evaluation of existing and future conditions. The end result of the data and evaluation tracks was a program of recommended future transportation improvements.

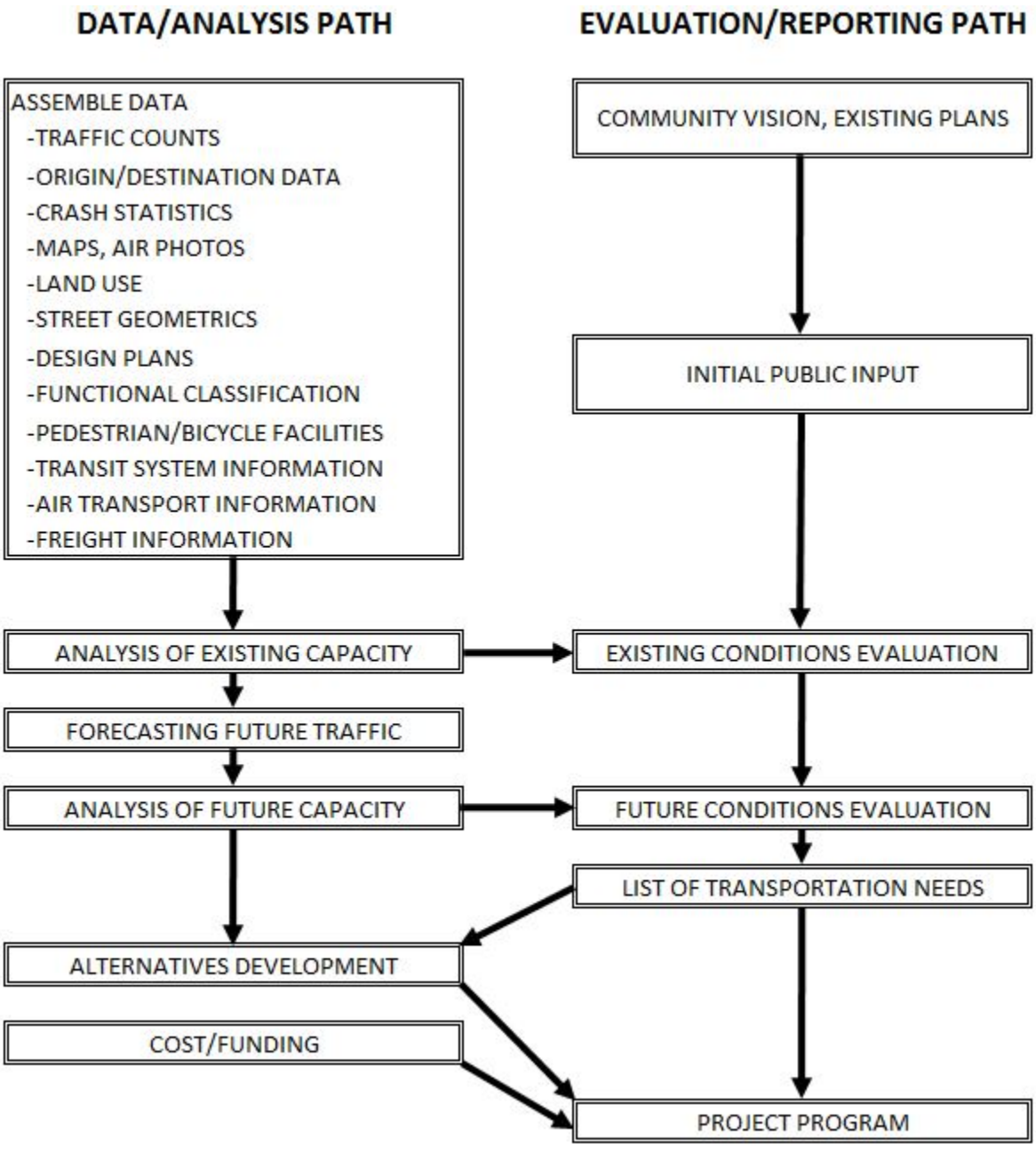


Figure 2 – Process Workflow

The study data was assembled from existing databases and from counts and surveys conducted by the project team in 2016. Roadway capacity analysis was conducted using Highway Capacity Manual techniques via Trafficware® SYNCHRO software. A new regional travel demand model was prepared to facilitate traffic forecasts.

Chapter 3 - Existing Conditions

A useful transportation planning effort begins with a comprehensive inventory of the existing transportation system. That inventory needs to include not just technical data, but also public perceptions of the existing transportation system. Therefore, the study proceeded with data gathering two types of data: 1) technical information from traffic counts, origin/destination surveys, and database searches, and 2) data regarding public perception of existing transportation system needs.

Transportation System Needs

A list of potential transportation system needs was generated through a multi-pronged input effort, including:

- Input from the project Study Team, comprised of State and Local transportation officials.
- Input from the public via written and spoken comments at the first public meeting.
- Input from the public via email and Facebook comments.

The input comments were assembled on **Figure 3 and Table 1**. They indicate that the primary areas of concern are related to individual intersection operations, safety, and access for bicycling.

Functional Classification

A well-functioning transportation system depends on having streets serving all the types of transportation needs, from local access and circulation streets to inter-regional highways. The existing Pierre-area roadway system provides the full compliment of streets and highways, with each street section classified according to its planned function.

The existing functional classification of the street system is shown in the current Major Streets Plan, **Figure 4**. It should be noted that the functional classification system maintained by local governments may differ slightly from the Federal functional classification maintained by SDDOT due to mileage limitations on certain types of roadways.

Traffic Counts

Vehicular turning movement counts were conducted to supplement existing traffic volume databases. Turning movement counts were performed on September 27, 2016, from 6 AM to 6 PM at the following intersections to provide data for intersection analysis:

- SD 1804/Range Rd.
- Euclid Ave./Capitol Ave.
- Euclid Ave./Broadway Ave.
- Euclid Ave./Elizabeth St.
- Euclid Ave./4th St.
- US 14-83/SD 1804
- US 14-83/Duluth Ave.
- US 14-83/Saunders Ave.
- US 14-83/Garfield Ave.
- US 14-83/N Airport Rd./Kingsway Rd.

- US 14-83/Plainview Rd.
- US 14-83/Buhl Ave.
- US 14-83/Triple M Travel Plaza
- US 14-83/293rd Ave.
- US 14-83/Grace Ave.
- US 14-83/205th St.
- Garfield Ave./Elizabeth St.
- Garfield Ave./Harrison Ave.
- Garfield Ave./Wal-Mart entrance
- Garfield Ave./4th St.
- Garfield Ave./Brookstone Loop
- 4th St./Governor's Dr.
- 4th St./Abbey Rd.
- Airport Rd./N. Airport Rd.
- Sioux Ave./Pierre St.

Count summary sheets have been provided in **Appendix Part 11.**

Volumes and Level of Service

Daily traffic volumes are shown on **Figure 6** – Existing Daily Volumes and Levels of Service. Figure 5 also displays the intersection levels of service in the study area.

Observations of traffic volumes provide an understanding of the general nature of traffic, but are insufficient to indicate either the ability of the street network to carry additional traffic or the quality of service provided by the street system. For this reason the concept of *level of service* (LOS) was developed to correlate numerical traffic operational data to subjective descriptions of traffic performance at intersections. Each lane of traffic has delay associated with it and therefore a correlating LOS. The weighted average delay for each of these lanes of traffic for a signalized intersection is the intersection LOS. LOS categories range from LOS "A" (least delay) to "F" (most delay).

The level of service analysis indicates that several intersections have reached LOS D – the point where they should be monitored for any further deterioration in service, and potentially considered for improvement. Those intersections include:

- US 14-83/SD 1804
- US 14-83/Garfield Ave.
- Garfield Ave./Elizabeth St.

Several intersections have reached LOS F during at least one peak hour. Those intersections include:

- Euclid Ave./4th St.
- Garfield Ave./Wal-Mart
- 4th St./Abbey Rd.

It should be noted that all six of the intersections listed above are controlled by stop signs on the minor street approach, with free movement for vehicles on the major street. Low levels of service on the stop sign-controlled approaches to arterial roadways are common and are not necessarily a sufficient reason for immediate improvements. The Euclid Ave./4th St. intersection is being studied in more detail for the need for changes in configuration and traffic control. The Garfield Ave./Wal-Mart intersection has been recently studied and improvements are being implemented. The 4th St./Abbey Rd. intersection serves new development and should be monitored as traffic flows change.

Safety

Safety was studied in detail and the results were reported in Technical Memorandum 1, reproduced in **Appendix 1**.

Bicycle and Pedestrian

Bicycle and pedestrian travel in Pierre is characterized by an established network of facilities with plans for future expansion. A system of multi-use recreation trails serve parts of the community and is planned for future expansion. The existing system of trails is shown in **Figure 7**. Other bicycle and pedestrian travel occurs on existing streets and sidewalks. Sidewalks are present along most of the study area streets, except in rural areas.

The bicycling community has identified that the existing system has gaps for recreational and commuting connections. Options for recreation and commuting routes are identified in later chapters.

Transit

The Pierre Area is served by River Cities Public Transit, which provides advance-reservation transit service throughout the community and in neighboring counties. The transit system also operates a daily shuttle to connect to the Jefferson Lines interstate commercial bus network. River Cities Public Transit conducts its own fleet and operations planning in cooperation with the South Dakota Department of Transportation and the Federal Transit Administration. The system generally serves the population that does not have access to an automobile. While a valuable service to the community, its impact on the roadway system is minimal.

Freight

Freight transportation needs in the Pierre area are met by truck and rail services. The primary routes for truck traffic through the study area are US 14/US 83, US 14B (Garfield Ave.), and SD 1804. Smaller truck volumes also use SD 34 and county roads to access the study area. Local hauling of bulk materials occurs on these routes. Additional delivery activity occurs on Pierre city streets.

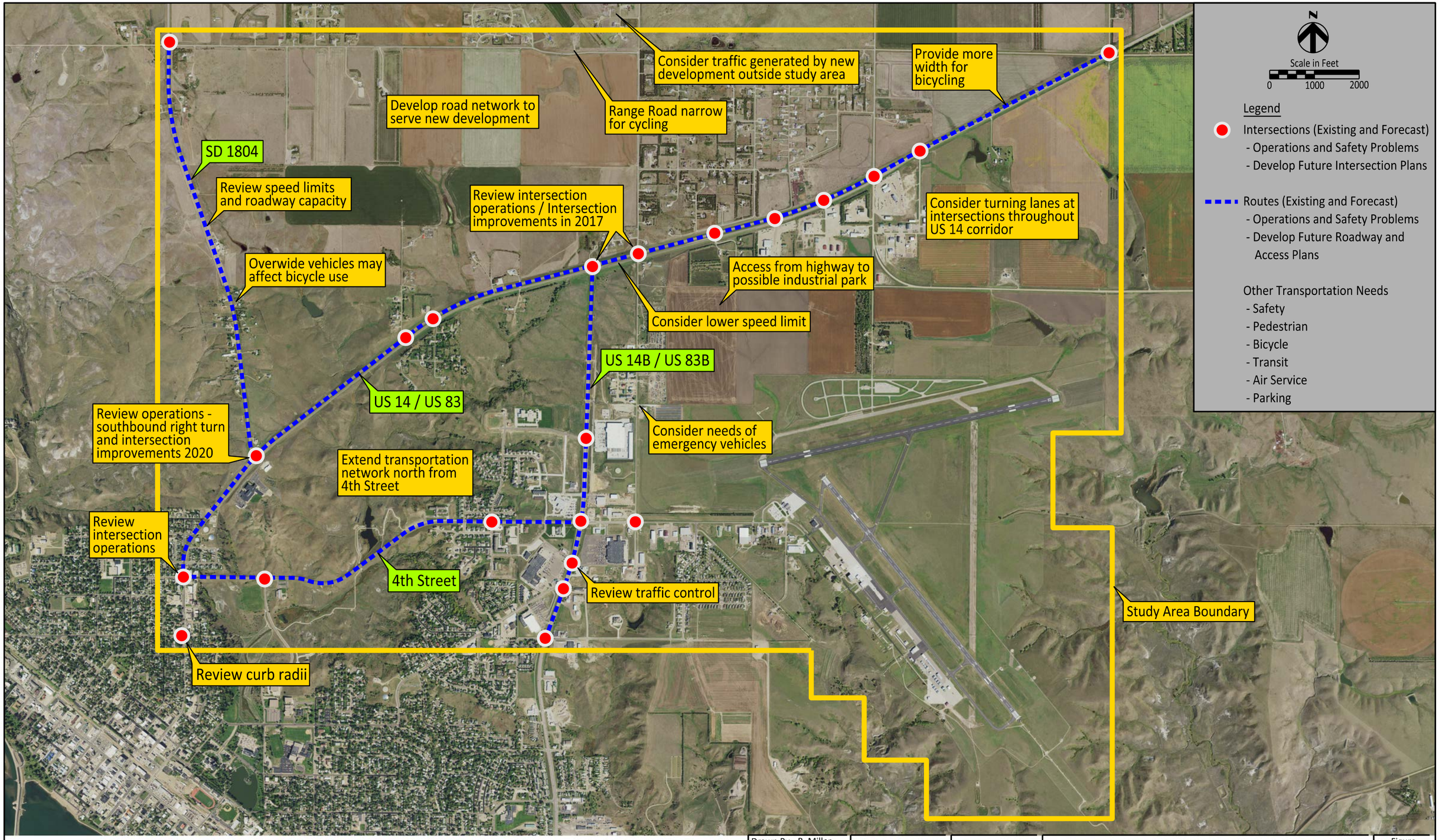
Freight rail service is provided by the Rapid City, Pierre and Eastern railroad which travels east and west through Pierre and provides connections to other railroad systems. There are several sidings within the study area to serve sources for grain and other goods.

Comments received from businesses and the general public during the study indicate that freight needs are currently being met and should continue to be met with normal growth of trucking and rail services.

Air

Commercial passenger service is provided at the Pierre Regional Airport by ADI/Great Lakes Jet Express, with service to Denver and Watertown. General aviation services are provided through a fixed-base operator. The airport is currently conducting an update of the Airport Master Plan, in coordination with the City of Pierre, the South Dakota Department of Transportation and the Federal Aviation Administration.

The airport lies within the study area of this transportation plan and the needs of airport users will be considered in development of transportation system plans.



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Date: 12/23/16
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South Dakota DOT Connecting South Dakota and the Nation

HDR

Issues Map

Northeast Pierre Transportation Plan — Pierre, SD

Figure 3

TABLE 1 - TRANSPORTATION ISSUES

NORTHEAST PIERRE TRANSPORTATION PLAN

LOCATION	ISSUE	SOURCE
SD 1804	REVIEW SPEED LIMITS AND ROADWAY CAPACITY	PUBLIC INPUT
SD 1804	OVERWIDTH VEHICLES MAY AFFECT BICYCLE USE	PUBLIC INPUT
EUCLID/ELIZABETH	REVIEW CURB RADII	PUBLIC INPUT
EUCLID/4TH	REVIEW INTERSECTION OPERATIONS	PUBLIC INPUT, PROJECT SCOPE
US 14/SD 1804	REVIEW OPERATIONS - IMPROVEMENTS PLANNED IN 2020	PUBLIC INPUT, ANALYSIS
RANGE ROAD	ROADWAY NARROW FOR CYCLING	PUBLIC INPUT
KINGSWAY ROAD	CONSIDER TRAFFIC GENERATED BY NEW DEVELOPMENT OUTSIDE STUDY AREA	PUBLIC INPUT
US 14	PROVIDE MORE WIDTH FOR BICYCLING IN TWO-LANE SECTION	PUBLIC INPUT
US 14	CONSIDER TURNING LANES AT INTERSECTIONS THROUGHOUT US 14 CORRIDOR	PUBLIC INPUT
N AIRPORT ROAD	CONSIDER ACCESS FROM HIGHWAY TO POSSIBLE INDUSTRIAL PARK (NOTE - CITY NEEDS TO PROTECT AIRPORT AREA FROM DEVELOPMENT INCOMPATIBLE WITH AIRPORT SAFETY ZONE)	PUBLIC INPUT
US 14	CONSIDER LOWER SPEED LIMIT	PUBLIC INPUT
N AIRPORT ROAD	CONSIDER NEEDS OF EMERGENCY VEHICLES	PUBLIC INPUT
GARFIELD/WAL-MART	REVIEW TRAFFIC CONTROL	PUBLIC INPUT
US 14/GARFIELD	REVIEW INTERSECTION OPERATIONS - INTERSECTION IMPROVEMENTS IN 2017	PROJECT SCOPE
4TH/ABBEY	NEEDS CAPACITY IMPROVEMENTS	ANALYSIS
GARFIELD/HARRISON	NEEDS CAPACITY IMPROVEMENTS	ANALYSIS
STUDY AREA	PROVIDE FOR THROUGH-TRUCKS AND LONG LOADS	ANALYSIS
STUDY AREA	COORDINATE WITH AIRPORT PLAN DEVELOPMENT	ANALYSIS
STUDY AREA	ACCESS IMPROVEMENTS - SEE ACCESS PLANS	ANALYSIS

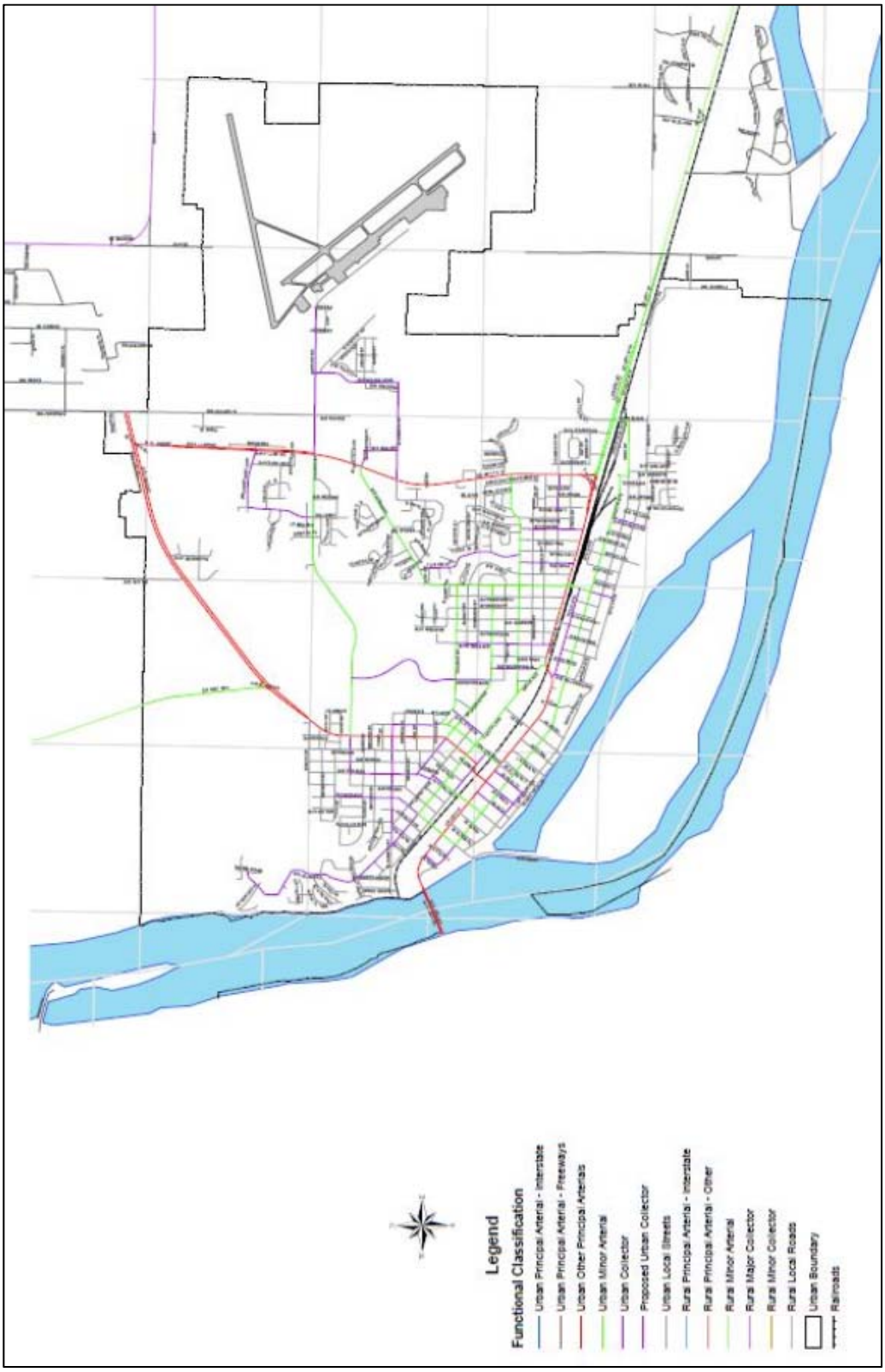
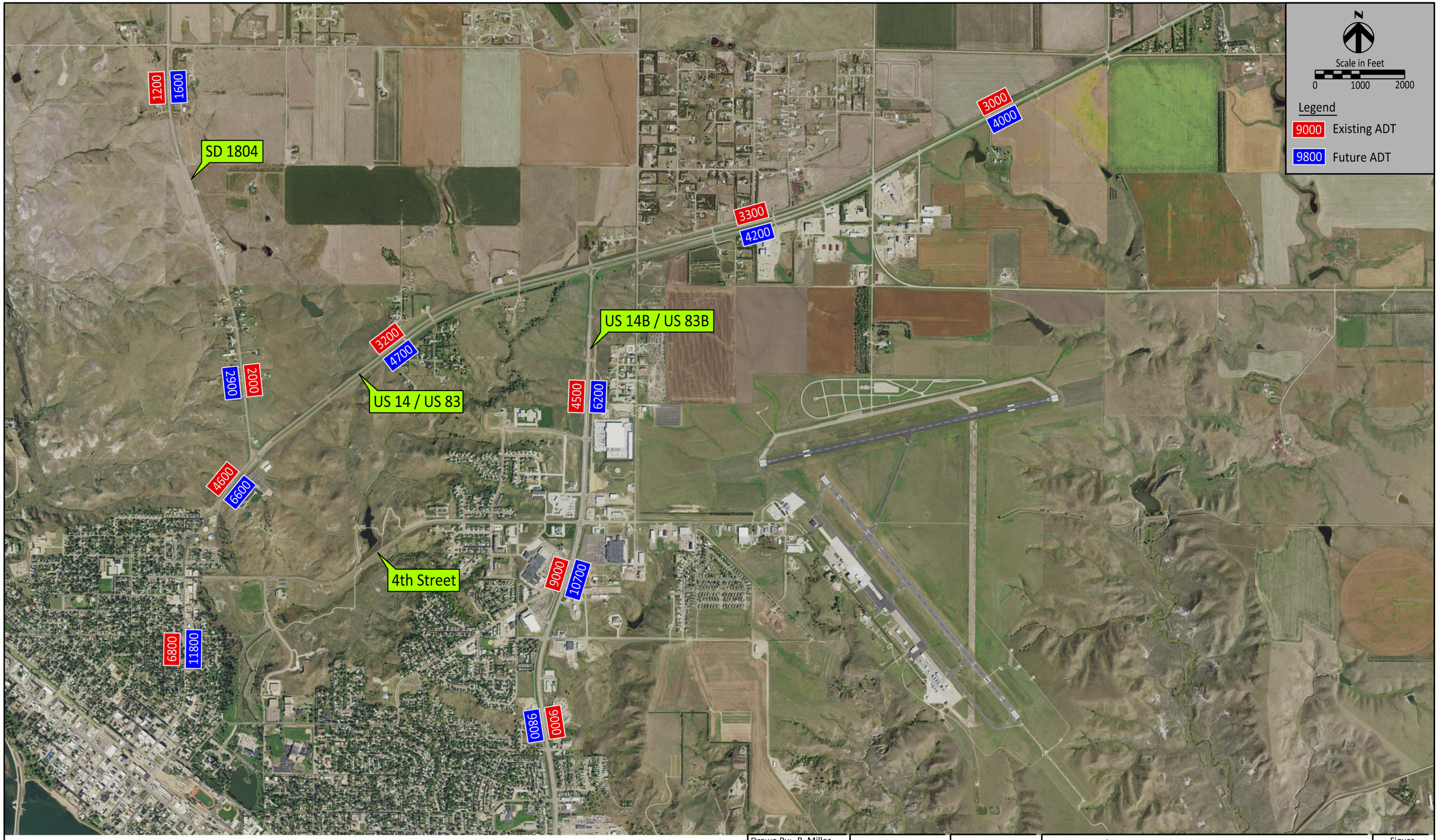


Figure 4 – Existing Major Streets Plan



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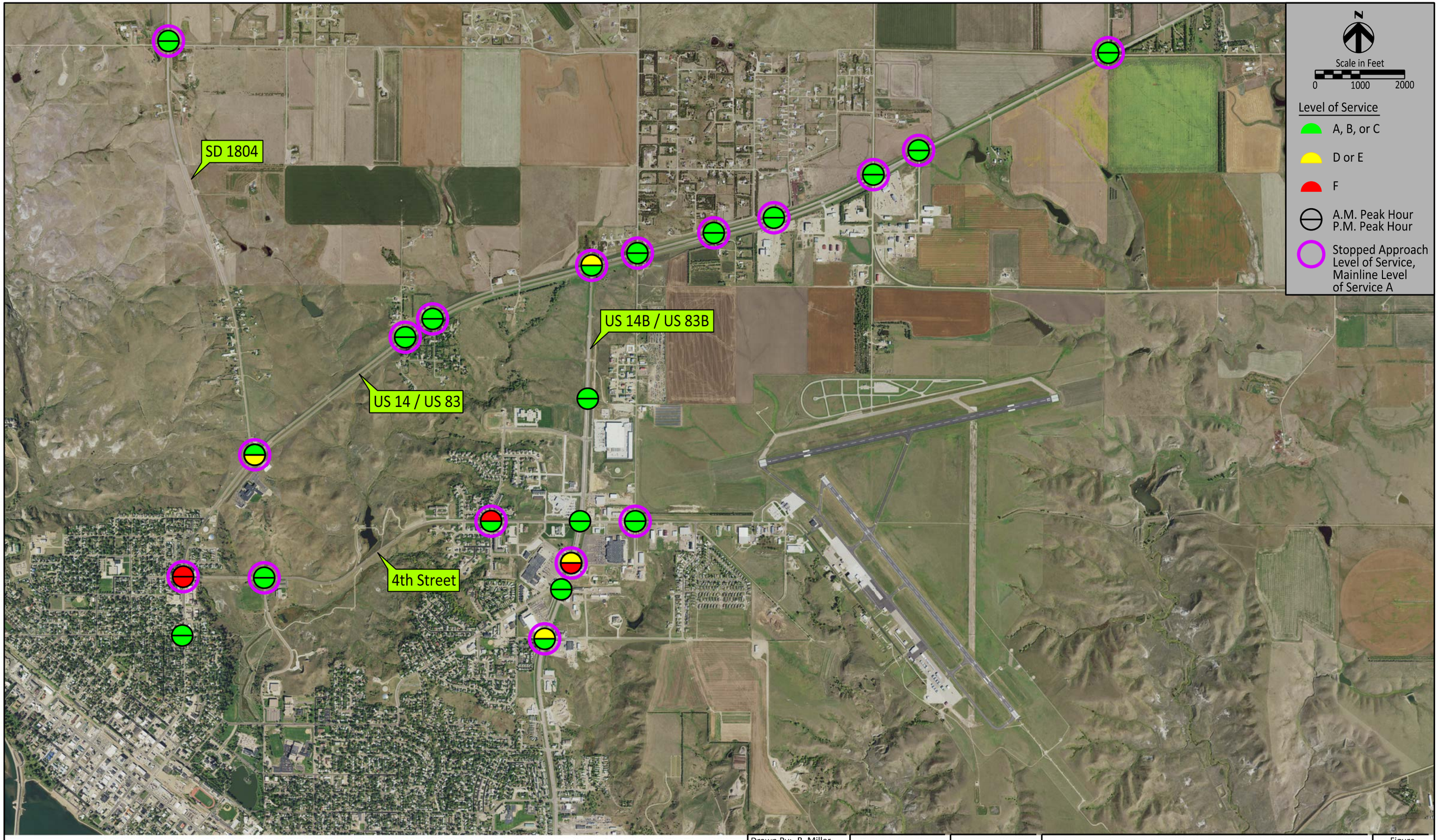

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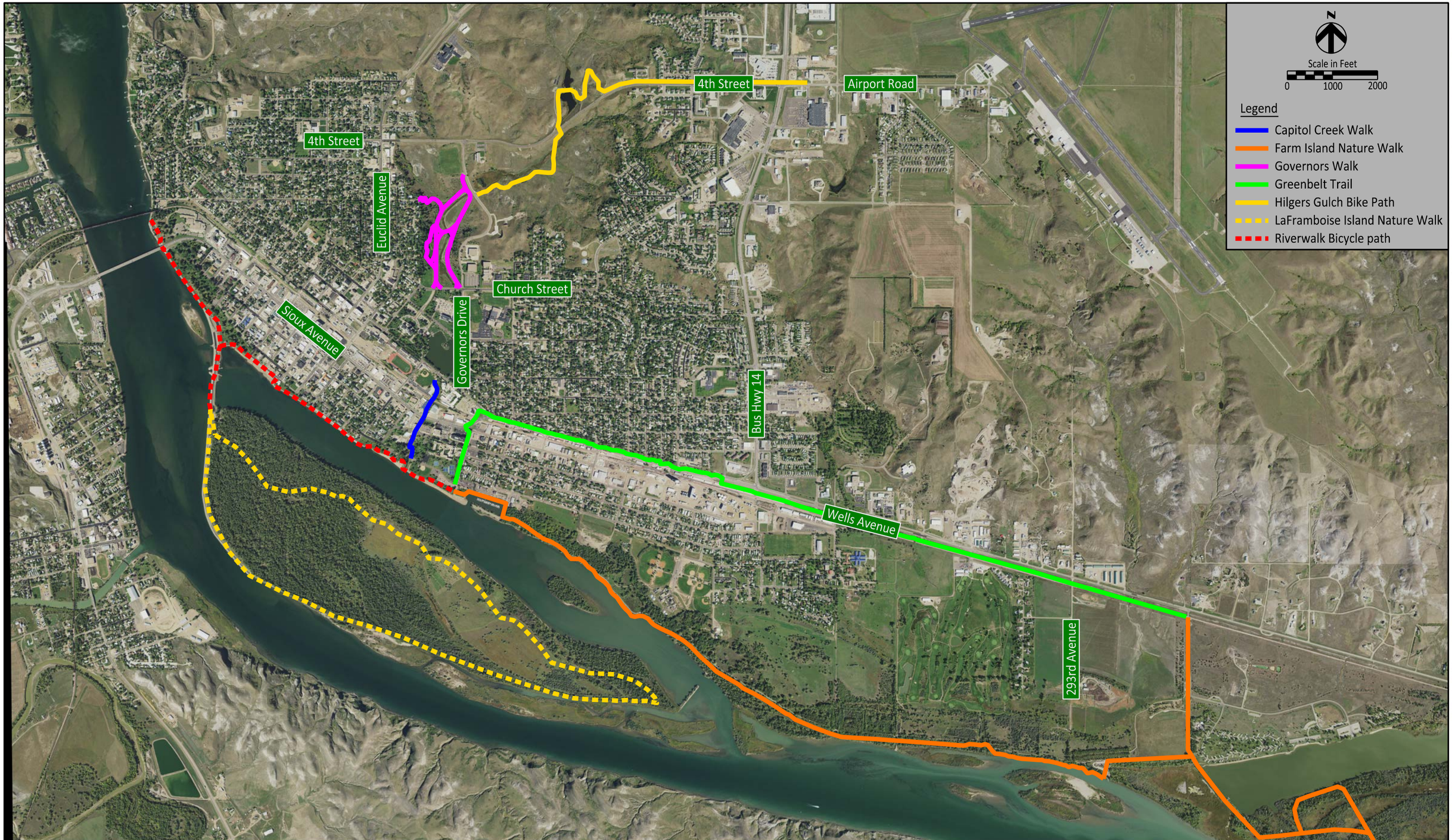
Date: 12/23/16

Revisions: 6/7/2017

Existing Traffic Operations

Northeast Pierre Transportation Plan — Pierre, SD

Figure 6



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Existing Recreational Trail System

Northeast Pierre Transportation Plan — Pierre, SD

Figure 7

Chapter 4 - Future Conditions

Transportation operating conditions were estimated for 2045 to provide insight on which transportation improvements will be needed within the planning horizon. The future operating conditions were estimated by first forecasting future levels of traffic, and then analyzing operations based on the forecast traffic. Finally, future transportation deficiencies were identified and a list of transportation needs prepared.

Traffic Forecasting

Traffic volumes for 2045 were forecast through preparation and use of a travel demand model. The model was prepared using QRS II software and correlates traffic volumes to land use, with model parameters tailored to study area conditions to better replicate locally-observed traffic patterns. The travel demand model estimates travel to and from a geographic level called traffic analysis zones (TAZ's). The TAZ structure is shown in **Figure 8** and represents areas of fairly uniform land use types with TAZ boundaries that fall along major area roadways. The model output was used to forecast future traffic growth levels, which developed factors for traffic counts to produce the 2045 traffic forecasts.

QRS II software was used because its cost is within reach of most municipal users and its flexible data structure allows use of simple land use/travel demand relationships.

Future Volumes and Level of Service

Forecast traffic volumes and Levels of Service for the 2045 Pierre-area roadway network are shown in **Figures 5 and 9**. Intersection levels of service for 2045 are in many cases similar to the 2017 levels of service because of moderate growth in traffic volumes between 2017 and 2045. The analysis shows that the following intersections are anticipated to be at LOS "D or E" in 2045:

- US 14-83/Garfield Ave.
- Garfield Ave./Elizabeth St.
- 4th St./Abbey Rd.

The following intersections are expected to reach LOS "F" by 2045:

- Euclid Ave./4th St.
- US 14-83/SD 1804
- Garfield Ave./Wal-Mart

Pedestrian and Bicycle Plans

The planned network of multi-use recreation trails and bicycle facilities is shown in **Figure 10**. This planned network was prepared through a community-based planning process, supplemented by system analysis, and represents a 2045 planning horizon. Pedestrian travel will also be facilitated by sidewalks in all new street development.

Pedestrian issues are also closely related to the planning and operations of schools. Tools such as coordinated school district/city planning, safe routes to school programs and school circulation studies provide the means for creating a safe, efficient pedestrian system and are recommended for implementation by Pierre-area local governments and agencies.

Transit Plans

River Cities Public Transit has created a plan for maintaining and operating their existing demand-responsive and shuttle services. Those services will continue in the future, as documented in the River Cities Public Transit plans.

List of Needs

A list of future transportation needs was prepared based on future year traffic analysis, safety analysis, existing plans and public comments. That list of needs is shown in **Table 2** and will serve as a basis for preparation of the ultimate project program found later in this report.

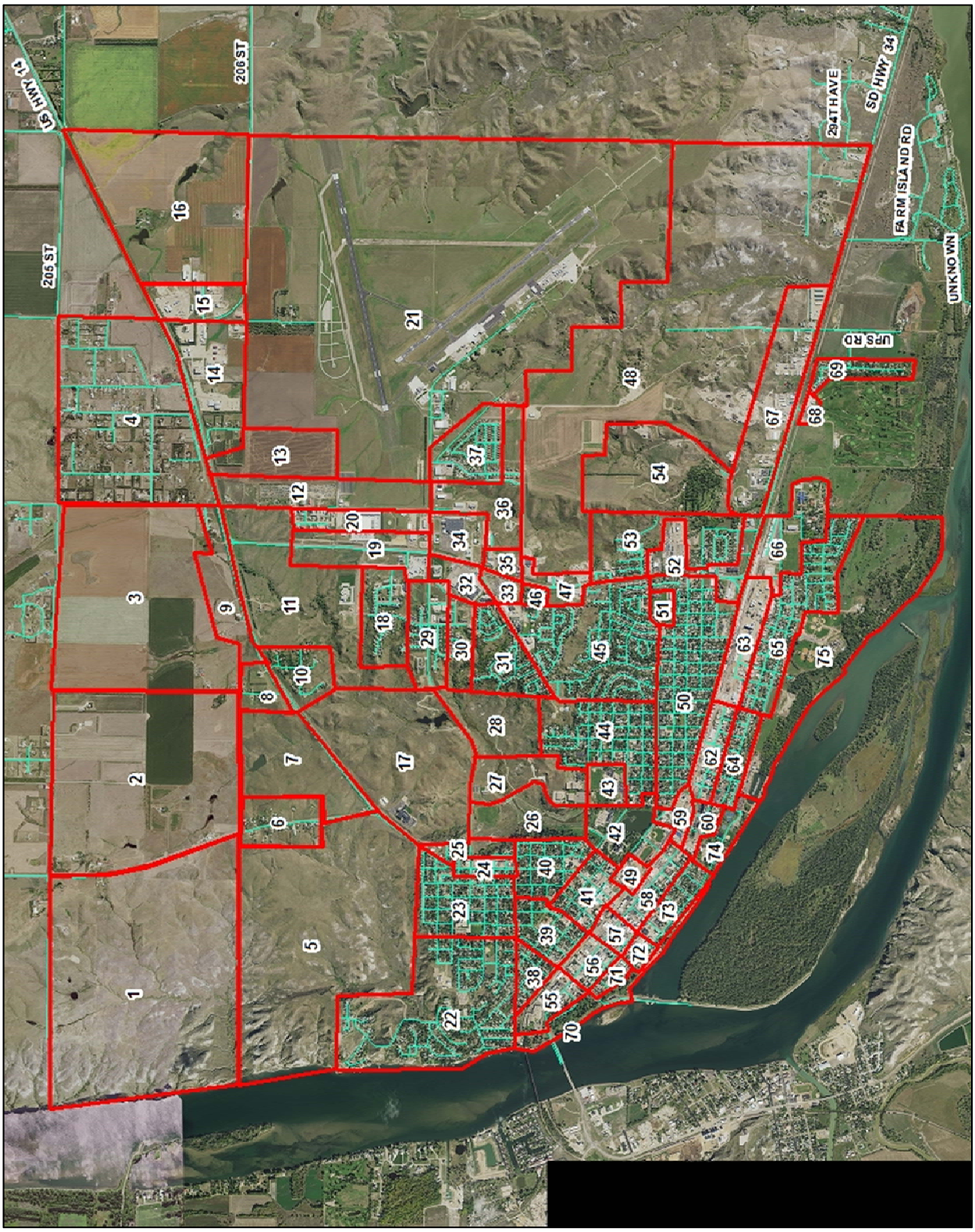
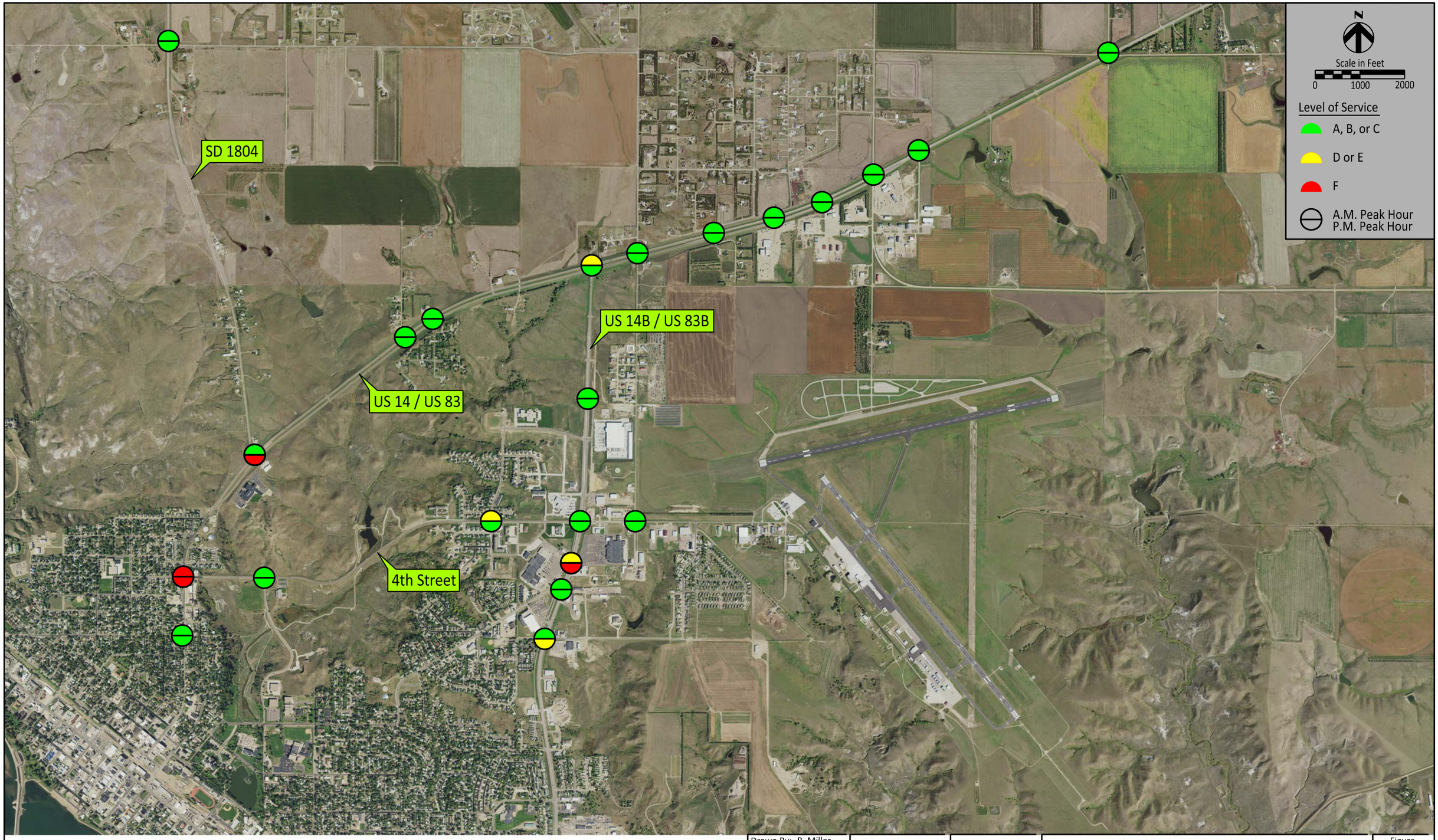


Figure 8 – Traffic Analysis Zone Structure



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Date: 3/1/17

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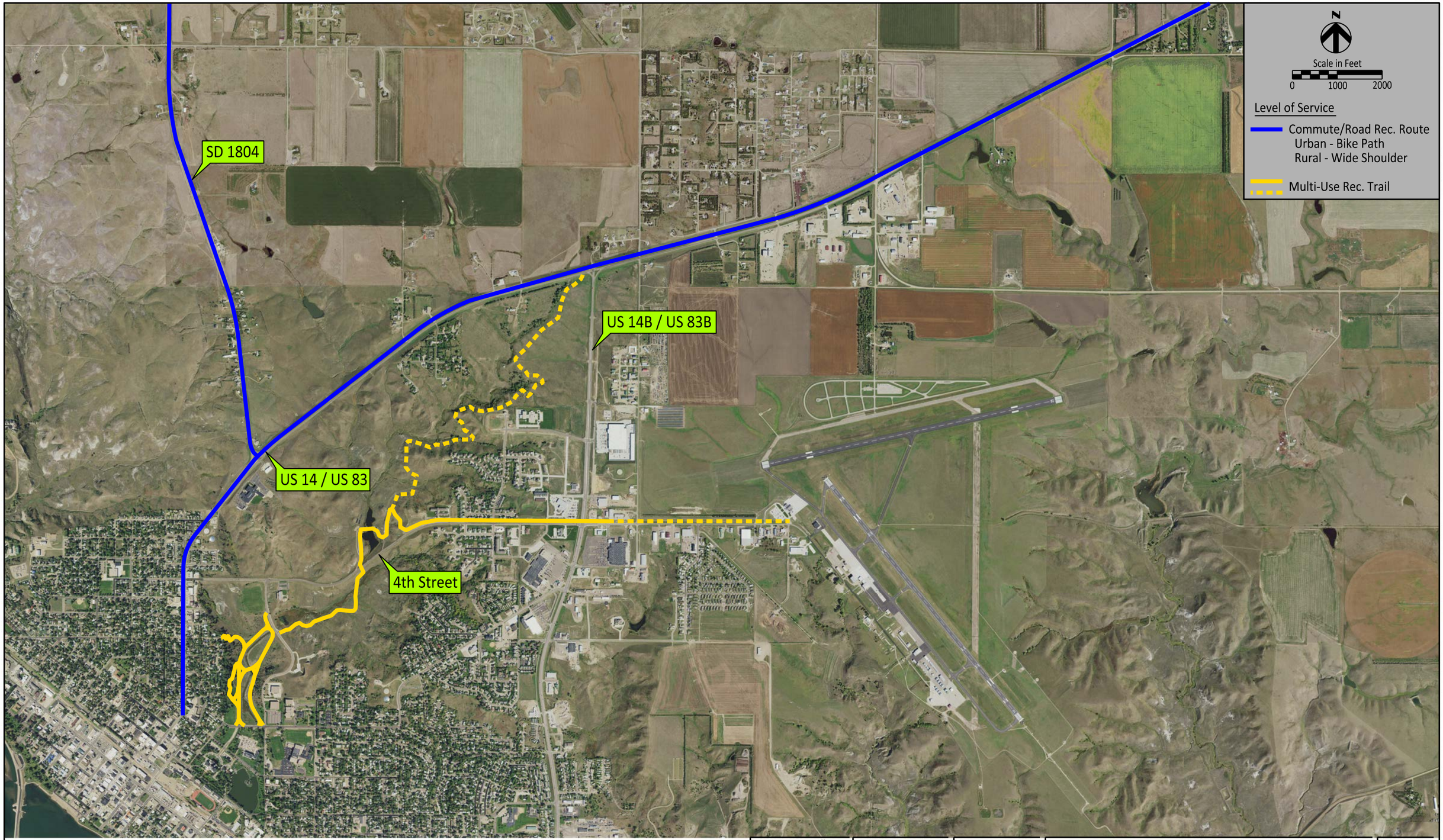
Future No-Build Traffic Operations

Northeast Pierre Transportation Plan — Pierre, SD

Figure 9



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Date: 6/7/2017
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Date: 6/7/2017
Revisions: 10/19/2017

Recreational Trail and Bicycle Facilities Plan

Northeast Pierre Transportation Plan — Pierre, SD

Figure 10

Chapter 5 - Standards Development

A City's goals and objectives are frequently translated into policies and procedures that guide future growth and development. Those policies and procedures have been included in updates and additions to Pierre' administrative documents, including the Major Streets Plan, Design Standards and Typical Street Cross-sections.

Major Streets Plan

The Major Streets Plan is shown in **Figure 11**. The Major Streets Plan was updated to show extensions of the urban street network into growth areas surrounding the city.

Access Management

Highway routes under the jurisdiction of the South Dakota Department of Transportation are subject to Administrative Rule 70:09 regarding access management. Each of the State-jurisdiction routes in the study area (US 14/83, US 14B (Garfield Avenue), and SD 1804) was reviewed for compliance with the access management rule and a plan was devised for access management on each route **(Appendix 3-5).** An access plan was also prepared for 4th Street, a roadway under City of Pierre jurisdiction. This access plan used access standards being proposed for the City of Pierre **(Appendix 7).**

Note that almost all the existing access points on these routes are grandfathered under the pertinent rules for the existing land uses. When the land uses changes, the access points will be subject to review. Likewise, when SDDOT or the City undertakes a reconstruction project on any of these routes, the access may be changed as part of the right-of-way negotiation process.

This process of retrofitting existing access points to more closely match access management standards is incremental and conflicts with landowners' property rights. In most cases, it results in improved access management, but may not reach full compliance with access standards.

Design Standards

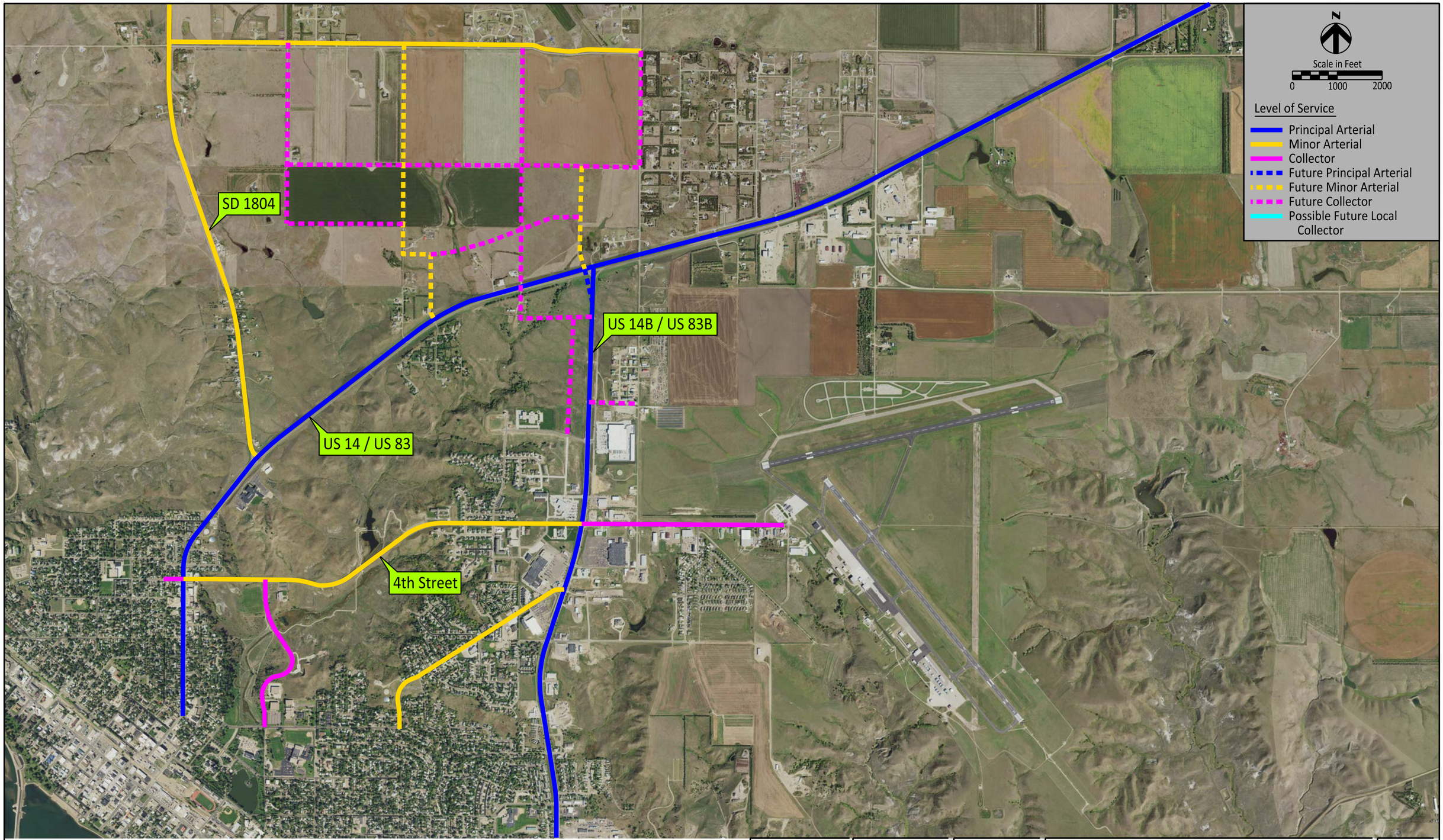
Design Standards were created for the City of Pierre to help guide development of new transportation facilities. The Design Standards strengthen the connection between land uses and transportation facilities, provide access management standards, and procedures for assessing the potential transportation impacts of new developments. The Design Standards are reproduced in **Appendix 7** and are accompanied by a number of supporting documents.

Pedestrian and Bicycle Facilities

Extensive planning of bicycle and multi-user recreational facilities has already taken place in the Pierre area and included in the Comprehensive Plan. Pedestrian and bicycle travel, however, also needs to be included as part of any future expansion of the transportation network. For that reason, pedestrian and bicycle facilities have been included as part of the Typical Street Cross-sections found in the Design Standards and in this report. Commuting and recreational bicycling opportunities will be expanded as part of growth in the study area and pedestrian service will be expanded as part of urban roadway projects.

Typical Street Cross-sections

The Typical Street Cross-sections are keyed to the various functional classes and will help guide the design of roadways shown in the Major Streets Plan. They are shown in **Appendix 7**.



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Date: 6/7/2017
Revisions: 8/22/2017

Updated Major Streets Plan

Northeast Pierre Transportation Plan — Pierre, SD

Figure 11

Chapter 6 - Public Involvement

Public participation in the transportation planning process was actively solicited throughout the study process and public comments have helped to drive the development and selection of future transportation projects. Public involvement opportunities included:

- Comments submitted via email and project website. The project website provided links to project information and contact information for SDDOT and HDR staff.
- Written and verbal comments provided at two public meetings and several rounds of stakeholder meetings. The public meetings, held January 4, 2017 and August 29, 2017, were well attended with an open-house format.

Open communication was also maintained with the Study Advisory Team and local elected officials throughout the study. Periodic Study Advisory Team meetings were held to discuss the methods and assumptions to be used in the study, to review work progress and present analysis results. Local elected officials participated in the public meetings and were represented on the Study Advisory Team.

Public comments were used along with technical analysis to develop the list of transportation needs **(Table 2)**, which carried forward to the project program. Summaries of the public comments are provided in **Appendix 8**.

TABLE 2 - LIST OF TRANSPORTATION NEEDS

NORTHEAST PIERRE TRANSPORTATION PLAN

NUMBER	NEED
1	IMPROVE INTERSECTION OF EUCLID AVE./4TH ST.
2	REVISE EUCLID AVE./US 14-83 TO INCLUDE TURN LANES, BIKE PATH/TRAIL, REVISED ACCESS
3	REVISE EUCLID AVE./ELIZABETH ST. INTERSECTION
4	IMPROVE INTERSECTION OF US 14-83/SD 1804
5	IMPROVE INTERSECTION OF US 14-83/GARFIELD AVE.
6	IMPROVE INTERSECTION OF US 14-83/N. AIRPORT RD./KINGSWAY RD.
7	CONNECT MULTI-USE TRAILS
8	EXTEND MULTI-USE TRAIL (BP-1)*
9	ADD FUTURE ROADWAY EW-1*
10	ADD FUTURE ROADWAY EW-2*
11	ADD FUTURE ROADWAY EW-3*
12	ADD FUTURE ROADWAY EW-4*
13	ADD FUTURE ROADWAY EW-5*
14	ADD FUTURE ROADWAY NE-1*
15	ADD FUTURE ROADWAY NS-1*
16	ADD FUTURE ROADWAY NS-2*
17	ADD FUTURE ROADWAY NS-3*
18	ADD FUTURE ROADWAY NS-4*
19	ADD FUTURE ROADWAY NS-5*
20	IMPROVE RANGE ROAD
21	IMPROVE SD 1804
22	4TH ST./ABBEY RD. - MONITOR FOR FUTURE CHANGE TO TRAFFIC CONTROL
23	GARFIELD AVE./HARRISON AVE. - MONITOR FOR FUTURE CHANGE TO CONFIGURATION
24	GARFIELD AVE./WAL-MART - MONITOR FOR FUTURE CHANGE TO CONFIGURATION

NOTES: 1) ITEMS LISTED ARE GENERALIZED TRANSPORTATION NEEDS WHICH MAY BECOME FUTURE PROJECTS

2) LIST IS NOT PRIORITIZED BASED ON IMPORTANCE OR NEED

3) *SEE APPENDIX 7 FOR GRAPHICAL REPRESENTATION

Chapter 7 - Transportation Program

The final section of this plan documents the preparation of a program of transportation projects for future construction. The List of Transportation Needs (Table 2) was prioritized based on analysis of need, public benefits and costs, and public input. The prioritization also reflects the expected timeline of urban growth in the study area, with greater priority assigned to projects serving near-term growth. Potential funding was applied to the ranked projects to result in the final transportation program.

Project List with Cost Estimates

The List of Transportation Needs was modified to show planning-level estimates of construction cost (current day cost). The resulting Project List with Cost Estimates is shown in **Table 3**. Project design concepts are shown in **Appendix Part 7** and standard cross-sections are shown in **Appendix Part 8**. Each of the projects is discussed in the following paragraphs:

Improve intersection of Euclid Ave./4th St.

Delays and poor peak-hour level of service have prompted public requests for traffic signals at Euclid Avenue/4th Street. A separate scoping study is being conducted for this portion of Euclid Avenue and the results of that study will be coordinated with this plan. The alternatives include narrowing Euclid Avenue to a three-lane cross-section with either a normal intersection or a roundabout intersection.

Improve intersections of US 14-83/Garfield Ave. and US 14-83/N. Airport Rd./Kingsway Rd.

A public perception of safety problems at these intersections has driven consideration of several alternatives for intersection improvements. The alternatives include two realignment options and one option for conversion of the intersection to a roundabout.

Improve intersection of US 14-83/SD 1804

A public perception of safety problems at this intersection has driven consideration of several alternatives for intersection improvements. The alternatives include two realignment options and one option for conversion of the intersection to a roundabout.

Revise Euclid Ave./US 14-83 to Include Turn Lanes, Bike Lanes, Revised Access

Transportation needs identified within this corridor include the addition of turn lanes and bike lanes (or other bike facilities). The need to revise access has also been identified to correspond to future roadway network connections and future development. Traffic forecasts have shown that a divided four-lane cross-section is not needed to handle future traffic. Conversion to a three-lane cross-section would better correspond to several of the intersection improvement options and provide slightly improved safety. Conversion to an urban street may be appropriate, depending on the stage of development adjacent to the roadway.

Connect Multi-Use Trails

There are two locations in Pierre where there are currently gaps between adjacent sections of multi-use trail. While trail users may traverse these gaps fairly easily, the system would benefit from way-finding signs and identified route connections in these areas.

Extend Multi-Use Trail (new route BP-1)

The need has been identified to extend the existing multi-use trail system from Mickelson Pond northeast along an existing drainageway to connect to the US 14-83 corridor. This route will parallel a planned sanitary sewer extension and may be designed and constructed as one project.

Add Future Roadway EW-5

New roadway connection EW-5 is a recently-platted street which will be designed and built to serve future development.

Add Future Roadway NS-5

New roadway connection NS-5 is partially-platted and will be designed and built to serve future development along the west side of Garfield Avenue. Its location makes it suitable for back access to businesses that may front onto Garfield Avenue.

Add Future Roadway NE-1

New roadway NE-1 is desired to provide a collector street connection that serves the area north of Kennedy Elementary School.

Improve SD 1804

As urbanization proceeds north from the existing City Limits, the need will grow to improve SD 1804 from its current rural cross-section. The future street configuration should include bike lanes or other bike facilities.

Add Future Roadway NS-4

New roadway NS-4 is planned to provide an arterial street connection into the new development areas north of the existing City Limits. It is included as an integral part of some of the intersection improvement alternatives at US 14-83/Garfield Ave.

Add Future Roadway EW-3

New roadway EW-3 will be designed and built to serve future development along the north side of US 14-83. Its location makes it suitable for back access to businesses that may front US 14-83. It also provides circulation for potential limited-movement access points on US 14-83.

Add Future Roadways NS-3 and NS-2

New roadways NS-3 and NS-2 will provide collector and arterial street service to the planned residential development area north of US 14-83.

Add Future Roadways EW-1, EW-4, and NS-1

New roadways EW-1, EW-4, and NS-1 will provide collector street service to the planned residential development area north of US 14-83.

Add Future Roadway EW-2

New roadway EW-2 will provide local street service to the fire station and businesses on N. Airport Rd.

Improve Range Rd.

As urbanization proceeds north from the existing City Limits, the need will eventually arise to improve Range Rd. from its current rural cross-section.

Additional Projects

Three additional projects involve monitoring intersections for future need for change in configuration or traffic control. These potential projects either involve routine traffic operations activities or activities involved in monitoring the implementation of past roadway improvements. The projects include:

- 4th St./Abbey Rd. – monitor for future change to traffic control
- Garfield Ave./Harrison Ave. – monitor for future change to configuration
- Garfield Ave./Wal-Mart – monitor for future change to configuration

Funding Potential

Financial planning is an essential part of civic improvements such as those contained in this transportation plan. The realities of available financial resources will determine whether projects can be built and will constrain the implementation of the project program. Therefore, it is useful to estimate the amount of funding that may be available during the life of this plan.

Transportation improvements in South Dakota may be funded by Federal, State or Local sources, with most projects receiving some mixture of funding sources. The South Dakota Department of Transportation administers Federal and State funds through a number of programs, including those specifically for the Interstate system, for urban roadways, for bridges, and for road safety. In addition, SDDOT has special programs for industrial park roads, agri-business roads and community access roads. The Transportation Alternatives Program (TAP) is also available to help fund enhancing the intermodal (primarily bicycle and pedestrian) transportation facilities. Counties and cities receive an annual apportionment of Federal funds and are able to swap Federal funds for State funds. Each local government has state-authorized revenue sources that are used for transportation.

Historically, SDDOT has spent an average of about $1.7 million per year in the Pierre area through all programs. The City of Pierre allocates approximately $1.5 million per year to transportation from sales

and use tax. The City may also assess some costs to adjacent property owners. Based on these findings, we estimate that approximately **$3.2 million** per year will be available to fund projects in this plan. Over the 25-year life of this plan the current sources could produce a total of **$80 million**, expressed in current-year dollars.

With the current rural economy stagnant and sales tax revenue not meeting projections, there is uncertainty with any revenue projections. The funding potential provided here has been prepared with the best available information, but should be reviewed as conditions change. The forecast project program is shown in **Table 3.**

While the estimate above provides financial context, it does not tell the whole story of transportation funding. Each year, the SDDOT and the local government entities program projects based on available funds. Those decisions are made based on whether a project qualifies for funding under the requirements of each funding source. Programming decisions are also based on the comparative advantages and disadvantages of each project. This plan provides information to make those programming decisions possible.

The proposed projects are shown with their estimated benefit/cost ratios in **Table 4**. Many of the projects, however, are new routes to serve land that has yet to be developed. The benefits of these projects may be expressed in general terms for the health of adjacent development and the wider Pierre community, but the benefits cannot be monetized in the terms usually used for public transportation benefits (travel time cost savings, fuel cost savings, emission cost savings, crash cost savings). Likewise, since the benefits of these facilities typically benefit adjacent development, the costs of these collector and arterial routes are frequently borne initially by developers and become part of the cost of newly-developed housing.

Concluding Remarks and Recommendations

The project program shown in **Table 3** is the result of technical analysis and input provided by the public, elected officials and the project Study Team. They are available to be chosen for inclusion in the local and statewide construction programs. The selection of projects is based on the latest understanding of transportation needs, public demand and available funding.

This plan is intended to serve as a resource for local and state planning and programming officials. It is limited, however, by a planning horizon of approximately 25 years, uncertainty about long term growth trends and funding capabilities, and should be periodically updated to maintain the best utility.

It is recommended that the forecasting model be periodically updated to allow it to provide continuing service. The next update should be scheduled for 2022. A model update process consists of gathering new count data, revising the street network to reflect construction, updating the land use data, and revising and recalibrating the forecasting model. Under current rules, cities are not eligible for Federal urban planning funds until their urban area population reaches 50,000 persons. SDDOT does have an application-based program that grants access to up to $250,000 of Federal statewide planning funds on an annual basis for communities the size of Pierre.

TABLE 3 - PROJECT PROGRAM, WITH COST ESTIMATES

NORTHEAST PIERRE TRANSPORTATION PLAN

PROJECT NUMBER	PROJECT	2017 ESTIMATED COST[1]	TIME FRAME		
			SHORT (0-5 YEARS)	MEDIUM (5-10 YEARS)	LONG (10-20 YEARS)
1	IMPROVE INTERSECTION OF EUCLID AVE./4TH ST.	$1,273,600		X	
2	IMPROVE INTERSECTION OF US 14-83/GARFIELD AVE.	$1,407,120		X	
3	IMPROVE INTERSECTION OF US 14-83/N AIRPORT RD./KINGSWAY RD.	$766,400		X	
4	IMPROVE INTERSECTION OF US 14-83/SD 1804	$835,200		X	
5	REVISE EUCLID AVE./US 14-83 TO INCLUDE TURN LANES, BIKE LANES, REVISED ACCESS	$19,806,000		X	
6	CONNECT MULTI-USE TRAILS	$2,500	X		
7	EXTEND MULTI-USE TRAIL (BP-1)	$1,564,000	X		
8	ADD FUTURE ROADWAY EW-5	$1,070,000		X	
9	ADD FUTURE ROADWAY NS-5	$2,195,800	X		
10	ADD FUTURE ROADWAY NE-1	$528,000		X	
11	IMPROVE SD 1804	$6,546,000			X
12	ADD FUTURE ROADWAY NS-4	$2,561,400			X
13	ADD FUTURE ROADWAY EW-3	$2,823,000			X
14	ADD FUTURE ROADWAY NS-3	$5,060,000			X
15	ADD FUTURE ROADWAY NS-2	$5,592,800			X
16	ADD FUTURE ROADWAY EW-1	$6,585,600			X
17	ADD FUTURE ROADWAY EW-4	$2,195,800			X
18	ADD FUTURE ROADWAY NS-1	$3,345,800			X
19	IMPROVE RANGE ROAD	$12,988,000			X
20	ADD FUTURE ROADWAY EW-2	$709,000		X	
	TOTAL	$77,856,020			

[1]When options have been identified for a project, the highest-cost option was cited.

TABLE 4 - BENEFIT/COST RANKING

NORTHEAST PIERRE TRANSPORTATION PLAN

PRIORITY RANKING	PROJECT NUMBER	PROJECT	PRESENT VALUE		B/C
			BENEFIT	COST	
1	3	IMPROVE INTERSECTION OF US 14-83/N AIRPORT RD./KINGSWAY RD.	$ 1,491,072	$719,485	2.07
2	1	IMPROVE INTERSECTION OF EUCLID AVE./4TH ST.	$ 2,506,323	$1,226,151	2.04
3	2	IMPROVE INTERSECTION OF US 14-83/GARFIELD AVE.	$ 2,617,426	$1,320,984	1.98
4	4	IMPROVE INTERSECTION OF US 14-83/SD 1804	$ 93,711	$59,708	1.57
5	5	REVISE EUCLID AVE./US 14-83 TO INCLUDE TURN LANES, BIKE LANES, REVISED ACCESS[1]	$ 266,713	$2,459,400	0.12
NQ	6	CONNECT MULTI-USE TRAILS	NQ	$2,500	NQ
NQ	7	EXTEND MULTI-USE TRAIL (BP-1)	NQ	$1,564,000	NQ
NQ	8	ADD FUTURE ROADWAY EW-5	NQ	$1,520,000	NQ
NQ	9	ADD FUTURE ROADWAY NS-5	NQ	$716,000	NQ
NQ	10	ADD FUTURE ROADWAY NE-1	NQ	$6,728,000	NQ
NQ	11	IMPROVE SD 1804 TO URBAN STREET	NQ	$6,546,000	NQ
NQ	12	ADD FUTURE ROADWAY NS-4	NQ	$3,808,000	NQ
NQ	13	ADD FUTURE ROADWAY EW-3	NQ	$1,840,000	NQ
NQ	14	ADD FUTURE ROADWAY NS-3	NQ	$4,120,000	NQ
NQ	15	ADD FUTURE ROADWAY NS-2	NQ	$8,160,000	NQ
NQ	16	ADD FUTURE ROADWAY EW-1	NQ	$6,808,000	NQ
NQ	17	ADD FUTURE ROADWAY EW-4	NQ	$4,876,000	NQ
NQ	18	ADD FUTURE ROADWAY NS-1	NQ	$2,208,000	NQ
NQ	19	IMPROVE RANGE ROAD	NQ	$12,988,000	NQ

NQ= NOT QUANTIFIABLE; GENERAL PUBLIC BENEFITS, BUT NOT ESTIMATED AS DELAY, FUEL, EMMISSIONS, OR CRASH SAVINGS

[1]MOST OF PROJECT COST ATTRIBUTABLE TO NORMAL RESURFACING

APPENDIX

(On CD)

PART 1 – Technical Memo 1 – Safety Analysis

PART 2 – Technical Memo 2 – Origin/Destination Information

PART 3 – Technical Memo 3 - Access Plan, US 14/US 83 Corridor

PART 4 – Technical Memo 4 – Access Plan, SD 1804 Corridor

PART 5 – Technical Memo 5 – Access Plan, US 14B (Garfield Avenue) Corridor

PART 6 – Technical Memo 6 – Access Plan, Fourth Street Corridor

PART 7 – Corridor Design Option Displays

PART 8 – Design Standards Documents

PART 9 – Public Input Summaries

PART 10 – Cost Estimates

PART 11 – Traffic Count Files

PART 12 – Synchro Output Sheets