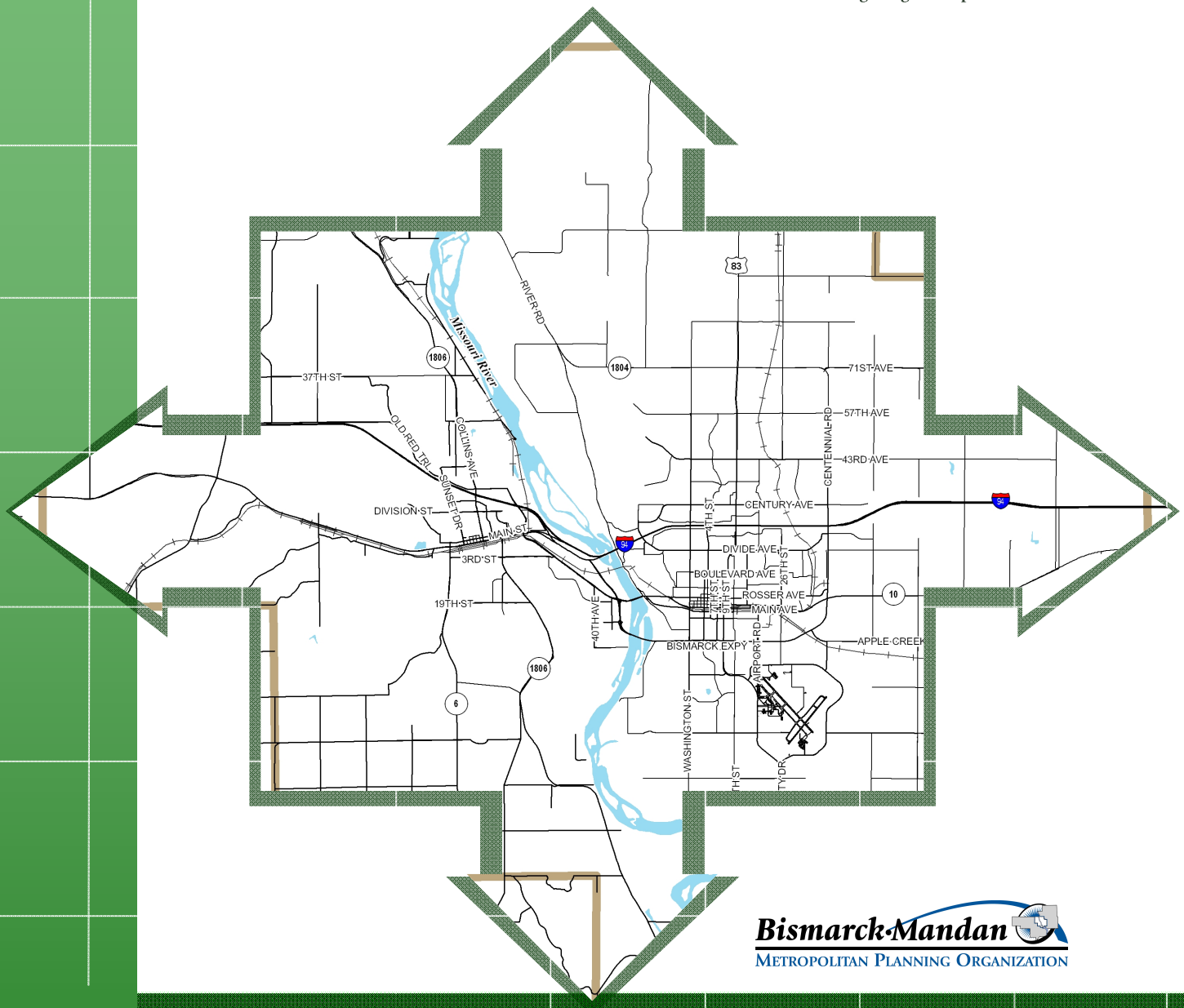
Bismarck-Mandan
Long Range Transportation Plan - 2035



Bismarck-Mandan
Metropolitan Planning Organization

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Houston Engineering Inc.

Bismarck-Mandan Metropolitan Planning Organization

March 2010

2010 – 2035 Long Range Transportation Plan Report

2010-2035 BISMARCK-MANDAN LONG RANGE TRANSPORTATION PLAN

MARCH 2010

Bismarck-Mandan Metropolitan Planning Organization
221 North 5th Street
Bismarck, ND 58506

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GLOSSARY OF TRANSPORTATION PLANNING TERMS

Americans With Disabilities Act (ADA) - Federal civil rights legislation for disabled persons passed in 1990; calls on public transit systems to make their services more fully accessible as well as to underwrite a parallel network of paratransit service.

Arterial Street – A major thoroughfare used primarily for through traffic rather than for access to adjacent land, that is characterized by high vehicular capacity and continuity of movement.

Average Daily Traffic (ADT) – The total amount of traffic observed, counted or estimated during a 24-hour period.

Capacity – The maximum sustainable vehicle flow rate that can be expected to traverse a roadway segment/intersection during a specific time period given roadway, geometric, traffic, environmental, and control conditions, usually expressed in vehicles per day (vpd) or vehicles per hour (vph).

Carpool – A ridesharing arrangement where individuals share a ride via private automobile. The vehicles are typically owned by one of the participants, and the ridesharing arrangement can be relatively informal and organized by the individuals involved, or organized/matched by an employer or government agency.

Clean Air Act (CAA), aka FCAA – Federal legislation that sets national air quality standards; requires each state with areas that have not met Federal air quality standards to prepare a State Implementation Plan (SIP). The sweeping 1990 amendments to the CAA, sometimes referred to as CAAA, established new air quality requirements for the development of metropolitan transportation plans and programs.

Clean Air Act Amendments of 1990 (CAAA) – The comprehensive Federal legislation that establishes criteria for attaining and maintaining the Federal standards for allowable concentrations and exposure limits for various air pollutants; the act also provides emission standards for specific vehicles and fuels.

Collector Street – A street that offers circulation within neighborhoods and subareas, provides a connection between neighborhoods and commercial areas and between local streets and arterial streets. Functionally, collectors serve low-to-moderate traffic volumes, and balance land access and mobility, with some favor land access over mobility.

Conformity – The ongoing process that ensures the planning for highway and transit systems, as a whole and over the long term, is consistent with the state air quality plans for attaining and maintaining health-based air quality standards; conformity is determined by metropolitan planning organizations (MPOs) and the U.S. Department of Transportation (U.S. DOT), and is based on whether transportation plans and programs meet the provisions of a State Implementation Plan.

Congestion Mitigation and Air Quality Program (CMAQ) – A transportation funding source contained in SAFETEA-LU for projects and activities that reduce congestion and improve air quality in regions not yet attaining Federal air quality standards.

Delay – The amount of time traffic spends not moving due to a traffic signal being red, or being unable to pass through an unsignalized intersection.

Development Concept – A likely future growth scenario used as an input to the travel demand model. The development concept for the 2035 Bismarck-Mandan LRTP is a representation of where and how many **new** houses and jobs are anticipated to be built/located between today and 2035.

Environmental Justice – An effort to ensure fair treatment and meaningful involvement of all people in the planning process regardless of race, color, national origin, or income.

Existing-Plus-Committed (E+C) – A transportation network scenario that assumes the only improvements to the current transportation system are those which are "committed" or are included in the current Transportation Improvement Program (TIP).

Expansion Project – An improvement that adds capacity to or reconfigures the transportation system. Expansion projects included added through lanes, turn lanes, new trails, new transit service, new or reconfigured interchange or other new roadway treatments that improve traffic flow/safety. These are the types of projects that are included in the Long Range Transportation Plan.

FHWA - Federal Highway Administration (See U.S. DOT).

Freeways – Highways that service longer-distance trips, connecting regions together. These facilities are typically higher speed, higher traffic volume roadways that limit access to interchanges only, with no direct land access.

FTA – Federal Transit Administration (See U.S.DOT).

Highway Trust Fund – The Federal trust fund established by the Highway Revenue Act of 1956; this fund has two accounts -- the Highway Account and the Mass Transit Account. Trust fund revenues are derived from Federal highway-user taxes and fees such as motor fuel taxes; trust fund uses and expenditures are determined by law.

Intermodal – Those issues or activities that involve or affect more than one mode of transportation, including transportation connections, choices, cooperation and coordination of various modes. Also known as "multimodal."

Interstate Maintenance (IM) – A SAFETEA-LU program that provides funding for resurfacing, restoring, rehabilitating and reconstructing the Interstate System.

ISTEA - the Intermodal Surface Transportation Efficiency Act, passed into law in 1991. ISTEA authorized the Federal surface transportation highway and transit programs for 1991-1997.

Level of Service (LOS) – A qualitative measure of intersection or road segment operating condition. A grading scale of A through F is used to characterize traffic operating conditions. The scale is based on the ability of an intersection or street segment to accommodate the amount of traffic using it, and can be used for both existing and projected conditions. The scale ranges from "A" which indicates little, if any, vehicle delay, to "F" which indicates significant vehicle delay and traffic congestion.

Local Street – A street within a neighborhood or subarea that's primary function is to provide property access; speeds and traffic volumes are typically low.

Maintenance/Rehabilitation Project – A category of transportation improvement focused solely on maintaining the current network/system. These projects include resurfacing, bridge replacement and reconstruction of the pavement. These types of projects are typically not included in a Long Range Transportation Plan.

Metropolitan Planning Organization (MPO) – A Federally required transportation planning body responsible for the regional transportation program and the transportation improvement plan (TIP) in its region; the governor designates an MPO in every urbanized area with a population of over 50,000.

Multimodal – The concept of incorporating private passenger vehicles, transit, and non-motorized (bicycles and pedestrians) transportation features into the planning process.

NEPA – National Environmental Policy Act of 1969.

National Highway System (NHS) – An approximately 155,000-mile network designated (partially) in ISTEA to provide an interconnected system of principal routes to serve major travel destinations and population centers. The NHS picks up where the Interstate Highway System left off.

North Dakota Department of Transportation (NDDOT) – The department charged with providing and maintaining the state's transportation system.

On-Street Bicycle Route – A designated roadway corridor shared by bicyclists and motorists. The route can involve either striped and signed bike lanes, which are designated for bicycle use only, or can be signed routes with no designated bike lanes where bicycles and automobiles share the same travel lane.

Peak Hour – The hour of greatest traffic flow at an intersection or on a road segment during a day. Typically, it is broken down into AM and PM peak hours.

Reverse Commuting – Movement in a direction opposite the main flow of traffic, such as from the central city to a suburb during the morning peak period.

Ridesharing – A form of transportation, other than public transit, in which more than one person shares the use of the vehicle, such as a van or car, to make a trip. Also known as "carpooling" or "vanpooling."

SAFETEA-LU – The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, signed on August 10, 2005. SAFETEA-LU authorizes the Federal surface transportation highway and transit programs for 2005-2009.

Single-Occupant Vehicle (SOV) – A vehicle with one occupant, the driver, who is sometimes referred to as a "drive alone."

Surface Transportation Program (STP) – STP is a funding source in SAFETEA-LU with monies are "flexible," meaning they can be spent on mass transit, pedestrian and bicycle facilities as well as on roads and highways.

Traffic Analysis Zone (TAZ) – The basic unit of geography in a travel demand model, with boundaries typically based on several elements, including Census boundaries, streets and roadways, rivers and lakes and railroads.

Transportation Control Measure (TCM) – A strategy to reduce driving or smooth traffic flows in order to cut auto emissions and resulting air pollution. Examples of TCMs include roving tow truck patrols to clear stalls and accidents from congested roadways, new or increased transit service, or a program to promote carpools and vanpools.

Transportation Demand Management (TDM) – Usually low-cost programs developed to reduce the levels or patterns of transportation demand in order to use the transportation system more efficiently, such as programs to promote telecommuting, flextime and ridesharing.

Transportation Enhancement Program (TE) – A transportation funding source in SAFETEA-LU used on projects/programs to strengthen the cultural, aesthetic, and environmental aspects of the Nation's intermodal transportation system. This source of funding is often used for multi-use trail construction.

Transportation Improvement Program (TIP) – This is primarily a spending plan for Federal funding expected to flow to the region from all sources for transportation projects of all types.

Transportation Management Area (TMA) – Urban areas with a population over 200,000 are given this a Federal designation for metropolitan planning purposes. TMAs have additional requirements and responsibilities placed upon them beyond smaller MPOs.

Transportation System Management (TSM) – Projects designed to increase the efficiency of the existing transportation system through minor, localized improvements such as focused intersection and signalization improvements.

Travel Demand Model – A computer application that simulates an area's land development patterns (often, where houses and jobs are located) and its transportation system, and looks at the interaction between the two. It is a tool used to evaluate transportation and land use scenarios, such as how travel is affected when changes are made to the transportation system, or how travel patterns change as land development patterns change in the metropolitan area.

United States Department of Transportation (U.S. DOT) – The Federal cabinet-level agency with responsibility for highways, mass transit, aviation and ports; headed by the secretary of transportation. The DOT includes the Federal Highway Administration and the Federal Transit Administration, among others.

Vanpool – A ridesharing arrangement where individual share a common commute via van. Vanpools are typically most effective for longer commutes and usually use a rented or leased vehicle supplied by an employer or government/quasi-government agency. Operating costs are typically divided among members, sometimes with employer or government subsidy.

Vehicle Hours Traveled (VHT) – A measurement of the total time (in hours) vehicles spend traveling within a region/study area during a given period of time. Reducing VHT reflects conditions where there is less congestion and potentially improved air quality.

Vehicle Miles Traveled (VMT) – A measurement of the total vehicle distance traveled within a region/study area during a given period of time. Reducing VMT can help ease traffic congestion, reduce emissions and improve air quality.

Volume to Capacity (V/C) Ratio – The resultant of dividing the counted or estimated traffic volume in a corridor or at an intersection by the facility's estimated capacity.

PREFACE

The Bismarck-Mandan MPO member jurisdictions, the cities of Bismarck, Lincoln, Mandan, and Burleigh and Morton Counties, each have reviewed the *2010-2035 Bismarck-Mandan Long Range Transportation Plan* (LRTP) and provided comments. Those comments were addressed, and each member jurisdiction has provided a resolution of acceptance/adoption for the plan.

This Preface summarizes the dates that the plan was presented to the members and a brief overview of any adjustments/modifications that were required prior to the individual members taking action to adopt the plan.

BISMARCK CITY COMMISSION HEARING, FEBRUARY 9, 2010

The Bismarck City Commission voted to receive the LRTP document at the February 9, 2010 meeting. The commission requested assurance that the recommendations for the 71st Avenue-Centennial Road corridor included the capability to accommodate a four-lane divided roadway section and the associated multi-use trail within the recommended right-of-way. A memorandum was provided to commissioners that stated that while the LRTP recommended plan provided for a three-lane section along 71st Avenue-Centennial Road from US 83 through I-94, the recommended right-of-way would be adequate to accommodate a four-lane divided urban roadway section.

BURLEIGH COUNTY COMMISSION HEARING, FEBRUARY 17, 2010

At the February 17 Burleigh County Commission meeting, the commission voted to adopt the LRTP. No comments requiring additional action were received at the meeting.

LINCOLN CITY COMMISSION HEARING, FEBRUARY 4, 2010

The City Commission, on February 4, 2010, expressed several concerns about the LRTP as presented. These comments/concerns were:

- As presented, the LRTP did not identify future household allocations within and immediately surrounding Lincoln consistent with the commission's expectations.
- Desire for a roadway connection between Bismarck and Lincoln along abandoned Rail Line.

- Potential timing conflicts between vacation of a segment of Airway Avenue for expansion of Runway 31 at the Bismarck Regional Airport and implementation of the segment of the Beltway that would provide a connection to South University Drive.
- Desire for a state route connecting Lincoln to I-94.
- Desire for identified LRTP improvements to occur in a nearer time period.
- Issues of flooding and recommendations in the plan should address maintaining convenient access between Lincoln and Bismarck during periods of flooding.

The commission's vote on LRTP adoption was tabled until February 11.

At the February 11 meeting, the LRTP study team presented a revised allocation of households in the Lincoln area, that included additional housing units beyond what was initially anticipated for 2035, and moved some of the growth that had been previously anticipated within Lincoln. In between the two meetings, the study team had passed along several of the other concerns to the relevant parties including the Bismarck Airport, the Burleigh County engineer and NDDOT. At the February 11 meeting, responses from the appropriate entities were discussed with the commission and the Lincoln City Commission was satisfied that the responses addressed their concerns. Thus, the commission voted to adopt the content and recommendations of the LRTP with an amended level of resident growth in the area. The information provided to the Lincoln City Commission in between the February 4 and February 11 meetings is presented in the Public Involvement Appendix (Appendix A).

MANDAN CITY COMMISSION HEARING, FEBRUARY 16, 2010

At the February 16 Mandan City Commission meeting, the commission voted to adopt the LRTP. No comments requiring additional action were received at the meeting.

MORTON COUNTY COMMISSION HEARING, MARCH 9, 2010

At the March 9 Morton County Commission meeting, the commission voted to adopt the LRTP. No comments requiring additional action were received at the meeting.

Commission resolutions of plan adoption or plan receipt are included on the following pages.

RESOLUTION OF ADOPTION

for the
2010-2035 Bismarck-Mandan
Long Range Transportation Plan

WHEREAS, the U.S. Department of Transportation requires the formulation, approval, and maintenance of a Long Range Transportation Plan for the Bismarck-Mandan Metropolitan Planning Organization (MPO) area as a condition of federal transportation funding; and

WHEREAS, the MPO has been designated by the Governor of North Dakota as the organization responsible for preparing and maintaining the Long Range Transportation Plan; and

WHEREAS, the MPO after extensive public involvement and substantial consideration of technical, environmental, financial, and social factors has prepared the 2010-2035 Long Range Transportation Plan which is in compliance with federal transportation planning standards; and

WHEREAS, City staff have had the opportunity to review the 2010-2035 Long Range Transportation Plan, and any comments received have been addressed within the Plan; and

WHEREAS, all relevant State and Federal agencies have had the opportunity to review the Plan and any comments received have been addressed within the Plan; and

WHEREAS, notices were published in the official newspapers of each jurisdiction for Planning Commission public hearings in accordance with State law, and the Planning Commissions of each jurisdiction have held public hearings on and reviewed the 2010-2035 Long Range Transportation Plan and have approved it as a guide for their future planning and development policies, and have recommended it to the Lincoln City Council; and

WHEREAS, notices were published in the official newspapers of the Lincoln City Commission for a public hearing in accordance with State Law, and the Lincoln City Commission held a public hearing on the 2010-2035 Long Range Transportation Plan; and

NOW, THEREFORE BE IT RESOLVED, by the Lincoln City Council that it adopts the 2010-2035 Long Range Transportation Plan; and

BE IT FURTHRER RESOLVED, that City staff are directed to implement the 2010-2035 Long Range Transportation Plan and use as a tool in their everyday planning and engineering activities.

Karen K Daly
Karen Daly, Council President
Lincoln City Council

2-11-2010
Date

RESOLUTION OF RECEIPT

for the
2010-2035 Bismarck-Mandan
Long Range Transportation Plan

WHEREAS, the U.S. Department of Transportation requires the formulation, approval, and maintenance of a Long Range Transportation Plan for the Bismarck-Mandan Metropolitan Planning Organization (MPO) area as a condition of federal transportation funding; and

WHEREAS, the MPO has been designated by the Governor of North Dakota as the organization responsible for preparing and maintaining the Long Range Transportation Plan; and

WHEREAS, the MPO after extensive public involvement and substantial consideration of technical, environmental, financial, and social factors has prepared the 2010-2035 Long Range Transportation Plan which is in compliance with federal transportation planning standards; and

WHEREAS, City staff have had the opportunity to review the 2010-2035 Long Range Transportation Plan, and any comments received have been addressed within the Plan; and

WHEREAS, all relevant State and Federal agencies have had the opportunity to review the Plan and any comments received have been addressed within the Plan; and

WHEREAS, notices were published in the official newspapers of each jurisdiction for Planning Commission public hearings in accordance with State law, and the Planning Commissions of each jurisdiction have held public hearings on and reviewed the 2010-2035 Long Range Transportation Plan and have approved it as a guide for their future planning and development policies, and have recommended it to the Bismarck Board of City Commissioners; and

WHEREAS, notices were published in the official newspapers of the Bismarck Board of City Commissioners for a public hearing in accordance with State Law, and the Bismarck Board of City Commissioners held a public hearing on the 2010-2035 Long Range Transportation Plan; and

NOW, THEREFORE BE IT RESOLVED, by the Bismarck Board of City Commissioners that it receives the 2010-2035 Long Range Transportation Plan; and

BE IT FURTHRER RESOLVED, that City staff are directed to implement the 2010-2035 Long Range Transportation Plan and use as a tool in their everyday planning and engineering activities.

John Warford, President
Bismarck Board of City Commissioners

2/16/2011
Date

RECEIVED
FEB 2 4 2010

RESOLUTION OF ADOPTION

for the
2010-2035 Bismarck-Mandan
Long Range Transportation Plan

WHEREAS, the U.S. Department of Transportation requires the formulation, approval, and maintenance of a Long Range Transportation Plan for the Bismarck-Mandan Metropolitan Planning Organization (MPO) area as a condition of federal transportation funding; and

WHEREAS, the MPO has been designated by the Governor of North Dakota as the organization responsible for preparing and maintaining the Long Range Transportation Plan; and

WHEREAS, the MPO after extensive public involvement and substantial consideration of technical, environmental, financial, and social factors has prepared the 2010-2035 Long Range Transportation Plan which is in compliance with federal transportation planning standards; and

WHEREAS, City staff have had the opportunity to review the 2010-2035 Long Range Transportation Plan, and any comments received have been addressed within the Plan; and

WHEREAS, all relevant State and Federal agencies have had the opportunity to review the Plan and any comments received have been addressed within the Plan; and

WHEREAS, notices were published in the official newspapers of each jurisdiction for Planning Commission public hearings in accordance with State law, and the Planning Commissions of each jurisdiction have held public hearings on and reviewed the 2010-2035 Long Range Transportation Plan and have approved it as a guide for their future planning and development policies, and have recommended it to the Mandan Board of City Commissioners; and

WHEREAS, notices were published in the official newspapers of the Mandan Board of City Commissioners for a public hearing in accordance with State Law, and the Mandan Board of City Commissioners held a public hearing on the 2010-2035 Long Range Transportation Plan; and

NOW, THEREFORE BE IT RESOLVED, by the Mandan Board of City Commissioners that it adopts the 2010-2035 Long Range Transportation Plan; and

BE IT FURTHRER RESOLVED, that City staff are directed to implement the 2010-2035 Long Range Transportation Plan and use as a tool in their everyday planning and engineering activities.

Tim Helbling, President
Mandan Board of City Commissioners

2-16-10
Date

RESOLUTION OF ADOPTION

for the
2010-2035 Bismarck-Mandan
Long Range Transportation Plan

WHEREAS, the U.S. Department of Transportation requires the formulation, approval, and maintenance of a Long Range Transportation Plan for the Bismarck-Mandan Metropolitan Planning Organization (MPO) area as a condition of federal transportation funding; and

WHEREAS, the MPO has been designated by the Governor of North Dakota as the organization responsible for preparing and maintaining the Long Range Transportation Plan; and

WHEREAS, the MPO after extensive public involvement and substantial consideration of technical, environmental, financial, and social factors has prepared the 2010-2035 Long Range Transportation Plan which is in compliance with federal transportation planning standards; and

WHEREAS, County staff have had the opportunity to review the 2010-2035 Long Range Transportation Plan, and any comments received have been addressed within the Plan; and

WHEREAS, all relevant State and Federal agencies have had the opportunity to review the Plan and any comments received have been addressed within the Plan; and

WHEREAS, notices were published in the official newspapers of each jurisdiction for Planning Commission public hearings in accordance with State law, and the Planning Commissions of each jurisdiction have held public hearings on and reviewed the 2010-2035 Long Range Transportation Plan and have approved it as a guide for their future planning and development policies, and have recommended it to the Burleigh County Board of Commissioners; and

WHEREAS, notices were published in the official newspapers of the Burleigh County Board of Commissioners for a public hearing in accordance with State Law, and the Burleigh County Board of Commissioners held a public hearing on the 2010-2035 Long Range Transportation Plan; and

NOW, THEREFORE BE IT RESOLVED, by the Burleigh County Board of Commissioners that it adopts the 2010-2035 Long Range Transportation Plan; and

Mark A. Armstrong, Chairman
Burleigh County Board of Commissioners

2/17/2010
Date

COMMISSIONERS:

MARK BITZ, Chairman
Mandan, ND

BRUCE STRINDEN, Vice Chairman
Mandan, ND

JAMES BOEHM,
Mandan, ND

DICK TOKACH
Mandan, ND

ANDY ZACHMEIER
Mandan, ND

MORTON COUNTY

STATE OF NORTH DAKOTA

210 2nd AVENUE NW
MANDAN, NORTH DAKOTA 58554

PAUL E. TRAUGER, County Auditor

RESOLUTION OF ADOPTION

for the
2010-2035 Bismarck-Mandan
Long Range Transportation Plan

WHEREAS, the U.S. Department of Transportation requires the formulation, approval, and maintenance of a Long Range Transportation Plan for the Bismarck-Mandan Metropolitan Planning Organization (MPO) area as a condition of federal transportation funding; and

WHEREAS, the MPO has been designated by the Governor of North Dakota as the organization responsible for preparing and maintaining the Long Range Transportation Plan; and

WHEREAS, the MPO after extensive public involvement and substantial consideration of technical, environmental, financial, and social factors has prepared the 2010-2035 Long Range Transportation Plan which is in compliance with federal transportation planning standards; and

WHEREAS, County staff have had the opportunity to review the 2010-2035 Long Range Transportation Plan, and any comments received have been addressed within the Plan; and

WHEREAS, all relevant State and Federal agencies have had the opportunity to review the Plan and any comments received have been addressed within the Plan; and

WHEREAS, notices were published in the official newspapers of each jurisdiction for Planning Commission public hearings in accordance with State law, and the Planning Commissions of each jurisdiction have held public hearings on and reviewed the 2010-2035 Long Range Transportation Plan and have approved it as a guide for their future planning and development policies, and have recommended it to the Morton County Board of Commissioners; and

WHEREAS, notices were published in the official newspapers of the Morton County Board of Commissioners for a public hearing in accordance with State Law, and the Morton County Board of Commissioners held a public hearing on the 2010-2035 Long Range Transportation Plan; and

NOW, THEREFORE BE IT RESOLVED, by the Morton County Board of Commissioners that it adopts the 2010-2035 Long Range Transportation Plan; and

BE IT FURTHRER RESOLVED, that County staff are directed to implement the 2010-2035 Long Range Transportation Plan and use as a tool in their everyday planning and engineering activities.

Mark Bitz

Mark Bitz, President
Morton County Board of Commissioners

3-9-10
Date

RESOLUTION OF ADOPTION

for the
2010-2035 Bismarck-Mandan
Long Range Transportation Plan

WHEREAS, the U.S. Department of Transportation requires the formulation, approval, and maintenance of a Long Range Transportation Plan for the Bismarck-Mandan Metropolitan Planning Organization (MPO) area as a condition of federal transportation funding; and

WHEREAS, the MPO has been designated by the Governor of North Dakota as the organization responsible for preparing and maintaining the Long Range Transportation Plan; and

WHEREAS, the MPO after extensive public involvement and substantial consideration of technical, environmental, financial, and social factors has prepared the 2010-2035 Long Range Transportation Plan which is in compliance with federal transportation planning standards; and

WHEREAS, all relevant State and Federal agencies have had the opportunity to review the Plan and any comments received have been addressed within the Plan; and

WHEREAS, notices were published in the official newspapers of each jurisdiction for Planning Commission public hearings in accordance with State law, and the Planning Commissions of each jurisdiction have held public hearings on and reviewed the 2010-2035 Long Range Transportation Plan and have approved it as a guide for their future planning and development policies, and have recommended it to their respective governing bodies; and

WHEREAS, notices were published in the official newspapers of the governing bodies (Bismarck, Lincoln, Mandan, Burleigh and Morton Counties) for a public hearing in accordance with State Law, and each of the governing bodies held a public hearing on the 2010-2035 Long Range Transportation Plan; and

NOW, THEREFORE BE IT RESOLVED, by the Bismarck-Mandan MPO Policy Board that it adopts the 2010-2035 Long Range Transportation Plan; and

BE IT FURTHER RESOLVED, that MPO staff are directed to implement the 2010-2035 Long Range Transportation Plan and use as a tool in their everyday planning and engineering activities.

Douglas R. Schnaert

~~Glenn Christmann, Chairman~~
Bismarck-Mandan MPO Policy Board
Douglas R. Schnaert,
Acting Chair, MPO Policy Board

16 MAR 2010
Date

LONG RANGE TRANSPORTATION PLAN INTRODUCTION

BACKGROUND

The *2010-2035 Bismarck-Mandan Long Range Transportation Plan* (LRTP) provides the blueprint for the area's transportation planning process over the next 25+ years. The transportation planning process is a collaborative effort between Bismarck, Mandan, Burleigh County, Morton County, Lincoln, the North Dakota Department of Transportation (NDDOT), Bis-Man Transit and other state/Federal agencies, where the multimodal transportation system was evaluated and a set of recommendations are made. The Transportation Plan addresses the study area displayed in Figure 1.

While the LRTP update is federally-required for all Metropolitan Planning Organizations (MPOs) every five (5) years, the update also provides the community an opportunity to identify what challenges and opportunities may lay ahead, re-examine its values as they related to urban travel and development patterns and communicate how they think their transportation system should look in the future. The Bismarck-Mandan LRTP, in accordance with federal requirements, addresses transportation system needs and provides a set of methods, strategies, and actions for developing an integrated multimodal transportation system that supports the efficient movement of people and goods.

The LRTP covers the transportation systems of the jurisdictions located within the Bismarck-Mandan MPO service area. The Bismarck-Mandan LRTP considers the interdependent nature of the metropolitan area's multimodal transportation systems through addressing the region's roadway, transit, bicycle, and pedestrian modes in a combined effort. The study area is illustrated in Figure 1.

THE BISMARCK-MANDAN MPO AND ITS ROLE

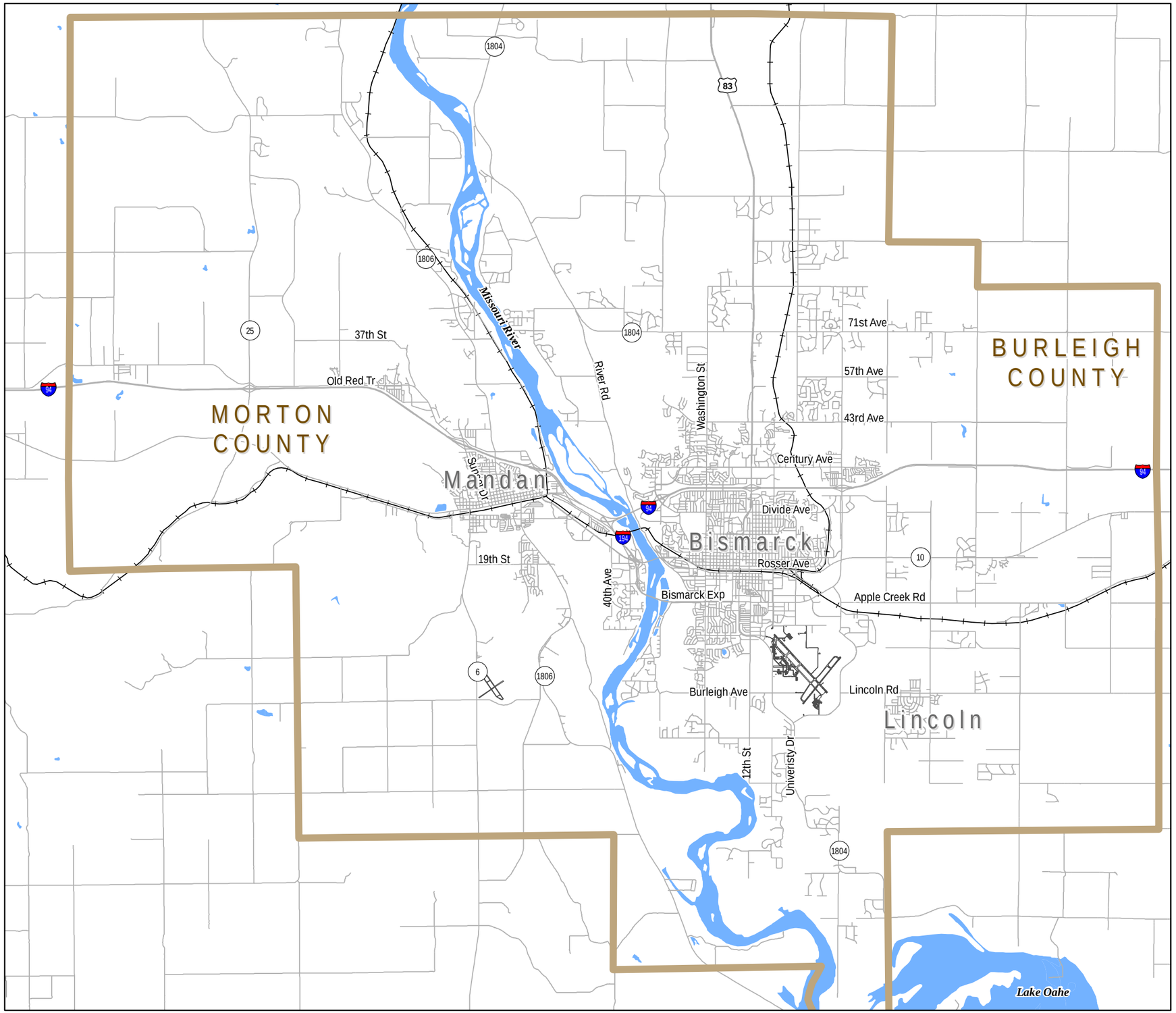
While elements of regional planning have existed since the 19th Century, the expectations for formalized metropolitan transportation planning were established with the 1962 Federal-aid Highway Act, which required metropolitan area transportation plans and programs to be developed through a "continuing, cooperative, and comprehensive" (3-C) planning process. The 1973 Surface Transportation Assistance Act required that MPOs be formed in all urban areas with more than 50,000 population. The MPOs were conceived as a regionally-based inter-governmental agency that would employ the 3-C planning process in allocating metropolitan area's federal transportation funds.

The MPOs are provided federal transportation funds directly for allocation within their region, and perform the following functions:

- **Establish a setting**: Establish and manage a fair and impartial setting for effective regional decision-making in the metropolitan area.
- **Identify and evaluate alternative transportation improvement options**: Use data and planning methods to generate and evaluate alternatives.
- **Prepare and maintain a Metropolitan Long Range Transportation Plan (LRTP)**: Develop and update a long-range transportation plan for the metropolitan area covering a planning horizon of at least 20 years that fosters (1) mobility and access for people and goods, (2) efficient system performance and preservation, and (3) good quality of life. The LRTP must be updated every 5 years.
- **Develop a Transportation Improvement Program (TIP)**: Develop a short-range program of transportation improvements based on the long-range transportation plan; the TIP should be designed to achieve the area's goals, using spending, regulating, operating, management, and financial tools. Bismarck-Mandan MPO typically updates the metropolitan TIP every year, although an update is only required every four years.
- **Involve the public**: Involve the general public and other affected constituencies in the core functions listed above.

The Bismarck-Mandan MPO provides a forum for public officials, citizens, and other interested groups to participate in establishing policies and plans for effectively addressing metropolitan transportation issues. The MPO's plans and programs are intended to lead to the development of an integrated, intermodal metropolitan transportation system that facilitates the efficient, economic movement of people and goods. The MPO includes two main committees:

- The **Policy Board**, which represents the member cities/counties and is the decision-making body of the MPO.



Bismarck-Mandan
Metropolitan Planning Organization

Bismarck-Mandan
Long Range Transportation Plan - 2035

Legend

MPO Study Area Boundary

Miles
0 1 2 4

Figure 1. 2010-2035 Bismarck-Mandan LRTP Study Area

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December 1, 2009

- The **Technical Advisory Committee (TAC)**, which represents the member cities/counties, NDDOT, freight interests, and the local transit authority, Bis-Man Transit. This group is responsible for facilitating the technical portions of the process and uses its technical expertise to develop recommendations to assist the Policy Board in the transportation planning decision making process for the MPO study area.

STAKEHOLDER INVOLVEMENT

The *2010-2035 Bismarck-Mandan Long Range Transportation Plan* is founded on the consent of the community as well as the various committees and bodies formed within the area. Support for implementation of the plan requires that the plan reflect the community's expectations for its transportation system as well as what tradeoffs the community is willing to make in order to achieve those expectations.

This commitment to community engagement is reflected in the Bismarck-Mandan MPO's *Public Participation Plan*, which lays out the MPO's comprehensive approach for engaging the region through "participation and involvement of a broad range of interest groups, organizations, governments and citizens to result in more creative and effective decision-making."

Development of this LRTP has been consistent with the Public Participation Plan's goals of providing:

- Early public involvement.
- Opportunities for active participation in the process.
- Information in a clear, timely and accurate manner.
- A process that has a flexible and varied set of techniques.

An early, varied and far-reaching involvement approach was used in the plan update to garner public input. In addition to three rounds of public meetings/open houses, with one meeting on each side of the river at each round, several additional elements were included in the involvement portion of the plan update including:

- Forming a **Community Committee** with representatives from a diverse cross-section of citizens and stakeholders including residents of both urban and rural areas from both sides of the river, transit users, bicyclists, business interests, schools and universities, freight, emergency responders, hospitals and human service agencies. The Community Committee was asked to be a sounding board at key update milestones to help the technical study team create a plan that reflects the community.
- The **Plan Update Website**, *bis-manplan2009.com*, was a timely source of information for the public and plan stakeholders throughout the course of

the update, providing streaming video of meeting presentations, opportunities for easy feedback to the study team, up-to-date study memoranda and reports and notices of upcoming meetings.

- At all three sets of public meetings, one meeting was a **Televised Plan Meeting** on the local cable television Government Channel 2. Two of the meetings were broadcast live, and interactive, public question-and-answer sessions were held via phone and e-mail. A third meeting was taped delayed and shown multiple times.
- Various methods of **Outreach to Agencies, System users and Interest Groups** were also employed. Mailings, e-mails and information were provided to resource agencies and system user groups throughout the LRTP update. Resource agencies were contacted and provided access to the latest study information and concepts at key milestones, LRTP displays were put up at public libraries and bike shops, and the local bicycle user group was consulted on non-motorized alternatives.

A summary of the public involvement efforts is provided in Appendix A.

SAFETEA-LU COMPLIANCE

In its role as the transportation planning agency for the Bismarck-Mandan region, the MPO's planning process must be consistent with Federal law. The current Federal surface transportation funding authorization is provided by the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA LU) legislation. This section provides a preview of the LRTP document, describing how it reflects the requirements of the SAFETEA LU legislation. There are eight (8) planning factors included in SAFETEA-LU, which are specified areas that need to be considered for all metropolitan planning activities. Furthermore, there are other elements spelled out in the planning requirements that need to be addressed as well.

SAFETEA-LU is the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users*, signed on August 10, 2005. SAFETEA-LU authorizes the Federal surface transportation highway and transit programs for 2005-2009.

The eight planning factors included in SAFETEA are included in the following bullets, along with a description of how elements of the plan address the factors.

1. **Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency**.

   The LRTP update addresses this planning factor through the following actions:

   - Providing a goal and related objectives related to supporting and enhancing the regional economy.
   - Economic impact was a performance measure in prioritizing alternatives, prior to developing a draft recommended plan project list. More information on the prioritization of improvement alternatives is described in the alternatives analysis documentation.

- Economic development, freight and local business interests were represented on the LRTP update Community Committee, providing feedback about Plan direction and alternatives.
- The transportation plan focused not only on maintaining the existing transportation system in built out/developed portions of the metropolitan area, it also addressed the transportation infrastructure needed to support Bismarck-Mandan's growth areas.

2. **Increase the safety of the transportation system for motorized and nonmotorized users.**

   The LRTP update addresses this planning factor through the following actions:

   - Creating a unique goal and related objectives related to providing a safe transportation system.
   - System safety was a performance measure used in screening and prioritizing alternatives prior to developing a draft recommended plan project list.
   - Evaluation of crash history and identification of locations on the street network that had a high crash rate. At these locations, improvements to address crash issues were evaluated to improve safety.
   - Screening of locations for multiple instances of bike or pedestrian crashes.

3. **Increase the security of the transportation system for motorized and nonmotorized users.**

   The LRTP update addresses transportation system security through several actions, including:

   - Incorporating a unique LRTP goal and related objectives into the planning process from the beginning of the plan update.
   - Including System Security as a performance measure in prioritizing alternatives, prior to developing a draft recommended plan project list.
   - Involving emergency responders/local police/firefighters on the Community Committee, garnering feedback from their perspective on the Security elements of the various alternatives.
   - Recommending and outlining an action plan for developing a regional transportation security plan.

4. **Increase the accessibility and mobility of people and for freight**.

The LRTP update addresses this planning factor through several actions, including:

- Providing goals and associated objectives dedicated to providing an efficient multimodal transportation system for moving people and goods (i.e., freight).

- Evaluating accessibility through the LRTP update approach of evaluating multimodal operations and connectivity, looking for locations of existing and future deficiencies in operations and system connectivity across all modal systems.
- Performance measures that prioritized projects based on multimodal operations benefits and multimodal connectivity benefits.
- Evaluating freight connections across the region, identifying gaps in the system and providing a performance measure that prioritized projects based on freight benefit.

5. **Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.**

   The LRTP update addresses this planning factor through several actions, including:

   - Providing goals and objectives related to considering transportation system's impact on the environment, including energy impacts.
   - Considering impacts on the environment when screening all projects in the alternatives analysis phase of the update, including impacts to the nature and built environment and to vehicle miles traveled (VMT)/energy usage.
   - Incorporating local land use planning efforts in developing a future land development concept, the framework used for identify future regional travel needs.
   - Documenting environmental agency consultation efforts and potential mitigation activities during project development.

6. **Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.**

   The LRTP update addresses this planning factor through several actions, including:

   - Incorporating a plan update goal to "provide a multimodal transportation system that efficiently and effectively moves people and goods between their desired origins and destinations."
   - Establishing performance measures that prioritize projects based on multimodal connectivity benefits.
   - Evaluating freight connections across the region, identifying gaps in the system and providing a performance measure that prioritized projects based on freight benefit.
   - Recommending multimodal improvements that addressed continuity gaps in the systems, including improvements to the truck route system.

- Recommending an on-street bike network to complement/supplement the existing non-motorized trail system.

7. Promote efficient system management and operation.

Efficient system management and operation was promoted through the following LRTP update actions:

- Providing a plan update goal to "preserve the existing and planned system."
- Plan approach was multimodal in nature, looking at intermodal connections and opportunities to enhance multimodal alternatives in the region.
- The costs associated with facility maintenance and/or operations were a screening criterion in the alternatives analysis.
- Transit recommendations related to improved operations were included.
- Travel demand management recommendations were incorporated into the document, allowing for better management of existing system resources/capacity.

8. Emphasize the preservation of the existing transportation system.

Preservation of the existing transportation system was accounted for through the following LRTP update actions:

- Established an LRTP goal and related objectives to preserve the existing multimodal system.
- Incorporated maintenance budgets into the funding evaluation before a system expansion/reconstruction budget was estimated.
- Many recommendations fall within the system management realm, whether through roadway improvements that incorporate minor reconstructions to enhance the functionality of the existing transportation system, or minor improvements to the transit system to improve potential system ridership, or using the existing street system to fill in gaps in the non-motorized network.

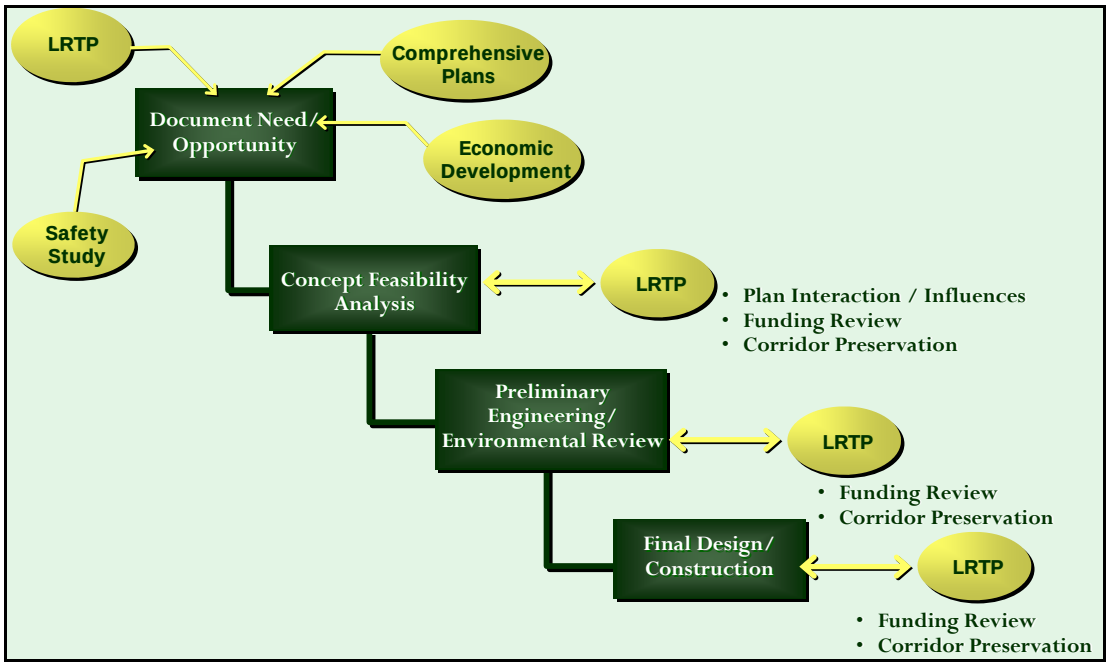
Other SAFETEA-LU emphasis areas that were addressed include:

- **Strategic Highway Safety Plan (SHSP):** NDDOT published the *Strategic Highway Safety Plan* in 2006. It includes 7 emphasis areas, most of which are outside of the scope of an LRTP. However, two particular emphasis areas are relevant to a metropolitan transportation plan, to "Improve Intersection Safety" and "Improvements to Address Lane Departure Crashes". As noted above, the 2010-2035 LRTP update included an extensive traffic safety evaluation, looking at the crash data available from NDDOT for the region, identifying locations with high crash rates, evaluating the types of crashes that were occurring and then evaluating improvements when feasible.

- **Existing Transportation Facilities:** It is now required that the LRTP include discussion of strategies to improve the performance of existing facilities. In addition to including a planning goal and associated objectives dedicated to preserving the existing system, many of the recommendations in this plan include projects/programs focused on improving the current system, and providing new connections to the existing multimodal system that will improve its performance. Furthermore, maintenance of the current system was a key element addressed in the LRTP funding approach.
- **Agency Consultation:** SAFETEA-LU states the MPO must document in the LRTP how the following agencies are consulted with in the transportation planning process: environmental protection, wildlife management, land management and historic preservation. The process for consulting with agencies is described in the "Environmental Considerations in the Plan" chapter.
- **Environmental Mitigation:** The LRTP must include discussion of potential environmental mitigation activities to be developed in consultation with federal, state and tribal wildlife, land management, and regulatory agencies. Potential environmental impacts and mitigation measures were included in the evaluation of multimodal alternatives. A more complete discussion is included in the "Environmental Considerations in the Plan" chapter.

The LRTP is typically one of the initial stages of project development, where the need for a solution is identified and the opportunity for implementing the project/ concept/program is first proposed. However, the spirit and project guidelines established in the LRTP can be carried through the subsequent steps of a project. Figure 2 illustrates the LRTP's role within the project development lifecycle.

Figure 2. The Role of the LRTP in Project Development



WHAT IS IN THE LRTP

The *2010 – 2035 Bismarck-Mandan Long Range Transportation Plan* includes discussion of the following topics:

- **Goals, Objectives and Standards** that reflect input from a broad range of perspectives and guided plan development.
- **Existing Transportation System Conditions**, including technical analyses of current roadway, non-motorized and transit conditions.
- **2035 Housing/Employment Development and Future Travel Demands**.
- **Multimodal Alternatives Analysis**, a summary of the various projects and programs evaluated to address the long-term needs of the community.
- **Funding the LRTP**, which summarizes the available and projected sources of revenue through the 2035 horizon year.
- **Recommended LRTP**, including a financial plan that demonstrates the consistency of proposed investments with the anticipated revenue.
- **Environmental Considerations**, discussing the types of mitigation analyses and mitigation strategies that may be used; a discussion of environmental justice, and relative equity considerations of the recommended projects; and a summary of the plan update effort to consult with resource agencies

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TRANSPORTATION SYSTEM GOALS AND OBJECTIVES

Development of the planning goals and objectives was a critical first step in the Transportation Plan update process, as it defined the community vision for the future transportation system. The goals and objectives laid out the general course for the update of the 2035 Long Range Transportation Plan. The 2035 LRTP goals and objectives were developed by:

- Using the multimodal transportation goals and objectives included in the 2030 LRTP (completed in 2005) as a starting point.
- The study team then developed an updated draft set of 2035 goals and objectives. The draft set was established to reflect input received during the current plan update, and ensure that the 2035 Plan addressed updated planning requirements in SAFETEA-LU.
- The goals and objectives were finalized through an open process that involved soliciting input from many stakeholders. The draft goals and objectives were presented to the stakeholder groups and their feedback was incorporated into the final goals and objectives. The stakeholder groups that were involved in comment and revision of the draft goals and objectives included:
    - The Community Committee
    - The MPO's Technical Advisory Committee
    - The MPO's Policy Board
    - The general public

The goals and objectives developed for the 2035 LRTP are connected concepts, representing different levels of the established regional transportation planning vision. The role of the goals and objectives within the larger Metropolitan LRTP are illustrated in Table 1. The section that follows summarizes the goals and objectives established for the 2010 – 2035 LRTP.

Goals represent the overarching statements of Plan intent and the direct elements of the community's vision.

Objectives are more-focused statements of specific actions / measures / procedures that reflect how a particular goal can be attained.

Table 1. Transportation Planning Steps, From Goals to Recommendations

Long Range Transportation Plan Element	Element Description	Developed with Input From	Public Review Opportunities
GOALS	General statements of Plan intent / direction	MPO Staff MPO TAC MPO Policy Board Community Committee	July-Aug 2008 Public Meetings Posted on Study Website
OBJECTIVES	Actions needed to be completed in order to achieve goal	MPO Staff MPO TAC MPO Policy Board Community Committee	July-Aug 2008 Public Meetings Posted on Study Website
IMPROVEMENT STRATEGIES/CONCEPTS	Define specific programs / system modifications (alternatives) considered to address goals	MPO Staff MPO TAC MPO Policy Board Community Committee	April 2009 Public Meetings Posted on Study Website
SCREEN USING MEASURES OF EFFECTIVENESS	Establish benchmarks or performance measures to screen how each strategy / concept fits with Plan objectives	MPO Staff MPO TAC MPO Policy Board Community Committee	April 2009 Public Meetings Posted on Study Website Existing Conditions Report
ACTIONS / RECOMMENDATIONS Improvement Projects / Funding Plan to Finance Projects	Tasks / steps required to implement the selected strategies / concepts	MPO Staff MPO TAC MPO Policy Board Community Committee NDDOT	Aug-Sept 2009 Public Meetings Posted on Study Website Televised Meeting Commission Meetings

Bismarck-Mandan Transportation Goals and Objectives

Goal #1

Provide a multimodal transportation system that efficiently and effectively moves people and goods between their desired origins and destinations.

Objectives

- Establish and utilize measurable criteria to evaluate how well the multimodal transportation system is operating.
- Identify and implement appropriate programs intended to reduce or shift vehicular travel patterns, such as ridesharing and park-and-ride lots connected to the CAT bus system, to reduce the need to expand roadway capacity.
- Identify and address the impacts of freight movement on areas surrounding truck routes (noise, air quality, safety).
- Identify transit facility and service improvements that would make using CAT more effective and increase the percentage of all trips using transit.
- Encourage jurisdictions to consider establishing appropriate guidelines for determining where property access may or may not be allowed along the roadway system (access management).

- Increase system access to major traffic generators/attractors within the framework of established access management guidelines for each specific jurisdiction.
- Identify and reduce/eliminate freight linkage deficiencies with the objective of improving freight movement.
- Continue to improve the cost-effectiveness of transit services by, where appropriate, shifting paratransit riders to CAT service.
- Ensure that the existing roadway system provides a proper functional mix, providing an acceptable balance of land access and travel mobility.
- Improve regional connectivity across barriers such as major roadways, railroads, and rivers.
- Coordinate with non-motorized system users in Bismarck-Mandan MPO planning activities.
- Ensure that mobility-challenged populations, such as low income, persons with disabilities or senior citizens, have travel options in the region.

Goal #2

Provide a safe transportation system.

Objectives

- Reduce the incidence of crashes on the system, particularly at high-crash locations
- When transportation improvements are being reviewed in the LRTP update and through individual projects, consider the potential that a proposed improvement concept or program has for reducing motorized and non-motorized crashes.

Goal #3

Provide a secure transportation system.

Objectives

- Develop action plans and improvement needs based on identified critical transportation assets identified in the LRTP process.
- Incorporate state and local emergency response and security plans into Bismarck-Mandan MPO planning activities.

Goal #4

Preserve the existing and planned system.

Objectives

- Equitably account for roadway, trail and sidewalk network maintenance in the financial element of the plan.
- Address transit service operations and maintenance in the recommended Long Range Transportation Plan.
- Identify and reserve/protect/preserve planned future transportation corridors, even if construction is many years into the future.
- Promote ideas that acceptably balance the need for land access, while recognizing the need to ensure corridor safety and mobility through access management.

Goal #5

Address the transportation system's impact on the built, social and natural environment.

Objectives

- Prioritize roadway system improvements based on costs versus funding availability, degree of system benefit (impact), and level of impacts to the adjacent areas.
- Promote transportation projects, plans and/or programs that encourage reducing energy consumption.
- Reduce the pressure to expand the current system and improve the performance of the existing roadway system by implementing programs that increase average vehicle occupancy rates.
- Coordinate transportation planning activities with appropriate federal, state, and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.
- Engage stakeholders and the public in the decision-making stage of the transportation planning process.
- Coordinate transportation planning activities with regional land use planning activities, including the Regional Future Land Use Plan.

Goal #6

Provide a transportation system that supports and enhances the regional economy.

Objectives

- Coordinate area economic development activities with LRTP development.
- Implement transportation projects/programs that contribute to the region's quality of life, whether through improved recreational, aesthetic or cultural amenities.

EXISTING TRANSPORTATION SYSTEM CONDITIONS

To gain a more complete understanding of what actions, policies and improvements might be desired by the communities and constituencies in the Bismarck-Mandan region, it is first important to consider the state of the current transportation system. Current transportation system performance and issues are the underpinnings of future transportation system needs. The current transportation system is composed of:

- The street and highway system
- Non-motorized system
- Regional transit system
- Intercity bus transportation
- Freight transportation
- Land access to air transportation facilities

CURRENT MULTIMODAL ISSUES

The initial stages of the plan update included working with the general community and the MPO TAC to document current or emerging transportation system issues. Issues were collected from Technical Advisory workshops, citizen feedback from public meetings and the study website and meetings with the Community Committee.

The first step in documenting the LRTP issues was an “issues synthesis”. The effort encompassed preparing a summary/synthesis of the numerous multimodal transportation studies that have been completed in the Bismarck-Mandan-Lincoln region over the past several years. The 2030 LRTP was also a source that was reviewed and summarized. Documents included in the issues synthesis were:

- 2030 Long Range Transportation Plan (LRTP)
- SAFETEA-LU Compliance Transportation Plan Update
- Interstate and Bismarck Expressway Corridor Study
- US Highway 83 Corridor Study
- Lincoln/Bismarck Connection Study

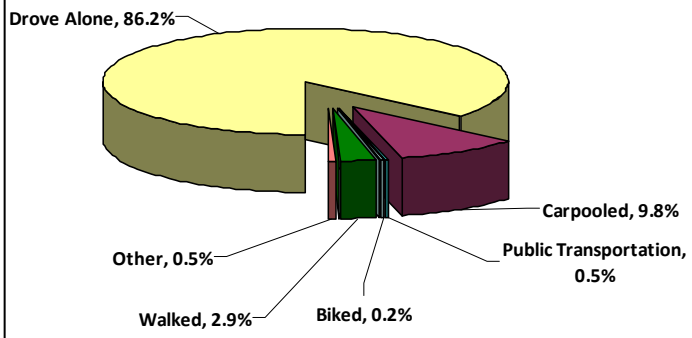
- Bismarck-Mandan Transit Development Plan
- Regional Land Use Study
- 71st Avenue-Centennial Road Corridor Study
- Regional North-South Beltway Corridor Study
- Northern Bridge Corridor Study
- Fringe Area Master Plans
- West Side Transportation Study
- 12th Street Corridor Study
- River Road Study
- Northern Plains Commerce Center Traffic Impact Study
- Downtown Bismarck Parking Study
- Northwest Subarea Study
- TransAction II: North Dakota's Statewide Strategic Transportation Plan
- North Dakota 2008 Crash Summary

In addition to summarizing the issues for earlier studies, the initial involvement efforts associated with the Plan update focused on gathering input from the public and stakeholders on their multimodal transportation issues. A summary of the issues collected from stakeholders and the public through the 2010 Plan update involvement efforts is provided in Figure 3. Appendix B includes documentation of the issues synthesis collected from previous studies.

STREET AND HIGHWAY SYSTEM

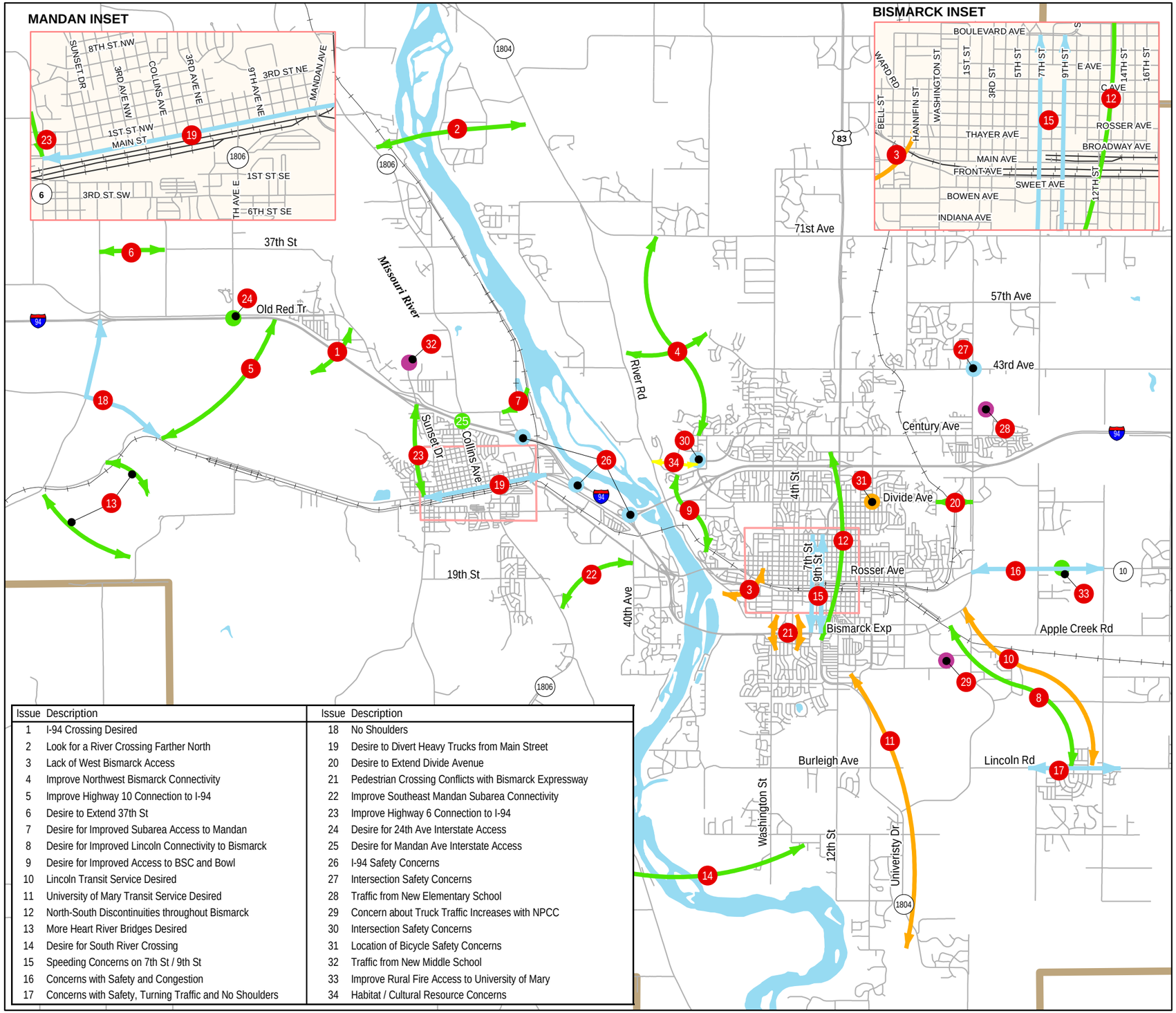
The street and highway system is the primary backbone of the Bismarck – Mandan transportation system. In 2000, approximately 96 percent of work trips in the region were made by automobile on the street and highway network[1]. The street and highway system provides connections within the region, connections to other cities and regions and connections between various modes of travel within the metropolitan area. This section provides an overview of the various components of the street and highway system.

Bismarck-Mandan Means of Travel to Work



Source: U.S. Census Bureau, Census 2000, Summary File 3. Bismarck MSA, Table P30.

[1] U.S. Census Bureau, *Census 2000*, Summary File 3.



Issue	Description	Issue	Description
1	I-94 Crossing Desired	18	No Shoulders
2	Look for a River Crossing Farther North	19	Desire to Divert Heavy Trucks from Main Street
3	Lack of West Bismarck Access	20	Desire to Extend Divide Avenue
4	Improve Northwest Bismarck Connectivity	21	Pedestrian Crossing Conflicts with Bismarck Expressway
5	Improve Highway 10 Connection to I-94	22	Improve Southeast Mandan Subarea Connectivity
6	Desire to Extend 37th St	23	Improve Highway 6 Connection to I-94
7	Desire for Improved Subarea Access to Mandan	24	Desire for 24th Ave Interstate Access
8	Desire for Improved Lincoln Connectivity to Bismarck	25	Desire for Mandan Ave Interstate Access
9	Desire for Improved Access to BSC and Bowl	26	I-94 Safety Concerns
10	Lincoln Transit Service Desired	27	Intersection Safety Concerns
11	University of Mary Transit Service Desired	28	Traffic from New Elementary School
12	North-South Discontinuities throughout Bismarck	29	Concern about Truck Traffic Increases with NPCC
13	More Heart River Bridges Desired	30	Intersection Safety Concerns
14	Desire for South River Crossing	31	Location of Bicycle Safety Concerns
15	Speeding Concerns on 7th St / 9th St	32	Traffic from New Middle School
16	Concerns with Safety and Congestion	33	Improve Rural Fire Access to University of Mary
17	Concerns with Safety, Turning Traffic and No Shoulders	34	Habitat / Cultural Resource Concerns

Bismarck-Mandan Metropolitan Planning Organization

Bismarck-Mandan Long Range Transportation Plan - 2035

Legend

Plan Update Issues

- Access/Continuity Issue
- Non-Motorized Issue
- Safety Issue
- Traffic Generator

Miles

0 0.75 1.5 3

Figure 3. Public / Stakeholder Identified Transportation System Issues

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Functional Classification

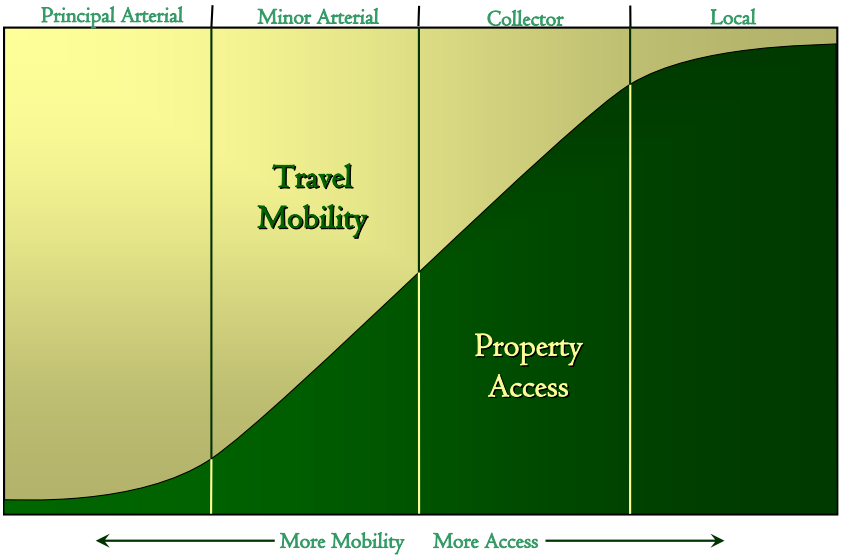
Functional classification is an approach to grouping roadways into various categories according to the character of the travel service that they are intended to provide. An underlying recognition of creating the hierarchical concept is that several functional types of streets are used for most vehicle trips. For example, a resident's morning commute from home to work likely traverses streets covering the entire range of functional classifications, from local streets to arterials. While a trip to the store may include fewer classifications and a trip to the park would, in the preferred condition where park access is convenient, include fewer classifications.

Unique rural and urban functional classification systems have been developed for the metropolitan planning area, in recognition that urban and rural areas are fundamentally different in terms of development density and land use types and require somewhat different, but interrelated, approaches to addressing street function. To retain the ability to interrelate the urban network with the rural network, building block functions of access and mobility are common to each. The various functional classifications define a roadway's general role in performing the two primary functions:

- Providing access to adjacent properties
- Providing travel mobility from one part of the region to another.

On any street/road, these two functions are always in competition, but across each of the functional classification categories there are general guidelines regarding which of the two functions is dominant. The relative level of mobility and access performed by the various facility types is illustrated in Figure 4. In general, local streets primarily provide access to adjacent property, while arterial roadways the primary, or dominant, function is to move vehicles or provide mobility. The collector category is where the two functions are expected to be somewhat balanced.

Figure 4. Functional Emphasis on Mobility and Access by Facility Type



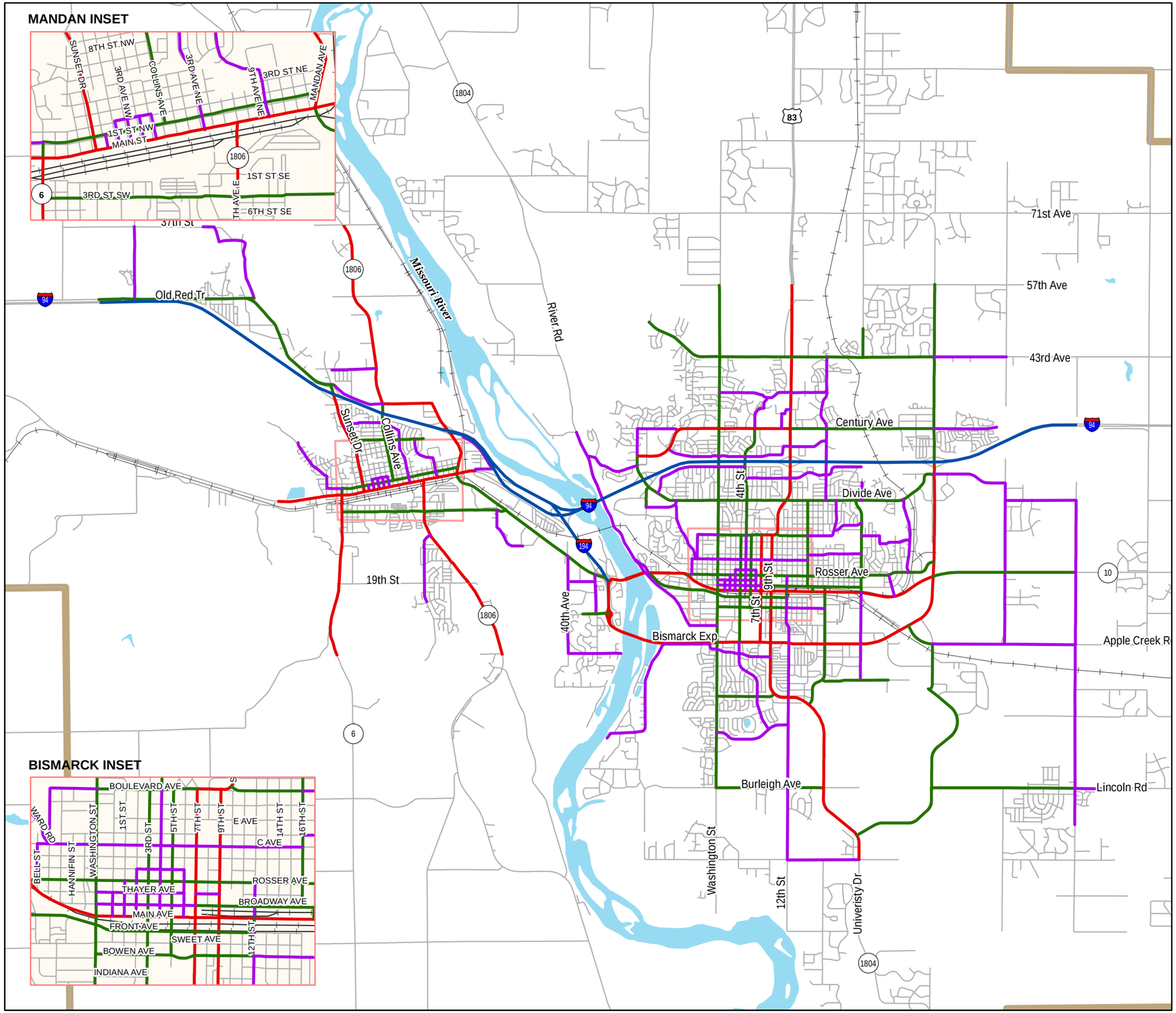
While the functional classification systems in rural and urban areas of a metropolitan area are prepared somewhat independently of one another, there is the understanding that the classification of a unique piece of roadway is dynamic. It is dynamic because the function of that unique piece of roadway can and should change as the land uses adjacent to it and the activities in the areas of the region it connects change. The changes in classification that need to be considered include moving along the scale from local to arterial as needs and movement between the rural format and the urban format as development and annexation dictate.

To make the reported information more streamlined and to reduce the potential for confusion, the focus of the remainder of the functional classification discussion will be on the urban system. This is not to say that the rural areas are less important, but the urban area roadways and system is generally more complex and represent areas of the greatest conflict between identified classification and actual function a route serves in the system. Within the rural portions of the metropolitan planning area, the interstate and state highway systems (US 83, ND 1804, ND 1806, ND 6, ND 25, I-94) comprise the arterial system where county designated routes are generally classified as collector routes.

The urban functional classification system for roadways within the transportation planning area includes the following categories:

- Interstate
- Principal Arterials
- Minor Arterials
- Collector
- Local

The general characteristics of the various classes are described in Table 2; providing an overview of the role each type plays in the roadway network. The conflict between mobility and access is recognized by the designated functions each facility type is intended to serve. Interstates and arterials favor travel mobility and limit property access, while collectors and local streets favor property access and limit travel mobility. The MPO functional roadway classification is illustrated in Figure 5. Table 2 also demonstrates the high mobility role offered by interstates and arterials, typically results in them tending to carry higher traffic volumes for longer distances.



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Legend

Roadway Class

- Interstate
- Principal Arterials
- Minor Arterials
- Collectors

N

0 0.75 1.5 3 Miles

Figure 5. Existing Street and Highway Urban Functional Classification

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December 3, 2009

Table 2. Urban Functional Classification Characteristics, Mileage and Usage

Facility Type	General Role	Mobility/Access	Typical Spacing	Existing System Mileage	Existing Daily VMT
Interstate	Connects Bismarck-Mandan to other cities and regions.	High travel mobility, no direct property access.	I-94 and I-194 are the only interstates.	15 miles	236,000 VMT
Principal Arterial	Serve major activity centers and subareas within region, major entry points for traffic from outside of region.	Facility emphasis is on mobility, with limited property access.	In developed portions of metro area, spacing is typically 1 to 2 miles.	36 miles	496,000 VMT
Minor Arterial	Connects activity centers, interfaces with principal arterials and collectors.	Primarily provides mobility, some property access provided.	In developed areas, spacing is typically ¼ mile to 1 mile.	62 miles	329,000 VMT
Collector	Offers circulation within subareas and connection between neighborhoods and commercial areas.	Favor land access over mobility.	In developed areas, spacing can range from a few hundred feet to ½ mile.	58 miles	146,000 VMT
Local	Streets that offer direct property access.	Primarily property access. Low mobility due to lower speeds and discontinuous network.	Varies according to parcel size, enough density to support direct access to individual parcels.	334 miles	

Sources: Bismarck-Mandan GIS databases, Bismarck-Mandan Regional Travel Model, URS Corporation, 2005 Bismarck-Mandan LRTP

The Bismarck-Mandan roadway network generally conforms to the FHWA-recommended urban classification guidelines for system mileage and vehicle miles traveled (VMT) by class. This comparison would generally indicate that the current regional roadway system is structured in a manner to generally provide a good mix of system mobility and property access.

Traffic Operations

The roadway system has a finite vehicle-carrying capacity. The maximum number of vehicles that a roadway segment or intersection can accommodate is defined as roadway capacity. As traffic volumes increase and approach the capacity of a segment or intersection, travel delays increase. When traffic volumes are at the roadway's capacity threshold, delays are excessive and traffic flow breaks down.

Several elements determine roadway capacity, but two key components are particularly important in determining intersection/segment capacity:

- **Roadway Geometrics**, or the number of through travel lanes and turn lanes throughout the MPO planning area. The roadway geometrics are a key input to determine the capacity of the street and highway system.
- **Traffic Volumes**, the number of vehicles using the roadway system affects how the roadway system performs. When volumes approach intersection or segment capacity, increases in traffic levels will lead to increases in travel delay. Average daily traffic (ADT) volume counts are illustrated in Figure 6.

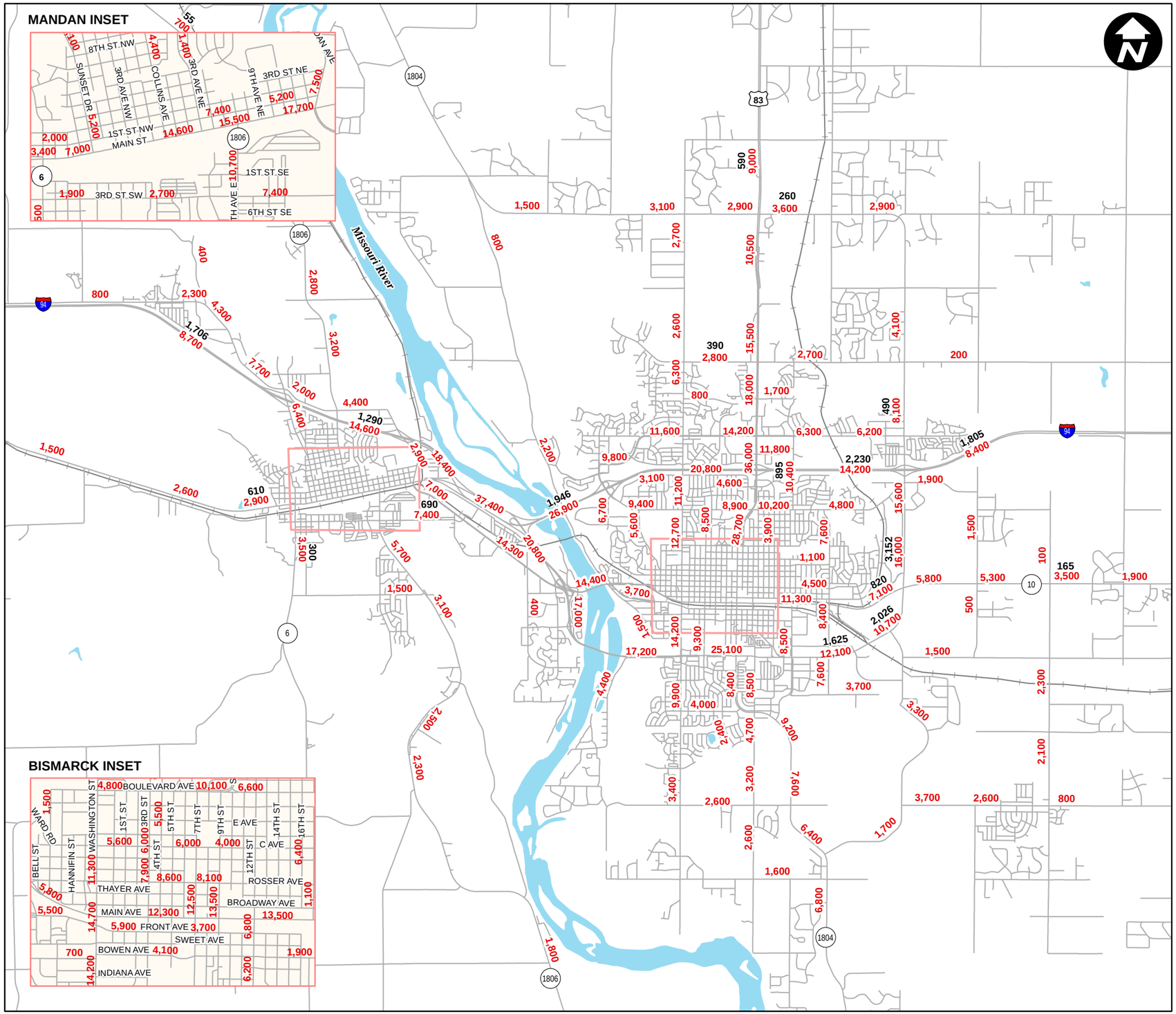
While it is possible to define and estimate the absolute capacity threshold of a roadway segment or intersection, it is recognized that the excessive travel delays associated with traffic operations at-capacity conditions are not ideal and/or acceptable to most travelers in the Bismarck-Mandan region. Even at volumes below capacity, roadways still have travel delays. The quality of traffic flow is defined by the concept of level of service (LOS), which is a continuum of letter grades associated with various travel conditions. Descriptions and illustrations of level of service are provided in Figure 7. It is the desire of the MPO and NDDOT to provide LOS C conditions, where practical.

For the purposes of the LRTP update, intersections or segments are considered "deficient" when traffic flow is estimated to operate at LOS D or worse. The capacities used in this evaluation are presented in terms of *daily* traffic volumes, but have been developed to reflect the approximate daily traffic levels at which a roadway will experience *peak* period congestion. Thus, roadways that have daily traffic volumes that are approaching or exceeding the daily capacities, likely only

Traffic Terminology

Roadway Capacity is the maximum number of vehicles a street segment / intersection can accommodate. As traffic volumes approach roadway capacity, travel delays increase.

Capacity Deficiency is the condition where traffic volumes reach a level that causes undesirable travel delays. In Bismarck-Mandan, this is defined as a level of service D or worse. At level of service D, the average vehicle traveling through an intersection will be delayed at least 35 seconds during the peak hour of travel before clearing the intersection.



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Legend

165 2006 Average Daily Truck Volume (where available)

2,800 2006 Average Daily Traffic Volume

0 0.75 1.5 3 Miles

Figure 6. Current (2006) Daily Traffic Volumes

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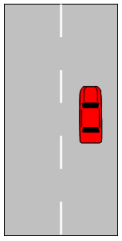
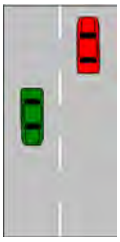
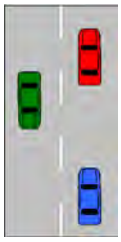
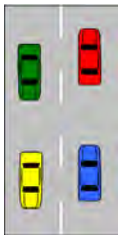
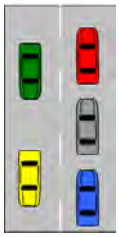
December 21, 2009

Figure 7. Level of Service Definitions for Intersections and Illustration

	LOS A	LOS B	LOS C
Illustration			
Delay Per Vehicle	*Signalized*: < 10 Seconds *Unsignalized*: <10 Seconds	*Signalized*: 10 to 20 seconds *Unsignalized*: 10 to 15 seconds	*Signalized*: 20 to 35 seconds *Unsignalized*: 15 to 25 seconds
Description	*Free Flow, Insignificant Delays.* Very little, if any, delay incurred. Corridor travel speed is within 10% of the free-flow operating speed (travel speed without any outside influences controlling any one drivers decision as how fast to drive).	*Stable Operation, Minimal Delays*. Described as reasonably unimpeded operations. A driver's ability to maneuver within the traffic stream is only minimally restricted by other vehicles. Operating speeds are within approximately 30 percent of the free-flow speed.	*Stable Operation, Acceptable Delays.* Operations with the corridor are stable, but maneuvering between lanes or turns may be restricted. Not all vehicles during every signal cycle clear the intersection (cycle failures).

	LOS D	LOS E	LOS F
Illustration			
Delay Per Vehicle	*Signalized*: 35 to 55 Seconds *Unsignalized*: 25 to 35 Seconds	*Signalized*: 55 to 80 seconds *Unsignalized*: 35 to 50 seconds	*Signalized*: >80 seconds *Unsignalized*: >50 seconds
Description	*Restricted Flow, Regular Delays.* Limits of stable flow. Slight changes in vehicle flow results in substantial increases in delay. Typical operating speeds are 40 percent of the free-flow speed. Queues may develop, but dissipate rapidly without excessive delays.	*Maximum Capacity, Extended Delays*. Volumes at or near the finite capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. Typical operating speeds in the corridor are less than 35 percent of the free-flow speed.	*Forced Flow, Excessive Delays*. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: *Highway Capacity Manual (HCM 2000)*, Transportation Research Board and URS Corporation

experience relatively short periods of travel delays (often an hour or two) over the course of the day. Figure 8 displays estimated current street/roadway level of service.

Traffic Safety

One of the transportation goals established through the planning process is to "provide a safe transportation system." The related objectives are to:

- Reduce the incidence of crashes on the system, particularly at high-crash locations.
- When transportation improvements are being reviewed in the LRTP update and through individual projects, consider the potential that a proposed improvement concept or program has for reducing crashes.

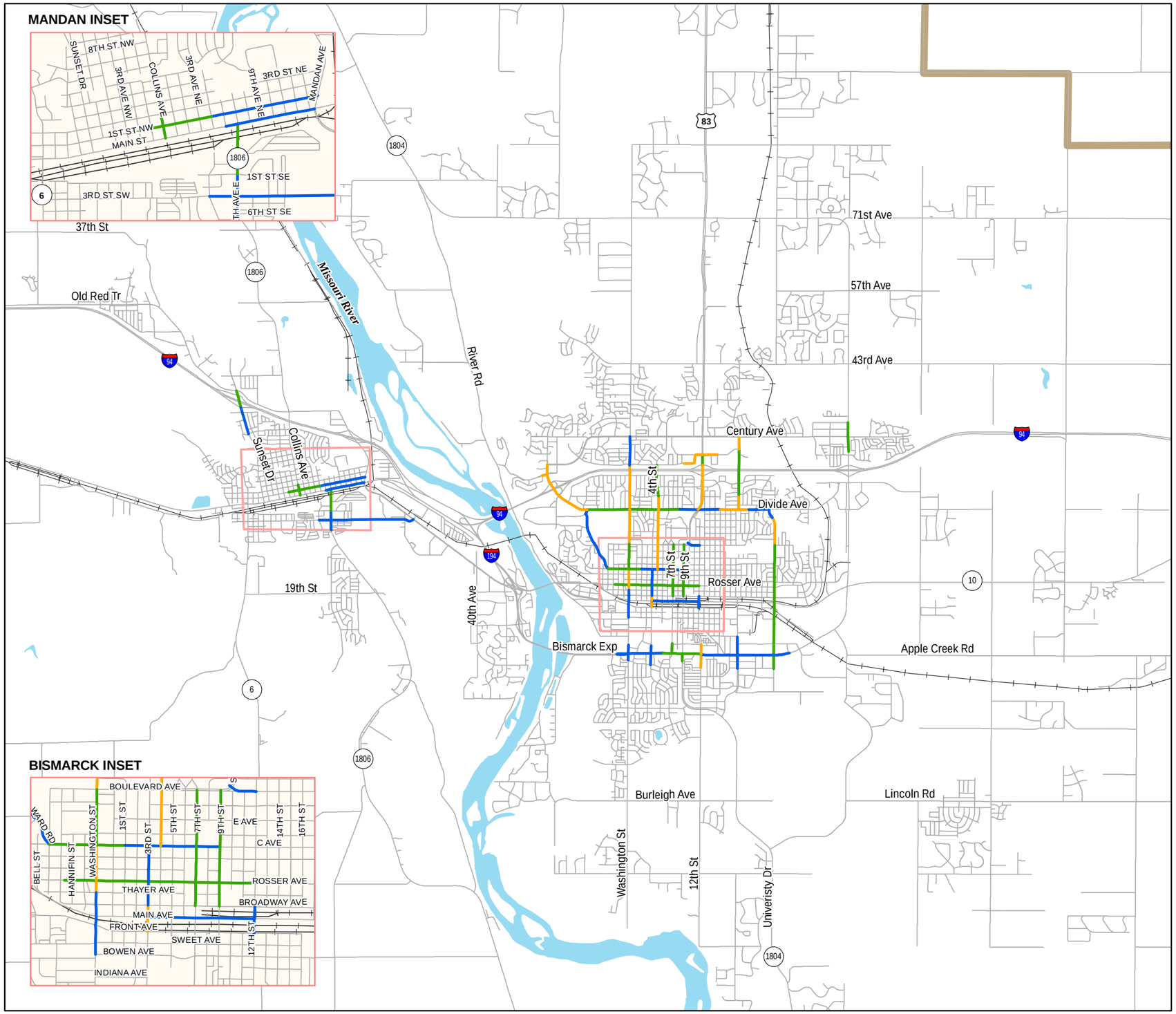
A key action within the Transportation Plan is to identify the metropolitan area's high-crash locations. The traffic safety conditions were evaluated through review of available crash data from the NDDOT. A statistical approach was used to identify intersections which had statically higher crash rates[2]. This approach found that 23 intersections in the study area had "high" crash rates. All of these high-crash intersections are located in Bismarck.

Safety issues were noted in the Bismarck – Mandan MPO study area in the *North Dakota 2008 Crash Summary*. The statewide assessment of crash rates found that of all North Dakota counties, Burleigh County has the highest overall crash rate, the highest alcohol-related fatality rate per million vehicle miles traveled (VMT), and the highest speed-related crash rate in the state.

Figure 9 illustrates the intersections with available data and provides the crash rates observed during the 2005 to 2007 analysis period. The crash rates are presented in terms of Million Entering Vehicles (MEV). A complete discussion of the traffic safety assessment is provided in the *Existing Conditions Report* at:

www.bismarck.org/MPO

[2] Based on a critical crash rate method, as documented in *Traffic Safety Fundamentals Handbook*, Minnesota Department of Transportation, April 2001. 95 percent confidence level assumed.



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Legend

2006 Level of Service

- LOS C
- LOS D
- LOS E
- LOS F

Note: Level of service estimates reflect conditions during peak hour of traffic.

N

0 0.75 1.5 3 Miles

Figure 8. Current Roadway Level of Service

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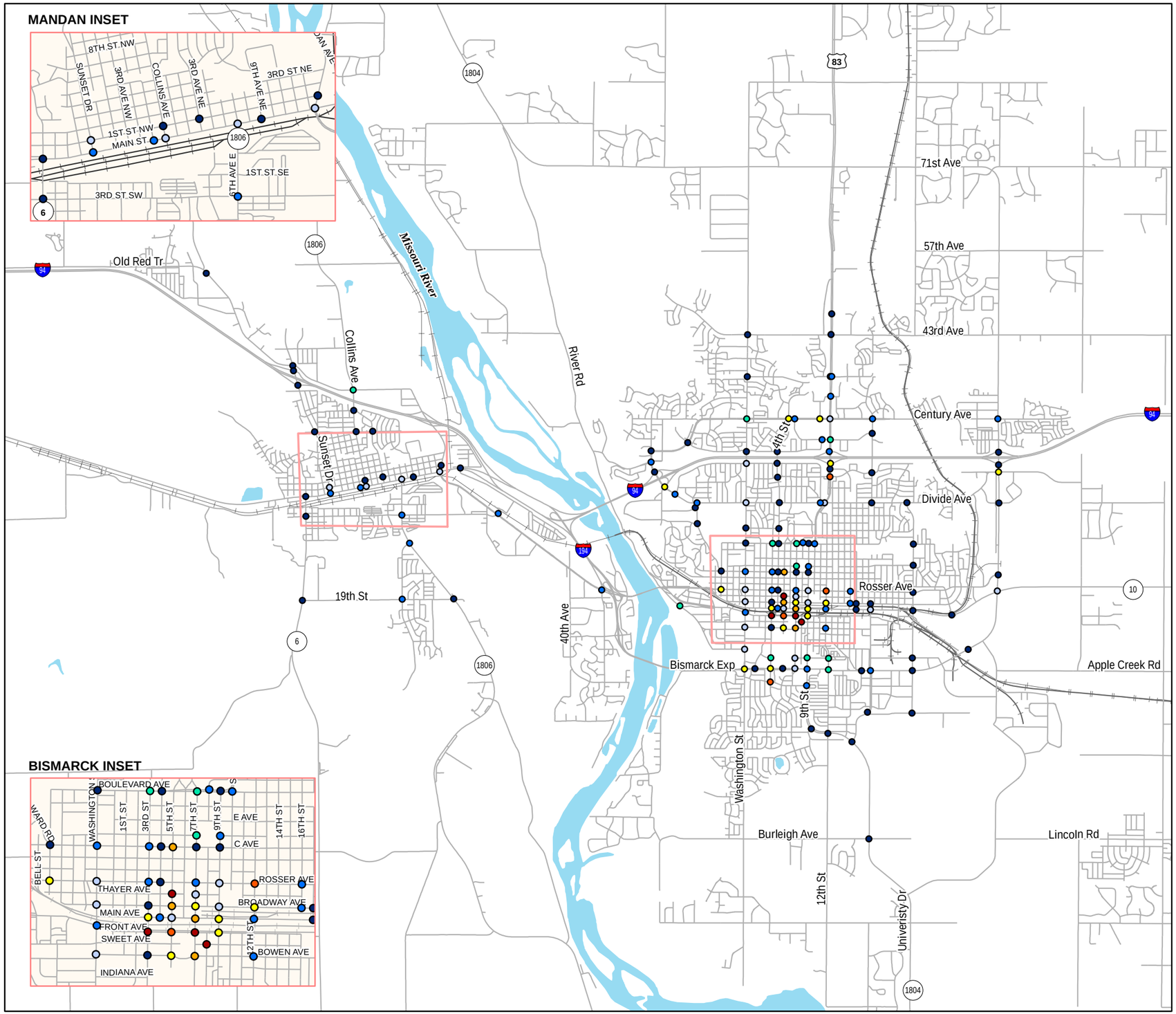

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Legend

Intersection Crashes

Crash Rate (per MEV)*

- 0.6 or Less
- 0.6 to 0.8
- 0.8 to 1.0
- 1.0 to 1.2
- 1.2 to 1.4
- 1.4 to 1.6
- 1.6 to 1.8
- More than 1.8

* MEV = Million Entering Vehicles

Note: Average study area crash rate is 0.78 per MEV.

0 0.5 1 2 Miles

Figure 9. Intersection Crash Summary, 2005 to 2007

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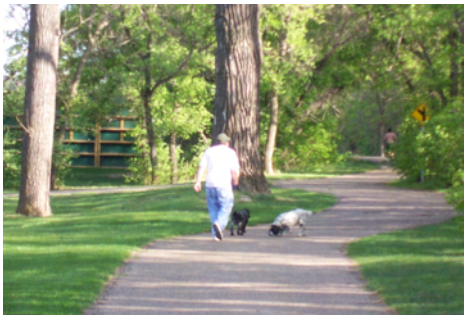
December 1, 2009

NON-MOTORIZED SYSTEM

The Bismarck-Mandan community has embraced the idea that not all trips need to be made by automobile and has developed an extensive non-motorized transportation system. Planning for a non-motorized system that offers viable transportation alternatives to the citizens of the Bismarck-Mandan region is consistent with the goals and objectives identified in the early stages of this plan update, including the following objectives:



- Identify and implement appropriate programs intended to reduce or shift vehicular travel patterns.
- Promote transportation projects, plans and/or programs that encourage reducing energy consumption.
- Implement transportation projects/programs that contribute to the region's quality of life.

The Bismarck-Mandan region has an extensive multi-use trail system that offers both recreational and transportation opportunities. The current trail system includes approximately 65 miles of facilities and is supplemented by an extensive sidewalk system on both sides of the river. The system provides connections to many of the region's major travel origins and destinations, including residential areas, shopping, educational, health care and recreational attractions. Figure 10 shows the existing, and soon to be constructed, multi-use trail system in the Bismarck-Mandan area.

Most metro area trails have a 10-foot wide asphalt paved cross-section. The Bismarck Parks and Recreation Department is currently implementing alternative surfaces including a woodchip-surfaced trail and a gravel-surfaced trail.

Sidewalk guidelines and requirements are provided by the Cities of Mandan and Bismarck. Both cities require that sidewalks meet minimum construction requirements, be Americans with Disabilities Act (ADA) compliant and be maintained in good repair by the adjacent property owner. In Mandan, sidewalks need to be at least 5 feet wide; in Bismarck, the sidewalks must be at least 4.5 feet wide along residential lots and at least 6 feet wide along school, commercial or industrial lots. Bismarck has an active program in place to enforce construction of sidewalks adjacent to parcels where there currently is no sidewalk. Bismarck is currently completing a 10 year+ program where staff are reviewing neighborhoods and identifying gaps in the sidewalk system that could be filled in to form a more inter-connected system. Undevelopable lots in Bismarck still have sidewalks constructed adjacent to them.

In the Plan update review of the current non-motorized system, the most extensive sidewalk system gaps were noted in the following locations:

- Bismarck Expressway between 18th Street and East Rosser Avenue.
- State Street/US 83 north of Calgary Avenue.
- 26th Street between Rosser Avenue and Bismarck Expressway.
- Memorial Highway in Mandan.
- Across the City of Lincoln.

The metropolitan area street system is also used for bicycle travel. The LRTP update team worked with a local bicycle user group to rate various streets for their sufficiency for bicycle usage. The intent of this effort is to evaluate the street segments for on-street bicycle use based on various performance measures, including:

- Posted vehicle speeds
- Lane widths
- Surface type
- Daily vehicular traffic
- Street grades/slopes

That effort is reflected in the recommended on-street bicycle routes, included later in this report.

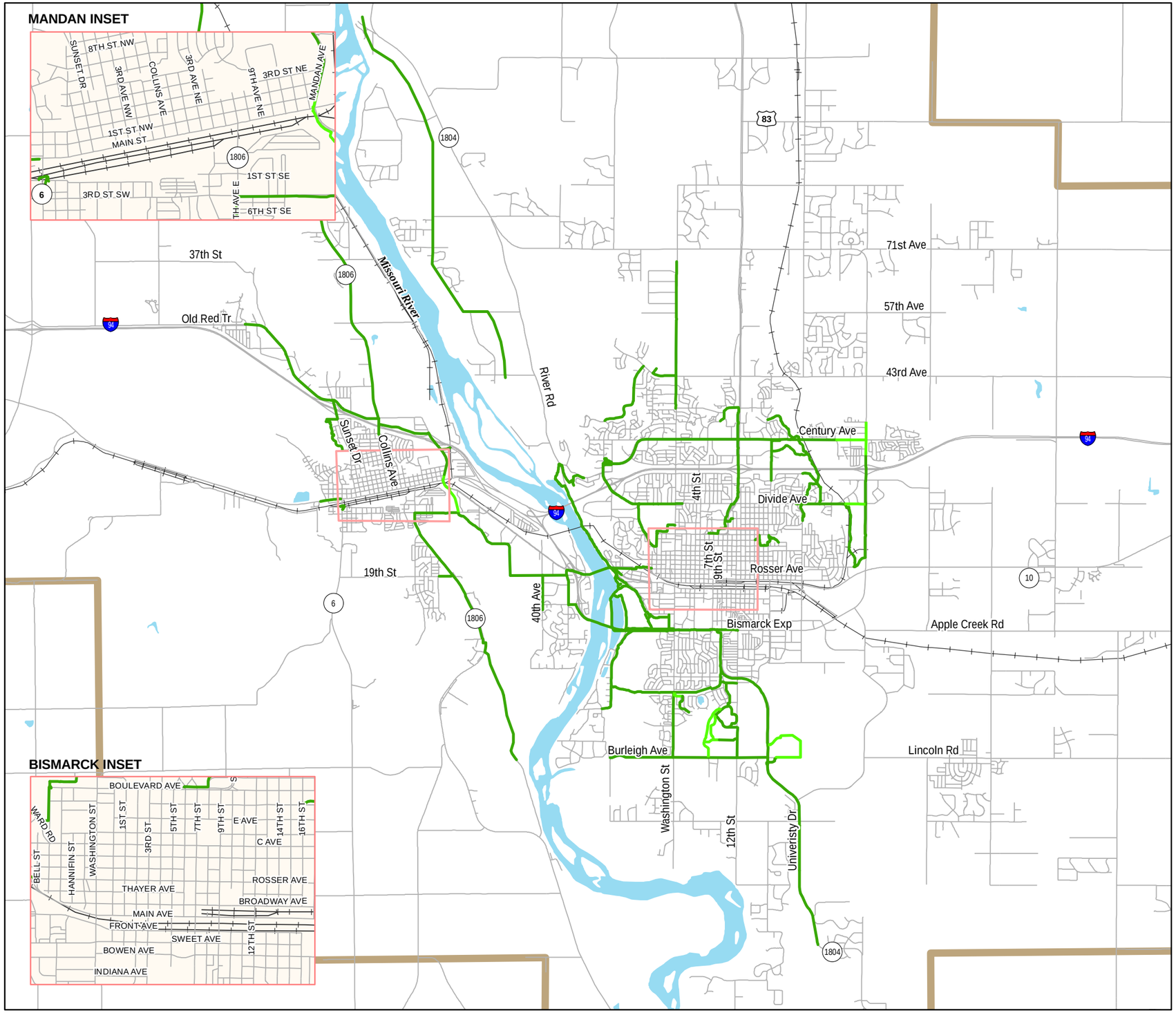
REGIONAL TRANSIT SERVICE

Transit Overview

Transit services in the Bismarck-Mandan region are managed by the Bis-Man Transit Board, which oversees two integrated services within the Bismarck-Mandan region.

Bis-Man Paratransit is a paratransit/demand responsive transit service for seniors (60 year old plus) and persons with disabilities. Bis-Man offers door-to-door service for its users 24 hours a day, seven days a week. The Bis-Man Transit service was initiated in 1991 as a coordinated effort between a number of independent for profit and non-profit providers. Users of the Bis-Man demand responsive service need to have pre-registered for the service and provide 24-hours of notice for a ride. Fares for the Bis-Man service are $2.50 per ride (as of 2009).

Capital Area Transit (CAT) is a fixed-route bus service, initiated in 2004, that operates on a total of 12 routes across Bismarck and Mandan. Depending on the route, CAT operates from approximately 6:00 AM to 7:00 PM, Monday through Friday, with limited Saturday service. Most service headways are either 30 minutes or one hour frequencies, with Bismarck to Mandan/Mandan to Bismarck service running every two hours. Fares are $1.25, with reduced $0.50 fares for seniors, disabled, Medicare and students (as of 2009). The current CAT routes are illustrated in Figure 11. CAT buses have racks to carry two bikes, which allow users to bicycle



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Legend

Existing and Near Term Trails

- Existing Trail
- In TIP (2010-2013)

0 0.75 1.5 3 Miles

Figure 10. Multi-Use Trails

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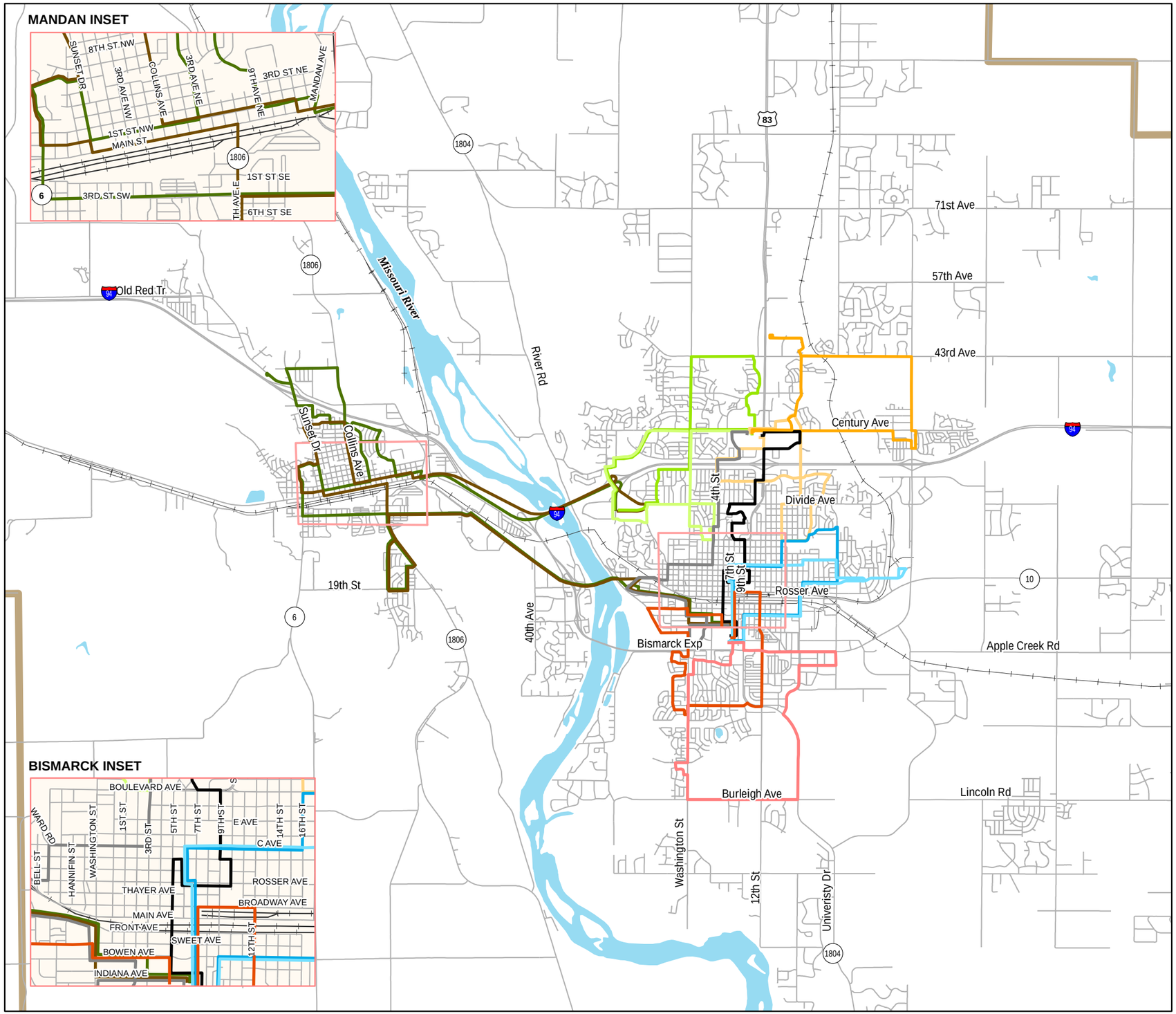
February 5, 2010



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CAT Bus Routes

- Route A1
- Route A2
- Route B1
- Route B2
- Route C1
- Route C2
- Route D1
- Route D2
- Route E1
- Route E2
- Route M1
- Route M2

N

0 0.75 1.5 3 Miles

Figure 11. Capital Area Transit Bus Routes

URS With HE

December 7, 2009

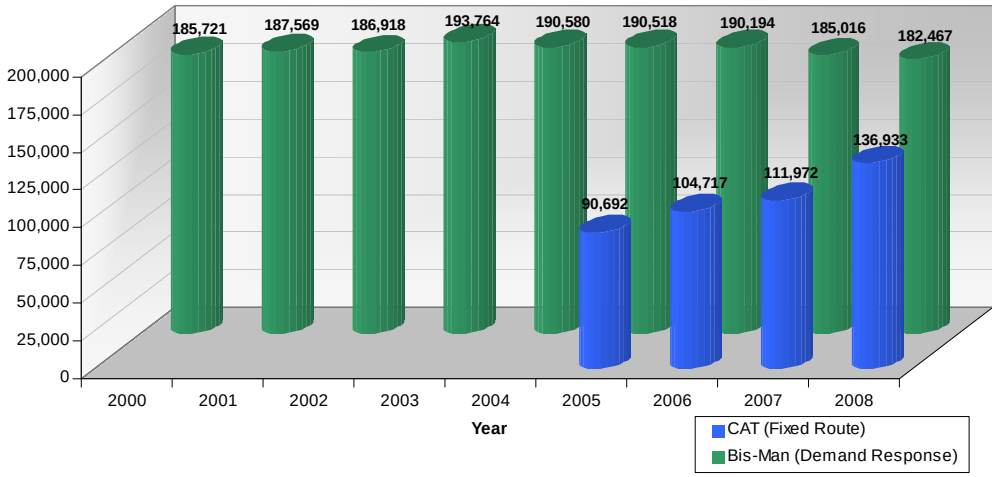
to/from bus stops. For safety reasons, users of the Bus and Bike program need to be certified with CAT prior to using the on-bus bike racks.

Transit Ridership

In the 2007 *Bismarck-Mandan Area Transit Development Plan*, it was noted that "one of the desired outcomes of the introduction of fixed route transit service was a shift of some trips from Bis-Man Transit's demand response service to CAT.[3]" It is a continued goal of Bis-Man Transit to shift able-bodied paratransit riders. A shift is desired because adding passengers to CAT would make overall regional service more cost-effective.

Figure 12 shows the historical ridership trend for both the Bis-Man and CAT services. Data for CAT is only shown since 2005, its first full year of operations. As shown in Figure 12, in each year of operation CAT ridership has increased, while there has been a slight decrease in Bis-Man ridership. Bis-Man Transit's demand responsive service provided 182,000 passenger trips in 2008, while the CAT fixed-route service provided 137,000 passengers trips in 2008. Bis-Man demand responsive service had its peak annual ridership in 2003, the year before the fixed-route service started. CAT fixed-route bus service has had steady increases in ridership its first three years of full operations, from 90,700 riders in 2005 to 137,000 riders in 2008.

Figure 12. CAT and Bis-Man Transit System Ridership (2000 – 2008)



Source: National Transit Database, 2000-2006; Bis-Man Transit, 2007-2008.

[3] *Bismarck-Mandan Area Transit Development Plan*, 2007, p. 66.

In reference to the stated goal of shifting demand responsive trips to the fixed route service, it should be noted that Bis-Man demand responsive ridership in 2008 is at a slightly lower ridership level than it was in 2000, prior to establishing CAT fixed-route service.

Transit Operating Statistics

Table 3 compares the operating statistics of the fixed route and demand responsive transit services in the Bismarck-Mandan region. Seven buses are in operation for the CAT routes during the average weekday, while 26 vehicles are in operation for the Bis-Man demand responsive service on the average weekday.

Table 3. CAT and Bis-Man Transit Operating Statistics, 2008

Operating Statistics	Reported 2008 Annual Totals	
	CAT	Bis-Man
Rides	136,933	182,467
Passenger Miles	322,154	702,717
Average Trip Length	2.35	3.85
Total Vehicle Revenue Miles	305,000	685,165
Total Vehicle Revenue Hours	23,000	54,000
Scheduled Days Operated	314	365
Passenger Trips/Revenue Mile	0.45	0.27
Passenger Trips/Revenue Hour	5.95	3.38

Source: Bis-Man Transit

Intercity Bus Transportation

Intercity bus transportation provides access between the Bismarck-Mandan region and other cities, providing shorter inter-city trips that are not efficiently served by the air transportation system, and provides users a cost-effective mode of travel. There are three companies that offer intercity bus service through the Bismarck-Mandan region to surrounding cities and states. Intercity bus services are stationed in the Bis-Man Transit center on East Rosser Avenue, allowing intercity bus travelers to connect with Bismarck-Mandan bus routes.

The intercity bus lines serving Bismarck-Mandan include:

- **Rimrock Trailways**: Rimrock Trailways offers daily bus service east and west of Bismarck-Mandan on I-94 between Billings, MT and Fargo, ND. The Rimrock line has a daily arrival and departure for both eastbound and westbound routes every day. The Rimrock connections to Fargo and Billings allow for transfers to the wider Greyhound bus network.

- **North South Shuttle**: The North South shuttle connects Bismarck-Mandan to the south with Pierre, SD. From Pierre, riders can travel on to Rapid City, SD via Jefferson Lines. There is one southbound departure and one northbound arrival on Mondays and Thursdays.
- **New Town Bus Line**: The New Town Bus Line provides service to the north of Bismarck-Mandan via US 83 to Minot. The service runs every day but Thursday and Saturday. The New Town line also runs between Minot and Grand Forks via US 2, but for scheduling reasons there is not currently a same-day connection between Bismarck and Grand Forks.

The intercity bus routes serving Bismarck-Mandan are illustrated in Figure 13.

FREIGHT SYSTEMS

Recognizing the key role that freight transportation plays in the Bismarck-Mandan region, the MPO is increasing the level of focus on regional and local freight needs and impacts in the LRTP. Integration of freight into the transportation system planning starts with including freight/goods movement in the transportation system goals and objectives. Specifically, freight shipping and/or movement of goods on trucks using streets and highway have been the focus of the following LRTP goals:

- **Goal #1**: Provide a multimodal transportation system that efficiently and effectively moves people and goods between their desired origins and destinations.
- **Goal #5**: Address the transportation system's impact on the built, social and natural environment.
- **Goal #6**: Provide a transportation system that supports and enhances the regional economy.

Through *TransAction II*, the North Dakota statewide transportation policy plan, the NDDOT emphasizes addressing multimodal freight movement needs domestically within the state, nationally, and internationally at port of entry points and along distribution lines. Freight movement is directly, or indirectly, the focus of three of the six North Dakota transportation goals:

- Safe and secure transportation for residents, visitors, and freight.
- A transportation system that allows the efficient and effective movement of freight.
- A transportation system that supports economic diversity, growth, and competitiveness with consideration of environmental and social impacts.

The vision established through the transportation goals for the state and MPO clearly state that the emphasis needs to be directed on freight and goods movement as an economic driver in the state and as a quality of life concern. This vision is associated with the need to address the system interaction with large commercial trucks, trains, and airplanes.

Freight/commodities move through the region by highways, rail, pipeline and air. The Bismarck-Mandan region was an early crossroads for the railroads, moving freight between ports to the east and settlements to the north and west. Locating I-94 through Bismarck and Mandan and continual service by the Burlington Northern Santa Fe (BNSF) Railroad, operation of the Dakota, Missouri Valley and Western (DMVW) Railroad, and development of freight service through the Bismarck Regional Airport, has provided opportunities for the region to retain its position as a regional freight crossroads.

Freight Transportation's Importance in the Planning Process

The effectiveness and efficiency of freight transportation is a major factor in manufacturing costs, and directly and indirectly in the retail costs paid by consumers. Manufacturers look for reliability, speed, and quality control in the carriers that deliver their raw materials and finished products on time for enhanced productivity. Retailers assume that the cost of transporting products will be less than the cost of maintaining large inventories. These producer and retail expectations for a "just-in-time" inventory system are indicators of the overall strength of the nation's transportation system.

While freight movement is crucial to maintaining the high quality of life that we expect through product delivery and movement, no one wants to contend with heavy commercial vehicles on the roadways. Thus, addressing the conflicts in both the comprehensive land use plan and the regional transportation plan is required to reduce the severity.

Rather than just documenting the types and tonnage of commodities that are being moved through the various modes across the region, the focus of the *2010-2035 Long Range Transportation Plan* relative to assessing the current freight and commodity movement systems and identification of future needs, includes:

- Identification of locations in the region that represent origins and destinations for freight/commodities, focusing on the larger distribution and transloading facilities that are located in industrial areas.

Freight Terminology

Transshipment is the movement of goods to an intermediate destination, and then from there to yet another destination.

Transloading is transferring a shipment from one mode to another in the course of moving it from the origin to the final destination. Example: Grain shipments from fields to agricultural processor – first leg from field is by truck to elevator, where the grain is loaded into train cars and shipped to the processor. The transfer from truck to train cars is the transloading process.

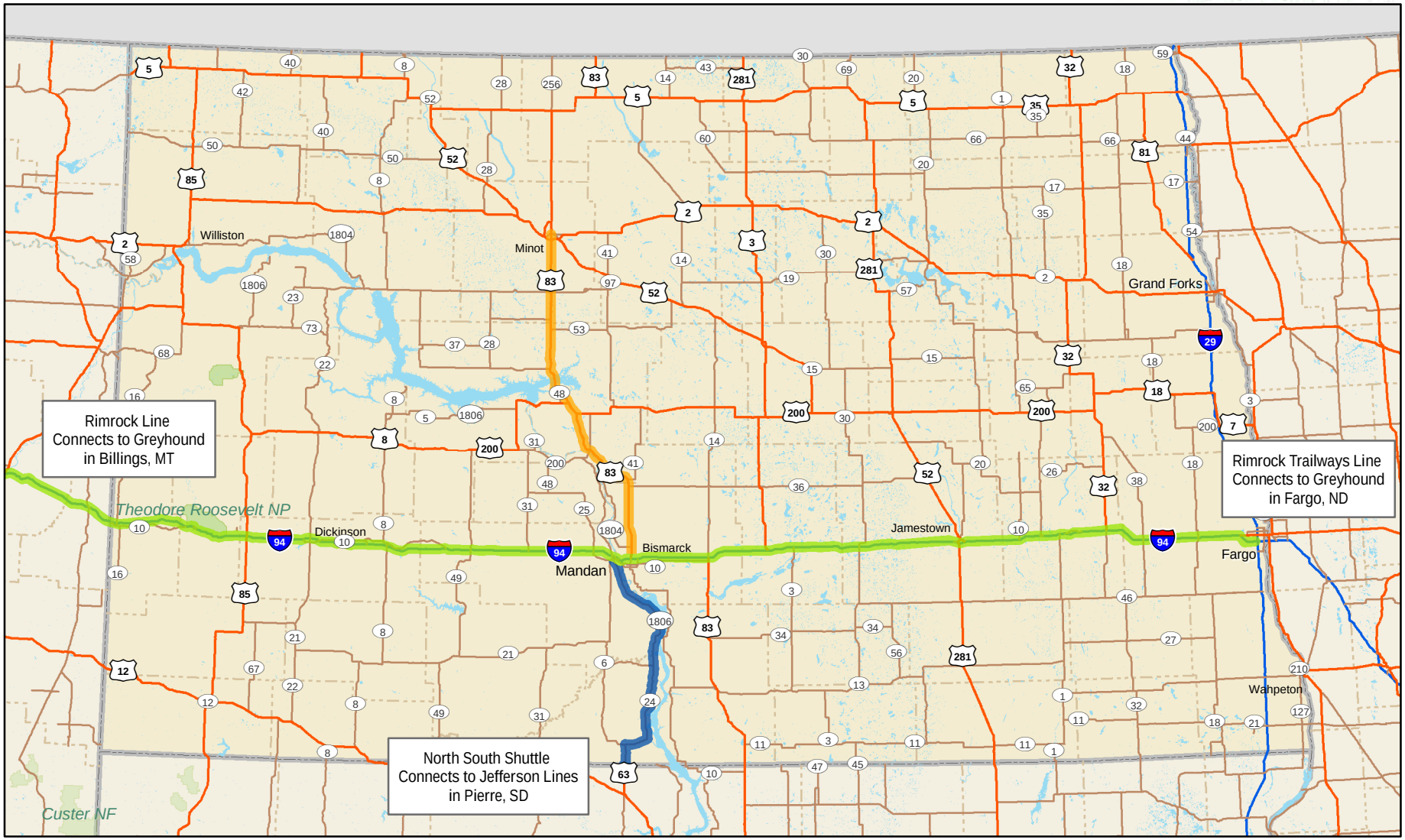


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Figure 13.
Intercity Bus Lines Serving Bismarck-Mandan

Legend
New Town Line
North South Shuttle
Rimrock Trailways Line

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- Identification of surface freight movement facilities that serve, or connect freight origins and destinations with the regional highway systems (I-94, US 83, etc.).
- Identification of deficiencies in the connectivity, capacity, and/or design of the commercial freight movement system.
- Assessment of land use conflicts/inconsistencies that are present in the current commercial freight movement system. A conflict or inconsistency is defined as more sensitive land uses being located directly adjacent (without a reasonable setback) to facilities defined as truck routes and/or routes that carry substantial percentages of heavy commercial vehicles.[4]
- Evaluation of the compatibility of transportation activities that occur within designated commercial vehicle corridors (truck routes) or along routes which currently carry a relatively high percentage of trucks. Along commercial vehicle corridors and along routes that are carrying a relatively high percentage of commercial vehicles, the desire is to have separated auto/truck and non-motorized travel facilities, rather than relying on:
    - Shoulders (paved/unpaved)
    - Back of curb sidewalks.
    - Uncontrolled or stop controlled pedestrian-bicyclist/vehicle conflict points (crosswalks, trail crossings, etc.).

Freight-Commodity Origin and/or Destination Areas in Region

Freight and commodities that travel through and within the region generally fall into one of three primary categories (for roadway and rail):

- Through traffic, the freight and commodities traveling through the MPO area on vehicles that do not stop in the region.
- Locally transshipped/transloaded freight or commodities destined for other areas/regions.
- Local originating or destined freight or commodities.

Through traffic will be addressed in a later section as part of the Truck Route review. Locally transshipped/transloaded freight or those with local origins/destinations are addressed in the next section.

[4] There are no formally adopted Truck Routes in Mandan. The identified routes Mandan routes reflect those that are commonly used by heavy commercial vehicles.

Freight Origin/Destination and Handling Facility Locations

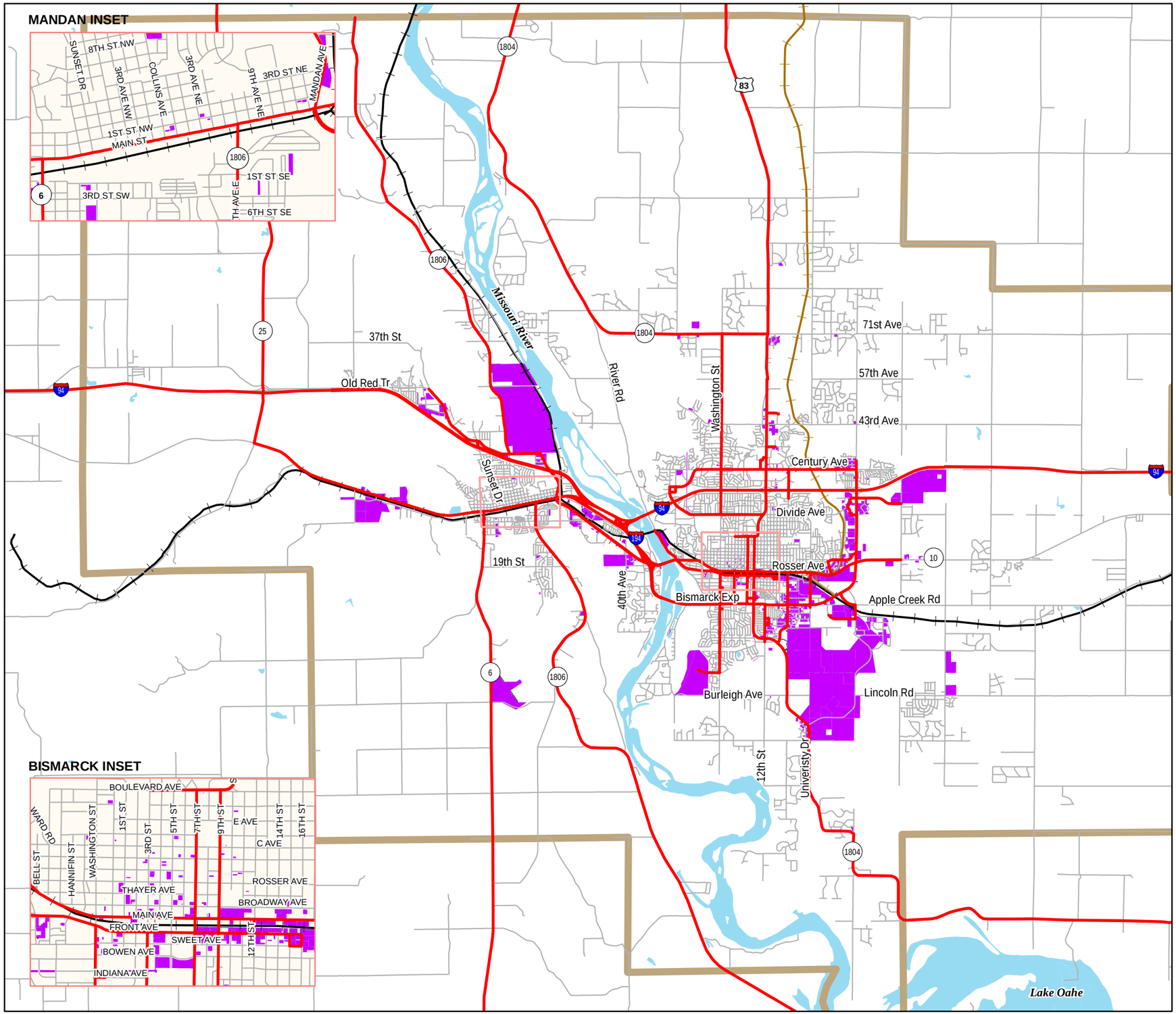
The focus of the freight assessment is on the larger, more intense activity centers, which are generally located in industrial parks or on individual industrial properties in the region. In either case, the properties would be located in areas zoned for industrial activities in one of the communities or within either county of the metropolitan area. Figure 14 displays the industrial zoned areas in the study area in relation to truck routes and rail lines.

Existing Truck Routes

Each of the jurisdictions in the MPO is sensitive to conflicts that are created when heavy commercial vehicle traffic is mixed with local vehicle, pedestrian and bike traffic. Addressing the sensitivity is not intended to portray truck traffic as a negative element in the community, but is simply recognition that mixing a range of activities in a single corridor (freight movement, recreational biking, commuter traffic, shopping traffic, sightseeing traffic, commuter biking, pedestrians, etc.) has the potential to create conflicts.

In addition, the jurisdictions have responsibility for managing the level of conflict that is occurring in the system. One means of managing the conflict potential is establishing a designated truck route system for the community. Just as land access and mobility are the primary criteria across a sliding scale for roadway functional classification, freight movement and people movement similarly fall along a sliding scale in assessment and designation of truck routes. Unlike the functional classification prioritization where access and mobility each are provided almost complete prioritization in selected classifications (i.e. local streets are almost exclusively adjacent land access and little mobility; principal arterials are almost exclusively mobility and little adjacent land access) the movement of people is always afforded the majority of the priority in all corridors. In designated truck routes, freight movement is provided a higher corridor priority through the following:

- Pavement that is designed for heavier loads.
- Providing non-motorized travelways separate from the roadway through setback sidewalks, separated multi-use trails and signalized pedestrian crossings. Non-motorized travel is not prohibited, but rather is separated from vehicles (both autos and trucks).
- Prohibiting pedestrians and bicyclists (such as along I-94 and I-194).



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Long Range Transportation Plan - 2035

Legend

Truck Routes

Truck Route*

Rail Lines

BNSF

DMVW

Industrial Land Use

Existing Industrial

* Mandan has not adopted official truck routes. The truck routes displayed in Mandan reflect routes on the NDDOT's Highway Performance Classification System, which allow trucks. The Old Red Trail segments included provide access to industrial areas used by heavy trucks.

N

0 1 2 4 Miles

Figure 14. Existing Industrial Land Uses in Relation to Rail and Truck Routes

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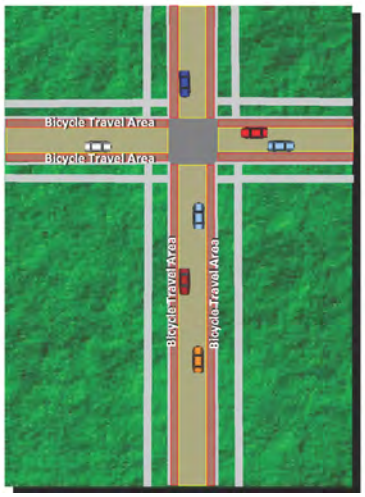
In regards to the second bullet from the list above, various sidewalk and trail treatments within road right-of-ways are illustrated below.

Examples of Sidewalk / Trail Treatments Road Right-of-Ways

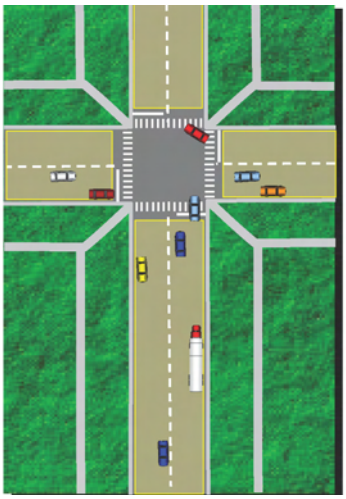
Local Route – No Sidewalk

- Single-Lane
- Acceptable to Mix Peds/Bikes/Vehicles in Travelway
- Smaller Curb Radius – Shorter Crossing Distance
- Uncontrolled Ped Crossings



Local Route - Sidewalks

- Single-Lane
- Acceptable to Bikes/Vehicles in Travelway
- Uncontrolled Ped Crossings
- Sidewalks with Minimal Setback Based on Snow Storage



Arterial Truck Route

- Multi-Lane Roadway
- Detached Sidewalk-Trail (Greater Setback)
- Larger Curb Radius to Accommodate Turning Trucks
- Marked/Signalized Ped Crossings
- Travelway – Restricted to Motor Vehicles Only

Assessment of the Existing Truck Route System

One key element of the freight evaluation is the current level of connectivity between industrial areas and the regional roadway system. Performance measures used in assessing the level and quality of connectivity are:

- **Performance Measure #1**: When heavy trucks are the primary means of moving freight:
  - All-season connections to/from the regional system should be available.
  - Access to/from the property should be available along a designated Truck Route.
- **Performance Measure #2**: Left and/or right turn lanes should be provided from arterial routes to industrial properties when warranted.
- **Performance Measure #3**: Traffic signals should be provided at entrances to individual freight terminals and industrial parks when warranted.

Performance Measure #1 is used for an initial assessment of the current freight system. Designated truck routes in the region, along with the industrial zoned properties/areas, are displayed in Figure 14. Industrial areas that satisfy the initial performance measure are bordered or bisected by a designated truck route, while industrial areas without direct access to a truck route would not satisfy the initial

performance measure. No substantial deficiencies relative to Performance Measure #1 were identified in the region.

While it is desirable to have industrial areas served by truck routes, it is undesirable in the region to locate trucks routes and residential properties in close proximity to one another. Thus, deficiencies in the system would be observed in residential areas with direct property/driveway access onto a truck route. Within the region, residential properties are located along much of the truck route mileage, but much of this residential development backs or sides to the truck route and does not have direct driveway access to the truck route. Corridors in the urban area that have direct residential access to a truck route include:

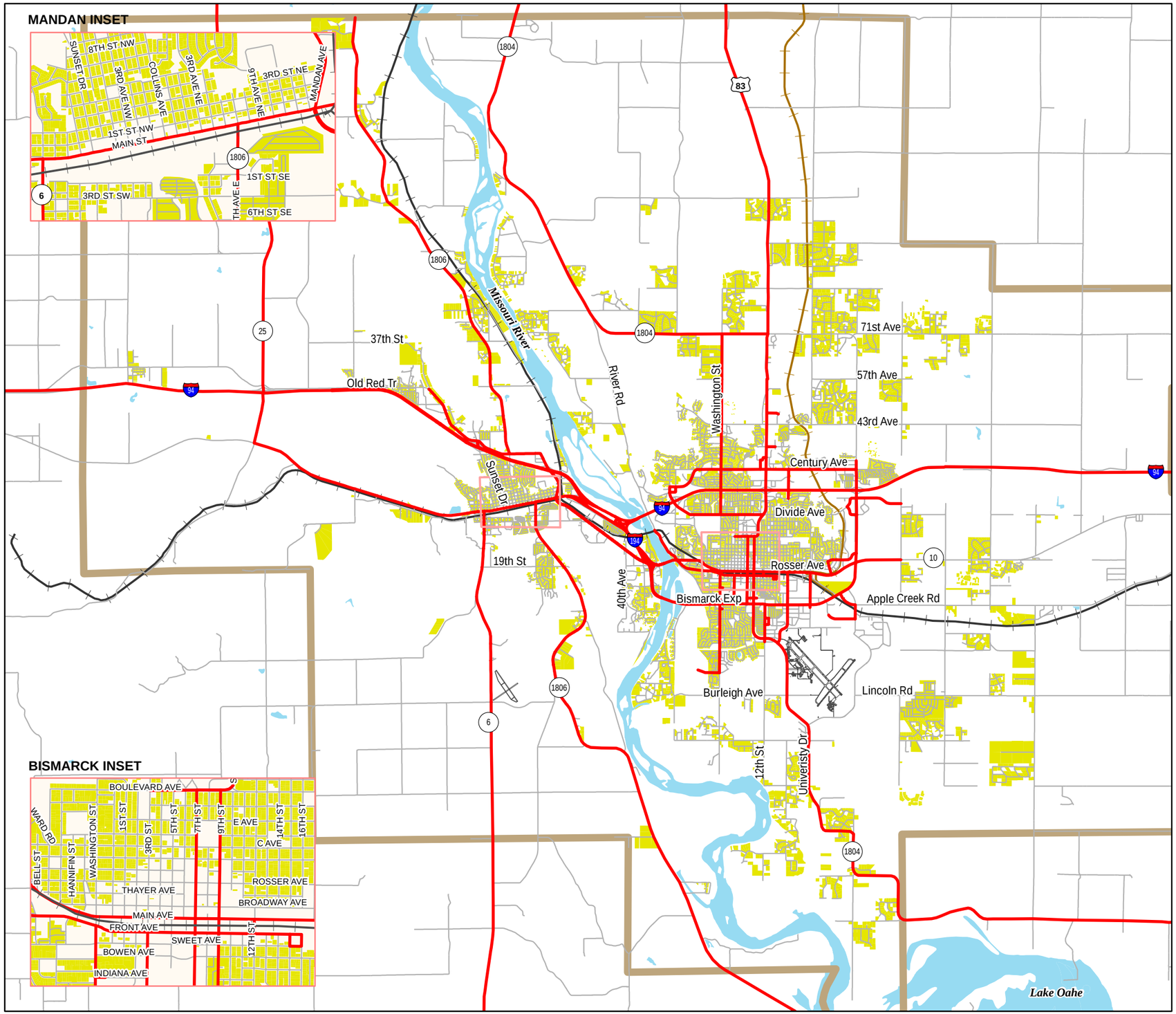
- South Washington Street from Denver Avenue to Augsburg Avenue, in Bismarck.
- North Washington Street from south of Century Avenue to Divide Avenue, in Bismarck.
- 7th/9th Street from Avenue B through Boulevard Avenue, in Bismarck.
- Divide Avenue from College Drive through State Street, in Bismarck.
- River Road from Fraine Barracks Road to Memorial Highway, in Bismarck.
- Old Red Trail south of Highland Road, in Mandan.
- Highland Road, in Mandan.

These conflict areas are illustrated in Figure 15, which shows residential areas and truck routes in the study area.

Non-Designated Routes Carrying Higher Truck Volumes

In general, the truck route system provides reasonable connectivity between the more intense truck generators and the regional shipping routes into and out of the area. There are, however, a number of routes that presently carry truck volumes (measured as a percentage of total daily vehicle traffic) consistent with designated truck routes, but the routes are not designated as truck routes nor are the roadways designed to address the conflicts that arise as a result of mixing activities (heavy commercial vehicles and pedestrians/bicyclists). Within the region, these facilities include:

- 71st Avenue from US 83 through Centennial Road, in Bismarck.
- Centennial Road from 71st Avenue to Century Avenue, in Bismarck.
- Washington Street from Divide Avenue to Main Avenue, in Bismarck.
- Lincoln Road from 66th Street to 52nd Street, in Lincoln.



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Legend

Truck Routes

Truck Route*

Rail Lines

BNSF

DMVW

Residential Land Use

Existing Residential

* Mandan has not adopted official truck routes. The truck routes displayed in Mandan reflect routes on the NDDOT's Highway Performance Classification System, which allow trucks. The Old Red Trail segments included provide access to industrial areas used by heavy trucks.

N

0 1 2 4 Miles

Figure 15. Existing Residential Land Uses in Relation to Rail and Truck Routes

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Freight Rail Service

The Bismarck-Mandan MPO area is served by the Burlington Northern Santa Fe (BNSF) Railroad and the Dakota, Missouri Valley & Western (DMVW) Railroad. The BNSF runs a combination of single and double track mainline through both Mandan and Bismarck as well as operation of:

- Switchyards in both communities.
- A transloading facility at the Northern Plains Commerce Center.

Three BNSF subdivisions of the Jamestown Subdivision, Dickinson Subdivision, and the Zap Subdivision come together in Mandan. The Dickinson and Jamestown Subdivisions combine with the KO Subdivision to create the BNSF mainline through the state. The mainline carries approximately 20 trains per day through Bismarck and Mandan. The DMVW is a single track short line rail road operating on a line between Bismarck and Max on track leased from the Canadian Pacific (CP) Railroad. The line is a relatively low speed track (10 miles per hour through much of Bismarck) that carries approximately one train per day along the line travel through northern Bismarck.

A focus area of the LRTP relative to freight rail is the rail crossings, and in particular at-grade crossings, where vehicle/pedestrian/bicyclist/train activities must be coordinated address potential conflicts. In terms of crossing safety, three vehicle-train crashes were reported at at-grade intersections in the 2005-2007 crash dataset reviewed for the LRTP update. The three crashes were classified as property damage only, and were located at three different intersections in Bismarck.

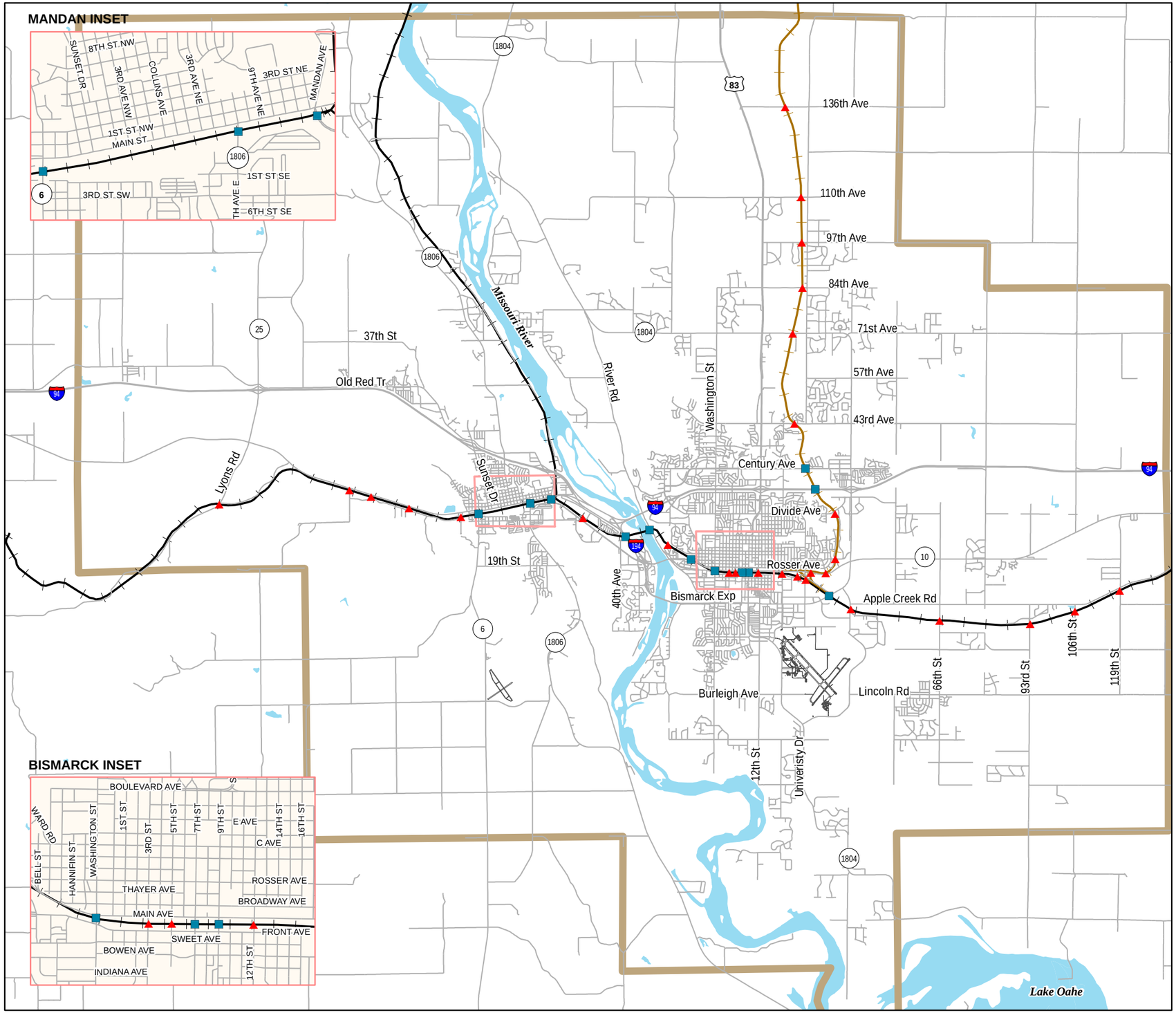
Table 4 documents attributes of each of the at-grade and grade separated railroad crossings through the MPO area, and Figure 16 displays each of the crossings.

Transloading Facility

The only transloading facilities in the MPO area are located at the Northern Plains Commerce Center (NPCC) along the BNSF line in southeast Bismarck. The NPCC transloading facility provides space along a single track for up to 10 railcars. The general type of commodities moved through the facility, according to information from BNSF and NPCC, are lumber and building materials, steel coil, pipe, and machinery. The NPCC transloading facility, which is fenced and provides outdoor storage for products/material, covers approximately 4.5 acres of the 240 acre facility.

Table 4. At-Grade Rail Crossings in Study Area

Railroad / Cross Street	Number of Tracks	Mainline/ Other	Average Trains Per Day	Crossing Protection		Train Speed (MPH)	Quiet Zone?	2006 ADT at Crossing
Burlington Northern Santa Fe RR								
119th Street	1	Mainline	19	Gates Signs	Flashers Bells	<60	No	no data
106th Street	1	Mainline	19	Gates Signs	Flashers Bells	<60	No	no data
93rd Street	1	Mainline	19	Gates	Flashers Bells	<60	No	no data
66th Street	1	Mainline	19	Gates	Flashers Bells	<60	No	2300
Yegan Road	1	Mainline	20	Gates	Flashers Bells	<60	No	No Data
26th Street	2	Mainline & Other	20	Gates	Flashers Bells	<35	No	9000
24th Street	4	Mainline & Other	19	Gates	Flashers Bells	<35	No	1900
19th Street/Airport Road	2	Mainline & Siding	19	Gates Signs	Flashers Bells	<35	No	9200
12th Street	4	Mainline & Siding / Ind	19	Gates	Flashers Bells	<35	No	6800
5th Street	1	Mainline	21	Gates Signs	Flashers Bells	<35	No	3000
3rd Street (Bismarck)	1	Mainline	21	Gates Signs	Flashers Bells	<35	No	10800
Fraine Barracks	1	Mainline	21			<35	No	no data
3rd Street (Mandan)	1	Mainline	21	Gates Signs	Flashers Bells	<35	No	1100
15th Avenue SW	1	Mainline	22	Gates	Flashers Bells	<20	No	200
? Sunny to 94B Connector	1	Mainline	22	Gates	Flashers Bells	<20	No	no data
? Sunny to 94 B (gravel?)	2	Mainline & Siding	22	Gates Signs	Flashers Bells	<50	No	no data
24th Avenue West	1	Mainline	22	Gates	Flashers Bells	<50	No	no data
Lyons Road	1	Mainline	22	Gates	Flashers Bells	<50	No	1100
Dakota, Missouri Valley & Western RR								
Main Avenue	1	Mainline	2	Gates Signs	Flashers Bells	<40	No	7300
Eastdale Drive	1	Mainline	2	Signs		<40	No	1475
Rosser Avenue	1	Mainline	1	Gates Signs	Flashers Bells	<20	No	5700
Divide Avenue	1	Mainline	1	Signs		<35	No	3350
43rd Avenue	1	Mainline	1	Signs		<40	No	2650
71st Avenue	1	Mainline	1	Gates Signs	Flashers Bells	<35	No	4000
84th Avenue	1	Mainline	1	Signs		<35	No	no data
97th Avenue	1	Mainline	1	Gates Signs	Flashers	<35	No	no data
110th Avenue	1	Mainline	1	Signs		<35	No	no data
136th Avenue	1	Mainline	1	Signs		<35	No	no data



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Legend

Rail Lines

BNSF

DMVW

Rail Crossing Type

At Grade

Grade Separated

Miles
0 1 2 4

Figure 16. At-grade and Grade Separated Railroad Crossings

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December 1, 2009

AIR TRANSPORTATION

The Bismarck-Mandan area is served by two airports: the Bismarck Municipal Airport and the Mandan Municipal Airport. Planning for the operations of the airports themselves are not within the MPO's planning mission. However, for the purposes of the Long Range Transportation Plan, it is important to understand the interactions of these two airports with the land-based regional transportation system. Thus, this plan recognizes that airport activity does affect the regional transportation system, and this section defines the level of existing service at the airports.

The Mandan Municipal Airport is a general aviation airport located four (4) miles south of Mandan along Highway 6. The airport offers fueling services, hangers and tie downs and two runways: one asphalt and one turf. The Mandan airport has 32 based planes and averages 22 operations per day, including local general aviation, transient general aviation, military and air taxi operations.

The Bismarck Municipal Airport is located on the south side of Bismarck, with its primary access located off of University Drive/ND 1804. In 2007, ND 1804 was upgraded from a rural two-lane to a four-lane with a center left turn lane from approximately the University of Mary four miles to the south to the previous four-lane section. While there were not operations concerns at the airport entrance with the old section, expansion of the corridor will provide adequate capacity into the foreseeable future and improve safety at the airport access by providing a separated turn lane to remove slower or stopped vehicles from the through lanes that are carrying higher speed traffic.

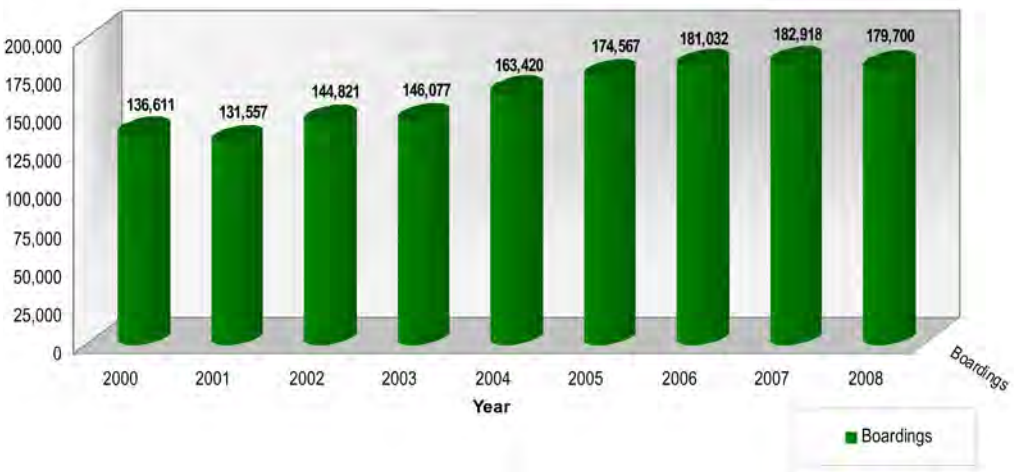
The airport provides commercial air service and general aviation operations to the region. The commercial air passengers are served by a relatively new terminal constructed in 2005, and service is provided by three airlines:

- Allegiant Air, with arrival and departure flights four days a week to/from Las Vegas and Phoenix/Mesa.
- Delta/Northwest Airlines, with six arrival and six departure fights daily to/from Minneapolis and Salt Lake City.
- United Airlines, with four arrival and three departure flights daily to/from Denver and Chicago.

Figure 17 shows how commercial passenger activity at the Bismarck Municipal Airport has risen steadily over recent years, increasing by 33 percent between 2000 and 2007. Boardings decreased 1.8 percent between 2007 and 2008, but the Bismarck Municipal passenger decrease was less than the national passenger drop of 3.8 percent during the same period.

The overall trend of growing commercial air service at Bismarck Municipal Airport will have *some* effect on multimodal surface transportation system demand adjacent to the Airport.

Figure 17. Bismarck Municipal Airport Boardings, 2000 to 2008



Source: Federal Aviation Administration, Air Carrier Activity Information System, Form 41 Schedule T-100 Database.

FUTURE BISMARCK-MANDAN HOUSING, EMPLOYMENT AND TRAFFIC ESTIMATES

LAND USE-TRANSPORTATION OVERVIEW

Land use planning and land development control transportation planning. Transportation planning controls land use planning and land development. These two statements launch discussions that do not have consistent conclusions from community-to-community, or even for different areas across the same community. What can be consistently concluded, however, is that land use planning and land development influence transportation planning and transportation planning influences land use planning and land development.

From the land use planning and land development perspective, the location, mix and density of uses are the most influential factors affecting transportation planning, as they expand or contract the breadth reasonable opportunities for location and transportation modal investment. Consistently, communities shape how their land develops (where development occurs, what types of development occur and the density of development) based on its transportation investment decisions. These investment decisions are where it builds its transportation infrastructure and the modes (roadway, transit, bicycle, and/or walking) in which it invests.

The back and forth connection between land use planning/land development and transportation planning was a guiding consideration throughout the LRTP update. The land development plans incorporated into the transportation planning process:

- Represent the most up to date assumptions on location, type, intensity and mix.
- Reflect locally approved/supported assumptions, which means also that the land use/land development assumptions have been discussed publicly and reflect input by stakeholders.

Completing an iteration of the transportation planning and land use planning/land development cycle assumes that the recommendations prepared as part of the LRTP process will also be incorporated into the land use planning process and land development plans. If the cycle is not completed, the information exchange chain is broken which can lead to inconsistent assumptions and ultimately conflicting action plans between land use and transportation.

For the transportation plan preparation, land development plans are expressed as population, households and employment levels reflective of 2008 (base year) and the 2035 planning horizon. The change/increment of population, households and employment forecasted for the region reflect the land development plans developed as part of the following regional and/or subarea land use planning activities:

- 2006 adopted *Bismarck-Mandan Regional Future Land Use Plan*.
- 2007 adopted *US Highway 83 Corridor Transportation Study.*
- *South 12th Street Stormwater Master Plan* .

LAND DEVELOPMENT ASSUMPTIONS OF THE TRAVEL DEMAND FORECASTS

The two primary items associated with the development concept were:

- Establishing the **regional control totals** for total anticipated metropolitan housing and employment in 2035. The control totals provide a summary of the increment new households and employment, or *how many* new houses and jobs are anticipated to be added between 2007 and 2035.
- Determining the **allocation** of the new household and employment regional increment, or *where* new houses and jobs will be located.

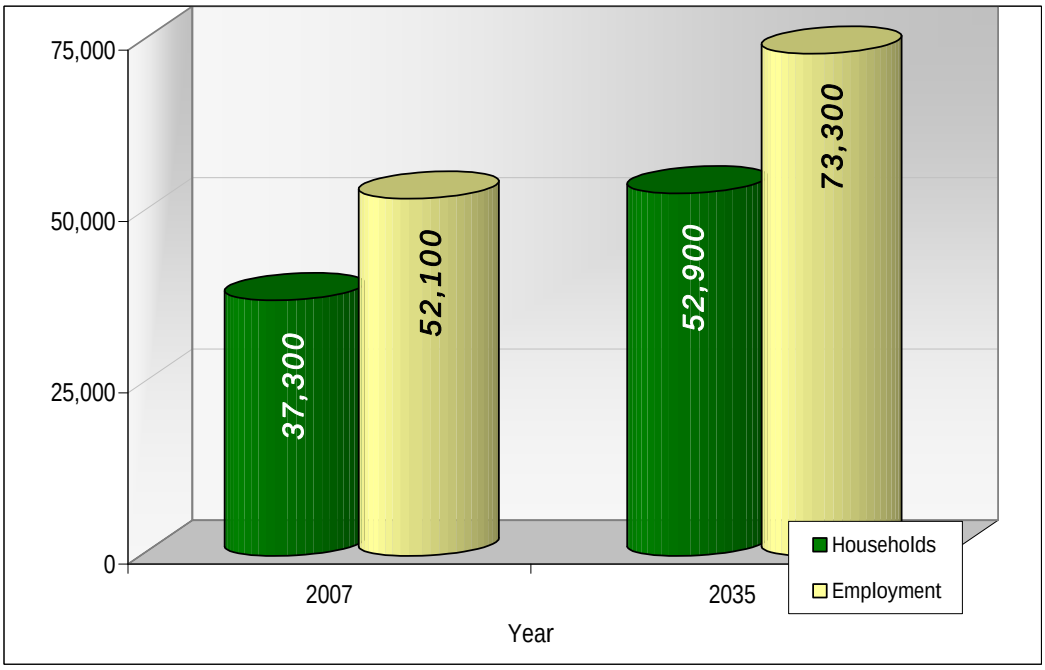
The development concept is a key input to the transportation plan update process. The growth areas identified by the development concept are the primary sources of *new* trips/traffic on the multimodal transportation system within the region between today and 2035.

2035 Regional Control Totals

The 2035 regional control totals were developed based on collaboration with staff from local jurisdictions in the region, reviewing their plans and available data. MPO staff reviewed the data and confirmed that the housing and employment projections received were relatively consistent with historical trends. Employment was divided into retail jobs, service jobs and other-sector jobs. The regional control total household and employment projections are provided in Figure 18. As shown, it is expected that households and employment in the Bismarck-Mandan region will both grow by approximately 40 percent by 2035.

There are many factors that affect how a metropolitan area grows over time. Most of those factors are active, changing and not controlled by any single entity, such as the national and regional economy, decisions of individual local businesses, and unforeseen trends in demographics, migration and technologies. Given the uncertainties associated with projecting future population, housing and employment, the regional control total projections for housing and employment

Figure 18. Bismarck – Mandan MPO Study Area Housing and Employment Projections, 2007 to 2035



Source: Bismarck-Mandan MPO

were checked against two other sources of information for consistency and reasonableness:

- Employment and housing projections from an independent firm, Woods and Poole, specializing in economic/demographic forecasts.
- Historical Bismarck-Mandan housing and employment trends fit to a regression model and extrapolated to the year 2035.

In both comparisons, the development concept regional control totals were quite similar to the other sources of data. As a result, the regional control totals were believed to be a reasonable projection of future development levels.

2035 Development Concept Allocation

After establishing the regional control total projections, which dictate *how much* housing and job growth should be expected by 2035 in the Bismarck-Mandan region, the next step was to determine *where* that growth would go.

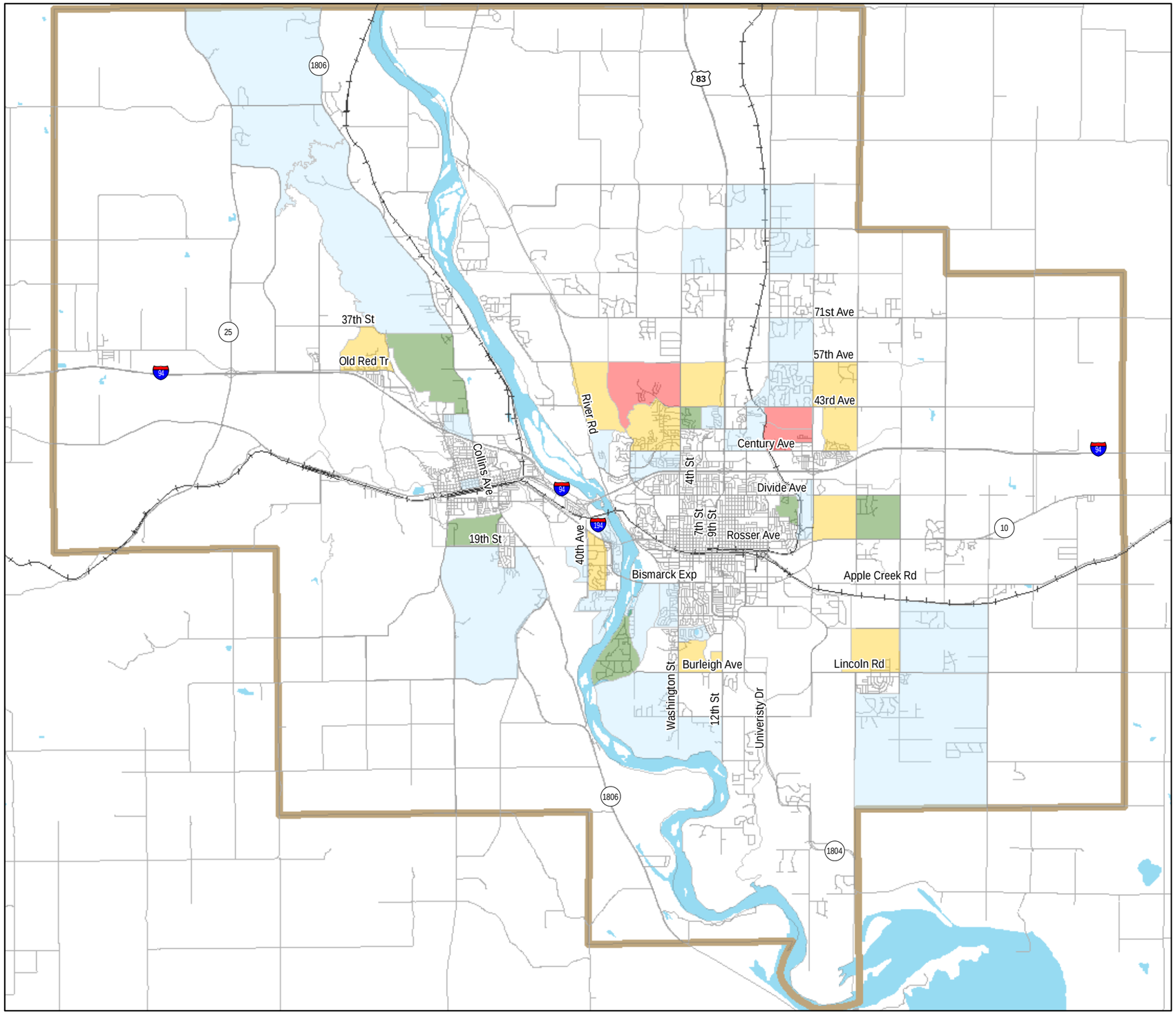
The allocation of forecasted new jobs and households was first based on discussions with local planning staff, getting their feedback on areas where development activity was happening or where interest in development was occurring. These discussions also involved an evaluation of how much development growth areas could/should absorb in terms of development capacity, taking into account land

suitability, infrastructure capacity to those areas, building permits and consistency with historical development patterns.

As discussed in the introduction to this chapter, a second element that influenced the 2035 development concept allocation was a review of the several planning efforts that have been carried out recently in the Bismarck-Mandan region, including: the 2006 *Regional Future Land Use Plan*. MPO staff also relied on other corridor studies that have been completed in the region, including the *US 83 Corridor Study* and *South 12th Street Storm Water Master Plan*. The amount of land considered in these previous studies included an area of development well beyond the 2035 horizon. In an effort to identify the specific locations and intensities in which development would occur, MPO staff:

- Developed a land use allocation model in ArcGIS Spatial Analyst. For the Urban Residential, Rural Residential, Retail/Service Employment, and Other Employment land uses a variety of criteria were developed including proximity to water and sewer lines, proximity to existing and future streets, proximity to incorporated communities, slope, cultural resources, surface water/wetlands, floodplains, and future land uses. It was assumed that the land uses would correspond to the uses identified in the aforementioned adopted land use studies. The resulting output identified optimal locations for specific types of land uses to develop based on the criteria used.
- The results of the model exercise were brought to staff of the local jurisdictions to review and refine. Staff provided input where they felt development may actually occur based on their experiences to further refine or in some cases deviate from the model output.

Through this process of using the previous land use planning work as a guide and applying GIS tools and knowledge of local development patterns and land suitability, the MPO and local planning and development staffs worked together and agreed on a likely future development allocation in each planning jurisdiction. The development concept allocation of new housing is shown in Figure 19. The development concept allocation of new jobs is shown in Figure 20. In both figures, the new housing and employment growth is shown at the level of traffic analysis zone (TAZ), which does not necessarily correspond to the level of parcel or subdivision. TAZs are the basic geography of the travel demand model (described below), which is used to estimate future travel levels in Bismarck-Mandan. Note that Figures 19 and 20 do not show *total* housing and employment, just where the *new* jobs and households between today and 2035 are anticipated to be located.



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Legend

Household Growth

- 50 or Less
- 51 to 200
- 201 to 500
- 501 to 1,000
- More than 1,000

N

Miles
0 0.751.5 3

Figure 19. Locations of Household Growth, 2007 to 2035

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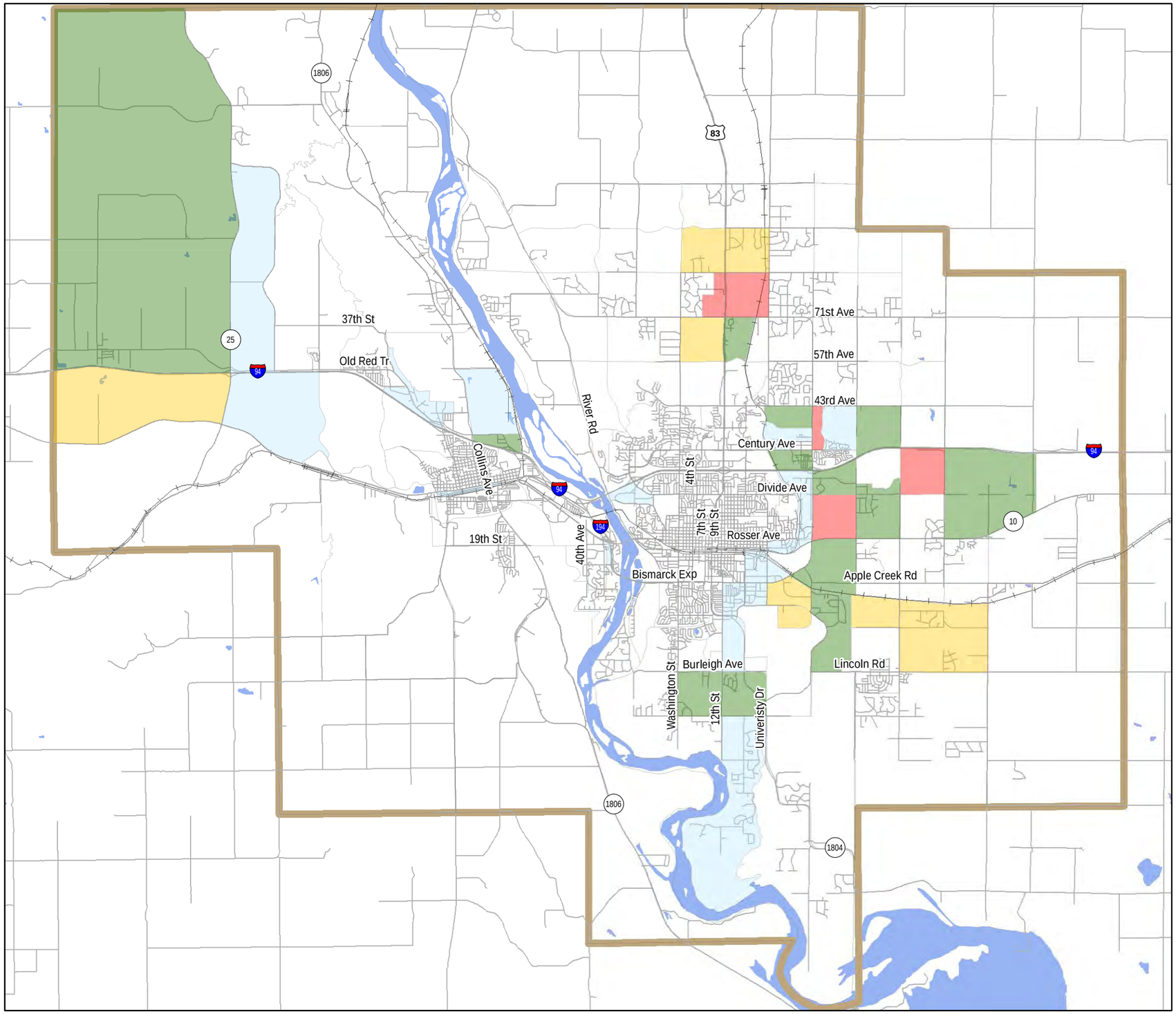
February 17, 2009



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Legend

Employment Growth

- 50 or Less
- 51 to 200
- 201 to 500
- 501 to 1,000
- More than 1,000

Miles
0 0.75 1.5 3

Figure 20. Locations of Employment Growth, 2007 to 2035

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February 3, 2009

2035 Traffic Forecasts

The basis for the 2035 daily traffic forecasts is the *Bismarck Mandan Travel Demand Model*. The travel model is a computer application developed and maintained by the MPO as a tool to evaluate how people travel. The model estimates travel based on information it is provided on where people live, work, shop and recreate (land uses). The model also is provided information on the transportation infrastructure that is in place (street system). Based on the land use and street system information provided to the travel model, it can be used to look at the interaction between the two. Specifically, the travel model can be used to:

- Estimate the traffic levels associated with a specific level and type of land development, such as estimating how much traffic would occur with a new retail center or housing development. These "what if" scenarios can be done with either a current or future time frame and can help us to gain an understanding of the potential traffic impacts associated with new/ different land use scenarios.
- Estimate the travel effects of changes to the roadway network, such as the effects on traffic volumes if a new street is added or if an existing street is widened. Thus, through changing the input roadway characteristics, the travel model allowed the study team to test various transportation system changes/alternatives identified through the course of this study.
- Determine the effects of not making a particular transportation system improvement. As the model has the capabilities to assess how congestion on various routes results in people diverting through neighborhoods to avoid congested arterial routes and how congestion results in longer travel times between two points, it is a good tool to provide information regarding "what if we do not do this".

As noted in the "Existing Transportation System Conditions" chapter, the primary mode of travel in Bismarck – Mandan is via automobile. For this reason, the travel model is constructed to estimate travel on the roadway network, and does not evaluate bus, bicycle and pedestrian travel. The study team did use some elements of the model to complete evaluations of travel growth areas to identify candidate locations for potential transit service and non-motorized network extensions.

The 2035 daily traffic forecasts required two separate travel model development steps:

- **Validation**, the process of adjusting the model parameters so that it more accurately reflects observed traffic levels/patterns. Staff from the Advanced Traffic Analysis Center (ATAC) at North Dakota State University updated and validated a base year (2007). ATAC's travel model validation report is included for reference in Appendix C.
- **2035 Travel Model Base Scenario** development, which updated the validated 2007 model to represent the "base" future condition. This 2035 base travel model includes:

- Forecasts of 2035 housing and employment growth included in the development concept.
- The "Existing-plus-Committed" (E+C) condition future roadway network. The base network includes only the current street and roadway system, and includes improvements that are programmed on the MPO's four-year TIP (those projects for which funding has already been identified, and construction is anticipated in the short-term). The TIP projects included in the E+C condition are:
    - Widen Century Avenue to a four-lane arterial with turn lanes from Hamilton Street to Centennial Road.
    - Widen Centennial Road to a four-lane arterial with turn lanes from Trenton Avenue to Jericho Avenue.
    - Reconstruct and widen Divide Avenue from Volk Street through Bismarck Expressway.

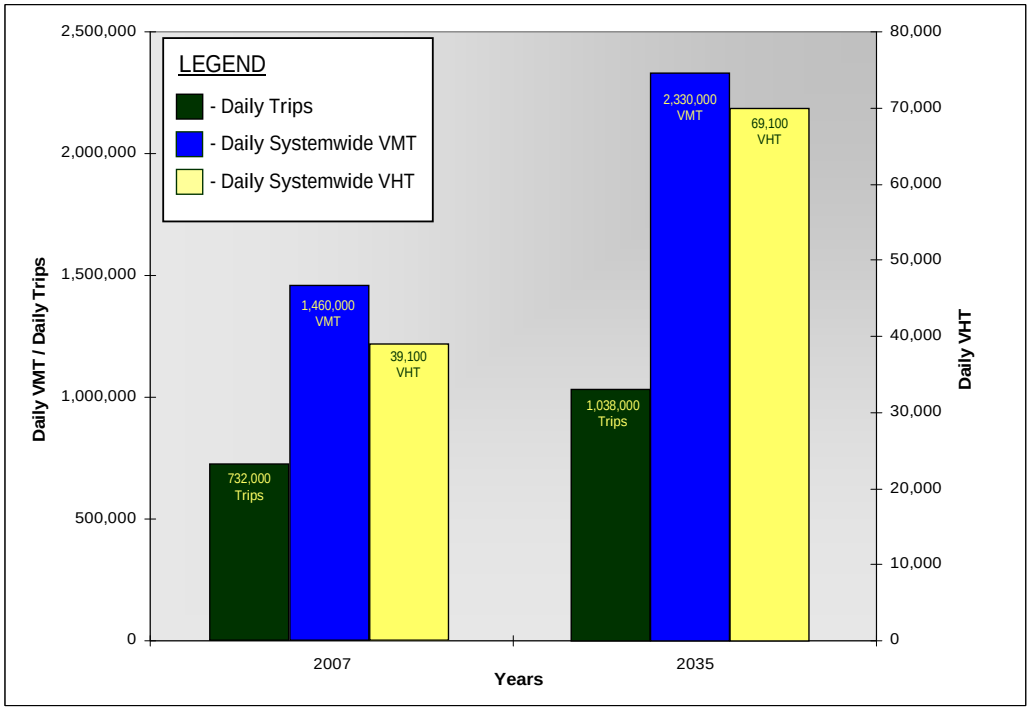
The 2035 E+C roadway network scenario was the starting point for the development of future improvement alternatives. It represents a scenario where 26 years of anticipated land development/growth occurs, the travel demand/increased traffic associated with that new development is accounted for, but the roadway network is not improved beyond those projects programmed in the 2010-2013 TIP.

Traffic volumes for 2035 were forecasted by applying the travel model, based on the 2035 household and employment levels projected in the development concept. Figure 21 documents the existing and forecasted 2035 E+C network trip levels for the study area, from three different perspectives.

The travel demand perspectives shown in Figure 21 are:

- **Trip generation** growth, providing a summary of the daily number of trips that occur across the metropolitan area. Trip generation is projected to increase by approximately 42 percent, a rate similar to the level of housing and employment growth.
- **VMT** growth, which is a calculation of the number of metro area trips multiplied by their trip length. VMT between 2007 and 2035 is projected to grow by more (60 percent) than trip generation (42 percent), indicating that the average trip length is forecasted to increase over the planning horizon. This should be expected, given that the majority of new development is anticipated to occur on the fringe of existing development.
- **Vehicle Hours Traveled (VHT)** growth, a summary of the total, daily metropolitan travel time. VHT is projected to grow 77 percent between 2007 and 2035, greater than trip generation growth or VMT growth. This comparison indicates that systemwide travel time and congestion (which is measured in travel time) will increase if improvements are not made.

Figure 21. Bismarck-Mandan Regional Travel Demand Summary, 2007 to 2035



Source: Bismarck-Mandan MPO Travel Model

The daily traffic forecasts associated with the 2035 E+C roadway network are presented in Figure 22.

2035 Existing-Plus-Committed Traffic Operations

Regional 2035 baseline traffic operations were estimated for all functionally-classified regional roadways, based on the 2035 traffic forecasts and the estimated roadway capacities in the E+C scenario. Roadway segments are considered "deficient" when traffic flow is estimated to operate at LOS D or worse. Figure 23 illustrates those segments which are forecasted to operate at LOS "C" (approaching deficient) or LOS "D" or worse (deficient) in the 2035 E+C condition.

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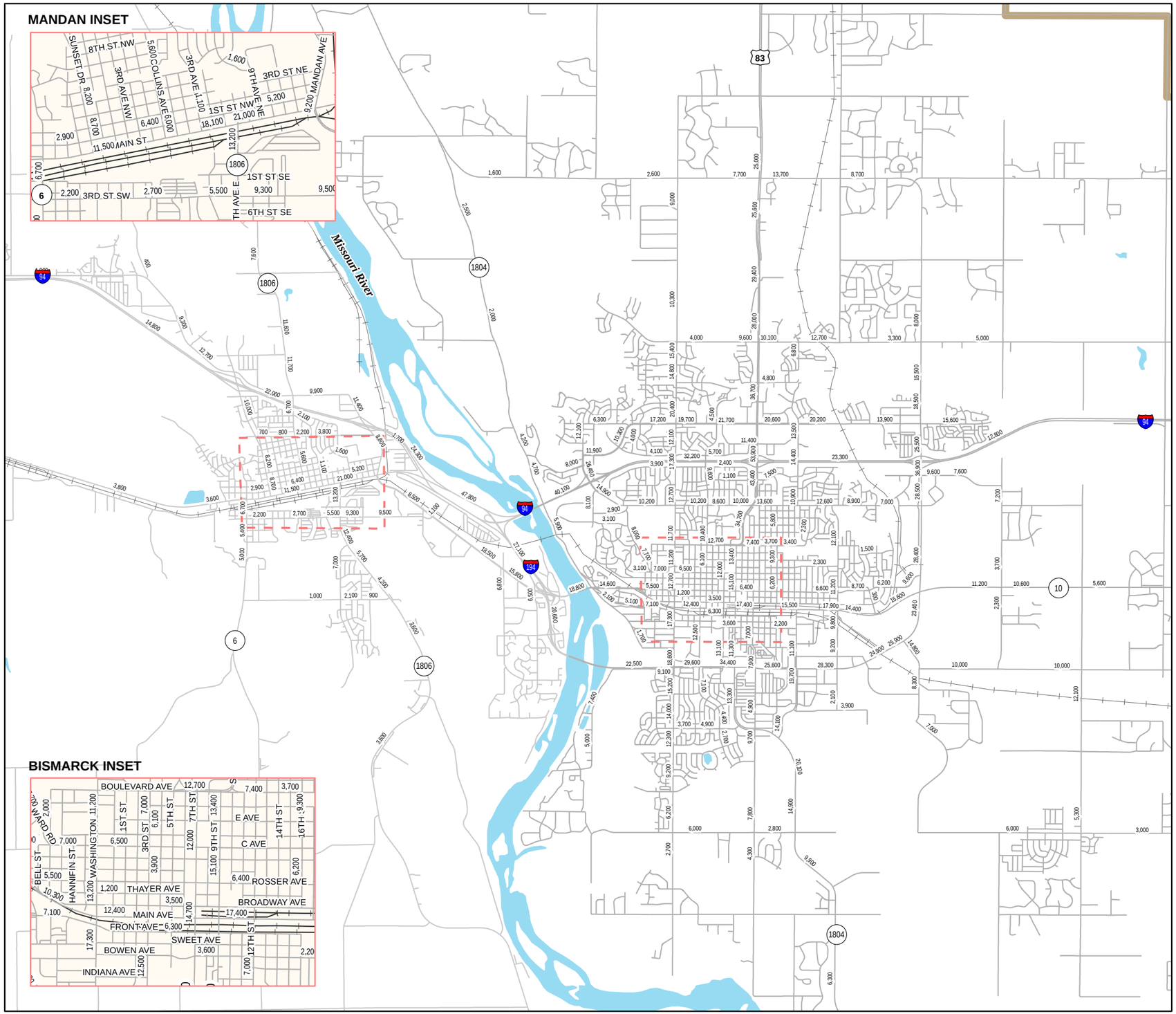

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Legend

8,200 2035 Daily Traffic Forecast

N

0 0.5 1 2 Miles

Figure 22. 2035 Daily Traffic Forecasts
E+C Scenario

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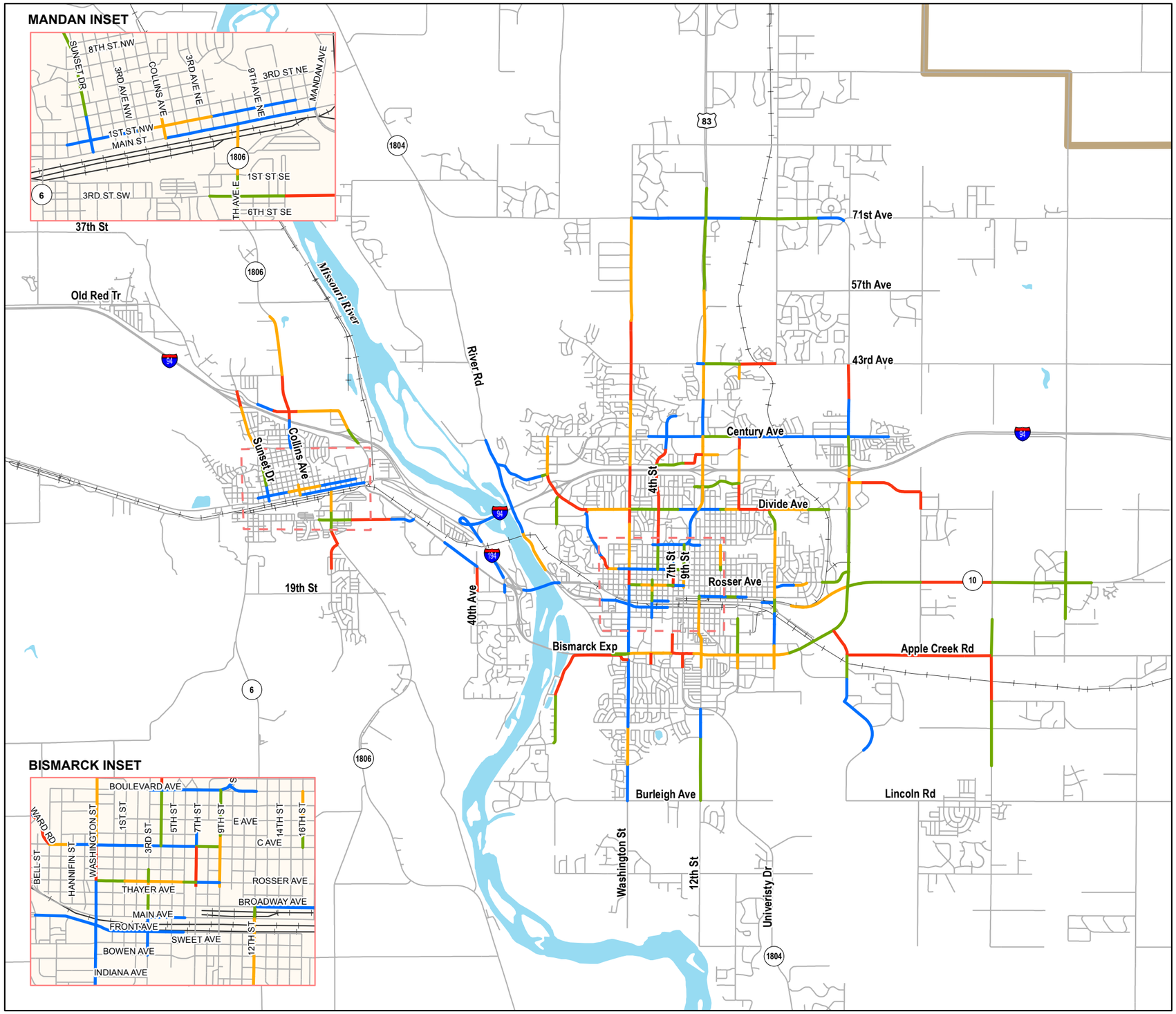
February 17, 2009



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2035 Level of Service

- LOSC
- LOSD
- LOSE
- LOSF

Note: Level of service estimates reflect conditions during peak hour of traffic.

N

0 0.75 1.5 3 Miles

Figure 23. 2035 Traffic Operations, E+C Scenario

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February 17, 2010

MULTIMODAL TRANSPORTATION ALTERNATIVES ANALYSIS

OVERVIEW

To this point in the Long Range Transportation Plan document, the update focused on two primary areas: establishing plan direction and evaluating how the current and future multimodal system works. The direction was set by garnering feedback from the public and stakeholders and through establishing study goals and objectives. The alternatives analysis involved developing potential solutions to the issues/deficiencies that were raised, while tailoring the evaluation perspectives to reflect the direction provided by public input, such that the recommendations reflected in the community's values.

The alternatives analysis process incorporated both quantitative and qualitative approaches to reviewing the range of concepts for potential inclusion in the LRTP. As the priorities of the community are quite diverse in terms of what individuals/groups want done (build new roadway corridors, improve the trail system, enhance transit, etc.), and there is no truly mathematical way of balancing conflicting priorities, so qualitative assessment based on broad community input must be brought into the process.

Through the alternatives analysis the range of improvements in each of the modal systems (roadway, transit and non-motorized) included:

- **Travel demand management (TDM)** alternatives, those intended to alter the level or timing of vehicle or person travel. Examples of TDM measures are carpooling/ vanpooling, staggered work hours (flex-time) to reduce peak hour travel, telecommuting, etc. Formalized TDM approaches would be relatively new to the Bismarck-Mandan region, and these alternatives are described in more detail later in this chapter.
- **Transportation system management** alternatives are minor improvements to the existing system, including adding turn lanes to intersections, improving the efficiency of signal system operation to increase the hourly throughput capacity of an intersection or corridor, conversion of two-way streets into one-way flow, modification of transit routes or arrival/departure times at specific locations to better serve the travel needs of the population, add electronic fare collection to improve the efficiency of moving people onto transit vehicles,

adding user amenities to a trail corridor, investing into efficient building technologies, etc.

- **Expanding current facilities/programs or developing new facilities/programs**, which provide additional through capacity in existing corridors, or entail construction of new roadway or pedestrian/bicyclist routes, adding service hours along a current transit route, extending multi-use trails, increasing the frequency of buses in a corridor, etc.

As with each of the key elements of the plan, the transportation goals and objectives were incorporated into the multimodal alternatives analysis, through utilizing the measures of effectiveness in the alternatives screening. The measures of effectiveness were developed as part of the transportation goals and objectives preparation and represent the benchmark criteria against which each of potential improvement was compared. As illustrated previously in Table 1, the measures of effectiveness are benchmarks, based on the goals and objectives, used to evaluate how well each of the alternatives reflect the community's vision for the transportation system.

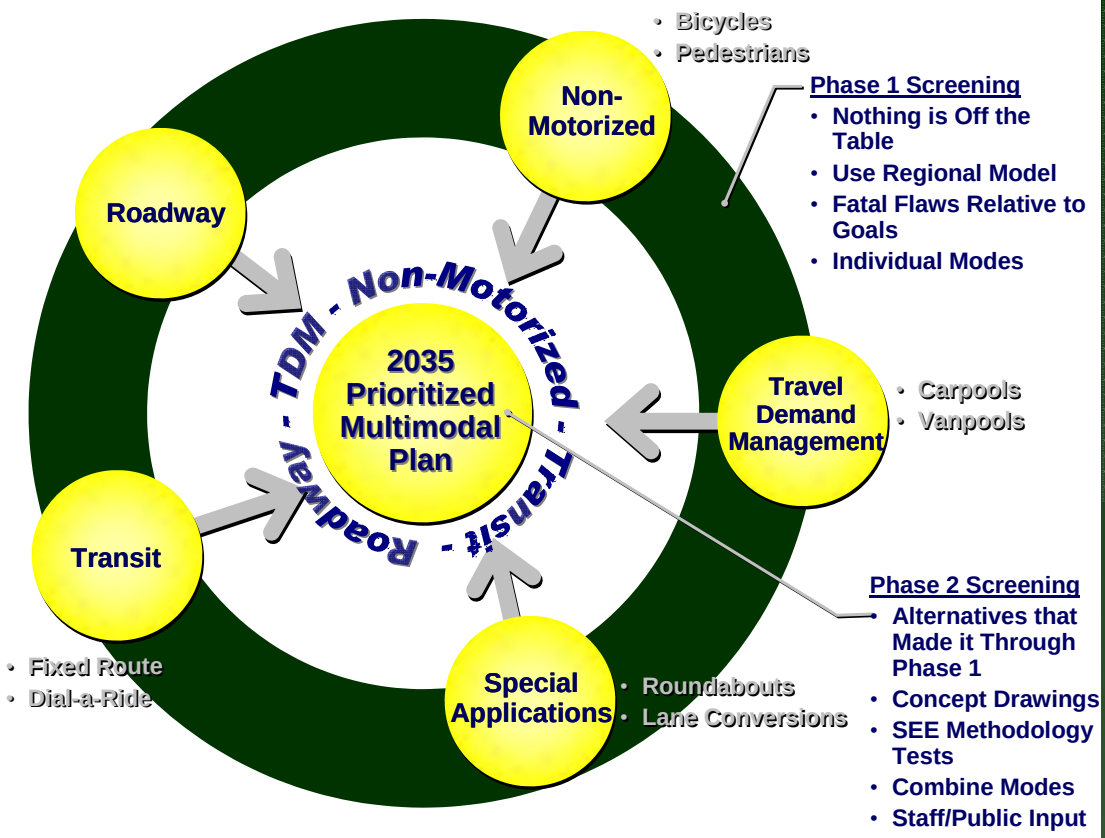
ALTERNATIVES SCREENING PROCESS

To efficiently sort through the relatively numerous and wide-ranging set of potential system improvements, a two-level alternatives analysis process was used:

- The **Phase 1 Screening** narrowed the list of potential alternatives by removing those concepts that did not reasonably reflect the transportation goals or did not have local support. The first phase allowed the study team to review a broad range of alternatives, while still completing the assessment in a reasonable time frame, by reviewing the alternatives in more broadly-described measures and removing those with fatal flaws.
- The **Phase 2 Screening** included more detailed assessments for those alternatives that were maintained through the Phase 1 screening, evaluating the positive and negative aspects of the improvement concepts relative to the evaluation criteria. A prioritized listing of the remaining projects was the product of this phase, and was used as a tool in determining the final list of projects/concepts to be included in the transportation plan. The prioritized list was based on how well individual or combinations of alternatives performed compared to other alternatives when considering the criteria.

The two-phase alternatives analysis process is illustrated in Figure 24.

Figure 24. Illustration of the Multimodal Alternatives Analysis



The alternatives analysis for the roadway, transit and non-motorized systems followed similar screening processes in evaluating the alternatives. The steps for the non-motorized and transit systems were streamlined from the process employed for the roadway system because there was not the same level of selection between multiple improvement options for a particular issue. Thus, for the non-motorized system the process jumped forward to the second level screening (documented below) and for the transit system only the first level of screening was conducted. The generalized screening process was completed through the following steps:

- Define current and future multimodal transportation needs in region. Current and future needs were defined through information gathered during the public involvement process and through technical analysis of the system safety, traffic operations, and economic development
- Work with the TAC and Community Committee to identify a range of improvements that could address the transportation issue/deficiency. Document the range of improvements and solicit input.
- Conduct an initial screening of the range of alternatives. For those locations where multiple concepts were identified to address a specified need or issue, an initial screening was conducted in order to reduce the range of potential alternatives to a preferred concept. Analyses that covered the

traffic impacts of the alternatives and a general assessment of the physical impacts to the adjacent area were conducted for individual areas of need rather than grouping them into packages of improvements. Through this individual idea analysis, the positives and negatives of the specific concept could be documented.

- The results of the initial screening were documented in a matrix format and presented to the TAC and Community Committee prior to a screening workshop held in March 2009. Documentation of the initial screening assessment was presented at a pubic meeting held in April 2009. The initial screening is summarized in Appendix D.
- A second level screening was conducted, where each of the alternatives maintained through the initial screening were reviewed in greater detail and cost estimates were developed for each alternative program/project. The alternatives were reviewed relative to the following perspectives:
    - Social effects
    - Engineering feasibility
    - Environmental impacts.

  A second level alternatives workshop was held in May 2009. The second level screening is summarized in Appendix D.
- The second level screening included a project scoring system that was used to score, in relative terms, how each alternative would meet the Plan goals and objectives, and the community vision. Using the scoring system each improvement concept was evaluated using a scale from 0 to 6 in a broad range of criteria categories. The criteria addressed the impacts/benefits of a project from the social, engineering and environmental perspectives. The approach and results of the prioritization are documented in Appendix D.
- A series of preliminary project/program "packages" were developed that addressed the various transportation needs and were within the anticipated funding availability through 2035. Packages that focused on a range of themes were presented to the TAC to gather input. Packages were revised and modified a number of times, and a combined version that included elements of the various packages was presented to the community at the August and September 2009 public meeting. The packages that were considered are documented in Appendix D.

Not all of the higher-scored projects were included in the recommended plan, because the recommended plan is required to be cost constrained and the cumulative cost of the projects maintained through the second level of assessment far exceeded the likely available transportation funding. Thus, one more step was required in selection of the plan projects. The combined final package reflected a concept that:

- Incorporated elements for each of the systems; roadway, transit and non-motorized.

- Directly addressed many of the key transportation needs in the region.
- Was consistent with the plan Goals and Objectives.

The recommended multi-modal projects and programs are documented in the "Recommended Transportation Plan" chapter.

TRAVEL DEMAND MANAGEMENT ALTERNATIVES

As noted earlier in this chapter, formalized travel demand management programs would be a relatively new concept to the Bismarck-Mandan region, and warrant some additional discussion in regards to alternatives. Evaluation of TDM alternatives falls somewhat outside of the alternatives screening process, as the program elements are really intended as a complement to the existing and future multimodal system. Thus, the process of identifying recommendations for TDM activities in the Bismarck-Mandan region involves reviewing the toolbox of TDM options that might be available, and determining which of those TDM alternatives are both feasible to implement and would provide the most benefit given limited resources.

TDM programs have traditionally been viewed as viable options only in corridors and urban areas where travel comes at a higher cost. Cost is broadly defined as the time lost due to congestion, parking shortages and/or additional transportation costs such as tolls and parking fees. Communities such as Bismarck-Mandan, with limited congestion and relatively high parking accessibility, have traditionally had little incentive to actively implement TDM programs. Through the 2010-2035 LRTP update process, the MPO has placed more emphasis on the demand side of the solution when addressing transportation issues.

TDM programs for the Bismarck-Mandan region are specifically supported by two LRTP objectives related to Goal #5, *Address the transportation system's impact on the built, social and natural environment*:

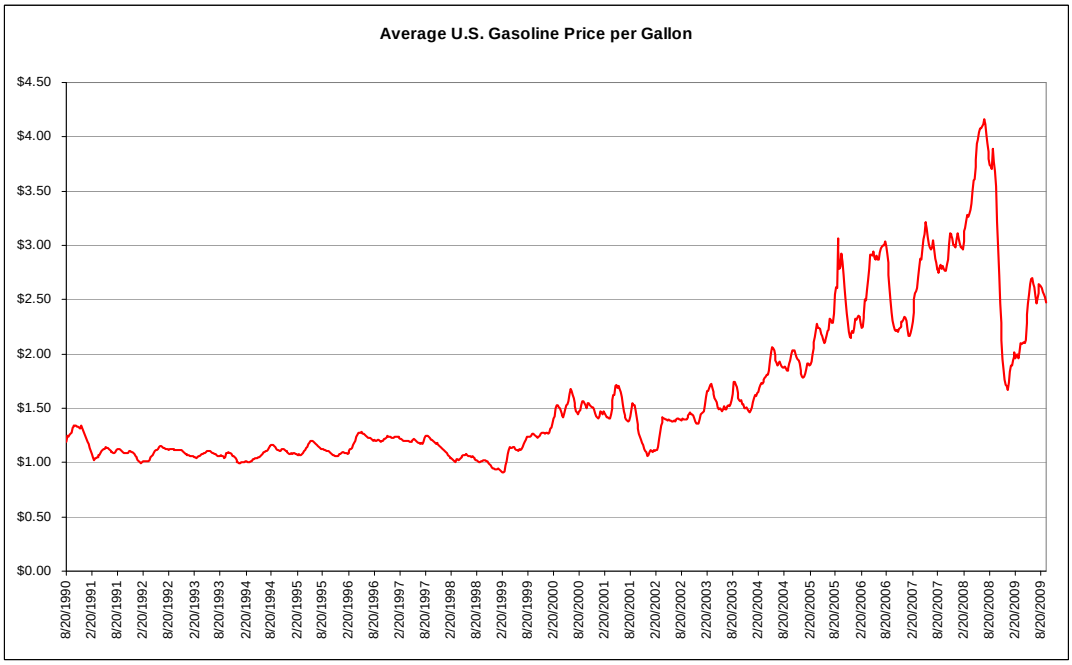
- Promote transportation projects, plans and/or programs that encourage reducing energy consumption.
- Reduce the pressure to expand the current system and improve the performance of the existing roadway system by implementing programs that increase average vehicle occupancy rates

In addition to being supported by the community vision for the regional transportation system, two emerging factors make providing an active TDM program in the Bismarck-Mandan region potentially more viable for the 2035 LRTP:

- The first is the volatility and anticipated future increases in the cost of gasoline. Gas price increases last year made the cost of automobile trips increase substantially. The hardship that fuel price increases can create is demonstrated by the nationwide VMT decline of 3.6% between 2007 and 2008. Historic gasoline prices are shown in Figure 25, which shows that the price for gasoline nearly quadrupled between December 2001 and July 2008. While prices have decreased due to the global recession, Department

of Energy short-term forecasts anticipate a 9% increase in gasoline prices through 2010. An active, effective TDM program can provide more affordable travel options to a portion of the traveling public in Bismarck-Mandan, and would help soften the economic effects of future energy price spikes.

Figure 25. Average US Gasoline Price per Gallon, August 1990 – September 2009



Source: US Department of Energy, Energy Information Administration, October 2009

- The second factor is roadway construction costs. These costs are measured in both the monetary costs associated with system construction and the potential impacts to the built and natural environment that can be associated with transportation system expansion and reconstruction. Roadway construction costs increased approximately 20 percent per year between 2005 and 2008. An active TDM program can reduce the demand on the current roadway system, which in some instances may delay and even eliminate the need for some roadway expansion projects.

There are several different regionally-based TDM strategies to consider, each with varying mechanisms to affect travel behavior. The various TDM strategies can also be administered by different entities, whether state, regional or local governments, quasi-public agencies and/or individual or groups of employers. The TDM strategies include expansion of travel choices, through implementation of:

- **Rideshare programs**, including both carpooling and vanpooling. When formalized, both types of programs can be implemented and administered by employers, transportation management associations or a governmental

entity. Carpools typically use private vehicles, while vanpools typically use leased vehicles or vehicles owned by the governing entity, not the vanpool users. There are various elements that can be incorporated into rideshare programs, including:

- Guaranteed ride home: This element of the program provides regular users of the rideshare program a ride home if an emergency happens during the day (via taxi, rental car or transit).
- Web-based matching databases/bulletin boards: Employers and governments can provide web-based applications for ride matching based on commute origin and destination.

- **Alternative work arrangements**, are employer-based approaches including:
  - Flexible working hours: Employees are allowed some flexibility in their work schedules, which allows employees to commute to work during an off-peak travel times, reducing congestion.
  - Compressed work week: The number of work days is reduced, typically by increasing the length of the remaining work days.
  - Telecommuting: Employees work from home or at a "closer-to-home" satellite/neighborhood office to reduce daily work travel.
- **Financial Incentives**, which provide commuters money for considering alternative modes of travel. These program elements can include:
  - Parking cash-out programs: Employees can choose the cash value of their parking spot instead of the spot itself, allowing commuters to shift the money spent on parking on alternative commuting.
  - Employer incentives: Employers can provide up to $115 per month in "Qualified Transportation Fringe Benefit" tax-free, including payments for employees' rideshare and transit usage.

A key factor in implementing an effective TDM program is having a viable multimodal system in place so travelers have a true alternative to single-occupant automobile travel. Many of the recommendations in this LRTP include enhancements to the non-motorized system (through on-street bicycle lanes/routes and new and/or improved trails) and to the transit system (through route extensions into new development areas), which support the viability of non-automobile travel in Bismarck-Mandan. In addition to having an effective non-roadway transportation network, land use planning and development guidelines affect travel behavior immensely, and can be formed to provide an environment more conducive to successful TDM strategies. TDM programs are more effective in environments with relatively dense development with clusters of trip origins and destinations. In addition to critical densities, the site-development policies can also make TDM programs more effective, such as site parking policies and building orientations that make pedestrian, bicycle and transit access more convenient.

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FUNDING THE PLAN

INTRODUCTION

Key to the Long Range Transportation Plan update is demonstrating that the costs associated with projects and programs included within the recommended plan are within the region's transportation budget. In the planning process, the MPO must document the costs of short-term (TIP) and long-term (LRTP) planning period recommended actions and that there is funding (federal, state, or local sources) to implement the action. The LRTP financial assessment is required to address the costs and funding of both system improvements (expansion) and maintenance / operation / rehabilitation of the existing and expanded systems. While it is a local decision as to how much of the total estimated transportation budget will be allocated to system expansion (new routes, adding lanes to existing routes, adding new or improving existing interchanges) relative to the amount allocated to maintenance and operations (overlays for existing routes, signal system upgrades and operating routes), FHWA evaluates the reasonableness of the split relative to the planning guidelines. The federal planning guidelines address ensuring maintenance of the current system as well as accommodating future growth.

Expansion Projects

Focused on improving traffic flow or safety through:

- Adding through lanes or turn lanes.
- New streets/roads.
- Upgrading to an intersection roundabout.
- New / Improved Interchanges on the interstate.

Maintenance/Operations Projects

Are solely focused on maintaining the current network:

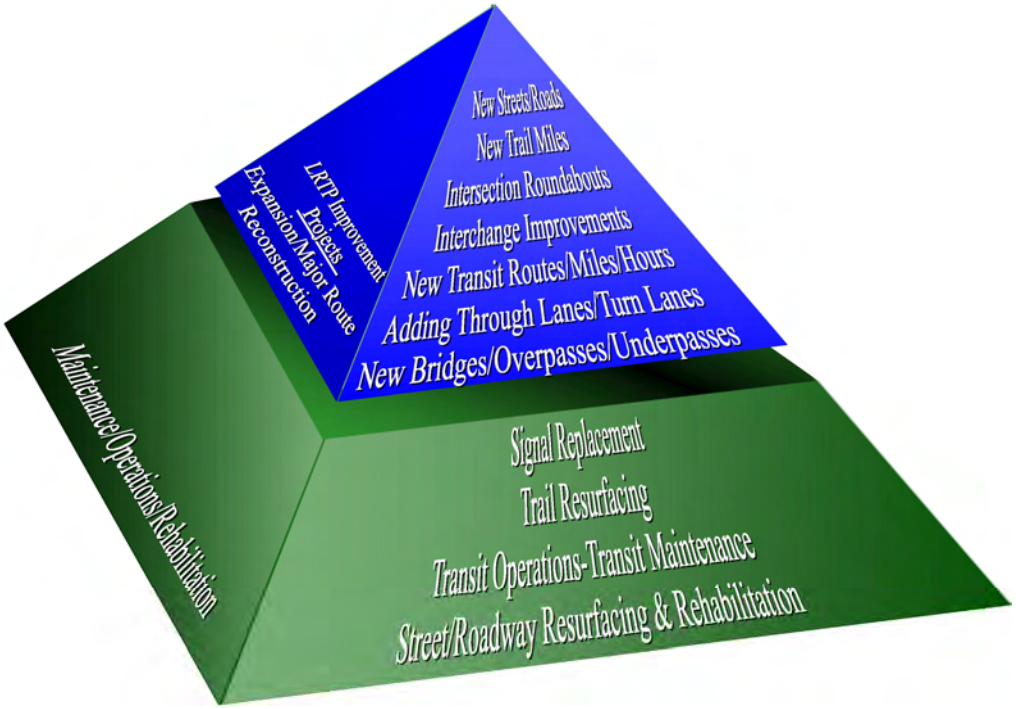
- Resurfacing and reconstructing streets (no new lanes)
- Bridge replacement.
- Maintaining buses.
- Operating daily transit service
- Trail maintenance.

The financial assessment for the LRTP is divided into two key elements:

- Funding level estimates for the planning period through 2035.
- Individual project and program costs for:
  - Maintaining the current multimodal system.
  - Operating the current multimodal system.
  - Expanding the current multimodal system to address current deficiencies and/or future growth in the region.

The purpose of this chapter is to document the methods, assumptions and estimates of the funding available for LRTP projects throughout the planning period. The types of projects that are included in the LRTP are illustrated in the pyramid below as the blue top of the pyramid; those projects that relate to maintenance / operations / rehabilitation shown in green are not included in the LRTP project list.

Allocation Categories for Transportation Funding in LRTP



FUNDING APPROACH

Direction in federal metropolitan transportation planning rules is relatively broad in that MPOs are required to provide estimates of the funding that can reasonably be expected to be available for throughout the planning period. The MPO and the LRTP study team has employed a relatively conservative interpretation to the word "expected" in establishing the local method for defining the funding available through the 2035 planning horizon. The method is characterized as conservative in that the future funding assumptions are based on actual expenditures in the region over a period of time rather than simple factoring of federal funding levels and the expectation of continued increases in future federal transportation bills.

***TITLE 23 USC* SECTION 134 – METROPOLITAN TRANSPORTATION PLANNING**

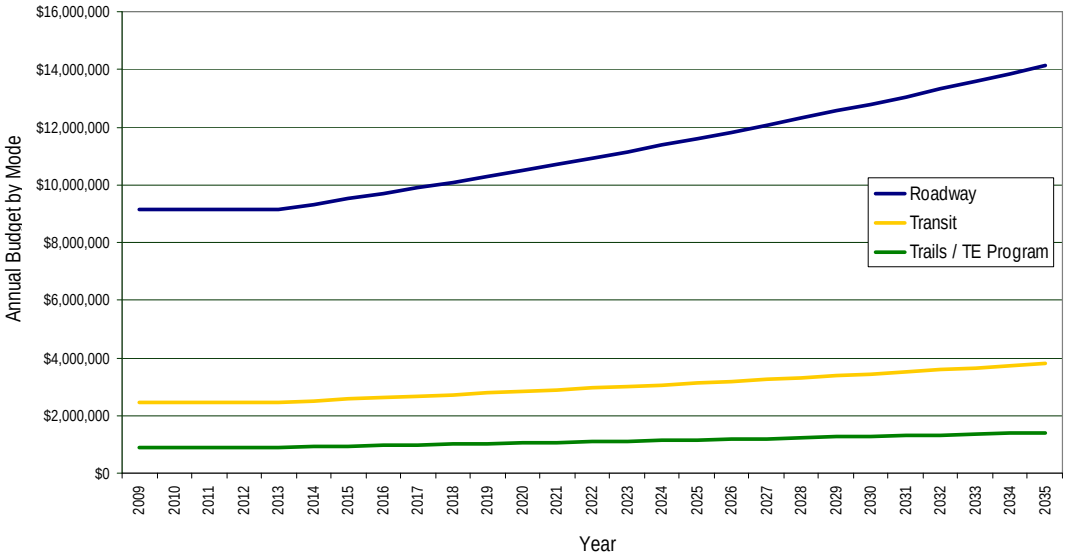
A transportation plan under this section shall be in a form that the Secretary determines to be appropriate and shall contain, at a minimum, the following:
…indicates resources from public and private sources that are **reasonably expected** to be made available to carry out the plan, and recommends any additional financing strategies for needed projects and programs.

The methodology used to prepare future funding estimate included:

- Examining historical actual transportation expenditures in the MPO area over a period, including separating system expansion projects (those similar to the LRTP focus) from maintenance, operations and rehabilitation projects.
- Addressing the inflation impacts on the buying power of a dollar over the historical review period. As expenditures in specific years were included in the analysis, it was possible to bring the historical period dollars forward to 2009 dollars, which was the base year of the funding assessment. Consumer Price Index (CPI) inflation rates over the period were applied to expenditure values in each of the years in a period to develop 2009 dollar amounts.
- Determining an annual average expenditure on transportation system maintenance, operations and rehabilitation relative to expansion expenditures. The recommended transportation plan individual projects focus on expansion, however, maintenance costs for the existing system are removed from the total funding prior to developing the individual expansion project list.
- Working with FHWA and NDDOT staff to identify whether future transportation funding would be greater than, less than or about equal (in real dollars) to current levels.
- Applying the annual funding level changes expected to the annual average LRTP-related project expenditures (2009 dollars).
- Discussing with each jurisdiction, the NDDOT and FHWA the reasonableness of the estimates derived through this approach. The assumptions, based on the feedback received from them, were that:
    - For the first five years of the funding analysis (2009-2013), the LRTP should assume no growth in Bismarck-Mandan transportation funding.
    - Beyond the first five years of funding analysis (2014-2035), a 2% annual growth rate in revenues for the region was acceptable.

Figure 26 shows the annual funding levels by mode anticipated through 2035. The budget levels are shown in terms of 2009 dollars.

Figure 26. Annual Modal Funding Projection by Year (2009 Dollars)



Listed below are the total levels of modal funding, including Federal, State and Local funds that are projected to be available throughout the region between today and 2035 for expansion and major reconstruction projects:

- Street and Roadway Funding (2009-2035): $300,285,000
- Transit System Funding (2009-2035): $80,889,000
- Trails Funding/Transportation Enhancement (TE) Dollars (2009-2035): $29,914,000

Some of the funds identified above are already committed to transportation projects through the current TIP. The currently approved TIP runs through 2013, and the transportation plan needs to identify projects and funding beyond those currently committed by the TIP. Thus, the funding that is projected to be available for the region between 2014 and 2035 for expansion/reconstruction is:

- Street and Roadway Funding (2013-2035): $254,575,000.
- Transit System Funding (2013-2035): $68,569,000.
- Trails Funding/TE Dollars (2013-2035): $26,274,000.

Financial constraint of the LRTP-recommended projects must now be demonstrated in terms of "Year of Expenditure" dollars; meaning that the project or program costs and the regional transportation budget should be extrapolated forward to account for inflation cost and funding changes expected over the period of the plan (through 2035). The rule[5] was intended to address the assumption that in the past some long-range transportation plan construction cost estimates have understated construction cost increases in relation to transportation revenues and budgets.

[5] FHWA and Federal Transit Administration (FTA) Statewide and Metropolitan Planning Rule (72 Fed. Reg. 7224)

RECOMMENDED TRANSPORTATION PLAN

INTRODUCTION

Federal legislation regarding metropolitan area long range transportation plans requires balancing the area's multimodal system improvement projects with the transportation funding that can reasonably be anticipated from public and private sources. The *Long Range Transportation Plan* has been developed to address the area's future travel needs with the expected federal, state, and local funding available through the 2035 planning period. The LRTP was developed through review of numerous combinations of multimodal packages and evaluating their relative effectiveness in meeting the MPO's transportation system goals and objectives and the ability to fund the included programs and projects.

Alternate project and program lists were presented to the public, the Policy Board, the TAC, and the Community Committee to gauge the level of local support for plans that address varying levels of investment in the roadway, non-motorized and transit systems. Based on input received from each of the stakeholder groups and the technical analysis of the system plans, a multimodal improvement program for the region was developed. Elements of the system plan include:

- Current 2010 through 2013 Transportation Improvement Program (TIP) projects.
- Roadway system improvements that address safety, congestion/serviceability, and connectivity/accessibility goals.
- Non-motorized system investments the plan for an expanded trail network and establish an on-street bicycle route system.
- Transit system expansions that provide opportunities for the fixed route bus system to provide enhanced service through 2035.
- Travel demand management programs that will help address the long-term travel needs of the metropolitan area, leveraging the project/program investments recommended in this chapter by managing the growth in travel demand on the multimodal system.
- Detailed corridor/subarea studies of areas and issues that require more work than is associated with the LRTP.

The projects included in the various LRTP lists and recommended programs

represent those projects categorized as system improvement, reconstruction and expansion[6]. Operations and maintenance of the roadway, transit and non-motorized elements of the current system are not specified as line items in any of the system improvement lists. To address the need to maintain the current system, funding for operations and maintenance has been separated from the projects included in this section.

CURRENT TRANSPORTATION IMPROVEMENT PROGRAM, 2010-2013

The Bismarck-Mandan Transportation Improvement Program (TIP) includes projects that have been through a planning and project development process, have been identified as priority projects for implementation locally and have identified funding sources for implementation in the next four years. The latest TIP is the 2010-2013 program, and includes both maintenance/operations projects and system expansion/reconstruction projects. The expansion projects included in the current TIP are:

Roadway Expansion Projects:

- Schaefer Street/I-94/Tyler Parkway Intersection Improvements
- Mandan Strip Intersection Improvements
- Century Avenue/Centennial Road Widening
- Divide Avenue, Volk Drive to Bismarck Expressway Reconstruction/Widening

Non-Motorized Expansion Projects:

- Bismarck Southland Trail
- United Tribes Technical College Trail
- Riverwood Shared Use Trail
- Main Avenue to 3rd Street South Trail Connection (Mandan)

The 2010 to 2013 TIP includes projects that total $74,500,000, divided between maintenance/operations and expansion/reconstruction projects. Additional detail on each of the 2010-2013 TIP projects can be found at:

www.bismarck.org/MPO

RECOMMENDED MULTIMODAL IMPROVEMENTS, 2014-2035

Projects included in the recommended multimodal transportation plan have been demonstrated to address or support a need within the region and they have been discussed throughout the involvement process. Transportation needs within the

[6] Each of the recommended multi-modal projects includes a unique reference number, the same number it was assigned during the alternatives analysis. Thus, many of the project numbers shown in this chapter are not sequential / project numbers are missing. See Appendix D for more details on those alternatives that were not on the recommended list.

region exceed the locally available transportation funding estimates, so only those selected projects that have an anticipated source of funding were included in the fundable multimodal improvements plan. As described in the "Funding the Plan" chapter, the projects included in the recommended plan are those that are expansion or Interstate reconfiguration, and the recommended projects do not include maintenance/operations/rehabilitation projects that will occur over the planning horizon.

The recommended plan has been assembled in a manner that considers the interconnected nature of the various modes and uses existing corridors to introduce a new mode of travel. The LRTP also considers the interconnected nature of land use and transportation, recognizing that the locations and type of land development will affect the type and intensity of the transportation system that can/should be offered, while also recognizing that the quality/mix of transportation infrastructure affects the viability of land development.

Roadway System Improvements

Figure 27 illustrates the recommended system of roadway expansion improvements, showing the location of each of the recommended roadway projects within the region and illustrates the projects by time frame; short-term (within 5 years), mid-term (6 to 15 years) and long-term (16 to 25 years). The recommended roadway improvements are described in Table 5; providing a description and a year of expenditure cost estimate for each project.

The estimated total cost for roadway system improvements included in the recommended plan list is $309,760,000[7]. The 2014-2035 period revenue from those sources that are annually tapped for roadway system improvements is estimated to be $254,575,000 (in year of expenditure dollars). The revenue estimate does not reflect less frequently used funding sources such as the Interstate Maintenance (IM) program. In the period used to establish the basis for the future revenue estimate, there were no rehabilitation projects on I-94 or I-194 through the Bismarck-Mandan area, which would have used funds from the Interstate Maintenance program. It is reasonable to assume that between 2010 and 2035 rehabilitation/reconstruction of the interstate would be required and that projects that interchange reconstruction (not new interchange construction) projects included in the recommendations would be eligible for Interstate Maintenance (IM) program funds. Interstate Maintenance (IM) funds would be used as a funding source for several of the projects, including:

- Mandan Avenue/I-94 Interchange improvements.
- Reconstruct I-194 Memorial Highway and McKenzie Dr interchanges.
- Adding loop ramps at US 83/I-94 interchange.
- Adding loop ramps at Bismarck Expressway/I-94 interchange.

[7] Cost estimate assumptions are documented in the Alternatives Analysis Appendix D.

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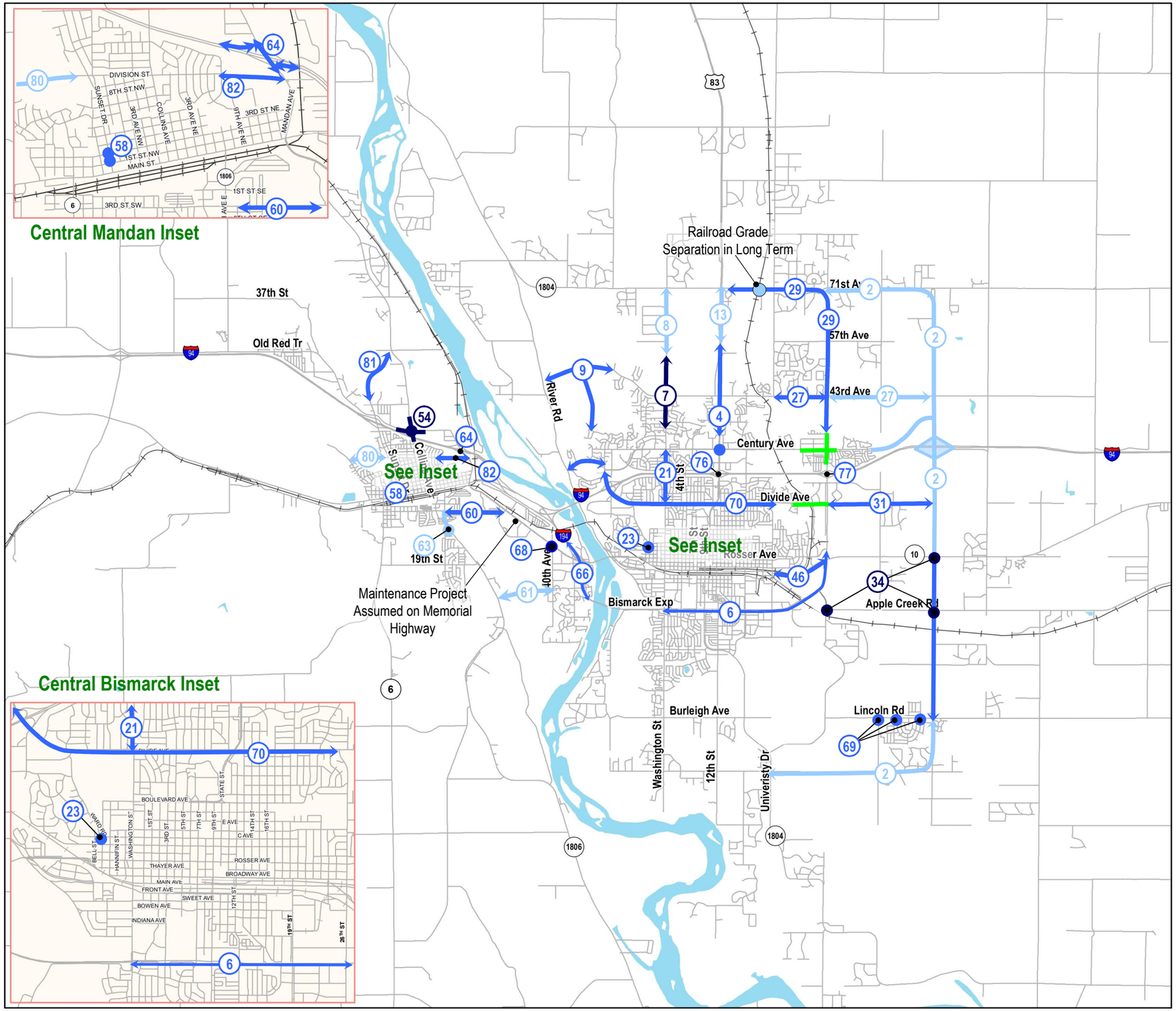

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Legend

In 2010-2013 Transportation Improvement Program

Recommended Project Implementation Timeframe*

- Short – Term Improvement (2009-2014)
- Mid – Term Improvement (2015-2024)
- Long – Term Improvement (2025-2035)

* The projects included on the recommended project list are expansion or Interstate reconfiguration projects. Maintenance, operations, or rehabilitation projects are not included.

0 1 2 4 Miles

Figure 27: Recommended Roadway Implementation Phasing 2035

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February 5, 2010

Table 5. Recommended Roadway Project Descriptions and Cost[8]

Roadway Projects				
Project Number	Project Description	2009 Cost Estimate	Phasing Period	Cumulative YOE Cost
2	North-South Beltway (Burleigh County Only) - Centennial Road to Lincoln, Century Avenue and 43rd Ave Extensions, 48th Ave South Extension and I-94 Interchange at 66th Street[9]	*$41,800,000*	Mid / Long	$86,630,000
4	US 83 (State Street) - Reconstruct and extend 6-Lane Section to 57th Avenue, include dual left-turn lanes at US 83 / Century Avenue intersection[10]	$19,800,000	Mid	$29,890,000
6	Bismarck Expressway Widening / Improvements: 6-Lanes between Washington and 9th Street and new turn lanes 12th Street to Rosser Avenue[11]	*$21,200,000*	Mid	$32,000,000
7	Widen Washington Street to a 4-lane divided roadway between Calgary Avenue and 43rd Avenue, signalize 43rd/ Washington intersection.	*$5,000,000*	Short	$5,520,000
8	Widen Washington Street to a 3-lane roadway between 43rd Avenue to 71st Avenue.	$4,320,000	Long	$9,840,000
9	Northwest Bismarck Arterial Improvements, 3 miles[12]	$6,480,000	Mid	$9,780,000
13	Add left-turn and right-turn lanes to major US 83 access points 43rd Avenue to 71st Avenue	$1,080,000	Long	$2,460,000
21	Washington Street, Divide Avenue to Century Avenue, remove on-street parking and restripe center left-turn lane[13]	$120,000	Mid	$180,000
23	Convert Ward Road / Avenue C / Griffin Street intersection to a roundabout OR add southbound left-turn lane	$720,000	Mid	$1,090,000

[8] The projects included on the recommended roadway project list are expansion or Interstate reconfiguration projects. Maintenance, operations, or rehabilitation projects are not included.
[9] Recommendation based on *North South Beltway Corridor Study*, Nov. 2008.
[10] Recommendation based on *US 83 Corridor Transportation Study*, June 2006.
[11] Recommendation from *Interstate and Bismarck Expressway Corridor Study*, Nov. 2006.
[12] Recommendation to include eventual recommendations of *Northwest Subarea Study*.
[13] Recommendation from *West Side Transportation Study*, May 2004.

Table 5. Recommended Roadway Project Descriptions and Cost (continued)

Roadway Projects				
Project Number	Project Description	2009 Cost Estimate	Phasing Period	Cumulative YOE Cost
27	Add turn-lanes at key 43rd Avenue access points, 26th Street to Centennial Road	$1,330,000	Mid / Long	$2,690,000
29	Centennial Road / 71st Street: Add turn lanes and consolidate accesses, grade separate DMVW crossing[14]	*$7,100,000*	Long	$16,180,000
31	Extend / Improve East Divide Avenue from Bismarck Expressway to 66th Street[15]	$5,040,000	Mid	$7,610,000
34	Add turn-lanes at key intersections: Yegen Rd / Apple Creek Rd, Highway 10 / 66th Street, Apple Creek Rd / 66th St[16]	$360,000	Short	$400,000
46	East Main TSM: Add left-turn lanes - eastbound dual lefts and right-turn lane at Bismarck Expressway, left-turn lanes at Eastdale Avenue	$410,000	Mid	$620,000
54	Improve and signalize Collins Ave / Old Red Trail Intersection	$7,440,000	Short	$8,210,000
58	Convert 4-way stops at 1st NW and 2nd NW to 2-way stops or signals	$480,000	Mid	$720,000
60	3rd Street: Add turn lanes at key cross streets, signalize 3rd St / Memorial Hwy intersection by 2035	$1,920,000	Mid	$2,900,000
61	Extend McKenzie Drive between 40th Ave SE and Highway 1806[17]	$5,880,000	Long	$13,400,000
63	Restripe Highway 1806 as 3-lane between Heart River to 3rd St SE	$60,000	Long	$140,000
64	Improve Mandan Ave through I-94 Interchange and Lengthen I-94 on-ramps[18]*	*$4,500,000*	Mid	$6,790,000
66	I-194, Memorial Highway and McKenzie Dr interchanges: Add C/D road and ramp reconstructions to improve interchange spacing[19]*	*$18,300,000*	Mid	$27,620,000
68	40th Ave / Memorial Hwy: Signalize and add turn lanes	$1,080,000	Mid	$1,630,000

[14] Recommendation from *71st Avenue-Centennial Road Corridor Study*, Apr. 2008.
[15] Recommendation based on *Fringe Area Road Master Plan*, Sept. 2003.
[16] Recommendation from *Lincoln to Bismarck Roadway Connection Study*, May 2006.
[17] Recommendation based on *Fringe Area Road Master Plan*, Sept. 2003.
[18] Recommendation from *Interstate and Bismarck Expressway Corridor Study*, Nov. 2006.
[19] Recommendation from *Interstate and Bismarck Expressway Corridor Study*, Nov. 2006.

Table 5. Recommended Roadway Project Descriptions and Cost (continued)

Roadway Projects				
Project Number	Project Description	2009 Cost Estimate	Phasing Period	Cumulative YOE Cost
69	Lincoln Road: Improve intersections at 52nd Ave, Benteen Dr and McDougall Dr (contingent on corridor study).	$600,000	Mid	$910,000
70	Implement West Divide TSM Projects: Restripe Divide Ave to 3-lane, I-94 to 26th St, Signalize Country West / Tyler Pkwy, Century / Tyler Pkwy	$600,000	Mid	$910,000
76	Provide Northbound to Westbound and Southbound to Eastbound loop ramps at US 83 / I-94 interchange*	$9,600,000	Mid	$14,490,000
77	Provide Northbound to Westbound and Southbound to Eastbound loop ramps at Bismarck Expressway / I-94 interchange*	$9,600,000	Mid	$14,490,000
80	Extend Division Street west of Sunset Drive[20]	$2,800,000	Long	$6,380,000
81	Extend Sunset Drive to Highway 1806[21]	$2,160,000	Mid	$3,260,000
82	Extend Division Street east to Mandan Avenue[22]	$2,000,000	Mid	$3,020,000
	Total Cost by Implementation Period	$181,780,000		$309,760,000

* - Project potentially eligible for Interstate Maintenance (IM) funding.

Based on historical funding levels, it is reasonable to assume that the $62,000,000 in YOE project costs for interstate interchange reconfiguration projects could be included within the program funding capacity for the Bismarck-Mandan area, bringing the total roadway funding capacity to $316,575,000.

Table 6 provides a summary of the anticipated roadway costs and budget over the planning horizon. Given the many uncertainties/assumptions that go into budget and cost forecasting, any interpretation of the data in Table 6 should simply be that anticipated roadway funding and the recommended roadway LRTP costs are approximately in-line.

[20] Recommendation based on *Fringe Area Road Master Plan*, Sept. 2003.
[21] Recommendation based on *Fringe Area Road Master Plan*, Sept. 2003.
[22] Recommendation based on *Fringe Area Road Master Plan*, Sept. 2003.

Table 6. Anticipated Roadway Budget and Costs, 2014 - 2035

Roadway Cost / Budget Element	Year of Expenditure Dollars
Anticipated Roadway Budget, 2014-2035	
Traditional Surface Transportation Sources	$254,575,000
Interstate Maintenance Sources	$62,000,000
Total Roadway Budget	$316,575,000
Total Roadway Projects Costs	$309,760,000

The *Bismarck Airport Master Plan* (2008) includes recommendations for roadway modifications to routes adjacent to the airport that would need to be made to accommodate future airport improvements. Modifications to the off-site roadway system associated with the airport master plan recommendations are assumed to be in-place by the 2035 LRTP planning horizon and include:

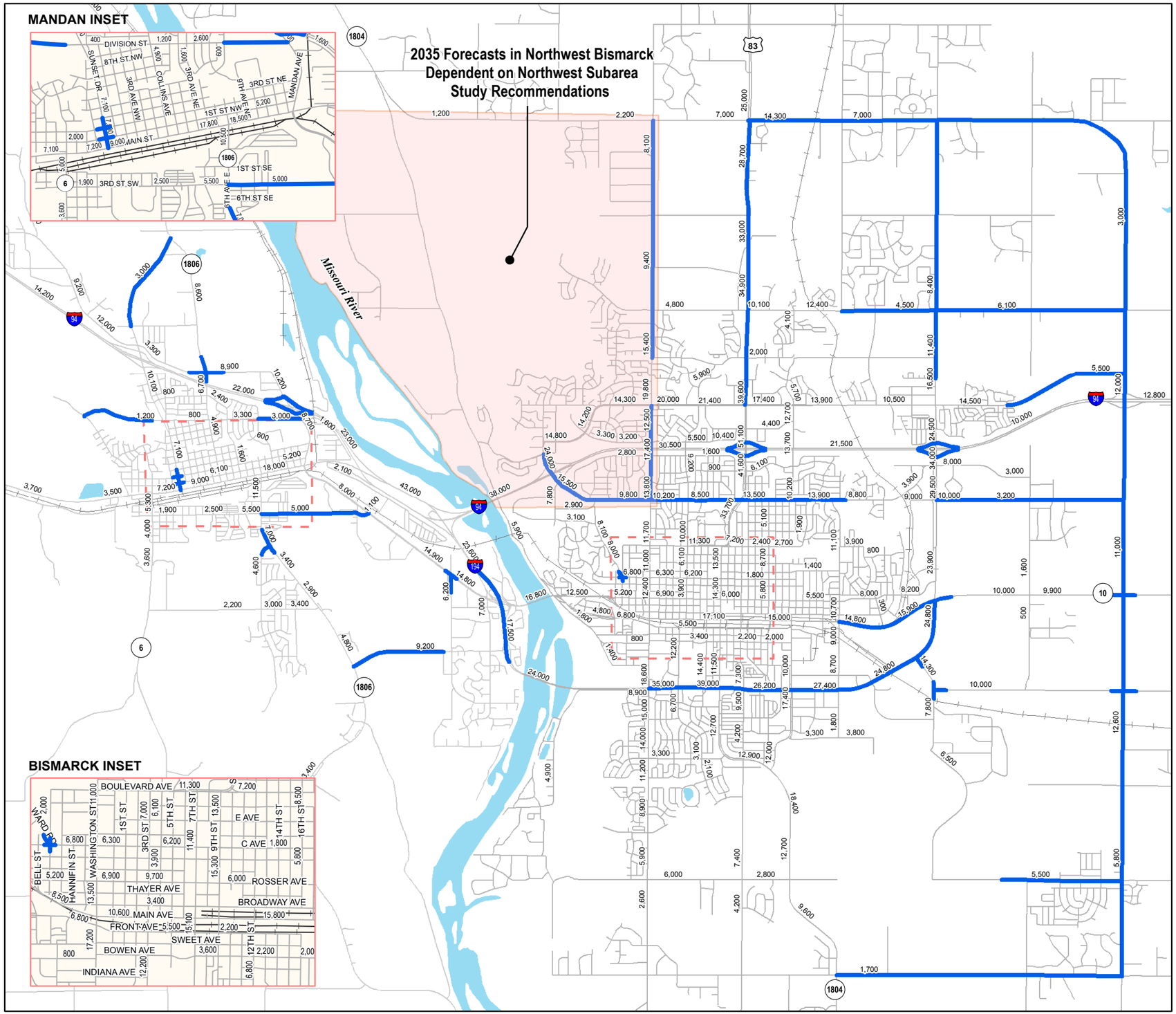
- **Airway Avenue Relocation**: Airway Avenue on the southeast side of the airport is in the runway protection zone of Runway 31. This airport project would close this section of the Airway Avenue, and would "relocate" Airway Avenue by constructing a new north-south route that connects 48th Street to Airway Avenue at the North Dakota Air National Guard facility.
- **Airway Avenue/Airport Road Intersection Relocation**: The Airport Master Plan found that Airway Avenue including the Airport Road intersection is an airspace obstruction. This project would relocate intersection and lower Airway Avenue.

The listed off-site roadway system modifications have not been included in the project cost analysis because they would be the airport's responsibility and are not assumed to be paid for with DOT funds.

The 2035 daily traffic levels that are forecasted to occur on the recommended roadway network are illustrated in Figure 28. Figure 28 also shows the locations of recommended roadway projects. The traffic operations associated with the 2035 recommended roadway network are illustrated in Figure 29, showing those segments which are forecasted to operate at LOS "C" (approaching deficient) or LOS "D" or worse (deficient). Roadway segments are considered "deficient" when traffic flow is estimated to operate at LOS D or worse. As shown in Figure 29, the projects included in the roadway portion of the recommended plan will address many of the deficiencies identified in the 2035 E+C condition (shown in Figure 23), but do not address all of the long-term deficiencies in the Bismarck-Mandan region.

Non-Motorized System Improvements

The Bismarck-Mandan area has many pieces of a strong non-motorized system in place and has opportunities to build on the existing system towards creating a more complete bicycle and pedestrian network. While pedestrian and bicycle travel are often considered to be primarily a recreational amenity, the Long Range Transportation Plan treats non-motorized travel from the perspective of meeting



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Long Range Transportation Plan - 2035

Legend

8,200 2035 Daily Traffic Forecast

LRTP Recommended Roadway Projects

0 0.5 1 2 Miles

Figure 28. 2035 Daily Traffic Forecasts, Recommended Network Scenario

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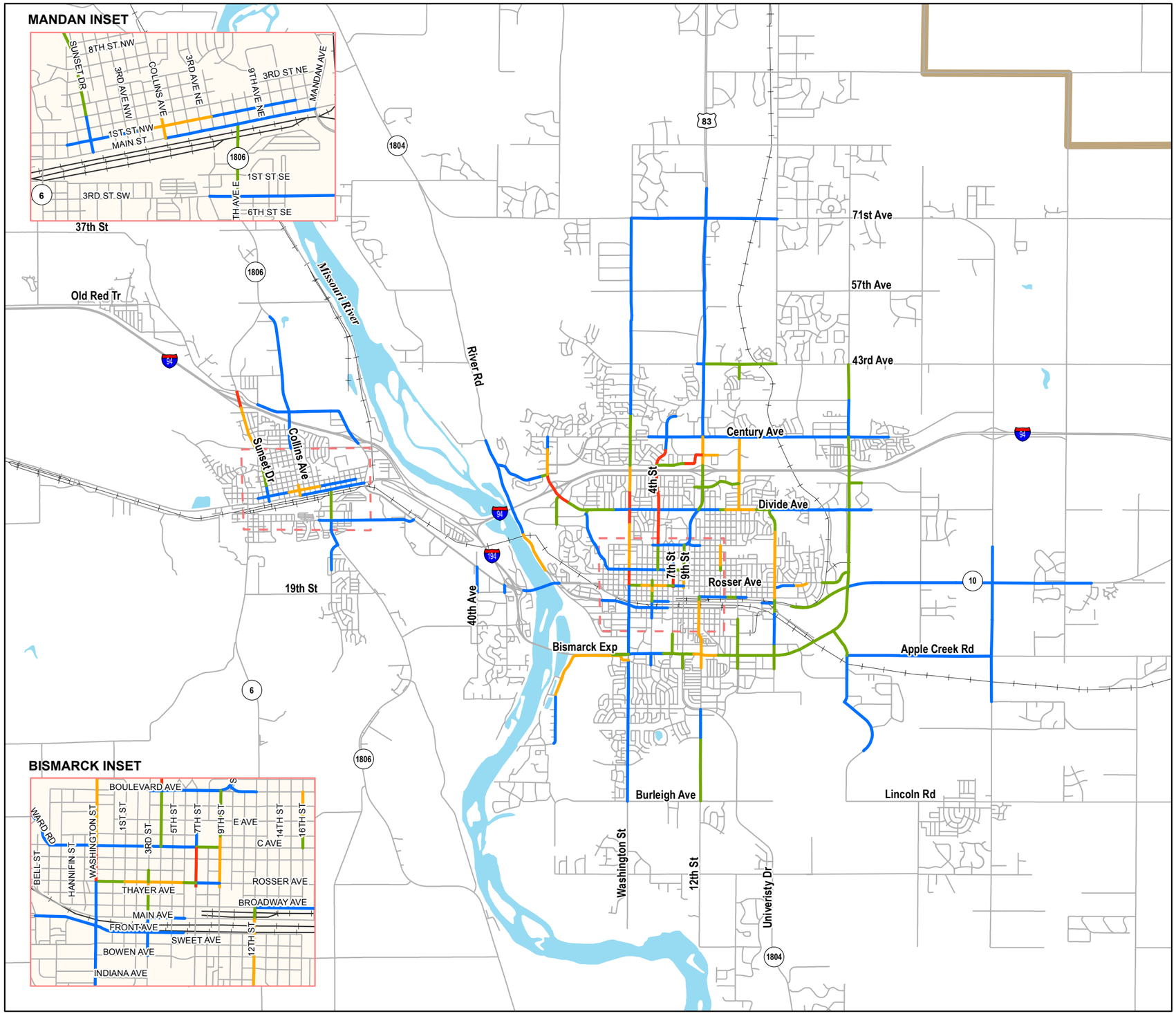
February 17, 2010



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Long Range Transportation Plan - 2035

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2035 Level of Service

- LOS C
- LOS D
- LOS E
- LOS F

Note: Level of service estimates reflect conditions during peak hour of traffic.

0 0.75 1.5 3 Miles

Figure 29. 2035 Traffic Operations, Recommended Network Scenario

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the transportation needs of the community. The recreational and fitness benefits of walking or biking may attract more people to choose a non-motorized mode for transportation, but there needs to be a viable non-motorized network in place to facilitate bicycling and pedestrian trips. Two main types of non-motorized improvements are being carried forward as recommendations:

- Expansion of the existing multimodal trail system
- On-street facilities, whether:
    - Designated shared-use streets for both motor vehicles and bicyclists
    - On-street bicycle lanes

The on-street bicycle facilities were only recommended in corridors that are not anticipated to require widening or removal of on-street parking to accommodate bike facilities. Table 7 describes each of the on-street bicycle routes. The cost of implementing the on-street routes is limited to signage (for routes and bike lanes) and striping (for bike lanes) costs. Table 8 provides a description and cost estimate for each of the recommended trail projects. As shown in Table 8, some of the projects are assumed to be paid for with TE funds, while others would be funded as a part of a roadway improvement project and would not require TE funds.

Table 7. Recommended On-Street Bicycle Routes

Route Corridor	Route Type
Division Street, Sunset Drive to 8th Avenue E	On-Street Route
West Mandan Route, 14th Street NW / 4th Avenue West	On-Street Route
East Mandan Route, 14th Street NE / 3rd Avenue East	On-Street Route
2nd Street North, 10th Avenue W to Mandan Avenue	On-Street Route
Washington Street Lanes, Century Avenue to Central Avenue	Bike Lanes
4th Street Lanes, Century Avenue to Capitol Avenue	Bike Lanes
Capitol Avenue Route, Washington Street to 26th Street	Bike Lanes / On-Street Route
Braman Avenue Route, 12th Street to Divide Avenue	On-Street Route
1st Street Route, Capitol Avenue to Downtown Bismarck	On-Street Route
6th Street Route, Boulevard Avenue to Downtown Bismarck	On-Street Route
12th Street Route, Braman Avenue to Rosser Avenue	On-Street Route
Ave A/B/D Route, 1st Street to 26th Street	On-Street Route
Rosser Avenue Lanes, Griffin Street to Bismarck Expressway	Bike Lanes
19th Street Route, Braman Avenue to Main Avenue	On-Street Route
26th Street Route, Avenue D to Bismarck Expressway	On-Street Route

Table 8. Recommended Trail Project Descriptions and Cost

Trail Project Number	2009 Cost Estimate	Phase	Description	Year of Expenditure Costs
Transportation Enhancement (TE) Funding				
1	$450,000	Mid-Term	Morton County connection funded, unfunded potential extension would connect Old Red Trail and 1804 trails.	$680,000
3	$360,000	Mid-Term	3rd Street Trail extension.	$540,000
4	$400,000	Mid-Term	10th Avenue SW Trail	$600,000
5	$500,000	Mid-Term	19th Street Trail extension	$750,000
6a	$910,000	Long-Term	Highway 10 - Division St Loop. Bridge over Heart River is assumed.	$2,070,000
7	$250,000	Mid-Term	Boundary Road Loop Trail.	$380,000
8	$230,000	Mid-Term	Marina Trail.	$350,000
9	$1,500,000	Long-Term	Highway 1804 Trail, connects State Street trail to Missouri Valley Trail.	$3,420,000
11	$60,000	Long-Term	North Washington Street Trail extension.	$140,000
12	$590,000	Mid-Term	Missouri Valley Trail extension.	$890,000
13	$230,000	Short-Term	West Century Trail extension to Missouri Valley.	$250,000
14	$250,000	Short-Term	Country West Spur Trail.	$280,000
15	$240,000	Short-Term	Horizon School Loop Trail.	$260,000
16	$140,000	Short-Term	4th Street to Calgary Trail connector.	$150,000
17	$290,000	Mid-Term	Calgary Trail extension.	$440,000
18	$1,700,000	Mid-Term	DMVW Trail. Bridge over creek and rail tracks is assumed.	$2,570,000
21b	$250,000	Mid-Term	East Century Avenue Trail extension, extension along existing Century Avenue.	$380,000
24a	$330,000	Long-Term	East Beltway Trail, Lincoln to Highway 1804 / University. Assume construction when roadway improvements are made.	$750,000
27	$340,000	Mid-Term	East Main Trail.	$510,000
30	$310,000	Mid-Term	Yegan Road Trail.	$470,000
31	$960,000	Long-Term	Airway Avenue Trail, south of Lincoln Rd.	$2,190,000
32	$430,000	Mid-Term	Lincoln Road Trail, west of 66th St.	$650,000
35	$650,000	Mid-Term	Highway 10 East Trail, east of 66th St.	$980,000
37	$120,000	Mid-Term	Mills Avenue Trail extension to River.	$180,000
39	$500,000	Long-Term	South Washington Street Trail extension.	$1,140,000
42	$220,000	Mid-Term	North 19th Street Trail.	$330,000
45	$1,050,000	Long-Term	South Mandan Trail loop.	$2,390,000
47	$130,000	Short-Term	McKenzie Trail extension.	$140,000
51	$960,000	Mid-Term	43rd Avenue Trail. If 4-lane widening of 43rd were to be constructed, this trail would be included in roadway portion.	$1,450,000

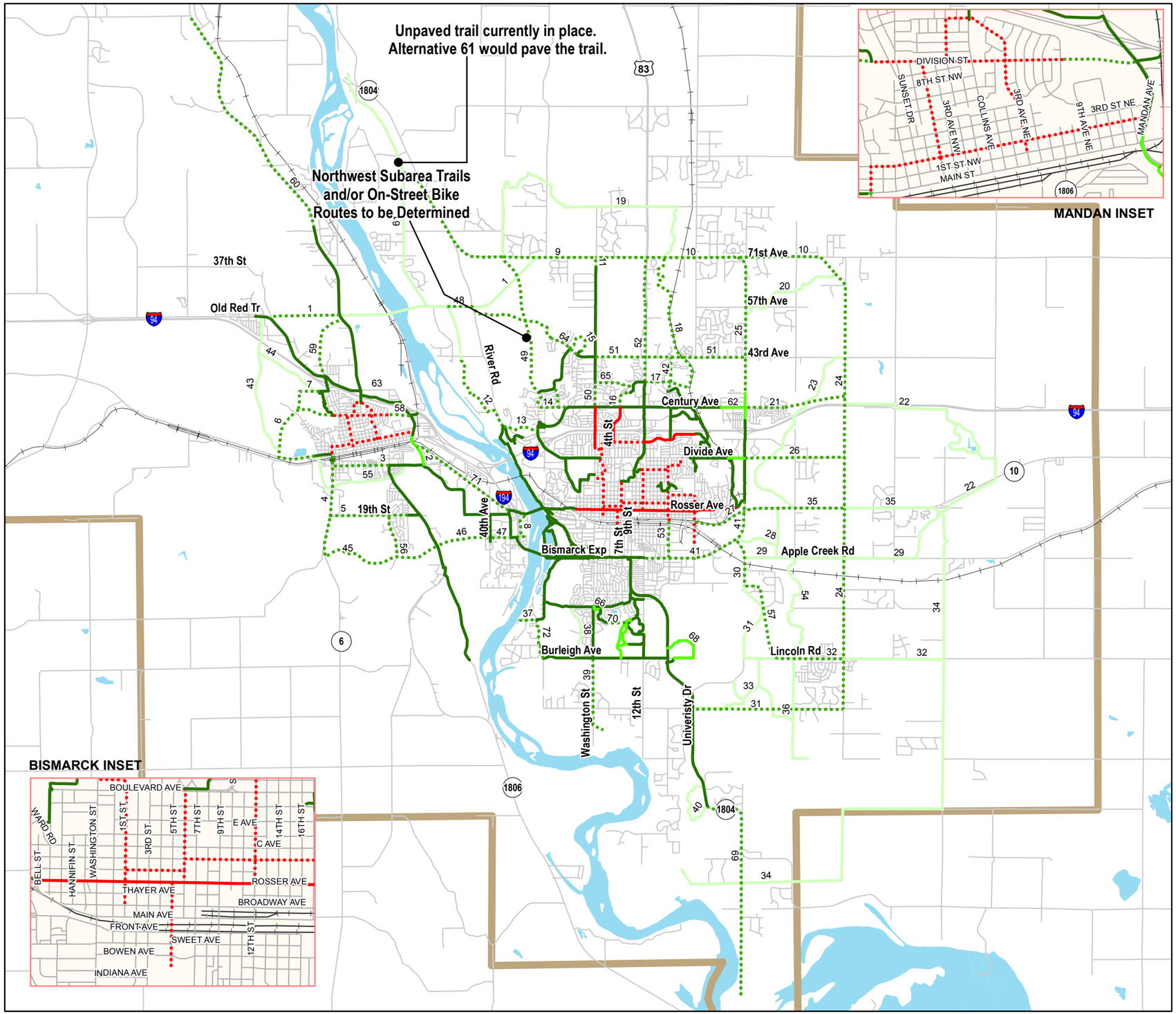
Table 8. Recommended Trail Project Descriptions and Cost (Continued)

Trail Project Number	2009 Cost Estimate	Phase	Description	Year of Expenditure Costs
52a	$280,000	Long-Term	State Street Trail extension. Assume trail is built at time of 6-lane widening between Calgary and 57th Avenue.	$640,000
53	$230,000	Mid-Term	South 19th Street Trail connection. Supplements on-street bike routes.	$350,000
56	$280,000	Mid-Term	8th Ave SE Trail connector.	$420,000
57	$580,000	Mid-Term	Lincoln to Yegan Road Soo Line corridor connection.	$880,000
60	$740,000	Short-Term	Trail to Harmon Lake.	$820,000
64	$200,000	Short-Term	West 43rd Avenue Trail extension.	$220,000
65	$250,000	Short-Term	West Calgary Ave trail extension.	$280,000
69	$1,400,000	Short-Term	Trail to the Desert.	$1,540,000
70	$210,000	Short-Term	Southland to Cottonwood Park connector.	$230,000
72	$280,000	Short-Term	Riverwood connector.	$310,000
			Total Cost for TE Funded Projects	**$31,020,000**
Included in Roadway Project Funding				
6b	$250,000	Long-Term	Highway 10 - Division St Loop. This segment tied to Division Street extension.	$570,000
10	$1,580,000	Long-Term	71st Ave Trail.	$3,600,000
21a	$390,000	Long-Term	East Century Avenue Trail extension, construction with Century Avenue roadway extension.	$890,000
24b	$1,520,000	Long-Term	East Beltway Trail, Highway 10 to 71st Ave / Centennial. Assume construction when roadway improvements are made.	$3,460,000
24c	$950,000	Mid-Term	East Beltway Trail, Lincoln to Highway 10. Assume construction when roadway improvements are made.	$1,430,000
25	$890,000	Mid-Term	Centennial Road Trail extension, 43rd Avenue to 57th Avenue.	$1,340,000
26b	$640,000	Mid-Term	East Divide Trail.	$970,000
41	$890,000	Mid-Term	Bismarck Expressway Trail Extension.	$1,340,000
46	$340,000	Long-Term	West McKenzie Trail extension. Assume construction occurs with roadway project.	$770,000
48	$770,000	Mid-Term	Trail would be located along Ash Coulee if it were extended from current terminus.	$1,160,000
49	$1,030,000	Mid-Term	Northwest Subarea Trail, alignment subject to change with roadway plans.	$1,550,000
50	$150,000	Short-Term	North Washington Street Trail extension.	$170,000

Trail Project Number	2009 Cost Estimate	Phase	Description	Year of Expenditure Costs
52b	$510,000	Mid-Term	State Street Trail extension, north of 57th.	$770,000
58	$140,000	Mid-Term	Division Avenue Trail (in TIP).	$210,000
59	$430,000	Mid-Term	Sunset Drive Trail extension	$650,000
71	$720,000	Short-Term	Memorial Highway / The Strip Trail	$790,000
Total Cost for Trails included in Roadway Project Funding				**$19,670,000**

Figure 30 shows the recommended non-motorized system improvements, including new trails and new on-street bike routes. Unlike roadways, trail projects are not programmed beyond 2010 due to the manner in which TE money is distributed in North Dakota. Thus, the available money for the planning horizon is assumed to run between 2011 and 2035, which means approximately $28,100,000 in *anticipated* TE funding will be available for trail improvements for the years not currently programmed. Based on the anticipated trail project phasing, it is estimated that the total costs for trails requiring TE funds is $31,020,000 in Year of Expenditure (YOE) dollars. This is approximately $2,920,000 or 10 percent higher than the anticipated TE funding between today and 2035. Given the inherent uncertainties with TE funding and timing of trail projects, the trails list and timing presented in this memorandum should be considered a reasonable, fundable trail project list.

The *2010-2035 Bismarck-Mandan Long Range Transportation Plan* recognizes that federal transportation funding associated with but not limited to the Recreational and Trails Program, Lewis and Clark Legacy Trail Program, and/or the Safe Routes to School Program may be used to fund programs, facilities, and/or equipment within the MPO area, which may be beyond the scope of this document.



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Long Range Transportation Plan - 2035

Legend

Recommended On-Street Bike

- Bike Lanes
- Bike Route

Recommended Trails

- Existing
- In TIP (Funded)
- Recommended Future (Funded)
- Illustrative (not Funded)
- 12 Trail Alternative ID

Miles
0 0.75 1.5 3

Figure 30. Recommended Trail Projects and On-Street Bicycle Facilities

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January 27, 2010

Transit System Improvements

The majority of the transit system improvement alternatives focused on two primary tasks:

- Evaluating future year 2035 conditions to identify opportunities to expand transit services in the Bismarck-Mandan region
- Evaluating the level of implementation for the recommendations that came out of the 2007 *Bismarck-Mandan Transit Development Plan*.

The service extensions would require a detailed operations study on a case-by-case basis as the targeted growth areas develop and bus service becomes a more feasible option. The service extensions could potentially be accomplished through extending/adjusting current routes or through adding new routes to the current CAT system.

The recommendations for transit route extensions between now and 2035 are described in Table 9.

Table 9. Transit Alternatives and Planning-Level Cost Estimates

Transit Alternative	Overview	Planning-Level Cost Estimates (2009$)
Expand Fixed Route to 71st / US 83	Provide service extension of 2 miles into future growth area.	Operations Cost: $40,000 / year. Capital Cost: $90,000 (dedication of 30% of a new bus).
26th St / Calgary Avenue	Short ¼ mile route extension into future growth area.	Operations Cost: $7,000 / year. No Significant Capital Costs.
Expand Fixed Route to Lincoln	Requires significant extension of current service approximately 4.5 miles.	Operations Cost: $90,000 / year. Capital Cost: $210,000 (dedication of 70% of a new bus).
Expand Fixed Route in North Mandan	Minor expansion into future growth area – likely an additional ¼ mile or so.	Operations Cost: $7,000 / year. No Significant Capital Costs.
University of Mary Service	Extension of current service approximately 3 miles. Likely a partnership with U Mary.	Operations Cost: $60,000 / year. Capital Cost: $150,000 (dedication of 50% of a new bus).

The summary of the recommendations from the Transit Development Plan, and summary of to what extent they have been implemented is included in Table 10. As shown in the table, many of the recommendations have already been implemented.

Table 10. Implementation of Transit Development Plan Recommendations

Recommendation from 2007 TDP	Discussion of Recommendation	Implementation Status
Fare Adjustments	Set structure to encourage non-ADA users to use fixed route, not dial-a-ride.	Implemented; Increased non-ADA Paratransit fare, decreased non-ADA fixed route fare.
Guaranteed Ride Home	Provide similar convenience to automobile, in terms of access to transportation on short-notice / emergencies.	Not part of the program at this time.
Reduced Paratransit Service	Reduce service hours for paratransit, which is currently 24 hours a day/7 days a week.	Service is still offered 24 / 7.
Paratransit No-Show Policy	Penalties for missed appointments, suspension for 4th miss in a month.	Implemented: No show policy with consequences in place.
Improved data collection and monitoring efforts	More detailed boarding / alighting information and transfer data.	In process: New fare boxes are coming that will allow implementation of data collection.
Route Adjustments • Eliminate / Restructure A-1 and A-2 Routes • Monitor / Adjust C-2	Routes loop and make for indirect / noncompetitive travel. Poor performing route to be monitored.	Not implemented. Implemented: Adjustments have been made to C-2.
Reduce Transfers • Interline Routes • Design routes past major destinations	Coordinate / interline key routes to reduce transfer penalty. Central Bismarck, Mandan and Medical were mentioned.	Some improvements to scheduling have been made. Notable recent improvement in service to BSC, expanded routes to suburban growth centers.
Improve Secondary and Middle School Service	High school schedules don't coordinate well with bus schedule.	Little change in bus schedules, due to schedule constraints. Improved Route D-2 extended to Horizon Middle School (43rd/ Washington).

TRAVEL DEMAND MANAGEMENT RECOMMENDATIONS

The best opportunities for improved travel demand management in the Bismarck-Mandan region are for enhanced ridesharing programs. The recommendations for enhanced ridesharing include:

- It is recommended that a **carpool coordination program** be established for the region. This can be a relatively low cost program administered by an agency, such as the MPO, or by an employer-funded transportation management association. Funding for these sources typically come from membership dues, public grants, user fees and/or district assessments on served commercial areas. The scope of the carpool program would include develop rideshare marketing/promotions, rideshare matching, provide guaranteed ride home services and other promotion/educational services that make TDM in Bismarck-Mandan easier and more feasible.
- It is recommended that a **vanpool program** be investigated for the region. A vanpool program was investigated for the Fargo/Moorhead region, but was discontinued due to the cost. If deemed feasible, several issues would need to be worked out prior to implementation, including how it would be administered and funded. It would likely start on a limited basis.

As noted from the Fargo vanpool experience, one of the issues with establishing a TDM program is that there are costs, including the staff-time associated with administering the program. Based on the experience of other MPOs, web-based carpool matching programs typically cost approximately $30,000 to set up and approximately $25,000 annually to maintain/administer. Vanpool programs can get more expensive, because in addition to administration costs, there is typically some subsidization of van leasing/operations/maintenance costs. One of the benefits of running the program by sharing resources between metropolitan areas or on a state-wide basis is that there it allows for a certain “economy of scale” with the program; dedicating specialized staff member(s) to a smaller TDM program can be relatively costly. Thus, pooling resources on a statewide basis may make sense if vanpooling was determined to be feasible for urban areas in North Dakota.

Park and Ride Lots

Park and ride lots are a related/supplemental TDM concept, where satellite parking would be established on the periphery of the Bismarck-Mandan area. The park and ride lots allow commuters to drive from home to the lot, park their vehicles and either share rides from that point (carpool) or commute into the cities via shuttle van/bus or some form of public transit. Through the course of this LRTP update, there has been interest in identifying opportunities for park and ride lots. In review of the available information and travel data, possible locations could include Kirkwood Mall and Gateway Mall, which are served by several CAT bus routes. However, as the ridesharing programs are established it is recommended that ridership patterns of persons signing up or expressing interest are

reviewed/monitored. If there are outlying areas with higher demand/rideshare usage, a satellite park and ride lot to serve these locations may be feasible.

FREIGHT SYSTEM RECOMMENDATIONS

The focus of the freight system recommendations was to ensure that the key freight generators were connected to the truck route system and/or the arterial system, and that the truck route system provided an efficient and continuous system. As documented in the "Existing Transportation System Conditions" chapter, no current locations that generate significant levels of trucks are considered deficient in terms of connections to the identified truck route system.

Several of the recommended improvements to the roadway system will directly support the freight system:

- I-194 improvements between Memorial Highway and McKenzie Drive.
- Interchange ramp additions at I-94/State St and I-94/Bismarck Expressway.
- Mandan Avenue interchange improvements.
- US 83/State Street widening projects.
- North Washington Street widening projects.
- Highway 1806 improvements between 3rd Street South and 8th Avenue South.
- East Divide Avenue extension/improvement between Bismarck Expressway and 66th Street/North-South Beltway.
- West Divide Avenue and Tyler Parkway TSM/Added Turn Lanes.
- Added turn lanes along east Main Street.
- Intersection improvement at Collins Avenue/Old Red Trail.
- Added left-turn lanes at Century Avenue/State Street.
- North-South Beltway (Burleigh County).

Many of the roadway improvements would ease truck volume pressure on non-truck route corridors by providing more competitive complementary corridors, with the expectation that through truck traffic on these routes would not increase over the planning horizon. These sensitive corridors include:

- **Sunset Drive and Collins Avenue south of I-94**: Sunset Drive and Collins Avenue are not truck routes, and have weight restrictions. The improved Mandan Avenue Interchange and Collins Avenue/Old Red Trail improvements make designated truck routes more attractive to freight movement, and should limit any growth in truck volumes on these two routes.

- **Centennial Road**: Centennial Road is not a truck route, but currently experiences greater heavy truck volumes than desired. The North-South Beltway would provide an improved, parallel truck route for heavy vehicle use, which should absorb some of the truck demand on Centennial Road.
- **River Road**: Most of River Road has weight restrictions and is not a truck route. Improvements along Washington Street north of I-94 and to US 83 north of I-94 should reduce some of the demand for through trucks on River Road.

Future industrial development that will generate significant levels of heavy trucks should be approved in locations where either truck routes are in place to support that development, or where the roadway system can feasibly be improved to a level sufficient to support that development.

CORRIDOR PRESERVATION

Corridor preservation is an approach that attempts to control/protect the right-of-way for a planned future transportation improvement. The planning process involved with developing a Long Range Transportation Plan offers a unique opportunity to initiate corridor preservation for the Bismarck-Mandan region.

Corridor preservation provides the opportunity to plan for future transportation corridors while:

- Preventing inconsistent adjacent land uses
- Minimizing or avoiding social and economic impacts
- Preventing the use of preferred corridors for non-transportation uses
- Streamlining project development and reducing costs.

Corridor preservation is most often implemented through land acquisition, landowner agreements and/or land-use regulation techniques.

This section identifies those corridors that are appropriate candidates for preservation. There were two different categories of corridors which have been identified for preservation:

- Recommended LRTP projects that will require right-of-way acquisition.
- Regionally-significant roadway alternatives that were not included in the fundable, recommended transportation plan, but a consensus of stakeholders felt are projects that will likely be eventually implemented beyond 2035 and should have right-of-way preserved.

The projects for which corridor preservation are recommended are shown in Figure 31.

ITS Elements in the Plan

Intelligent transportation systems (ITS) encompass a broad range of communications-based information and electronics technologies focused on improving traffic flow, reducing delays and improving safety. When integrated into the multimodal transportation infrastructure, and in vehicles themselves, these technologies offer many benefits, including more efficient use of our infrastructure and energy resources, significant improvements in safety, mobility, accessibility, productivity and enhanced traveler information.

Similar to the requirements to periodically update the LRTP, the MPO is responsible for updating the regional ITS architecture. As the LRTP highlights the framework for improvements to the multimodal transportation system, the ITS architecture is the framework document focusing on transportation information data gathering, analysis and distribution of traveler information that involves technology enhancements. Communication systems are at the heart of the technology enhancements addressed in the ITS architecture.

The *Bismarck-Mandan Regional ITS Architecture Update*, 2008 identifies several the following market packages for implementation:

- Network Surveillance.
- Surface Street Control.
- Traffic Information Dissemination.
- Traffic Incident Management System.
- Speed Monitoring.
- Maintenance and Construction Vehicle and Equipment Tracking.
- Roadway Automated Treatment.
- Winter Maintenance.
- Transit Vehicle Tracking.
- Transit Fixed-Route Operations.
- Demand Response Transit Operations.
- Transit Fare Collection Management.
- Transit Security.
- Emergency Call-Taking and Dispatch.
- Emergency Routing.
- Wide-Area Alert.

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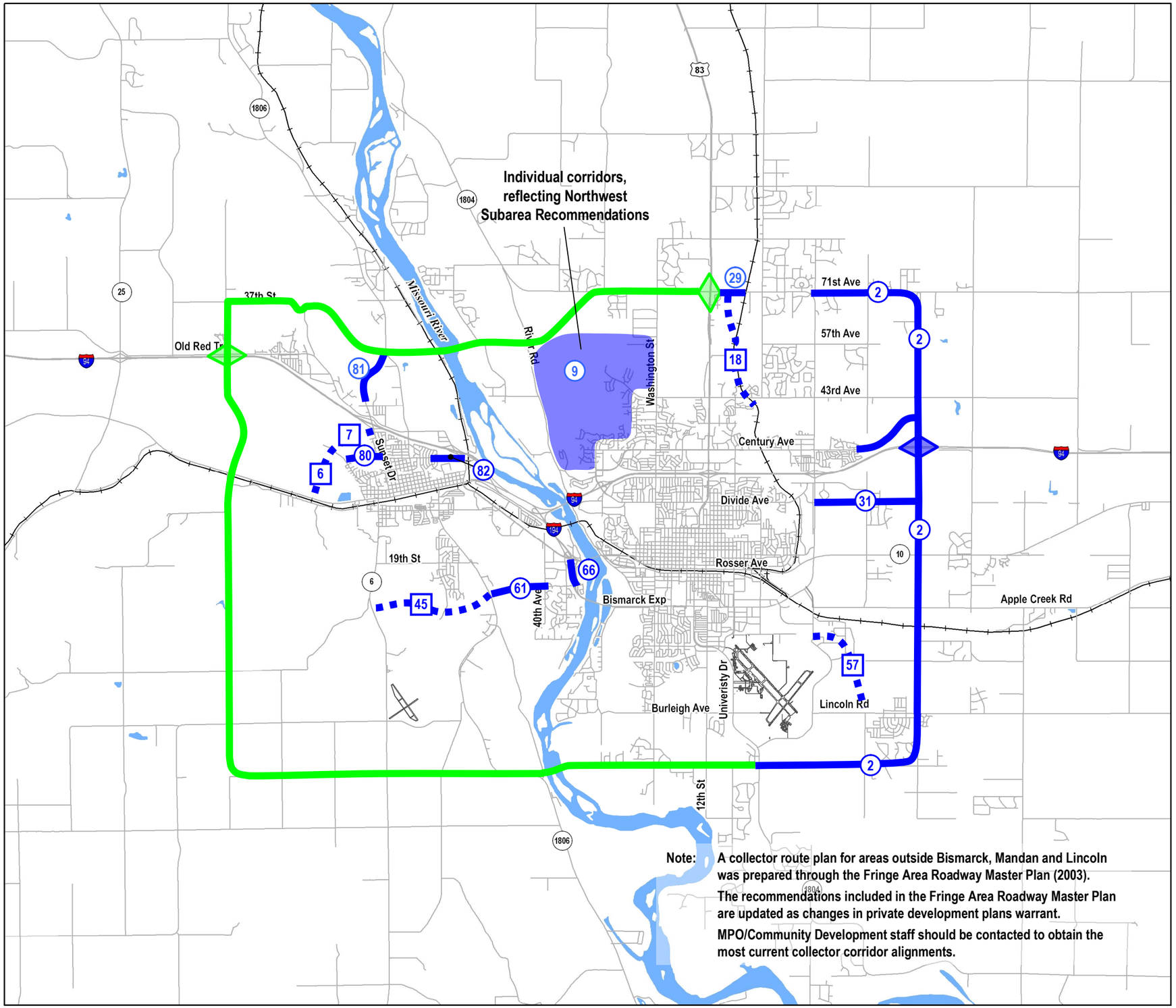

Note: A collector route plan for areas outside Bismarck, Mandan and Lincoln was prepared through the Fringe Area Roadway Master Plan (2003). The recommendations included in the Fringe Area Roadway Master Plan are updated as changes in private development plans warrant. MPO/Community Development staff should be contacted to obtain the most current collector corridor alignments.

Legend

Recommended Corridor Preservation Locations

- 31 Recommended Roadway Project
- 6 Recommended Trail Project
- Roadway Project, Implementation Beyond 2035

N

0 1 2 4 Miles

Figure 31. Recommended Corridor Preservation Locations

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February 5, 2010

Throughout the individual project development steps that lead to implementation of the projects in the LRTP, the compatibility of the technology elements with the applicable ITS architecture will be evaluated. For instance, projects that involve new signals/or signal upgrades would be designed to be consistent with the detection and coordination technologies being deployed throughout the region at the time of implementation, which could be very different from the current state-of-the-art.

Examples of technology projects in the LRTP that would need to be compatible with the ITS architecture are:

- Signal optimization/integration recommendations in the Bismarck Expressway and State Street/US 83 corridors.
- Bismarck Expressway recommendations include coordination of signals along 7th/9th with Expressway system.
- Transit farebox upgrades for improved data collection/analysis.
- Pedestrian crossing safety enhancements along Bismarck Expressway.
- Establishment of a rideshare-matching database for the MPO.

The regional TIP includes annual funding allocations for signal upgrade projects, and it is assumed that as some of the market packages are advanced into the implementation phase that some of these monies will be used. Bismarck has approximately $1,000,000 allocated to city wide signal projects for the 2010 to 2013 TIP.

System Security Recommendations

Transportation systems represent both sides of the security equation, as transportation infrastructure is both a vulnerability and an asset from a security standpoint. There are potential vulnerabilities with the transportation system, because there are large numbers of system users and our society comes to rely on it and an event that removed a single part of the system can cause a ripple effect throughout the entire network. Conversely, the system is an asset in that it provides mobility for response to events and in responding to evacuation due to natural disasters (flooding) or attacks. Typical actions that are taken to address the security of infrastructure include:

- Identifying transportation infrastructure vulnerability to natural disaster and attack.
- Developing approaches to shoring up protection of key assets.
- Generating plans to expedite response and recovery from natural disaster and attack, thereby mitigating the potential effects.

Transportation system security was provided its own goal and objectives during the initial stages of the LRTP update, and was used as a performance measure in project prioritization prior to development of the draft recommended project list.

It is recommended that a similar effort be coordinated for the security planning for the Bismarck-Mandan transportation system. Elements included in a transportation security planning process might include:

- Continue the work done on the SAFETEA-LU compliance amendments and working with various stakeholders such as emergency response representatives, the NDDOT, North Dakota Department of Emergency Response to establish the transportation security planning scope. This effort would include building off of the transportation security goal and objectives established in this LRTP.
- Coordinate with the North Dakota Department of Emergency Services to identify opportunities for security improvements. The Homeland Security Grants Section manages and administers grant programs that increase the capability of governments and first responders to prevent, protect against, respond to, and recover from catastrophic incidents. Burleigh County is currently part of a statewide group working with the department to initiate a statewide comprehensive regional response program.
- Identifying critical transportation assets, including:
    - Missouri River Bridges: I-94, Liberty Memorial and Bismarck Expressway Bridge.
    - I-94/I-194 Interchanges.
    - Access roads and structures supporting key security facilities, such as utility plants, the State Capitol, City and County buildings and hospitals.
- Assess the security risks on the multimodal system, including where bottlenecks/gaps in the system exist.
- Evaluate alternatives for securing the critical transportation assets and mitigating the security risks on the system. This evaluation should include a comparison of the value of the transportation assets to the probability/vulnerability of that asset to impact from natural disaster or attack.
- Establish a program for implementing any recommended improvements that incorporates a funding plan.

RECOMMENDED MPO-SPONSORED STUDIES

Given the regional nature of the LRTP update, there are some identified issues/deficiencies that will require more detailed, corridor/subarea specific planning studies during project development. The following studies are some potential corridor studies/subarea studies that may be considered in the near term:

- **Recommended Functional Classification System** and map for the MPO study area. Current functional classifications in the study area are a combination of urban and rural systems, and several subarea and corridor studies have provided recommendations on future classifications for proposed roadway corridors. A comprehensive study led by the MPO should establish a unified functional classification system for the study area, and should make classification recommendations for proposed future corridors.
- **East Bismarck Growth Area Study**, for the area generally bounded I-94, Highway 10, Bismarck Expressway and 66th Street.
- **North Mandan Growth Area Study**, for the area generally bounded by 37th Street, I-94, 24th Avenue and the Missouri River.
- **Lincoln Road Corridor Study,** to address the long-term access and mobility needs along the corridor and cross-roads between Airway Avenue and 66th Street. The study should evaluate a potential roundabout at the 52nd Street intersection and pedestrian issues/safety along the corridor.
- **Regional Rideshare Program Study**, evaluating implementation options, management/administration alternatives, costs and funding to support carpool and vanpool programs in the region.
- **Bicycle and Pedestrian Master Plan,** addressing the various non-motorized issues and opportunities identified through the course of the 2010-2035 LRTP update. The Master Plan could include an on-street bike route implementation element, which would include signing and striping requirements, treatments at route/trail transition areas and promotion. The Master Plan could also include recommendations for pedestrian crossing safety opportunities in various key corridors, such as Washington Street and Bismarck Expressway in Bismarck and Memorial Highway in Mandan.
- Update the **Transit Development Plan**.
- **Travel Model Practices Evaluation**, including an assessment of each of the steps in model process, with an evaluation of parameters and validation of the inputs looking for reasonableness and accuracy. The evaluation should compare the benefits and costs of any major adjustments to model components.

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ENVIRONMENTAL CONSIDERATIONS IN THE PLAN

This chapter provides an overview of the environmental considerations that went into development of the LRTP. These considerations include:

- **Environmental Mitigation**: A discussion of potential environmental mitigation activities in metropolitan transportation plans is a requirement of SAFETEA-LU. This chapter discusses potential environmental mitigation activities that will be undertaken as projects move from planning to project development.
- **Environmental Justice**: This chapter provides an overview of the LRTP in terms of environmental justice, an effort to ensure fair treatment and meaningful involvement of all people in the planning process regardless of race, color, national origin, or income.
- **Agency Consultation**: SAFETEA-LU also emphasizes consultation with federal and state land management, and wildlife and regulatory agencies. The last section of the chapter describes the consultation efforts that were made with resource agencies.

The Bismarck-Mandan region recognizes the need to balance the provision of regional mobility with the impacts the multimodal system can have on the natural and built environment. This is reflected by one of the LRTP's six goals, which is to "Address the transportation system's impact on the built, social and natural environment." More specifically, this spirit is reflected in several plan objectives, which have guided the development of this LRTP:

- Identify and implement appropriate programs intended to reduce or shift vehicular travel patterns, such as ridesharing and park-and-ride lots connected to the CAT bus system, to reduce the need to expand roadway capacity.
- Prioritize roadway system improvements based on costs relative to funding availability; degree of system benefit (impact); and level of impact to the adjacent area.
- Promote transportation projects, plans and/or programs that encourage reducing energy consumption.
- Implement programs that increase average vehicle occupancy, which reduces the pressure to expand the current system and improves the performance of the existing system.
- Coordinate transportation planning activities with the federal, state,

and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.

- Engage stakeholders and the public in the decision-making stage of the transportation planning process.
- Coordinate transportation planning activities with regional land use planning activities, including the Regional Future Land Use Plan.

ENVIRONMENTAL MITIGATION

This section discusses the potential environmental mitigation activities related to the projects/actions and programs recommended in the plan update. These mitigation activities will need to be evaluated and addressed for each project as they move towards implementation. As the scope of the LRTP update is regional in nature, and specific design-level details are not known for most projects at this early stage of project development, location-specific environmental impacts and mitigation efforts cannot be included within this document. It is possible to include a summary of the sensitive environmental features that exist within the MPO's LRTP study area, and discuss potential mitigation measures for each.

At the regional level of evaluation, it is apparent that there are many different locations and types of environmentally-sensitive areas throughout the Bismarck-Mandan region. Environmentally sensitive elements in the study area include:

- Wetlands
- Threatened and Endangered Species
- Floodplains
- Historical/Cultural Resources
- Transportation Noise
- Right-of-way/Property Impacts

Some of the identified sensitive areas, including wetlands and floodplains are summarized in Figure 32. It should be noted that while these features can be mapped at the regional level, these areas are best identified and verified through a project-level analysis. Thus, some environmentally-sensitive areas likely have not yet been identified at the current regional plan level. These non-identified areas might include resources such as historical properties, cultural resources and wetlands. As a project or program included in the LRTP transitions to corridor-level environmental, design and engineering phases, detailed evaluations will be required to identify how the program/project might impact these resources. Part of the LRTP's alternatives analysis

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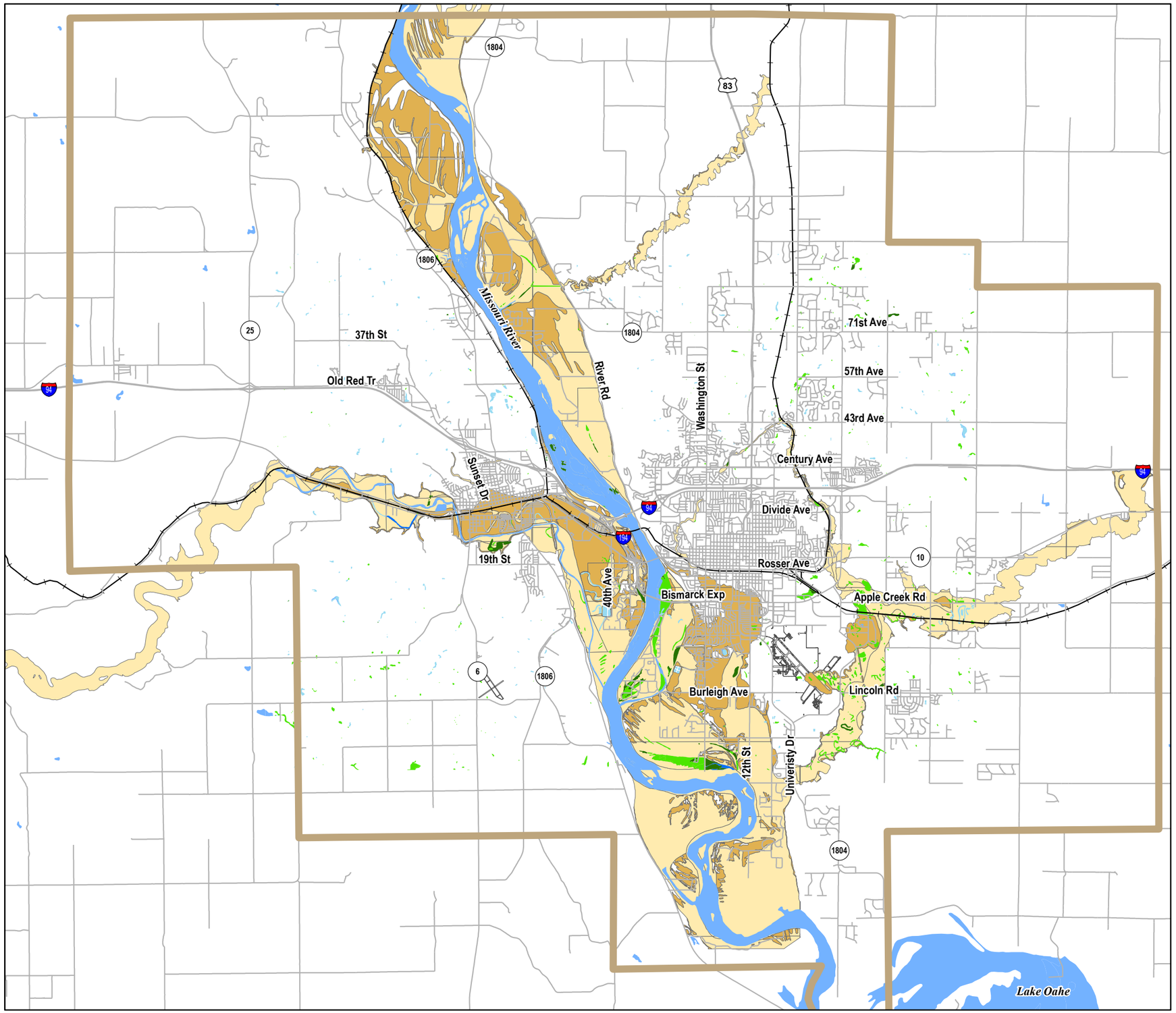

Legend

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Flood Plains

- 100-Year Floodplain
- 500-Year Floodplain

N

0 1 2 4 Miles

Figure 32. Identified Environmentally Sensitive Areas, Bismarck-Mandan Region

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November 20, 2009

process was to incorporate a cursory environmental review of each project concept, including evaluating how each alternative might impact natural and manmade resources.

Several different resources and impacts need to be considered, and are briefly described in the following subsections. Each subsection includes potential mitigation activities associated with each.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) has listed six species as threatened or endangered in Burleigh and Morton Counties[23]. These species and their status include:

- **Piping Plover** (*Charadrius melodus*): Threatened.
- **Black-footed Ferret** (*Mustela nigripes*): Endangered**.**
- **Gray Wolf** (*Canis lupus*): Endangered.
- **Interior Least Tern** (*Sternula antillarum*): Endangered.
- **Pallid Sturgeon** (*Scaphirhynchus albus*): Endangered.
- **Whooping Crane** (*Grus Americana*): Endangered.

Threatened and endangered species mitigation activities might include avoidance and minimization of impacts; time of year restrictions on activities; construction sequencing; design exceptions and variances; species research and fact sheets; Memoranda of Agreements for species management; environmental compliance monitoring.

Wetlands

Executive Order (EO) 11990, Protection of Wetlands, requires federal agencies to take action to minimize the loss of wetlands due to activities. Activities disturbing jurisdictional wetlands require a permit from the U.S. Army Corps of Engineers (USACE). Authorization/Permits are available from the USACE for activities regulated under Section 404 of the Clean Water Act (Section 404). The USACE would determine what, if any, mitigation would be required with these permits. The identified study area wetlands are shown in Figure 32.

Wetlands mitigation activities might include requirements involving avoidance, minimization and offset of impacts, which could include preservation, creation, restoration, in lieu fees, riparian buffers, design exceptions and variances and environmental compliance monitoring.

[23] United States Department of the Interior, USFWS, *Endangered, Threatened, Proposed and Candidate Species, North Dakota Counties*, October 2008.

Floodplains

Executive Order No. 11988, Floodplain Management, seeks to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of development within the floodplain where a feasible alternative exists. EO 11988 applies to Federally-funded projects and directs agencies to consider alternatives to projects in a floodplain. Actions within a 100 year floodplain must consider alternatives to avoid adverse effects in the floodplain. If no feasible alternatives exist to constructing a facility in the floodplain, the action must be designed to minimize potential harm to or within the floodplain. The FEMA-identified 100-year and 500-year floodplains are documented in Figure 32.

Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires any federally funded or licensed activity be evaluated for potential impacts to historic and archaeological properties. Cultural resource impacts are specifically considered for properties that would be eligible for the listing on the National Register of Historic Places (NRHP). Some level of mitigation needs to be considered if such properties exist and are potentially impacted either directly (such as construction) or indirectly (such as visual impacts).

Cultural resource mitigation activities might include avoidance and minimization of impacts; landscaping for historic properties; preservation in place or excavation for archeological sites; Memoranda of Agreement with the State Historical Society of North Dakota; design exceptions and variances; environmental compliance monitoring.

Traffic Noise

Traffic noise is defined as unwanted sound from roadway vehicles. For any street and roadway expansion or reconstruction projects that involve Federal funding, a traffic noise evaluation should be completed, based on guidance provided by NDDOT in *Noise Analysis and Abatement Guidelines* (NDDOT, 1997). The NDDOT Noise Analysis policy is consistent with 23 Code of Federal Regulations (CFR) Part 772, which provides procedures for traffic noise studies and noise abatement criteria (NAC). If noise impacts are found with a street improvement, mitigation measures could potentially include sound barriers/walls, alteration of the street alignment, lowering traffic speeds or restricting heavy trucks from the roadway.

Within the Bismarck city limits, noise from individual vehicles is regulated by Bismarck city ordinance, such that noise from trucks should not exceed 88 dBA and from passenger cars/light trucks should not exceed 80 dBA, both measured at 25 feet (Title 8, *Bismarck Code of Ordinances*). The use of unmuffled compression

brakes (also known as "jake brakes") is also prohibited (Title 12, *Bismarck Code of Ordinances*).

Right-of-Way Impacts

Transportation projects sometimes require the acquisition of private property. Through the alternatives analysis process, potential private property impacts were considered when evaluating the various potential multimodal transportation improvements. Impacts can include loss of agricultural land, impacts to neighborhoods, homes and businesses or parks and recreation area impacts. In many of these cases, the mitigation measures considered would include avoidance and minimization of impacts; context sensitive solutions to provide a better project "fit" within the adjacent environment; environmental compliance monitoring.

ENVIRONMENTAL JUSTICE

Environmental Justice Overview

Environmental justice is an effort to ensure fair treatment and meaningful involvement of all people in the planning process regardless of race, color, national origin, or income. Fair treatment is characterized as no group being asked or required to bear a disproportionate share of the negative environmental consequences resulting from the proposed actions (projects and programs) included in the Long Range Transportation Plan. Meaningful involvement means that:

- People have an opportunity to participate in decisions about activities that may affect their environment.
- Public input is included in the decisions being made as part of the long range transportation planning process.
- The MPO has actively requested input from the public that would be impacted by the proposed actions in the Long Range Transportation Plan.

Assessment of the potential for environmental justice concerns relies entirely on relative measures, not specific thresholds or measures and relying only on relative measures brings into the overall equation personal judgment. This includes:

- Judgment as to what is proportionate and disproportionate when it comes to the potential for impacts.
- Judgment as to whether the efforts made during the planning process to inform people were widespread enough to get the message out to the people potentially impacted.
- Judgment as to whether enough contacts were made, whether the timing of the contacts was reasonable, and/or whether the comments provided during outreach efforts were included in the decision-making process.

The Environmental Protection Agency (EPA), the federal agency responsible for evaluating the potential for environmental justice impacts, has developed general guidelines to aid in determining the potential for impacts with relative/qualitative

terms that describe the severity of impacts. The phrase *disproportionately high and adverse effects or impacts* has been provided by EPA to define an adverse effect or impact that:

1. Is predominately borne by any segment of the population, including a minority population and/or a low-income population.
2. Will be suffered by a minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect or impact that will be suffered by a non-minority population and/or non-low-income population.

The spirit of both the Civil Rights Act and the Executive Order covering environmental justice were incorporated into the Bismarck-Mandan MPO long range transportation alternatives analysis that was completed in preparation of the multimodal plan. The potential for impacts on lower-income, minority and Latino/Hispanic populations was one in the range of social, engineering and environmental performance measures used in the multi-level alternatives screening. EPA guidance has divided environmental justice assessment into two levels:

1. **Screening-level assessment** that is a cursory level review and demonstration that there is some evidence of different potentials for a range of exposure levels and increments of impacts in the community. This level is appropriate for the long range transportation plan.
2. More detailed **project-specific level assessment** for those project areas where environmental justice impacts cannot be ruled out in the screening-level assessment.

Environmental Justice Screening-Level Assessment

EPA guidance states that at the screening-level assessment, “some evidence” of the ability to differentiate between the severity of impacts on various populations by area is to be provided. For the Bismarck-Mandan MPO long range transportation plan, evidence of for being able to demonstrate the ability to differentiate is provided in Figures 33 through 35. In these figures each of the projects that will likely require additional right-of-way (for a new alignment or an intersection or corridor expansion) and would result in added traffic in an area presently not experiencing much traffic are mapped relative to:

- Percent population in poverty, based on Census definition of poverty. Percentage poverty by Census block group is shown in Figure 33.
- Percent non-white population. Percentage non-white population is shown in Figure 34.
- Percent Hispanic or Latino population. Percentage Hispanic or Latino population is shown in Figure 35.

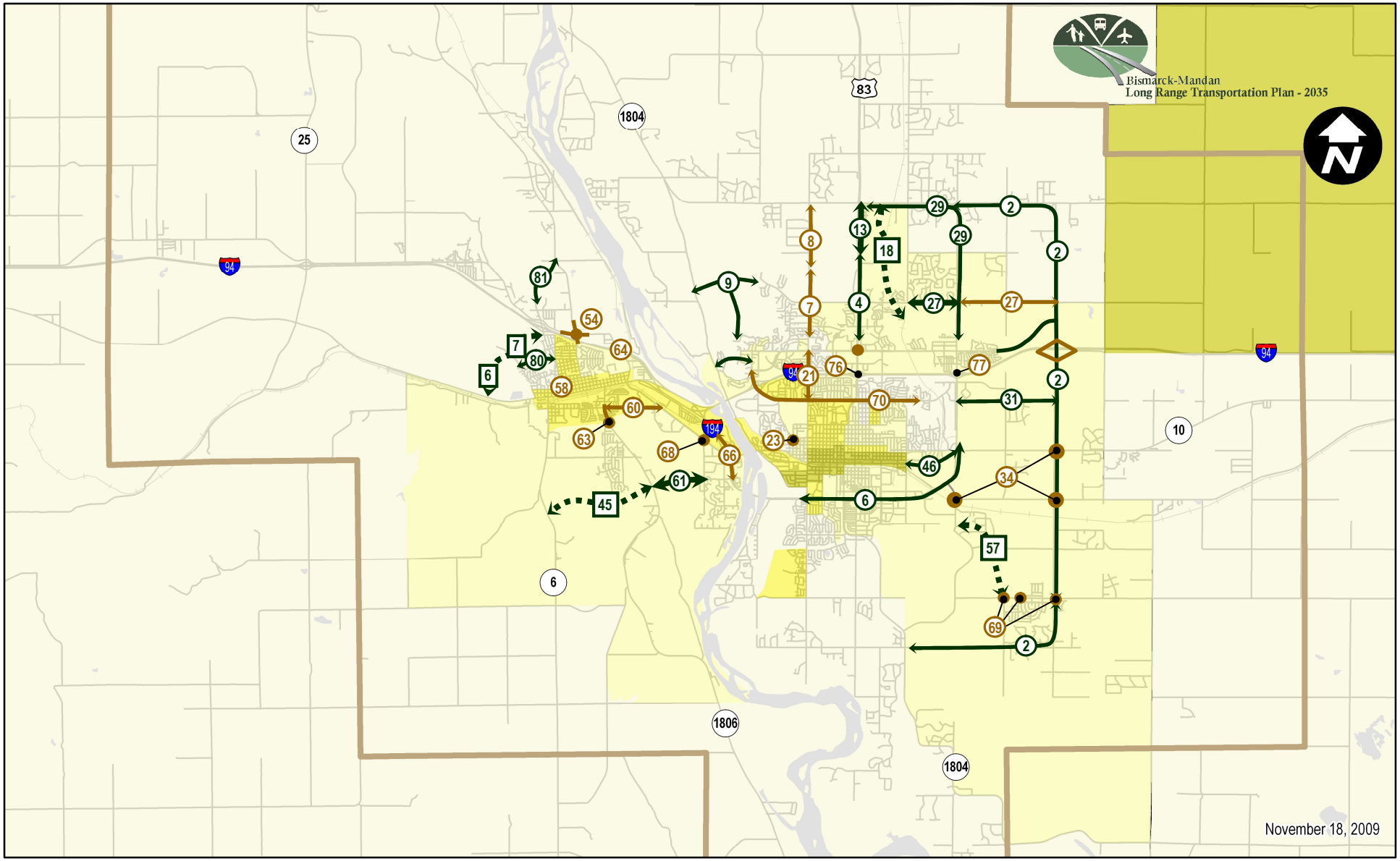

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Figure 33.
Census-Defined Population in Poverty by Census Block Group (2000 Decennial Census Data)

Legend

Population in Poverty

- 5% or Less
- 5% to 10%
- 10% to 20%
- 20% to 30%
- More than 30%

Recommended Projects

- Roadway Project
- Multimodal Corridor Project
- Trail Project in New Right-of-Way

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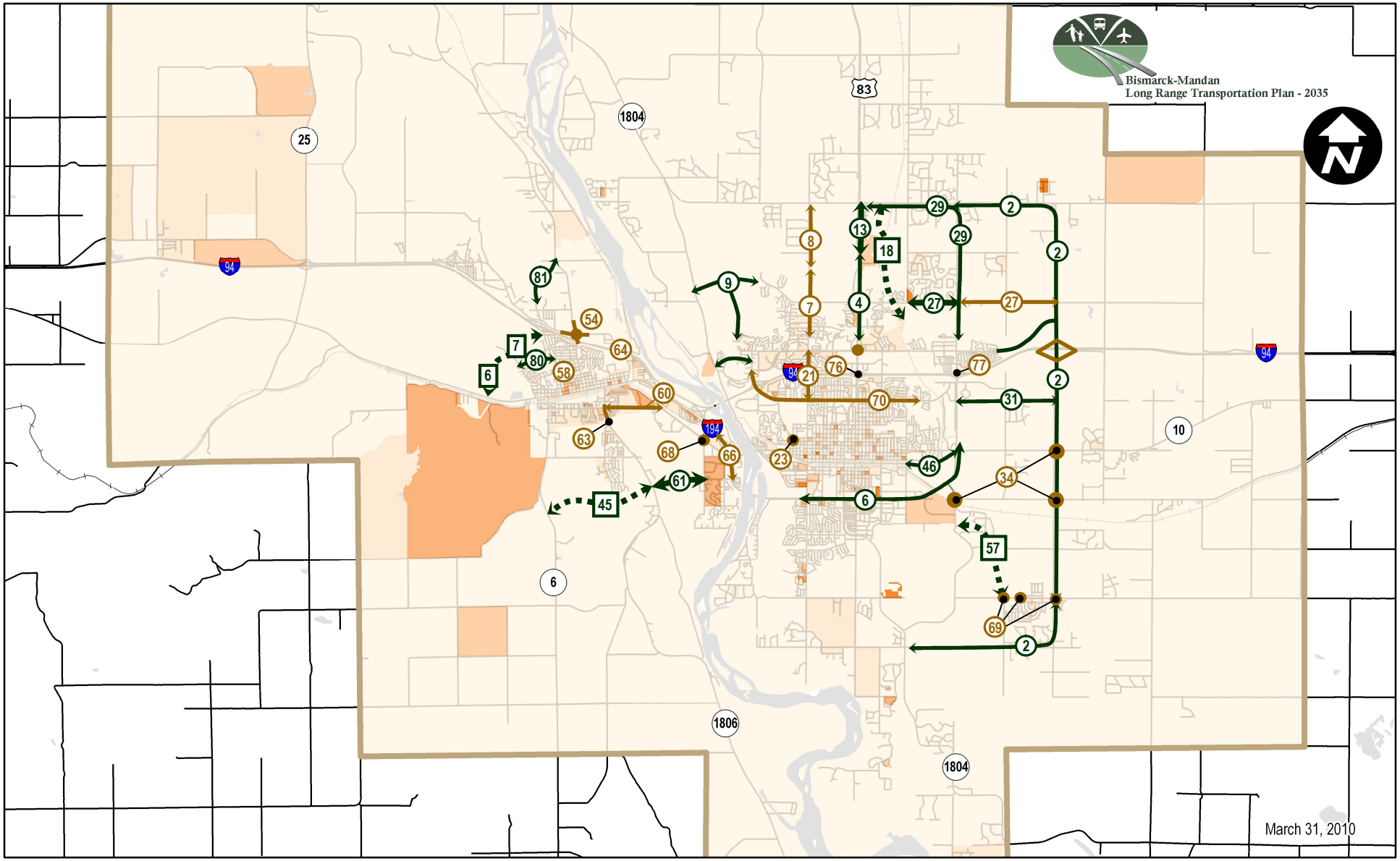

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Figure 34.
Census-Defined Non-White Population by Census Block (2000 Decennial Census Data)

Legend

Non-White Population

- 5% or Less
- 5% to 15%
- 15% to 25%
- 25% to 50%
- More than 50%

Recommended Projects

- 70 Roadway Project
- 2 Multimodal Corridor Project
- 45 Trail Project in New Right-of-Way

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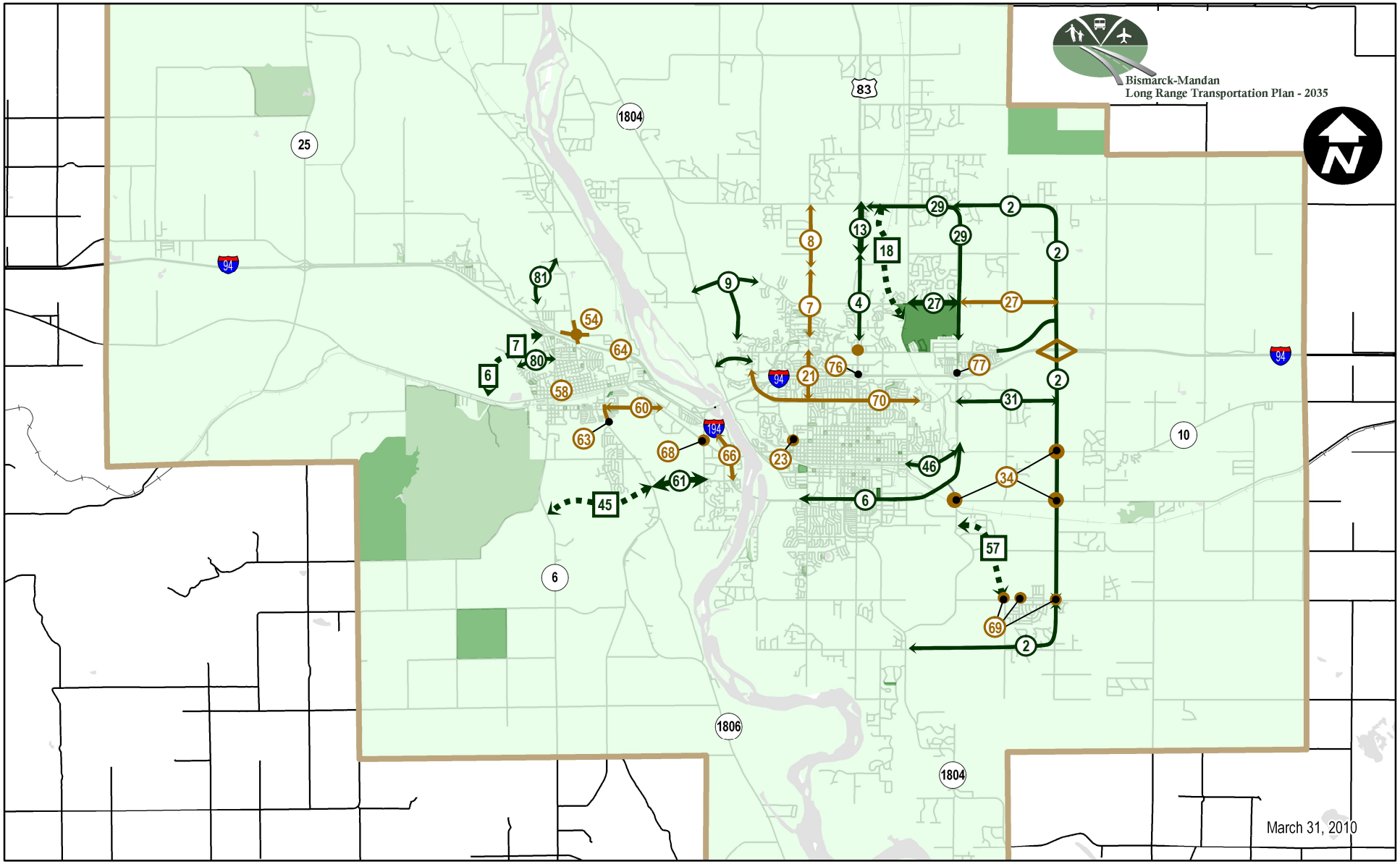

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Figure 35.
Census-Defined Hispanic or Latino Population by Census Block (2000 Decennial Census Data)

Legend

Latino / Hispanic Population

- 5% or Less
- 5% to 15%
- 15% to 25%
- 25% to 50%
- More than 50%

Recommended Projects

- 70 Roadway Project
- 2 Multimodal Corridor Project
- 45 Trail Project in New Right-of-Way

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Projects that would likely require additional right-of-way and would add substantial amounts of traffic to an area presently not experiencing much traffic were selected as they represent those projects that would be the most intrusive and as they would have the greatest potential for negative impacts.

The environmental justice evaluation relies on the latest population data available for the MPO study area, the 2000 Census Summary File 1 and Summary File 3 datasets. Summary File 1 datasets provide census block-level population data, including racial background and Hispanic/Non-Hispanic population breakdown. Income data, from which information on populations living in poverty was derived, are available from the Summary File 3 dataset at the more aggregated census block-group level.

The projects included in the fundable elements of the LRTP, which also includes the TIP, are at a relatively early stage of project development and key items such as final alignment of a new corridor have not been established. Thus, if there is potential for impacts to low-income and/or minority populations, adjustments can be made to lessen or fully mitigate potential impacts.

Transportation facilities, including roadway, sidewalks/trails and transit service provide benefits to adjacent areas by enhancing mobility and expanding economic opportunities that follow improved accessibility. These potential benefits were also taken into account in the multimodal alternatives analysis.

The mapped projects include:

- Recommended roadway projects
- Recommended multi-modal projects (roadway and trail additions)
- Recommended trail projects not within a current transportation right-of-way

From the evidence the mapping provided, the following conclusions were developed:

- Recommended roadway and non-motorized projects that require additional right-of-way are distributed throughout the region, and more than half of the “expansion” project mileage is in areas that are not presently developed to an urban density.
- The current regional percentage of the population in poverty is approximately 8.1 percent. Less than 25 percent of the expansion project mileage is located in areas that are reported to have a higher percentage of the population in poverty than the regional average. As less than 25 percent of the mileage is located in areas with a higher-than the regional poverty average, the potential for a disproportionate amount of impacts is low.
- Approximately five (5) percent of the 2000 population in the region was non-white. Less than 10 percent of the expansion mileage that would likely result

in additional right-of-way acquisition impacts and add substantial traffic to the subarea is located in areas with a population of more than five percent non-white. As the percentage of mileage is low, the potential for disproportionate impacts to non-white populations associated with expansion is also relatively low.

- Hispanic and Latino populations make up approximately 0.7 percent of the regional population, or approximately 600 of the more than 86,000 people in the region (as of the 2000 Census). Only one project in the Recommended Plan (Project 27 – Add Turn Lanes at Key 43rd Avenue Access Points, 26th Street to Centennial Road) would impact an area of the community with a Hispanic/Latino population of more than 5 percent of the subarea population. In the area, located south of 43rd Avenue, there was one (1) person reported in the 2000 Census to be Hispanic-Latino. Thus, is has been concluded that the potential for placing a disproportionate level of impact on Hispanic and Latino populations is very low.

Consultation Efforts

The Bismarck-Mandan MPO maintains a database of stakeholders for involvement purposes, including:

- Environmental resource agencies
- Economic development groups
- Freight interests
- Native American tribal governments in North Dakota
- Environmental advocacy groups
- Historic resource agencies
- Wildlife management agencies
- Land management agencies
- Transportation system user groups

These groups were sent notices at LRTP update milestones where their feedback and comments would be most valuable:

- In **April 2009** the first phase of the alternatives analysis where the entire range of potential multimodal improvement alternatives was being considered and feedback was being solicited on each option.
- In **August 2009** the draft multimodal plan list, where the alternatives had been narrowed down to a *draft* fundable list and public/agency input was desired prior to finalization.

- In **October 2009** the draft *2010-2035 Bismarck-Mandan LRTP* document was made available to the public and stakeholders through the LRTP update website, and notice was sent to the agencies and stakeholders for their review and comment.

The notices that were mailed and e-mailed to the agencies and groups included:

- Invitations to consult with the study team/provide feedback on the alternatives being considered.
- Notices/invitations to upcoming public meetings and televised meetings being held in both Mandan and Bismarck.
- Links to study website documents that provided overviews and illustrations of the potential improvements being considered or the Draft LRTP document. The study website provides an opportunity for providing feedback and asking questions from every page at the site.

The consultation notices and recipients and any feedback/comments received are included in Appendix E.