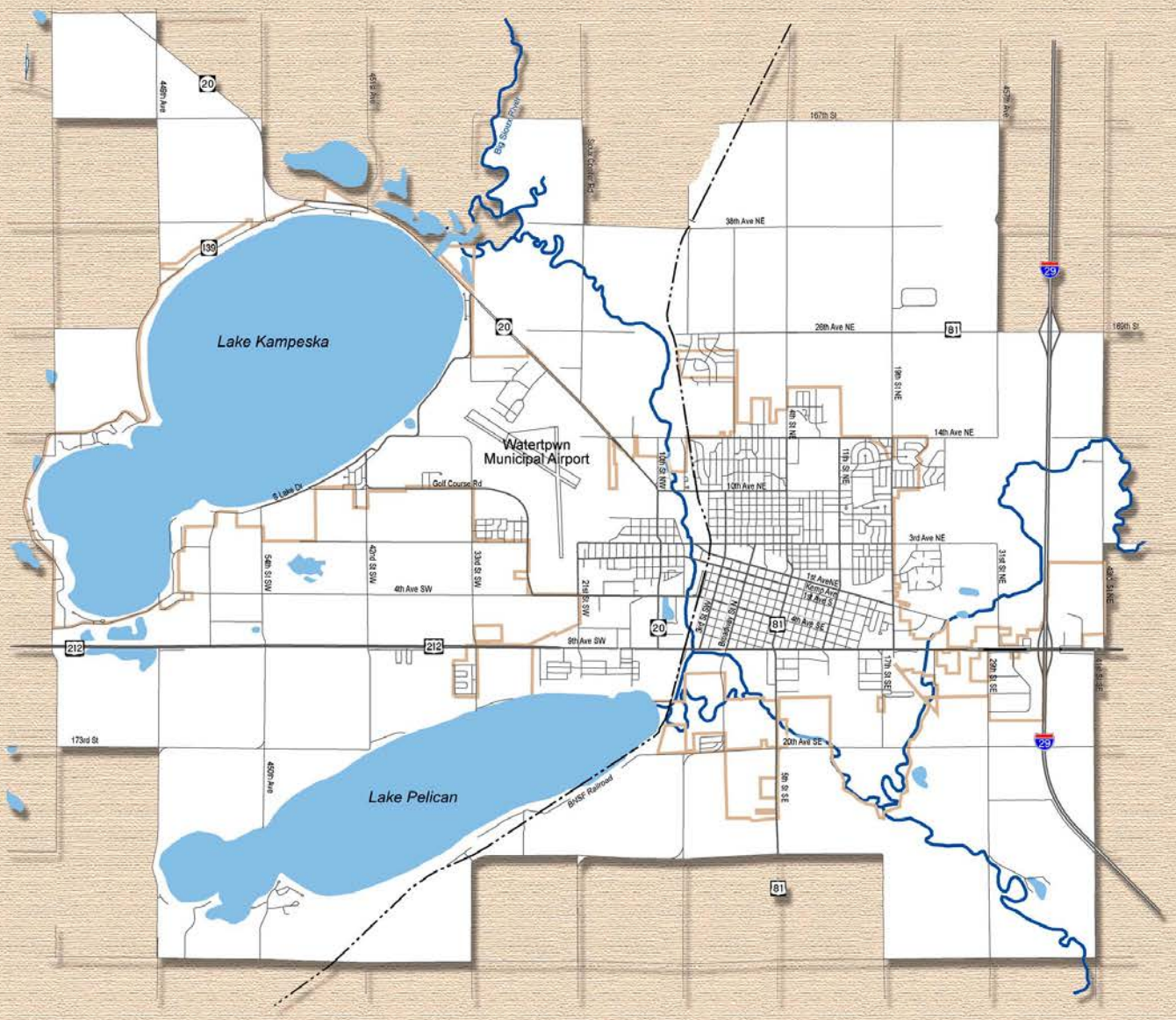
Watertown Area Transportation Plan



WATERTOWN
South Dakota's Rising Star

South Dakota DOT
Department of Transportation

URS
TRANSPORTATION

WATERTOWN AREA TRANSPORTATION PLAN

STUDY REPORT

November 2005

Prepared for:

Prepared By:

Acknowledgements

The Watertown Area Transportation Plan is the product of a coordinated effort between the City of Watertown, the South Dakota Department of Transportation and the plan Steering Committee. The study Steering Committee participants are listed below.

Watertown Area Transportation Plan Steering Committee Members

Rick Laughlin, South Dakota DOT Project Manager	South Dakota Department of Transportation
Herb Blomquist, City of Watertown Project Manager	City of Watertown, Public Works
Pat Culhane	Watertown City Council
Dave Petersen	City of Watertown, Engineering Department
Mike Rye	City of Watertown, Street Department
Ben Orsbon	South Dakota Department of Transportation
Joel Gengler	South Dakota Department of Transportation
Jeff Senst	South Dakota Department of Transportation
Ron Sherman	South Dakota Department of Transportation
Paul Nikolas	South Dakota Department of Transportation
Mike Behm	South Dakota Department of Transportation
Geoff Heig	Watertown Municipal Utilities
Todd Kays	1st District Association of Governments / Codington County Planning
Richard Benda	Focus Watertown
Craig Atkins	Focus Watertown
Doug Sharp	Focus Watertown
Rick Small	Codington County Highway Department

Transportation Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic (Definition on Page iii)
BNSF	Burlington Northern and Santa Fe Railway Company
DM&E	Dakota, Minnesota and Eastern Railroad
FAA	Federal Aviation Administration
FTA	Federal Transit Administration
FHWA	Federal Highway Administration
GIS	Geographic Information System
HBNW	Home-Based Non-Work Trip
HBW	Home-Based Work Trip
HCM	Highway Capacity Manual
LOS	Level of Service (Definition on Page *iii*)
MOE	Measure of Effectiveness
NHB	Non-Home Based Trip
NHS	National Highway System
O-D	Origin-Destination
SDDOL	South Dakota Department of Labor
SDDOT	South Dakota Department of Transportation
TAZ	Traffic Analysis Zone
TDM	Transportation Demand Management (Definition on Page *iii*)
TIP	Transportation Improvement Program
TSM	Transportation System Management (Definition on Page *iii*)
V/C	Volume-to-Capacity Ratio (Definition on Page *iii*)
VMT	Vehicle Miles of Travel (Definition on Page *iii*)
VPD	Vehicles Per Day
WAT	Watertown Area Transit

Transportation Glossary/Definitions

Average Daily Traffic (ADT) – The total amount of traffic observed, counted or estimated during a single, 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. Capacity is usually expressed in vehicles per day (vpd) or vehicles per hour (vph).

Critical Crash Rate – A traffic safety evaluation tool used to identify any study area intersections or roadway segments that have a statistically higher than expected crash rate.

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

Demand Responsive Service – Transit service that does not utilize a fixed route (see definition below). Demand responsive service allows passengers to make reservations to board and get off of the bus / van at any location within the service area; also called "Dial-a-Ride".

Development Concept – The transportation plan's land development scenario, which establishes where and how many new jobs and housing will be located over the planning horizon.

Fixed Route Service – Transit service provided on a repetitive, fixed-schedule basis along a specific route. Buses / vans stop to pick up and deliver passengers at specific locations; each fixed-route trip serves the same origins and destinations, unlike demand responsive service.

Increment of Development – The number of new households and jobs projected to be added to the study area between the base year (2004) and 2030.

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.

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

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

Planning Horizon – The period of time for which the plan is accounting. For the Watertown Area Transportation Plan, the planning horizon is 25 years. Thus, the plan recommendations are intended to account for transportation system conditions through the year 2030.

Traffic Progression – A measure of corridor traffic flow that looks at what portion of traffic arrives at a signal during its green phase without stopping. The better the progression, the higher the percentage of traffic that arrives at and passes through the signalized intersection during its green phase.

Transportation Improvement Program (TIP) – This is the list of all funded transportation projects in the Watertown area that are not yet implemented. The projects included on this list are scheduled to receive funding within the next five years.

Travel speed - The speed at which a vehicle travels between two points including all intersection delays.

Transportation Demand Management (TDM) – Programs developed to reduce the levels or patterns of transportation demand in order to use the transportation system more efficiently.

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.

Vehicle Miles of Travel (VMT) – A statistic that summarizes the total mileage traveled on the roadway system (number of trips x average trip length). Reducing VMT can help ease traffic congestion and improve air quality.

Volume to Capacity (V/C) Ratio – The resultant of dividing the counted/estimated traffic volume in a corridor by the estimated corridor/intersection capacity for a similar increment of time.

TABLE OF CONTENTS

INTRODUCTION **1**

PUBLIC INVOLVEMENT PROCESS **3**

TRANSPORTATION SYSTEM ISSUES **6**

GOALS AND OBJECTIVES **12**

EXISTING TRANSPORTATION SYSTEMS **16**

STATE/FEDERAL HIGHWAYS AND LOCAL ROADWAY SYSTEMS 16
Functional Classification *16*
Roadway Geometrics *19*
Traffic Volumes *19*
Measures of Corridor Operations/Roadway Capacity *21*
Current (2000) Capacity Deficiencies *24*
Traffic Safety Assessment *26*
Travel Survey *30*
LOCAL TRANSIT SERVICE 37
NON-MOTORIZED SYSTEM 40
FREIGHT MOVEMENT 43
Trucks *43*
Train Service *45*
AIR SERVICE 45
INTERCITY BUS 47

2030 POPULATION, EMPLOYMENT AND TRAFFIC PROJECTIONS **48**

OVERVIEW 48
CONTROL TOTAL POPULATION AND EMPLOYMENT PROJECTIONS (2030) 48
ALLOCATION OF THE DWELLING UNITS AND EMPLOYMENT GROWTH, 2000 TO 2030 51
EXISTING PLUS COMMITTED IMPROVEMENTS NETWORK 54
2030 DAILY TRAFFIC FORECASTS 56
Travel Forecasting Overview *56*
Forecasted 2030 Daily Traffic Volumes *58*
AIR SERVICE FORECASTS 61
2030 ROADWAY CAPACITY DEFICIENCIES 62

ALTERNATIVES ANALYSIS **64**

OVERVIEW 64
EVALUATION CRITERIA 64
GENERALIZED ALTERNATIVES SCREENING PROCESS 65
Non-Motorized System Screening *68*
FUNDING THE PLAN 73
ROADWAY ALTERNATIVES PRIORITIZATION 75

RECOMMENDED PLAN **80**
OVERVIEW 80
RECOMMENDED IMPROVEMENTS 80
Recommended Non-Motorized System Improvements *80*
Recommended Roadway System Improvements *82*
Watertown Municipal Airport Recommended Improvements *85*
Watertown Area Transit Recommended Improvements *85*
Corridor Preservation *86*
Access Management Recommendations *89*
PROJECT DEVELOPMENT AND IMPLEMENTATION 93
Capital Funding Project Progression *94*
Detailed Project/Program Development *95*
ON-GOING TRANSPORTATION PLANNING ACTIVITIES 96

LIST OF FIGURES

FIGURE 1. Watertown Area Transportation Plan Study Limits 2
FIGURE 2. Steering Committee Identified Transportation Issues 7
FIGURE 3. Public Meeting Identified Transportation Issues 9
FIGURE 4. Stakeholders Group Identified Transportation Issues 10
FIGURE 5. Current Roadway Functional Classification System 18
FIGURE 6. Current Daily Traffic Volumes 20
FIGURE 7. Existing Conditions Level of Service 25
FIGURE 8. High Crash Rate Locations 28
FIGURE 9. Estimated Daily Travel Through Watertown 36
FIGURE 10. Transit Ridership, Service Miles and Cost, 1999 to 2004 38
FIGURE 11. Trail and Sidewalk Connections 41
FIGURE 12. Current Sidewalk System 42
FIGURE 13. Truck Routes 44
FIGURE 15. Residential Growth Areas by Type, 2004 to 2030 52
FIGURE 16. Employment Growth Areas by Type, 2004 to 2030 53
FIGURE 17. Regionally Significant Committed Roadway Improvements 55
FIGURE 18. Future (2030) Base Condition Daily Traffic Volumes 59
FIGURE 19. Future (2030) Base Condition Level of Service 63
FIGURE 21. Recommended Multi-Use Trails and On-Street Bicycle Routes 81
FIGURE 22. Phasing of Recommended Roadway Projects 83
FIGURE 23. Examples of Directional Turn-Movement Restrictions 91
FIGURE 24. Plan Implementation Process 97

LIST OF TABLES

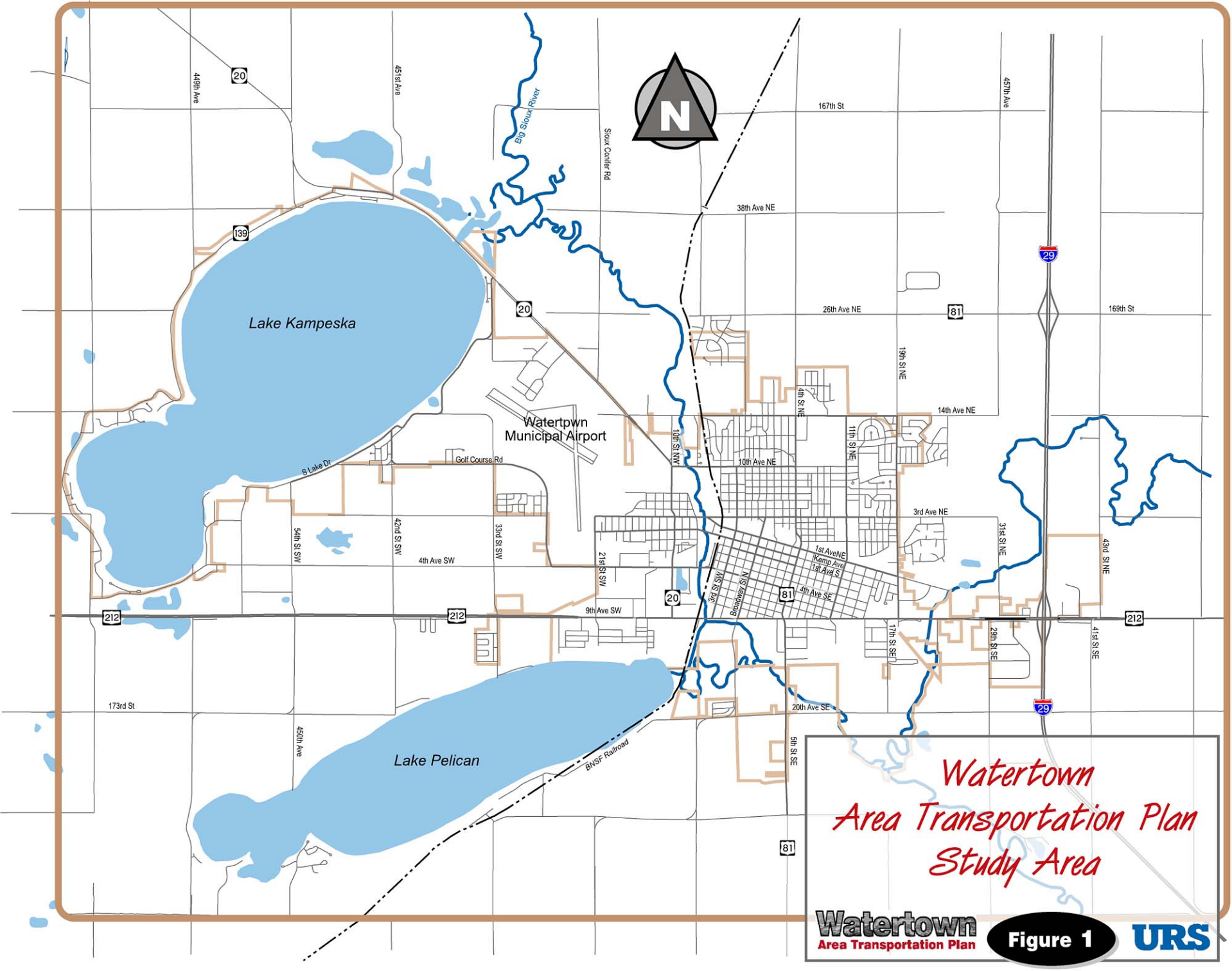
TABLE 1. Summary of Travel Survey Responses to Transportation Issues Question 11
TABLE 2: Watertown Transportation Plan Objectives 14
TABLE 3: Functional Classification System Design Criteria 17
TABLE 4: Current Mileage and Vehicle Miles of Travel By Facility Type 19
TABLE 5: Definition of Level of Service 22
TABLE 6. General Daily Roadway Capacity 23
TABLE 7: Crash Type by Location 29
TABLE 8: Crash Severity by Location 30
TABLE 9. Travel Survey Response Rate by Survey Station 32
TABLE 10. Persons Per Vehicle by Survey Period 33
TABLE 11. Trip Purpose Percentages by Survey Period 34
TABLE 12. Transit Funding Levels by Source 37
TABLE 13. Transit Performance Measures 39
TABLE 14. Transit Ridership by Trip Purpose (2004) 39
TABLE 15. Transit Ridership by Rider Classification (2004) 40
TABLE 14. Air Passenger Traffic, South Dakota Cities (2004) 47
TABLE 15. Historical Population Levels, Watertown and Codington County 49
TABLE 16. Historical Employment Levels, Codington County 49
TABLE 17. Study Area Population, Household and Employment Projections 50
TABLE 18: Trip Generation and Vehicle Miles Travel (2004 and 2030) 60
TABLE 19. Summary of Air port Utilization Forecasts 61
TABLE 20. Universe of Trail and Bicycle Route Concepts Considered 71
TABLE 21. Prioritization Criteria and Scoring for Roadway Alternatives 76
TABLE 22. Prioritization Ranking for Roadway Alternatives 77
TABLE 23. Recommended Roadway Projects 84
TABLE 24. Recommended Right-of-Way Widths by Functional Classification 89
TABLE 25. South Dakota Access Location Criteria 90

INTRODUCTION

The Watertown Area Transportation Plan provides the underlying structure for the area's transportation planning process over the next 25 years. The transportation planning process was a collaborative effort where the existing and future demands on the transportation system were evaluated. Based on those evaluations, a set of recommendations were made that guide the Watertown area to a desired outcome, as defined by locally identified issues, goals, objectives and benchmarks. The Watertown Area Transportation Plan addresses the study area displayed in Figure 1.

The overall plan considered a wide range of social, engineering, environmental and economic factors in establishing the Watertown area's transportation goals and objectives. These goals and objectives were developed to reflect the overall values of the community and are important because they set the general course for the study. The outcome of the plan was a set of short-range actions (within the next five years), mid-range actions (five to 15 years away) and long-range actions (15 to 25 years away) that will lead to the development of an integrated, multimodal transportation system that efficiently moves people and goods. A multimodal system is one that serves and connects various modes of travel and goods transported in and through the Watertown area, including automobile, pedestrian, bicycle, transit and rail and truck freight. In developing the transportation plan, the study team included the following elements and activities:

1. Identified the projected transportation demand of persons and goods in the study area over the planning period (through the year 2030).
2. Identified effective strategies to address congestion in a systematic way that meet current and future transportation demand.
3. Identified and evaluated pedestrian and bicycle transportation facilities.
4. Assessed methods to most efficiently use the existing transportation system to relieve roadway congestion and enhance the mobility of people and goods.
5. Evaluated the transportation, social, environmental and financial impacts of the plan with a multimodal perspective.
6. Considered the *City of Watertown's Comprehensive Land Use Plan* (October 2004) when developing the transportation plan.
7. Provided a plan that considered the financial capabilities of the community and recommends a set of strategies and improvements that are consistent with likely sources of revenue through the transportation plan's horizon year of 2030.


N
Lake Kampeska
Lake Pelican
Watertown
Municipal Airport
Big Sioux River
BNSF Railroad
449th Ave
451st Ave
450th Ave
457th Ave
Sioux Conifer Rd
167th St
169th St
173rd St
38th Ave NE
26th Ave NE
14th Ave NE
10th Ave NE
3rd Ave NE
4th Ave SW
9th Ave SW
4th Ave SE
20th Ave SE
S Lake Dr
Golf Course Rd
54th St SW
42nd St SW
33rd St SW
21st St SW
10th St NW
4th St NE
11th St NE
19th St NE
31st St NE
43rd St NE
1st Ave NE
Kemp Ave
1st Ave S
3rd St SW
Broadway St N
17th St SE
29th St SE
41st St SE
5th St SE
20
139
212
81
29
Watertown
Area Transportation Plan
Study Area
Watertown
Area Transportation Plan
Figure 1
URS

Public Involvement Process

It is important that the Watertown Area Transportation Plan be founded on the consent of the general community and the South Dakota Department of Transportation, as well as the various committees and bodies formed within the area. The plan must be a reflection of the community's and state's expectations for its transportation system as well as what tradeoffs the community and state are willing to make in order to achieve those expectations. A variety of public involvement methods were used throughout the study process. This chapter of the report summarizes the public involvement process employed for the transportation plan.

A transportation plan Steering Committee was organized and maintained throughout the development of the plan. The Steering Committee was a technical advisory group for the transportation plan, composed of staff from the city, the county, the South Dakota Department of Transportation (SDDOT), the First District Association of Governments, the Watertown Area Chamber of Commerce and Focus Watertown. Nine meetings were held with the Steering Committee throughout the course of the study.

A second advisory group, a Stakeholders Committee, was established as a group of community members that offered input throughout the plan development process. The Stakeholders Committee was composed of a cross-section of persons from the Watertown area brought a representative and diverse set of interests to the planning process. Thus, the Stakeholders Committee was a conduit between the various community constituencies and the study team. The Stakeholders Committee was used throughout the planning process to:

- Gather input on current and emerging transportation issues in the region.
- Act as a sounding board for ideas for potential modifications to the transportation system.

Three stakeholders group meetings were held throughout the course of the study.

An additional tool used to involve the general public was a study website. The website (www.watertowntransportation.com) was established to provide a constant, always available resource to disseminate information and receive feedback from the general public. Information at the website included both the telephone and email contact information for the planning

consultant. Any email comments submitted at the study site were distributed to the SDDOT and City project managers, as well as the consultant.

Various other methods for disseminating information to the public and/or receiving their feedback were used throughout the study. These additional methods included:

- *Local Media*: Interviews were conducted with the Watertown *Public Opinion* newspaper. Additionally, the consultant gave an informational presentation on the plan at the November 15, 2004 City Council meeting, which was broadcast live and on-tape delay several times on the local government television channel.
- *Study Travel Survey*: The travel survey administered in September 2004 included a question that asked "What specific transportation issues do you think need to be addressed in the Watertown area?". Those issues were summarized and reported to the Steering Committee and were considered through the study development process. Also included in the travel survey was a plan information sheet that included the website address and contact information for the study team.
- *Organization Outreach*: Consultant staff made several presentations to local organizations in an effort to increase community involvement. These meetings included presentations to the Watertown Rotary Club and Focus Watertown Board. Consultant staff also coordinated with a local, grass-roots project called *Vision 2015*. This community-based project is part of a process that identifies needs in Watertown. Consultant staff attended all of the Vision 2015 transportation committee's meetings to provide a summary of the transportation plan and to get feedback on transportation issues in the community.

Finally, public meetings were held at milestone points in the planning process. These public meetings are summarized in the following bullets:

- *Public Meeting #1*: September 28, 2004. This meeting included:
  - Introduction to the transportation planning process
  - What tasks were included in the plan
  - Identification of local transportation issues
- *Public Meeting #2*: June 9, 2005. This meeting presented an overview of the study, which included:
  - Identified transportation issues
  - Goals and objectives
  - Overview of existing conditions
  - The land use development concept

  - Traffic levels and summary of travel pattern changes associated with the concept
  - Identification of future deficiencies
  - Initial screening of improvement alternatives
- *Public Meeting #3*: September 20, 2005. This meeting presented the recommended transportation plan, following the results of the alternatives evaluation and recommendations for project staging of the implementation plan. This meeting offered a final opportunity to gather public input prior to going to the city council for plan approval.

Summaries of the public involvement process are included in Appendix A.

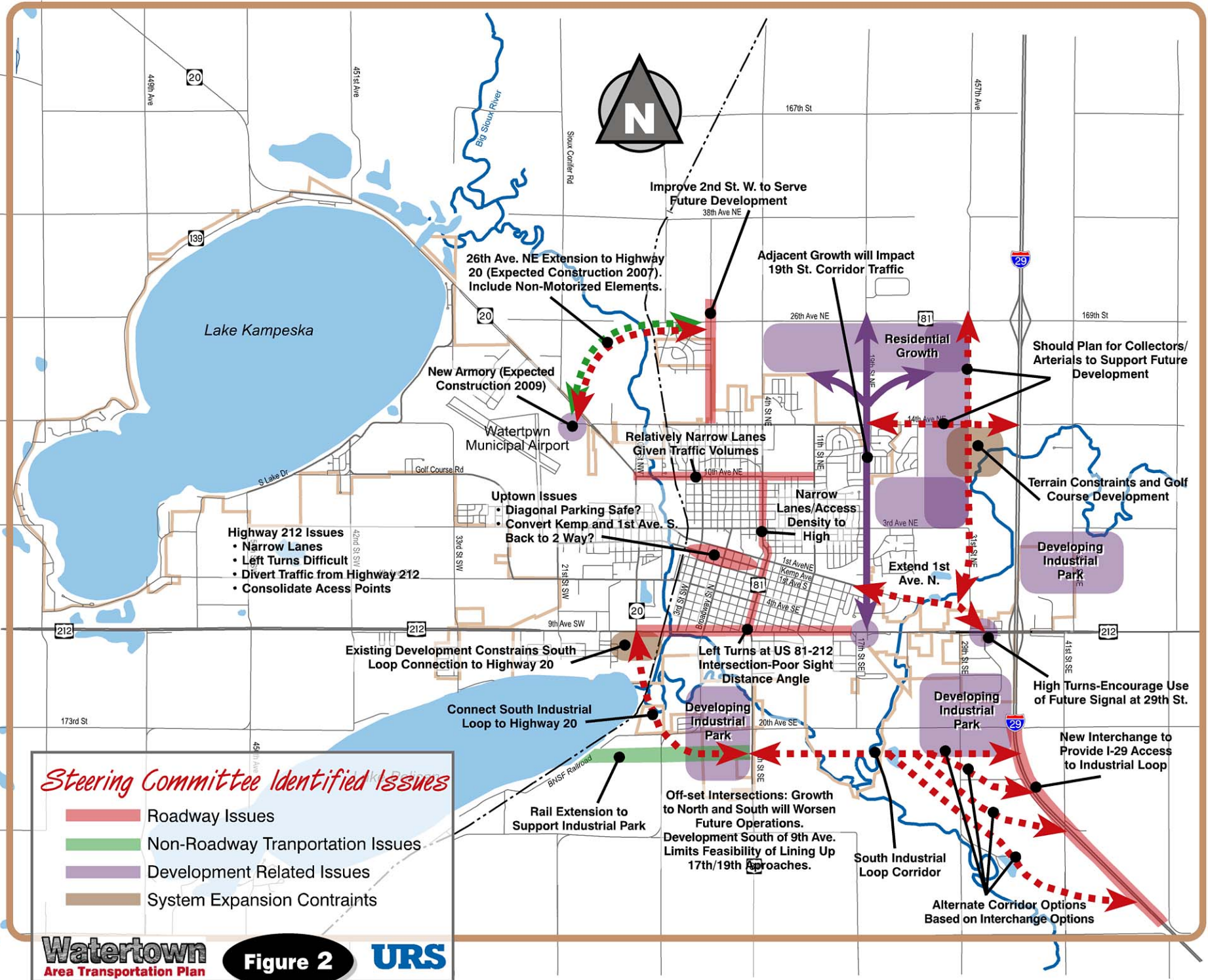
Transportation System Issues

The initial stages of the plan included working with the general community, the Steering Committee and Stakeholders Committee to document current or emerging transportation system issues. Local transportation issues were identified through four primary means:

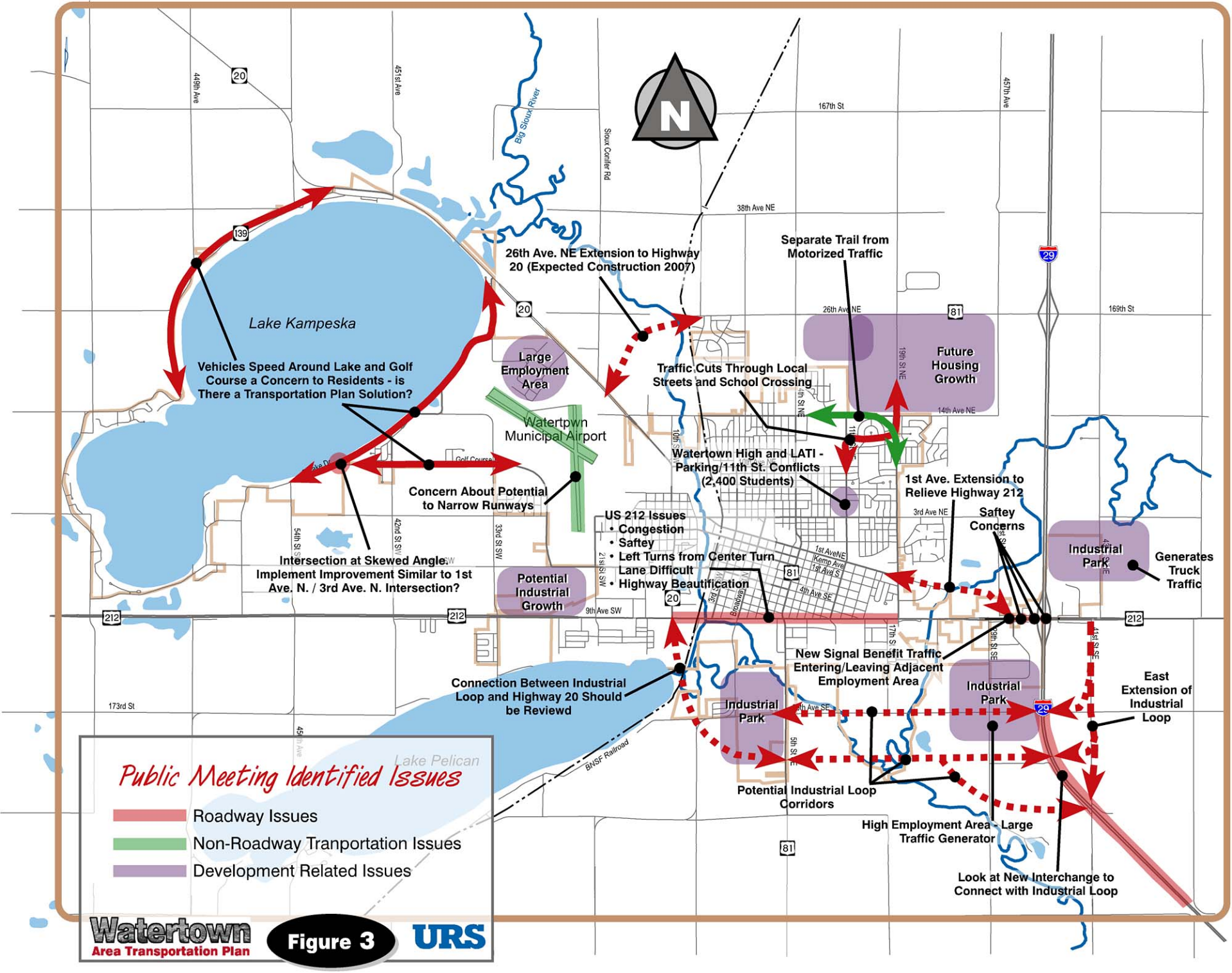
- *Steering Committee Workshop*: The Steering Committee workshop was held during the first Steering Committee meeting on September 28, 2004. During the workshop, the issues identified by the group were recorded on large aerial maps of the study area. Each of the issues identified and recorded by the group is identified on the attached Figure 2. As shown in the legend, the issues were divided into four general categories:
  - *Roadway Issues*: Identified issues, opportunities or concerns related to the existing or future roadway system.
  - *Non-Roadway Issues:* Identified transportation issues not directly related to the roadway system.
  - *Development Related Issues*: Identified issues or locations of existing and future land development that generate significant amounts of traffic and affect the transportation system.
  - *System Expansion Constraints*: Identified locations where current development or topography constrain/limit the ability to expand the transportation system.

  Members of the Steering Committee cited a number of non-location specific issues, including:

  - All transportation system improvements should include accommodations for bicycle and pedestrian facilities. Also, should consider safety of trails next to collectors/arterials.
  - On local (non-state) projects, city should include funding for street lighting.
  - The plan must identify continuous north-south and east-west roadway corridors through the city.
  - Need to have clearly defined roadway function hierarchy; some local streets seem relatively wide and encourage non-local use.
  - The plan should recognize that Watertown has a lower threshold / acceptance for travel delays.
  - As Watertown grows and annexes into the county, need to plan for jurisdiction issues related to annexed roads.


Steering Committee Identified Issues
Roadway Issues
Non-Roadway Tranportation Issues
Development Related Issues
System Expansion Contraints
Lake Kampeska
Big Sioux River
Improve 2nd St. W. to Serve Future Development
26th Ave. NE Extension to Highway 20 (Expected Construction 2007). Include Non-Motorized Elements.
Adjacent Growth will Impact 19th St. Corridor Traffic
Residential Growth
Should Plan for Collectors/ Arterials to Support Future Development
New Armory (Expected Construction 2009)
Watertown Municipal Airport
Relatively Narrow Lanes Given Traffic Volumes
Terrain Constraints and Golf Course Development
Uptown Issues
• Diagonal Parking Safe?
• Convert Kemp and 1st Ave. S. Back to 2 Way?
Narrow Lanes/Access Density to High
Highway 212 Issues
• Narrow Lanes
• Left Turns Difficult
• Divert Traffic from Highway 212
• Consolidate Acess Points
Extend 1st Ave. N.
Developing Industrial Park
Existing Development Constrains South Loop Connection to Highway 20
Left Turns at US 81-212 Intersection-Poor Sight Distance Angle
High Turns-Encourage Use of Future Signal at 29th St.
Connect South Industrial Loop to Highway 20
Developing Industrial Park
Developing Industrial Park
New Interchange to Provide I-29 Access to Industrial Loop
Rail Extension to Support Industrial Park
Off-set Intersections: Growth to North and South will Worsen Future Operations. Development South of 9th Ave. Limits Feasibility of Lining Up 17th/19th Approaches.
South Industrial Loop Corridor
Alternate Corridor Options Based on Interchange Options
Watertown Area Transportation Plan
Figure 2
URS

- *Public Meeting #1*: The primary purpose of this meeting was to introduce the public to the study team, inform attendees about the study process and to identify transportation system issues. Despite relatively low attendance at this first meeting, those in attendance identified several issues. As with to the Steering Committee meeting, large aerial maps were used to record the transportation system issues identified. The issues identified by the public meeting attendees are identified in Figure 3.
- *Stakeholders Meeting #1*: At the first stakeholders meeting held on January 20, 2005, the project team was introduced to the stakeholders. The study team provided information on the purpose of the study and provided the stakeholders an opportunity to give input on local issues at this meeting. This input gave the study team another group from which to gain input on local transportation issues and provided an opportunity to confirm whether already collected issues were representative of the general views of the community. The issues identified by the stakeholders group are shown in Figure 4. A complete summary of the feedback received at this meeting is included in a February 9, 2005 memorandum included in Appendix A.
- *Travel Survey*: The results of the travel survey included a summary of identified transportation issues. Those surveyed were people traveling into Watertown from outside of the study area, so the responses are not necessarily representative of the entire Watertown community. The answers to the open-ended question regarding identified issues are summarized in Table 1.


Public Meeting Identified Issues
Roadway Issues
Non-Roadway Tranportation Issues
Development Related Issues
Lake Kampeska
Lake Pelican
Big Sioux River
Vehicles Speed Around Lake and Golf Course a Concern to Residents - is There a Transportation Plan Solution?
26th Ave. NE Extension to Highway 20 (Expected Construction 2007)
Separate Trail from Motorized Traffic
Large Employment Area
Watertown Municipal Airport
Traffic Cuts Through Local Streets and School Crossing
Future Housing Growth
Watertown High and LATI - Parking/11th St. Conflicts (2,400 Students)
Concern About Potential to Narrow Runways
1st Ave. Extension to Relieve Highway 212
Saftey Concerns
US 212 Issues
• Congestion
• Saftey
• Left Turns from Center Turn Lane Difficult
• Highway Beautification
Intersection at Skewed Angle. Implement Improvement Similar to 1st Ave. N. / 3rd Ave. N. Intersection?
Potential Industrial Growth
Industrial Park
Generates Truck Traffic
New Signal Benefit Traffic Entering/Leaving Adjacent Employment Area
Connection Between Industrial Loop and Highway 20 Should be Reviewd
Industrial Park
Industrial Park
East Extension of Industrial Loop
Potential Industrial Loop Corridors
High Employment Area - Large Traffic Generator
Look at New Interchange to Connect with Industrial Loop
BNSF Railroad
N
Watertown Area Transportation Plan
Figure 3
URS

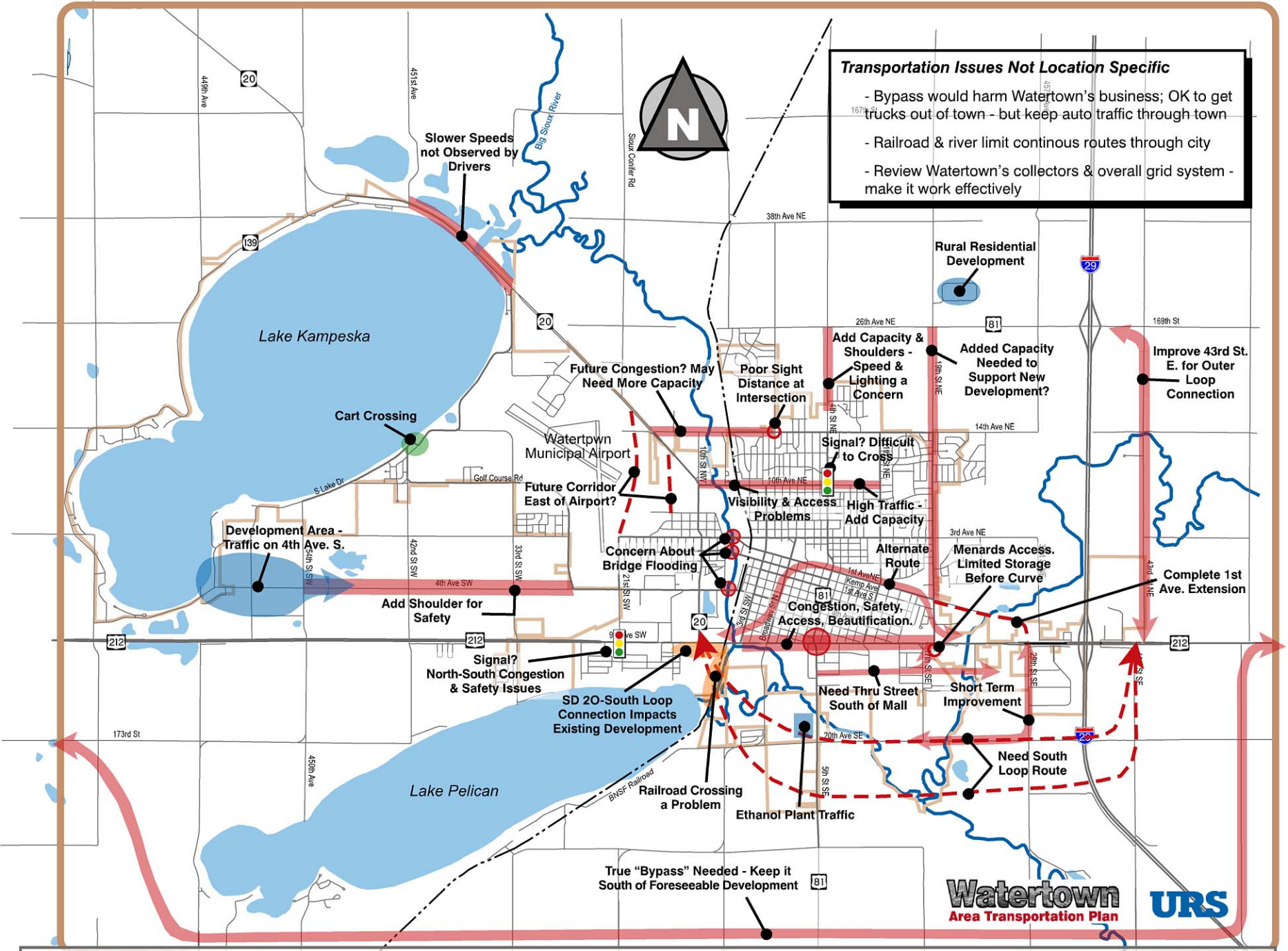

Transportation Issues Not Location Specific
- Bypass would harm Watertown's business; OK to get trucks out of town - but keep auto traffic through town
- Railroad & river limit continous routes through city
- Review Watertown's collectors & overall grid system - make it work effectively
N
Slower Speeds not Observed by Drivers
Big Sioux River
Lake Kampeska
Cart Crossing
Watertown Municipal Airport
Future Congestion? May Need More Capacity
Poor Sight Distance at Intersection
Add Capacity & Shoulders - Speed & Lighting a Concern
Added Capacity Needed to Support New Development?
Rural Residential Development
Improve 43rd St. E. for Outer Loop Connection
Signal? Difficult to Cross
Future Corridor East of Airport?
Visibility & Access Problems
High Traffic - Add Capacity
Development Area - Traffic on 4th Ave. S.
Concern About Bridge Flooding
Alternate Route
Menards Access. Limited Storage Before Curve
Complete 1st Ave. Extension
Add Shoulder for Safety
Congestion, Safety, Access, Beautification.
Signal? North-South Congestion & Safety Issues
SD 2O-South Loop Connection Impacts Existing Development
Need Thru Street South of Mall
Short Term Improvement
Need South Loop Route
Lake Pelican
Railroad Crossing a Problem
Ethanol Plant Traffic
True "Bypass" Needed - Keep it South of Foreseeable Development
Watertown Area Transportation Plan
URS
Stakeholders Identified Transportation Issues
Roadway Issues
Development Related Issues
System Expansion Constraints
Non-Roadway Transportation Issues
Figure 4

TABLE 1. SUMMARY OF TRAVEL SURVEY RESPONSES TO TRANSPORTATION ISSUES QUESTION

General Issue Category	Number of Responses	Percentage of Responses
Improve/Widen/Access Control on Highway 212	221	14.6%
Area Needs a Bypass/Truck Route	206	13.6%
Issues with Congestion/Operations at 212/81 Intersection	91	6.0%
No Problems/System is Good	89	5.9%
Road Construction Complaints	39	2.6%
Miscellaneous Issues at Specific Locations	37	2.4%
Improve Signal Timing/Coordination (Various Corridors)	33	2.2%
Miscellaneous Issues with the General System	26	1.7%
General Traffic Signal Comments	24	1.6%
Other Drivers' Skills/Behavior Needs to Improve	24	1.6%
Improve/Widen/Access Control on Highway 81 through City	21	1.4%
US 212 Rail Crossing is a Problem	21	1.4%
Improve Traffic Law Enforcement	20	1.3%
Improve Highway 81 Near 26th Ave/Northridge Subdivision	18	1.2%
Identified Maintenance Issues	18	1.2%
Extend Jensen Ave/Add More Service and Frontage Roads	16	1.1%
Improve Transit/Non-Motorized Modes	15	1.0%
New Signal Locations	15	1.0%
Signalize I-29/Highway 212 Ramp Jct	14	0.9%
Improve Signing/Pavement Striping	12	0.8%
Suggested Speed Limit Changes	12	0.8%
Control/Add Stop Signs to Residential Streets	12	0.8%
Signalize US 81/10th Ave N	10	0.7%
Add Another I-29 Exit	8	0.5%
Improve 19th Street	7	0.5%
Identified Issues Outside Watertown Study Area	7	0.5%
Traffic Concerns Regarding New Wal-Mart	6	0.4%
Do Not Like One Ways	5	0.3%
Did Not Like Travel Survey	5	0.3%
Snow Removal Complaints	4	0.3%
Improve Highway 20	3	0.2%
Do Not Build a Watertown Bypass	2	0.1%
No Response	477	31.4%
Total	1,518	100%

Goals and Objectives

Developing transportation goals and objectives was an early step in the overall Watertown area transportation planning process; a critical step that resulted in the framework for much of the remainder of the study process. The goals and objectives identified for this study were products of the overall plan vision, a statement of the desired plan outcome or what the community's transportation system should look like and how it should work.

The definition and application of goals and objectives for the transportation planning process are related concepts but represent two different levels of the process.

- **Goals** are far-reaching statements of intent, often generalized and somewhat conceptual. An example goal of a transportation plan might be "to provide a reliable transportation system that minimizes user delays". This example goal would communicate an intention, but the goal cannot be quantified or measured to determine the relative success of plan outcomes.
- **Objectives** are more focused statements of specific measures or procedures, typically more tangible statements of approach related to attaining the set goals. An example objective of a transportation plan would be "to reduce travel time and delays on the roadway system". This example objective offers a concrete means of measuring the relative success of plan outcomes, the relative amount of time it takes or the level of delay experienced when traveling through an intersection / corridor / region.

The development of the study goals and objectives was a critical early step in the planning process, because to a large extent they defined the general course of the study. The types of goals and objectives identified for this plan directed the study primarily in two ways:

- **The identified goals and objectives aided in prioritizing the types of problems/issues the plan addressed**. The plan-specific goals and objectives dictated the types of problem areas / deficiencies the study team evaluated during the existing and future year deficiencies analysis. If an identified objective is to reduce travel delays along corridors in Watertown, the study team will look for existing and forecasted locations of congestion.
- **The identified goals and objectives guided the types of alternative improvements the study evaluated**. The study specific goals and objectives dictated the types of improvements that

were considered when addressing an identified deficiency area. In the above example where reducing corridor travel delays is a goal, the study team considered various concepts for reducing travel delays in the identified corridors, including:

- *Transportation System Management (TSM)* alternatives, which are concepts such as installing new traffic signals or adding turn lanes at selected intersections.
- *Transportation Demand Management (TDM)* policies, which attempt to affect travel demand so that travelers use the existing system more efficiently.
- *Expansion Concepts,* which could include widening a congested corridor or developing a new corridor to divert traffic from congested corridors.

The goals and objectives developed for the plan were developed with input from Steering Committee. It was believed that these goals and objectives were representative of the values of the wider community, since they were consistent with public comments received via returned travel surveys, emails sent via the study website and comments received at the public and Stakeholders Committee meetings.

The five goals developed for the Watertown Area Transportation Plan are summarized below:

Goal 1: Provide for Community Connectivity for Motorized and Non-Motorized Modes

Goal 2: Improve Mobility, Safety, Efficiency and Transportation Choices in Watertown and the Surrounding Area

Goal 3: Provide a Transportation System that Supports Economic Growth and Development

Goal 4: Provide a Quality, Attractive and Affordable Multimodal Transportation System.

Goal 5: Provide a Transportation Project Development Process that incorporates Public Involvement.

The transportation planning objectives associated with the five goals are documented in Table 2. As many of the objectives support more than one goal, the information displayed in the objectives table reference each of the goals supported by the individual objectives.

TABLE 2: WATERTOWN TRANSPORTATION PLAN OBJECTIVES

Transportation Objective	Goal(s) Addressed
Use the existing transportation system (roadway, trails, sidewalks, transit) to its best advantage.	4
Develop a balanced transportation system that meets the mobility needs of the community and supports the City of Watertown's land use projections.	1, 2, 3, 4
Design a street and road improvement program that is both physically attractive and sensitive to the environs of urban neighborhoods.	4
Maintain a transportation system of major streets throughout the City to relieve central area traffic, while allowing the use of cul-de-sacs and innovative designs, which best utilize existing topography for drainage, reducing development costs, and creating neighborhood settings.	2, 4
Limit access (driveways/curbcuts) on arterial and major/minor collector streets.	2
Discourage through traffic on local streets within established neighborhoods.	2
Require continuity of collector streets between adjacent subdivisions.	1, 2
Develop sufficient off-street parking to meet existing and future demands.	2
Provide convenient access to residential areas with a minimum of traffic hazards.	2
Secure sufficient rights-of-way to accommodate Watertown's future arterial/collector street system and non-motorized access to walking and trail systems.	2, 3, 4
Increase the use of alternate means of transportation, including public transportation and bicycle and pedestrian movement, by improving and expanding facilities and services in built and developing areas and encouraging compact "walkable" land use patterns and project designs.	1, 2, 4
Provide safe, direct pedestrian and bicycle access from residential neighborhoods to schools, commercial centers and recreation areas through the use of sidewalks and/or bicycle trails.	1, 2
Maximize the safe and efficient movement of railroad traffic, while minimizing street conflicts and reducing the creation of barriers created by rail corridors.	3
Enhance and protect aviation facilities, while minimizing their effects on surrounding land uses.	3
Coordinate transportation plans with other jurisdictions.	2
Provide for an efficient system through a combination of programs/projects that address both supply (capacity) and demand (person and/or vehicle trips).	2
Prioritize transportation projects based on need and cost.	4
Identify future right-of-way needs and establish a program for advanced protection (preservation and/or reservation).	3
Increase the level of landscaping and variety of cross section designs to maintain and enhance the attractiveness of neighborhoods, open space	4

Transportation Objective	Goal(s) Addressed
and commercial corridors.	
Consider crash experience in addition to capacity, when determining the need for action and promote solutions that address crashes.	2
Plan and develop a transportation system that preserves environmentally sensitive areas, conserves energy and natural resources, and considers adverse environmental impact, particularly related to stormwater management.	4
Enhance the movement of goods and freight by identifying truck routes as funding priorities.	3
Sustain and enhance accessibility to centers of commerce, agricultural markets, major institutions, and tourist destinations.	3
Encourage private sector participation in providing the design, right-of-way and construction of transportation improvements.	3
Provide and support community education and involvement in transportation system planning.	5
Involve the public through project development through a variety of means, including: • Public meetings • Workshops • Preference surveys • Newsletters • News articles • Website information • Council presentations/briefings • Community forums	5
Provide a public participation process that is inclusive, appropriate and provides opportunities for the public to have input into the decision-making process.	5

Existing Transportation Systems

Gaining an understanding of the current system is vital to the planning process, in that the existing system and the demands on it form the underlying foundation for future system needs. The particular system needs for the study area are a function of the current and horizon-year traffic levels and patterns of travel throughout the region, relative to the transportation system in place. The Watertown area's current transportation system is composed of the following elements:

- State and Federal highways and local roadway systems
- A system of on-street and off-street multi-use trails
- Watertown Municipal Airport
- Intra-area Transit
- Intercity Bus Transportation
- Rail/Freight

State/Federal Highways And Local Roadway Systems

Functional Classification

The existing highway and roadway systems are categorized into a functional hierarchy based on the type of facility, facility ownership, and the role the facility serves in the local transportation system (as defined by the SDDOT). Within the study area, the roadways are grouped into five general functional categories:

- Interstate
- Principal Arterial
- Minor Arterial
- Collector
- Local

A general description of this classification system is included in Table 3. The table includes descriptions of desired mobility/access functions and typical right-of-way widths by roadway type.

TABLE 3: FUNCTIONAL CLASSIFICATION SYSTEM DESIGN CRITERIA

Functional Item	Interstate	Principal Arterial	Minor Arterial	Collector	Local
Trip-Making Service Performed	Connects Watertown to other regions.	Connects Watertown and other regions and within sub-areas of the region.	Connects activity centers within the study area.	Connects neighborhoods and commercial areas to arterials; offers subarea mobility.	Provides mobility within neighborhoods and subareas.
Location	Edge of development areas.	On edges of neighborhoods and commercial areas.	On edges or within neighborhoods and commercial areas.	On edges or within neighborhoods and commercial areas.	Within neighborhoods or commercial areas.
Mobility / Access Offered	Highest traffic mobility; no direct land access.	Medium to high traffic mobility, limited land access.	Medium traffic mobility; medium land access.	Limited traffic mobility; high land access.	Most limited traffic mobility; highest land access.
Approximate Spacing (Miles)	--	--	1/8 to 1	1/2 or less	As needed
Typical Speed Limit (MPH)	65 - 75	25 – 65	25 – 55	20 – 40	15-25
Right-of-Way Width (Typical Minimum)	300 Feet (Typical)	100 Feet	100 Feet	75 to 80 Feet	50 to 60 Feet
Pavement Width (Typical Minimum)	76 Feet (Not including median)	64 Feet	60 Feet	45 – 50 Feet	30 – 38 Feet
Linkage to Regional Roadways	--	Yes	Sometimes	Rarely	No
Parking	Prohibited	Generally Prohibited	Limited	Generally Permitted	Permitted
Traffic Management Tools	Interchange spacing; no direct land access.	Signal timing, land access (driveway) spacing.	Signal timing, land access spacing.	Geometry, number of lanes, access spacing.	Discontinuity, stop signs, etc.
Level of Continuity	Continuous	Semi-continuous	Semi-continuous	Usually not continuous	Discontinuous
Typical Signal Spacing (miles)	--	1/4 to 1/2	1/4 to 1/2	Only where arterial crossing signal warrant met	None

The current functional classification system displayed in Figure 5 was developed by the SDDOT, with the City of Watertown. The mileage and vehicle miles of travel (VMT) by functional class is documented in Table 4. VMT is a calculation of the number of trips across the roadway system multiplied by their trip length.

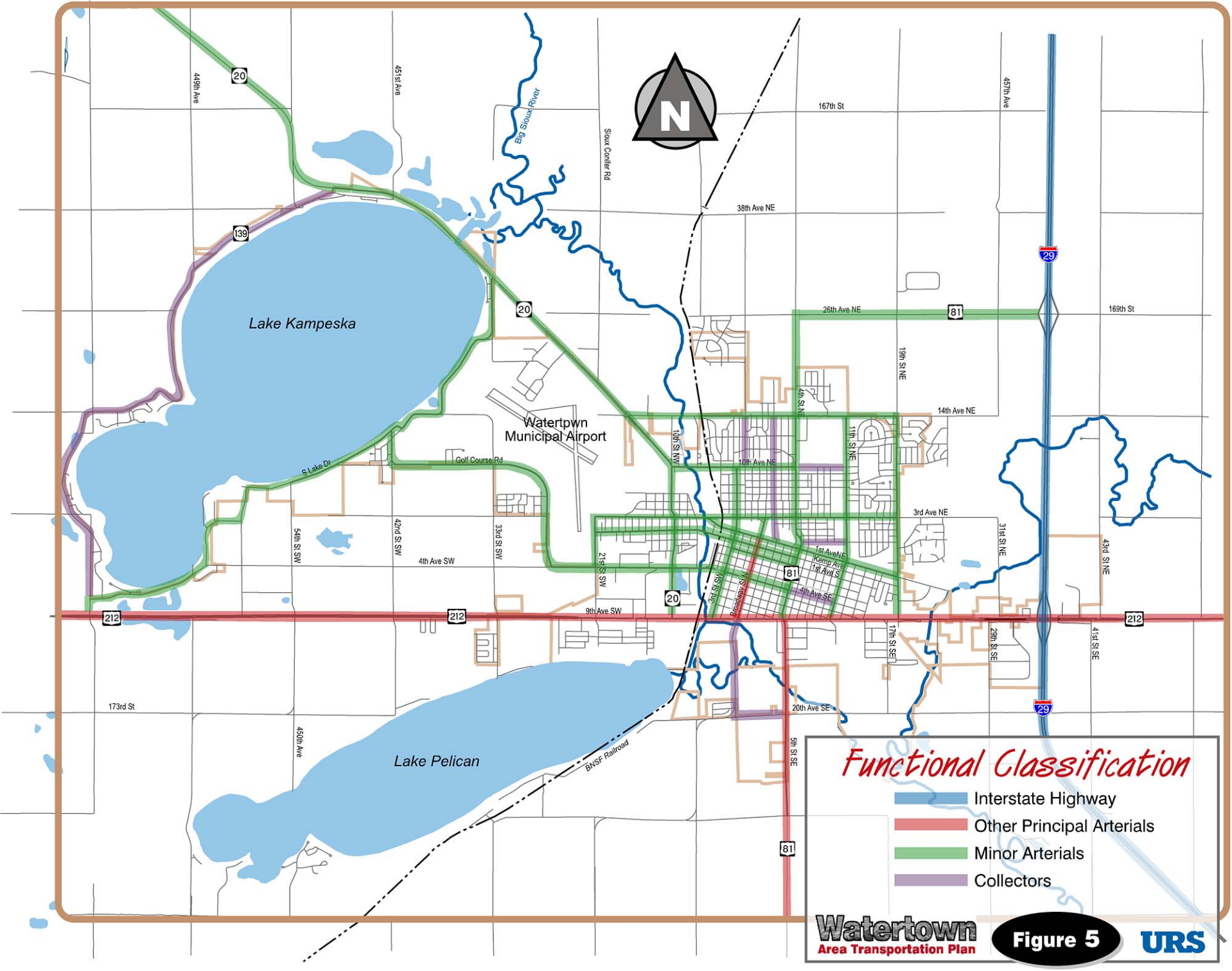

N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
449th Ave
451st Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
19th St NE
14th Ave NE
4th St NE
10th St NW
11th St NE
10th Ave NE
Golf Course Rd
S Lake Dr
54th St SW
42nd St SW
33rd St SW
4th Ave SW
21st St SW
3rd Ave NE
31st St NE
43rd St NE
1st Ave NE
Kemp Ave
1st Ave S
4th Ave SE
3rd St SW
Broadway St
9th Ave SW
17th St SE
29th St SE
41st St SE
173rd St
20th Ave SE
450th Ave
5th St SE
20
139
81
29
212
Functional Classification
Interstate Highway
Other Principal Arterials
Minor Arterials
Collectors
Watertown
Area Transportation Plan
Figure 5
URS

TABLE 4: CURRENT MILEAGE AND VEHICLE MILES OF TRAVEL BY FACILITY TYPE

Functional Category	Mileage	Vehicle Miles of Travel (VMT)
Interstate	10.9 miles	63,000
Principal Arterial	17.5 miles	141,600
Minor Arterial	46.0 miles	160,700
Collector	11.2 miles	10,900
Total	85.6 miles	376,200

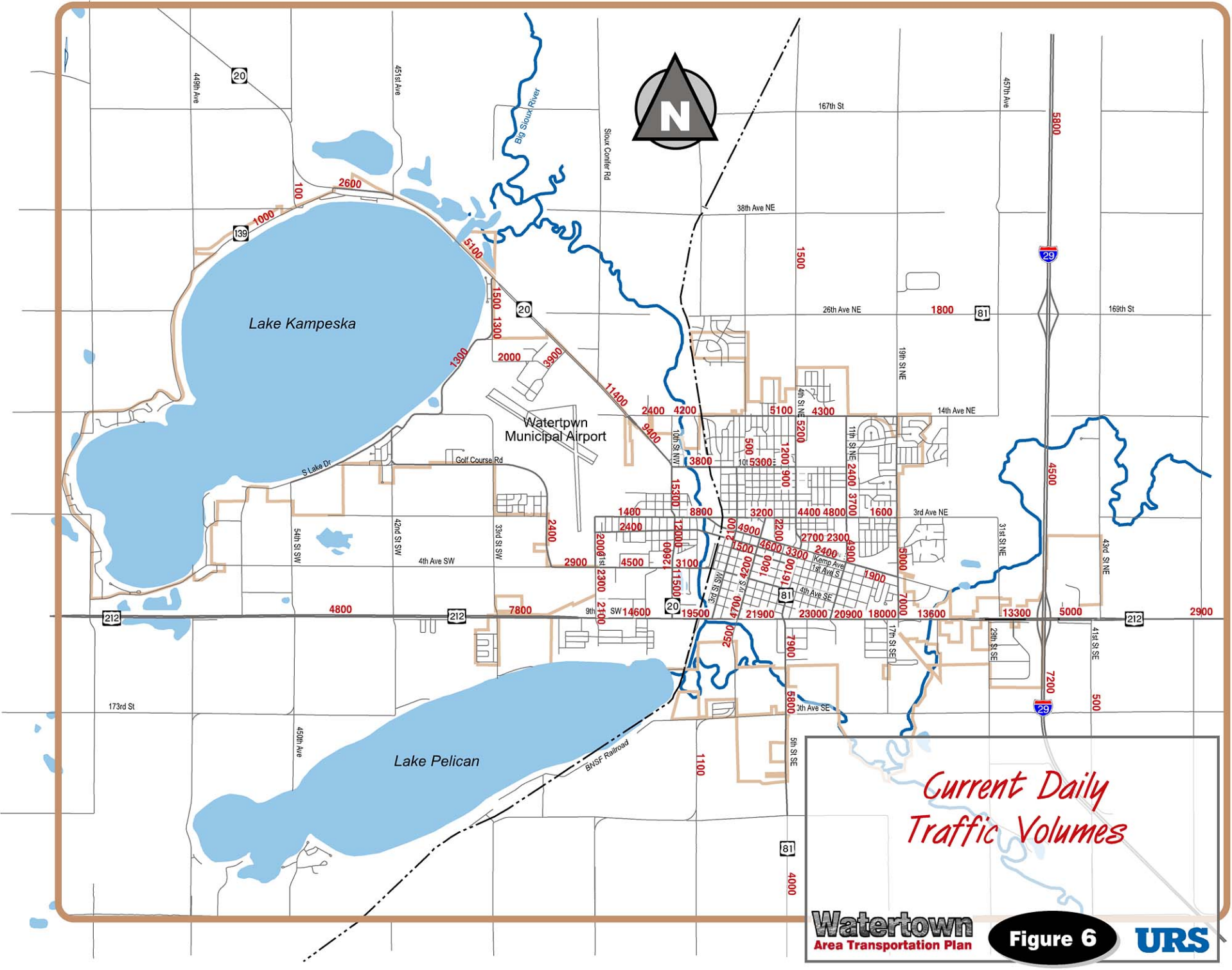
Source: URS Corporation

ROADWAY GEOMETRICS

The consultant collected information on the number of lanes for each approach to key intersections. A key intersection was defined as the junction of any two roadways functionally classified as collector, minor arterial, or principal arterial. The intersection lane geometry was collected on the basis of number of through lanes, and number of left-turn and right-turn lanes. This intersection information is a key input into determining the capacity of the current roadway system.

TRAFFIC VOLUMES

Current study area traffic volumes are an important component in the evaluation of the study area's existing transportation system conditions. Average daily traffic (ADT) counts are available from the SDDOT. The most recent available ADT data, collected between 2000 to 2002 for most locations, are illustrated in Figure 6. In addition to these daily volume counts, hourly turning volumes for several intersections in the study area were obtained from counts conducted by the study team.


Current Daily Traffic Volumes
Watertown Area Transportation Plan
Figure 6
URS
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
N
449th Ave
451st Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
19th St NE
14th Ave NE
4th St NE
11th St NE
10th St NW
3rd Ave NE
31st St NE
43rd St NE
Kemp Ave
1st Ave S
4th Ave SE
17th St SE
28th St SE
41st St SE
9th Ave SE
5th St SE
3rd St SW
1st St SW
9th St SW
4th Ave SW
54th St SW
42nd St SW
33rd St SW
Golf Course Rd
S Lake Dr
173rd St
450th Ave
20
139
212
81
29

MEASURES OF CORRIDOR OPERATIONS/ROADWAY CAPACITY

Each intersection approach and the roadway links connecting the intersections have finite capacities. The maximum number of vehicles that can be accommodated on a link or through an intersection, however, is greater than the number typically acceptable in a community the size of Watertown. Thus, for the purposes of the transportation plan, the concept of "acceptable" capacity was used as the threshold for defining a capacity deficiency.

In transportation studies, corridor/intersection quality of traffic flow is reported using a grading scale, termed level of service (LOS), which ranges from A through F (A being favorable and F reflecting failing conditions). There are generally two measures that determine LOS in urban streets:

- Average travel speed of vehicles through a corridor.
- Delay incurred at intersections.

The definitions and general criteria associated with each of the letter grades are outlined in Table 5. For the Watertown study area, corridors with level of service "C" operations were assumed to be the minimum acceptable quality of flow.

The calculated capacities used for current and future traffic analyses were based on the acceptable capacity of the intersections along a corridor, as opposed to the capacity of the links connecting the intersections. The acceptable intersection capacities were used in the deficiencies analysis, because intersections tend to control flow through the corridor more than link capacity. This method was more conservative when analyzing corridor capacity. Generalized acceptable intersection capacities are documented in Table 6. The traffic capacities document the general threshold at which both capacity (LOS "F") and traffic operations deficiencies (defined as LOS "D" in Watertown) are reached by roadway type and number of intersection approach lanes.

The capacities shown in Table 6 represent generalized daily traffic thresholds for corridors in Watertown. Consistent with methodologies used in the Highway Capacity Manual, additional adjustments to daily capacity were made on US Highway 212 (9th Avenue South) to account for:

- *Narrow Lanes*: Narrow lane widths reduce the flow of traffic during peak traffic flow periods. Capacities on US Highway 212 (9th Avenue South) were reduced to account for the narrow travel lanes (approximately 11 feet wide for through traffic).
- *Heavy Truck Percentage*: Heavy trucks, defined as vehicles with more than four tires, require more physical roadway space and have operating characteristics that reduce roadway capacity when present.

Capacities on US 212, US Highway 81 (5th Street East) and SD Highway 20 (10th Street West), all designated truck routes, were reduced to account for the portion of truck traffic observed during peak periods.

TABLE 5: DEFINITION OF LEVEL OF SERVICE

Level of Service	Description
A	*Free Flow, Insignificant Delays.* Very little, if any, delay incurred at intersections (< 10 seconds per vehicle). 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).
B	*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. Typical intersection delay is between 10 and 20 seconds per vehicle.
C	*Stable Operation, Acceptable Delays.* Operations with the corridor are stable, however, a one driver's ability to maneuver between lanes or make a turn, may be restricted due to needing to yield to other vehicles. Not all vehicles during every signal cycle clear the intersection (cycle failures). The average delay per vehicle at a controlled intersection ranges from 20 to 35 seconds.
D	*Restricted Flow, Regular Delays.* Reflects the limits of stable flow, and a slight change in vehicle flow may result in substantial increases in delay. The average vehicle travel speed is approximately 40 percent of the estimated free-flow speed. Queues may develop but dissipate rapidly, without excessive delays. The average intersection delay per vehicle ranges form 35 to 55 seconds.
E	*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 and intersection delay ranges from 55 to 80 seconds per vehicle.
F	*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, Washington, DC, 2000

TABLE 6. GENERAL DAILY ROADWAY CAPACITY

Functional Classification/ Lanes	Daily Capacity LOS E/F		Threshold ADT for Deficincies LOS C	
	CBD	Non-CBD	CBD	Non-CBD
- Interstate				
4-Lane	NA	67,100	NA	53,700
- Principal Arterial (Urban)				
2-lane	12,800	14,100	10,200	11,300
2-Lane/Left or Right [1]	17,100	18,800	13,700	15,000
2-Lane/Left/Right [2]	19,300	20,900	15,400	16,700
4-Lane (Undivided)	27,000	30,000	21,600	24,000
4-Lane Left or Right [1]	32,100	35,600	25,700	28,500
4-Lane/Left/Right [2]	34,300	38,000	27,400	30,400
- Minor Arterial (Urban)				
2-lane	9,800	10,900	7,800	8,700
2-Lane/Left or Right [1]	12,900	14,100	10,300	11,300
2-Lane/Left/Right [2]	14,100	15,400	11,300	12,300
4-Lane (Undivided)	20,800	23,000	16,600	18,400
4-Lane Left or Right [1]	24,400	27,000	19,500	21,600
4-Lane/Left/Right [2]	25,600	28,500	20,500	22,800
- Collector (Urban)				
2-Lane	7,100	8,000	5,700	6,400
2-Lane/Left or Right [1]	9,600	10,500	7,700	8,400
2-Lane/Left/Right [2]	10,800	11,600	8,600	9,300
4-Lane (Undivided)	15,100	16,900	12,100	13,500
4-Lane Left or Right [1]	18,000	20,000	14,400	16,000
4-Lane/Left/Right [2]	19,100	21,300	15,300	17,000
- Arterial/Collector (Rural)				
2-Lane	NA	10,100	NA	6,600
2-Lane with turn lanes	NA	12,800	NA	8,400

Source: URS Corporation, *Highway Capacity Manual (HCM 2000)*

1: Left and right turn lanes are assigned similar capacity for this macro-scale analysis.

2: Segments with divided and undivided medians are not separated; with left-turn lanes both types offer similar capacity.

CURRENT (2000) CAPACITY DEFICIENCIES

For the purposes of the Watertown Area Transportation Plan, a capacity deficiency was defined as the condition where a corridor's current daily traffic volume exceeded the roadway's acceptable capacity. The "threshold ADTs for deficiencies" in Table 6 define the general traffic volumes at which acceptable capacity is reached. Based on the capacity information presented in Table 6, the following LOS categories were identified by volume-to-capacity (v/c) ratios for application in the Watertown Area Transportation Plan:

- *LOS C*: Acceptable capacity; the condition should be monitored through the planning period. This condition is based on v/c ratios between 0.70 and 0.79.
- *LOS D*: This condition does not exceed the capacity of the corridor, but it represents a level of service that exceeds the *acceptable* capacity restraint for the Watertown area. This condition is based on v/c ratios from 0.80 to 0.89.
- *LOS E*: Higher travel delays and congestion than LOS D, with traffic volumes approaching the roadway's traffic capacity. This condition is based on v/c ratios of 0.90 to 0.99.
- *LOS F*: This condition is based on v/c ratios of 1.00 and greater.

Locations of current capacity deficiencies and those corridors carrying volumes that represent the acceptable capacities (LOS C) are displayed in Figure 7. For the purposes of the Watertown transportation plan, these measures of operations were applied based on general daily conditions through the corridor.

For the existing condition, the only corridor that is carrying volumes that exceed the estimated acceptable capacity is US Highway 212 (9th Avenue South) between Broadway and 14th Street East. Currently, the corridor is operating at level-of-service D, which reflects conditions of restricted flow with regular delays (congestion) during peak periods.

The following segments were identified as carrying volumes that approach the acceptable capacity for the study area at LOS C, and should be monitored through the planning period:

- US Highway 212 from SD Highway 20 (10th Street SW) to Broadway Street
- US Highway 212 from 14th Street East to approximately 19th Street East
- US Highway 81 (5th Street East) from 1st Avenue North to US 212
- 1st Avenue North from Uptown to US 81

N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
449th Ave
451st Ave
450th Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
19th St NE
14th Ave NE
4th St NE
11th St NE
10th Ave NE
10th St NW
S Lake Dr
Golf Course Rd
3rd Ave NE
31st St NE
43rd St NE
54th St SW
42nd St SW
33rd St SW
4th Ave SW
21st St SW
9th Ave SW
3rd St SW
Broadway St N
1st Ave NE
Kemp Ave
1st Ave S
4th Ave SE
17th St SE
29th St SE
41st St SE
20th Ave SE
5th St SE
173rd St
20
139
81
212
29
Existing Conditions Level of Service
Level of Service C
Level of Service D
Level of Service E
Level of Service F
Watertown
Area Transportation Plan
Figure 7
URS

Traffic Safety Assessment

The existing traffic safety analysis in the Watertown study area was based on evaluation of the crash/accident records available through the SDDOT. Summaries of crash records for the study area street system were obtained from the SDDOT for the period from January 1, 2001 to December 31, 2003 and were reviewed for this analysis. The Watertown Police Department currently maintains crash records in a paper format, which are kept for one year. Typical crash analyses rely on at least three years of data. Thus, the analysis relied on SDDOT supplied available crash records for non-state routes as well.

When it was feasible, the crash data were evaluated by intersection and by corridor segment. Only those corridors under state jurisdiction categorized crash records by both intersection and segment. These state routes include:

- US Highway 212
- US Highway 81
- SD Highway 20

For the intersection-based crash assessment, the crash rate was reported as the number of crashes per million entering vehicles at the intersection. Intersection crash data was available for 20 intersections along the state routes. The average crash rate for the 20 intersections along the state routes in the Watertown study area was 0.5 crashes per million entering vehicles.

For the segment-based crash assessment, the crash rate was reported as the estimated number of crashes per million VMT along the segment. Segment crash data was available for 90 segments along both state routes and local streets. The data was divided differently by SDDOT depending on whether it was a state route or local route, so two different crash rates were calculated. The average crash rate for state routes was 1.7 crashes per million VMT and for local streets was 3.2 crashes per million VMT. Once a crash rate was established for each intersection and segment, it was determined if that rate was unexpectedly high given the level of traffic using that intersection or segment.

To identify locations experiencing more crashes than would be "expected" based on the design and volume, an approach developed by the Minnesota DOT was employed. This approach calculates a "critical crash rate" for each intersection by comparing:

- Intersection traffic volumes
- Intersection crash rate
- Study-area wide crash rate

The critical crash rate calculation essentially determines if the intersection or segment has a statistically higher than expected crash rate. The higher the level of traffic at the location or the segment, the less variation is expected in crash rates from the study area average. Thus, the critical rate calculation tolerates less variation from the study-area average for higher traffic locations than it does for lower volume locations. Locations with higher than expected crash rates are shown in Figure 8, and are summarized as:

- For the intersection-based crash analysis, the US 212 / Broadway intersection was identified as having a higher than expected crash rate.
- For the segment-based crash analysis, the following segments were identified as having higher than expected crash rates:
  - *Arrow Avenue*: 5th Street East to 11th Street East
  - *1st Avenue North*: 3rd Street East to 5th Street East
  - *Kemp Avenue*: 5th Street East to 8th Street East
  - *1st Avenue South*: 4th Street East to 5th Street East
  - *US 212 (9th Avenue South)*: 5th Street East to 11th Street East
  - *21st Street West*: 3rd Avenue North to US 212
  - *3rd Street West*: 7th Avenue North to 9th Avenue North
  - *Broadway Street*: 1st Avenue North to 1st Avenue South
  - *11th Street East*: 4th Avenue South to 9th Avenue South

Many of the roadway segments identified above were partitioned so that they included the intersections related to higher volume cross-streets. Thus, these lower volume segments would often include some of the crashes related to relatively high volume intersections, but were assigned to lower volume segments.

All intersections and segments are documented in Appendix B with their traffic levels and crash rates.

A second level of crash evaluation was completed for locations with higher than expected crash rates, to analyze both the type and severity of crashes. Table 7 summarizes the types of crashes by percentage occurring at each location.

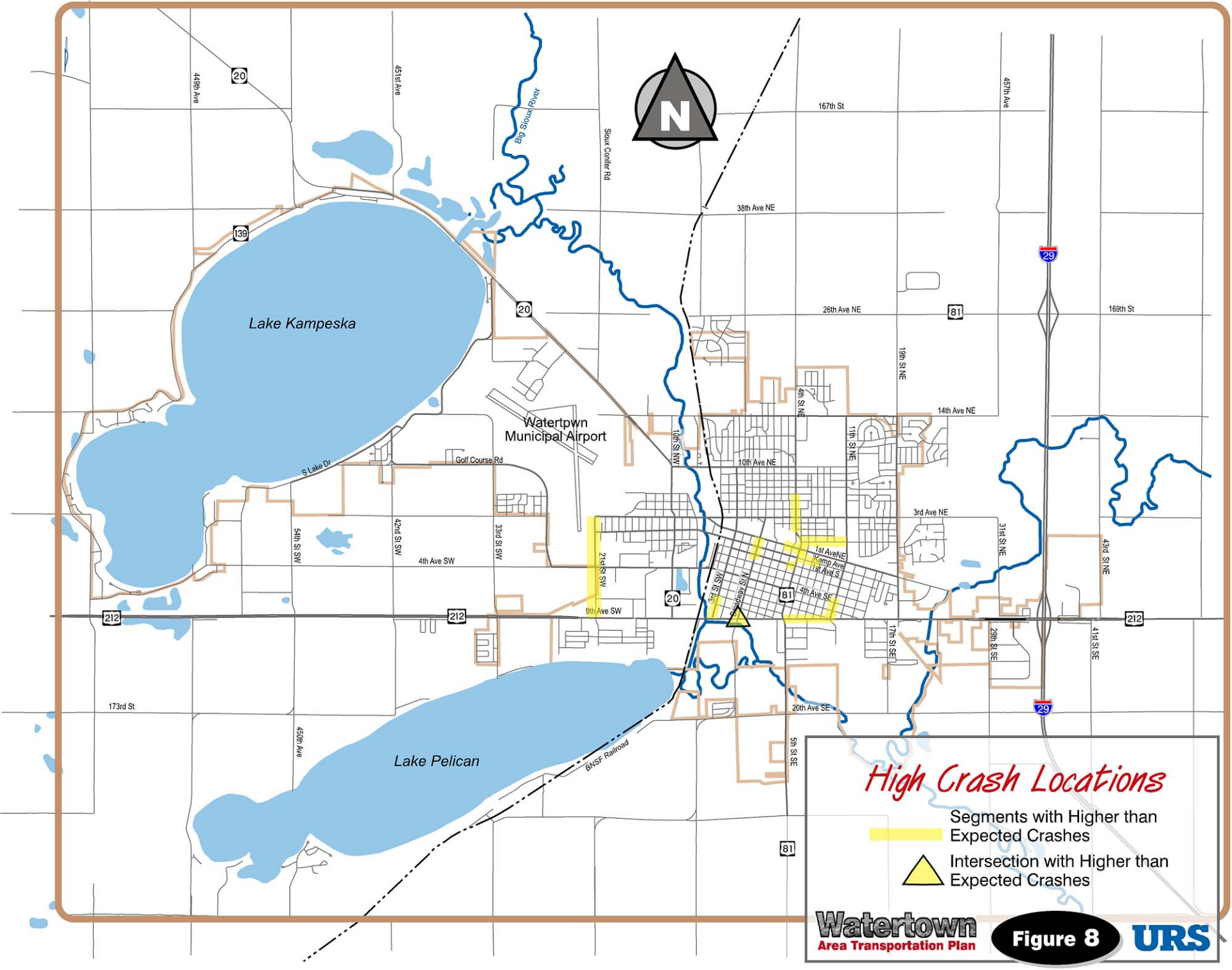

High Crash Locations
Segments with Higher than Expected Crashes
Intersection with Higher than Expected Crashes
Watertown Area Transportation Plan
Figure 8
URS
N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
449th Ave
451st Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
19th St NE
14th Ave NE
4th St NE
11th St NE
10th St NW
10th Ave NE
S Lake Dr
Golf Course Rd
3rd Ave NE
31st St NE
43rd St NE
54th St SW
42nd St SW
33rd St SW
4th Ave SW
21st St SW
1st Ave NE
Kamp Ave
1st Ave S
4th Ave SE
9th Ave SW
9th St SW
Broadway St
17th St SE
29th St SE
41st St SE
173rd St
20th Ave SE
450th Ave
5th St SE
20
139
81
29
212

TABLE 7: CRASH TYPE BY LOCATION

Segment	Crash Type[a]					
	LT	A	RE	P/B	O	Total
US 212, US 81 and 11th Street East	33%	14%	31%	0%	22%	100%
US 81, 1st Ave North and 6th Ave North	16%	24%	44%	4%	12%	100%
Arrow Ave, 5th St East to 11th St East	23%	0%	31%	0%	46%	100%
1st Ave North, 3rd St East to 6th St East	9%	35%	39%	0%	17%	100%
Kemp Ave, 5th St East to 8th St East	17%	58%	17%	8%	0%	100%
1st Ave South, 4th St East to 5th St East	33%	67%	0%	0%	0%	100%
21st St West, 3rd Ave North to US 212	25%	30%	10%	0%	35%	100%
3rd St West, 7th Ave South to US 212	42%	8%	25%	8%	17%	100%
Broadway, 1st Ave North to 2nd Ave South	20%	20%	40%	10%	10%	100%
11th St East, 3rd Ave South to US 212	15%	23%	54%	8%	0%	100%

[a] LT = Left Turn, A = Angle or turning crash; RE = Rear-end; P/B = Pedestrian/Bicycle; O = Other (e.g., sideswipe, fixed-object)

Source: URS Corporation

Rear-end crashes accounted for 31 percent of all crashes in the study area from 2001 through 2003. This crash rate was relatively consistent with data available from the Minnesota DOT, which suggests rear-end collisions typically account for approximately 36 percent of all urban crashes. The other categories of crashes recorded in the SDDOT database were not compatible with the available Minnesota DOT data. Rear-end crashes exceeded the study area rate by 10 percentage points at these intersections:

- *US 81*: 1st Avenue North to 6th Avenue North
- *11th Street East*: 3rd Avenue South to US 212

The severity of crashes for the high-crash rate intersections is documented in Table 8. There was one fatality during the period on 21st Street West. Along the higher-than-expected crash segments documented above, the percentage of crashes reported that involved injuries was relatively high at 56 percent of all collisions. This is significantly higher than the average crash rates for South Dakota urban area streets. Statewide in 2001, injury crashes

accounted for approximately 20 percent of all crashes on US and State Highways and approximately 37 percent of all crashes on local streets in urban areas[1].

TABLE 8: CRASH SEVERITY BY LOCATION

Segment	Crash Severity		
	Fatal	Injury	Property Damage Only
US 212, US 81 and 11th Street East	0%	69%	31%
US 81, 1st Ave North and 6th Ave North	0%	52%	48%
Arrow Ave, 5th St East to 11th St East	0%	38%	62%
1st Ave North, 3rd St East to 6th St East	0%	52%	48%
Kemp Ave, 5th St East to 8th St East	0%	75%	25%
1st Ave South, 4th St East to 5th St East	0%	50%	50%
21st St West, 3rd Ave North to US 212	5%	35%	60%
3rd St West, 7th Ave South to US 212	0%	58%	42%
Broadway, 1st Ave North to 2nd Ave South	0%	50%	50%
11th St East, 3rd Ave South to US 212	0%	69%	31%

Source: URS Corporation

Locations where the percentage of injury crashes exceeded the average of all high-crash locations by 10 percentage points were:

- US 212, US 81 to 11th Street East
- Kemp Avenue, 5th Street East to 8th Street East
- 11th Street East, 3rd Avenue South to US 212

TRAVEL SURVEY

In support of the transportation plan, a survey was conducted to collect detailed travel information about vehicular traffic entering the study area on September 14 and 16, 2004. The survey approach and results are fully documented in Appendix C.

[1] SDDOT, *2001 South Dakota Motor Vehicle Traffic Accident Summary*, Table 3-7.

The survey's primary objectives were to gather a sample of driver responses that would allow the study team to evaluate:

- The origins and destinations of traffic in the study area.
- The travel characteristics of the traffic surveyed.

Survey stations were established in seven locations to intercept traffic at the study area's major entry points:

- *Station 1*: US 212East near 460th Avenue.
- *Station 2*: Northbound I-29 off-ramp at Exit 177.
- *Station 3*: Southbound I-129 off-ramp at Exit 177.
- *Station 4*: US 81 South near 32nd Avenue South.
- *Station 5*: US 212 West near 447th Avenue.
- *Station 6*: SD 20 near 449th Avenue.
- *Station 7*: US 81 North south of 26th Avenue North.

The travel survey was conducted for a single day during the following periods:

- 7:00 AM to 9:30 AM
- 11:00 AM to 2:00 PM
- 3:30 PM to 6:00 PM

The survey, distributed to vehicles as they passed a survey station, was designed as a mail-back vehicle intercept survey. The following survey questions were asked of drivers regarding the trip they were making at the time they received the survey:

- Number of persons in the vehicle
- Purpose of the trip
- Trip origin and destination, coded by district
- Specific transportation issues that should be addressed in the study area

There was a relatively high response rate to the travel survey. As documented in Table 9, the survey response rate, based on surveys with complete origin-destination (O-D) data, was approximately 24 percent for the entire study area. This response rate allowed for a confidence interval of approximately +/- 2.4%.

TABLE 9. TRAVEL SURVEY RESPONSE RATE BY SURVEY STATION

Survey Station Location	Total Vehicles During Survey Period	Total Surveys Distributed	Total Responses	Estimated Daily Traffic (1-Way)	Responses with Usable O-D Data	Usable Response Rate[a]	Confidence Interval[b]
US 212 E	877	746	231	1,465	218	25%	5.8%
I-29 SB Off	525	461	88	1,540	85	16%	9.5%
I-29 NB Off	1,141	1,037	261	2,765	258	23%	5.4%
US 81 S	998	968	309	2,000	304	30%	4.6%
US 212 W	724	702	191	1,500	182	25%	6.3%
SD 20	433	321	64	1,100	55	13%	12.9%
4th St E/US 81 N	742	658	198	1,500	185	25%	6.2%
All Station Total	5,440	4,893	1,342	11,870	1,287	24%	2.4%

[a] Based on comparison of responses with usable O-D data to all vehicles passing stations during survey period.

[b] At a 95% confidence level.

Source: URS Corporation

The following bulletpoints summarize the major findings of the travel survey:

- *Vehicle Occupancy*: Drivers were asked how many persons were in the vehicle with them. The evaluation of vehicle occupancy is documented in Table 10. During the survey period, the average vehicle occupancy was 1.39 persons per vehicle. By period, the vehicle occupancies were:
  - Morning (AM) Period: 1.31 persons per vehicle
  - Midday (MD) Period: 1.53 persons per vehicle
  - Afternoon (PM) Period: 1.50 persons per vehicle

TABLE 10. PERSONS PER VEHICLE BY SURVEY PERIOD

Survey Station	Survey Period	Average Vehicle Occupancy
US Highway 212 East	AM	1.37
	MD	1.33
	PM	1.66
	Total	1.39
I-29 Southbound Off Ramp	AM	1.31
	MD	1.71
	PM	1.43
	Total	1.48
I-29 Northbound Off Ramp	AM	1.39
	MD	1.58
	PM	1.56
	Total	1.50
US Highway 81 South	AM	1.40
	MD	1.46
	PM	1.60
	Total	1.47
US Highway 212 West	AM	1.33
	MD	1.82
	PM	1.75
	Total	1.56
SD Highway 20 West	AM	1.33
	MD	1.58
	PM	1.33
	Total	1.38
US Highway 81 North (4th Street East)	AM	1.33
	MD	1.59
	PM	1.55
	Total	1.47
All Station Total		1.47

Source: URS Corporation

- *Trip Purpose*: Drivers were asked for the trip's primary purpose, which is documented in Table 11. The analysis of the surveyed trip purposes found that:
  - Nearly 60 percent of inbound trips during the morning period were home-to-work trips, indicating that employment opportunities in Watertown attract commuters from outside of the city. Watertown's role as a regional employment center is reinforced by the number of home-to-work trips compared the number of work-to-home trips surveyed for inbound traffic; there were significantly more inbound home-to-work trips (31 percent of all trips) surveyed than inbound work-to-home trips (12 percent of all trips).

– As expected, the home-based work trip percentages were much lower for the midday period (12 percent of all trips) and the afternoon period (6 percent of all trips).

TABLE 11. TRIP PURPOSE PERCENTAGES BY SURVEY PERIOD

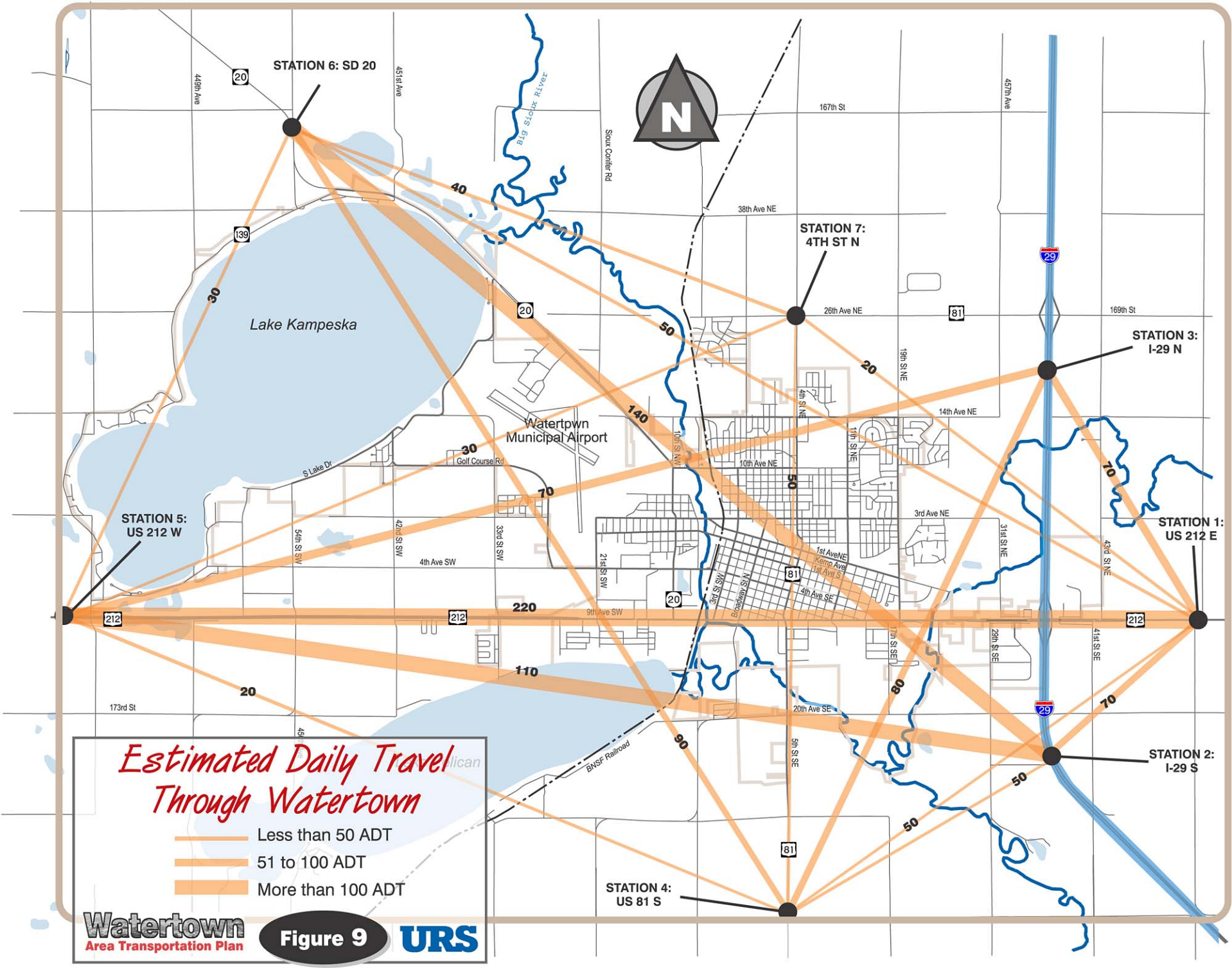
Survey Station	Survey Period	Trip Purpose					
		Home to Work	Work to Home	School	Shopping	Social / Recreational	Other
US Highway 212 East	AM	57.9%	1.8%	3.5%	8.8%	5.3%	22.8%
	MD	17.5%	4.8%	0.0%	25.4%	14.3%	38.1%
	PM	8.1%	19.4%	1.6%	14.5%	25.8%	30.6%
	Total	36.1%	7.0%	2.2%	15.4%	10.6%	28.6%
I-29 Southbound Off Ramp	AM	44.4%	0.0%	0.0%	8.3%	2.8%	44.4%
	MD	11.8%	17.6%	0.0%	20.6%	11.8%	38.2%
	PM	8.7%	21.7%	8.7%	8.7%	17.4%	34.8%
	Total	23.7%	11.8%	2.2%	12.9%	9.7%	39.8%
I-29 Northbound Off Ramp	AM	44.1%	3.2%	8.6%	5.4%	4.3%	34.4%
	MD	9.0%	7.7%	3.8%	14.1%	20.5%	44.9%
	PM	6.7%	24.4%	4.4%	11.1%	11.1%	42.2%
	Total	20.6%	11.8%	5.7%	9.9%	11.5%	40.5%
US Highway 81 South	AM	61.2%	4.3%	6.5%	5.0%	5.0%	18.0%
	MD	18.1%	9.6%	3.6%	15.7%	4.8%	48.2%
	PM	5.2%	27.1%	7.3%	17.7%	19.8%	22.9%
	Total	33.5%	12.5%	5.8%	11.8%	8.9%	27.5%
US Highway 212 West	AM	68.7%	2.0%	3.0%	4.0%	1.0%	21.2%
	MD	10.0%	4.0%	0.0%	22.0%	20.0%	44.0%
	PM	4.2%	35.4%	0.0%	6.3%	25.0%	29.2%
	Total	39.4%	9.0%	1.6%	9.6%	11.7%	28.7%
SD Highway 20 West	AM	46.0%	11.2%	6.9%	3.9%	10.8%	21.1%
	MD	0.0%	7.7%	0.0%	23.1%	7.7%	61.5%
	PM	5.6%	22.2%	5.6%	16.7%	16.7%	33.3%
	Total	16.9%	15.3%	5.1%	13.6%	13.6%	35.6%
US Highway 81 North (4th Street East)	AM	71.4%	1.1%	6.6%	6.6%	2.2%	12.1%
	MD	6.3%	17.5%	0.0%	25.4%	11.1%	39.7%
	PM	3.8%	32.7%	3.8%	3.8%	23.1%	32.7%
	Total	34.5%	14.1%	3.9%	11.7%	10.2%	25.7%

Source: URS Corporation

For all stations, the most frequent trip purpose for both the midday and afternoon periods was the "Other" purpose. Shopping was the second-most frequent purpose during the midday period and work-to-home was the second-most frequent purpose during the afternoon period.

- *Watertown Transportation Issues*: Drivers were asked an open-ended question about the transportation issues they believed needed to be addressed in the Watertown area. The responses to this question were included as identified issues in the *Transportation System Issues* chapter, summarized in Table 1. The total of all responses documented in Table 1 is higher than the total number of returned surveys because many respondents included two or more issues on the survey form. The two miscellaneous categories included individual responses which were either difficult to classify or were the only instance of that issue being cited.
- *Trip Origin-Destination Information:* Drivers were asked where their trip began and where their trip ended, and were directed to a reference map of internal districts and external exit points developed for the survey. The origin and destination of each trip was evaluated based on where the survey was handed out (tracked by the study team according to the form's serial number) and the surveyed response regarding trip destination.

The data were adjusted and corrected to account for the sampling method. The data were then reduced into an origin-destination matrix that summarized estimated daily trips exchanged between survey stations and/or internal districts. To more easily interpret the survey results, the origin-destination data for external-to-external traffic (trips made through the Watertown area without stopping), a map of desire line bandwidths of external-to-external traffic is shown in Figure 9. The bandwidths and data labels indicate the estimated number of daily vehicles traveling between the major study area entry/exit points.


Estimated Daily Travel Through Watertown
Less than 50 ADT
51 to 100 ADT
More than 100 ADT
STATION 1: US 212 E
STATION 2: I-29 S
STATION 3: I-29 N
STATION 4: US 81 S
STATION 5: US 212 W
STATION 6: SD 20
STATION 7: 4TH ST N
Lake Kampeska
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
N
220
140
110
90
80
70
50
40
30
20
Watertown Area Transportation Plan
Figure 9
URS

LOCAL TRANSIT SERVICE

Watertown Area Transit (WAT) is the public transit agency that offers dial-a-ride paratransit operations to the study area. The agency receives Federal Transit Administration (FTA) section 5311 funding. Section 5311 is a program that provides funding for planning, capital, operating and administrative assistance to transit organizations not located non-urbanized areas (less than 50,000 persons). The goals of the non-urbanized formula program are:

- To enhance the access of people in non-urbanized areas to health care, shopping, education, employment, pubic services, and recreation.
- To assist in the maintenance, development, improvement, and use of public transportation systems in rural and small urban areas.
- To encourage and facilitate the most efficient use of all federal funds used to provide passenger transportation in non-urbanized areas through the coordination of programs and services.
- To assist in the development and support of intercity bus transportation.
- To facilitate participation of private transportation providers in non-urbanized transportation to the maximum extent feasible.

The maximum federal share for capital and project administration is approximately 82 percent, with some exceptions. The maximum federal share for operating assistance is 50 percent of the net operating costs.

WAT also receives Title IIIB funding through the Federal Older Americans Act. In addition to its Federal funding, WAT receives matching funding assistance from the state, city of Watertown and private organizations. A breakdown of WAT's funding sources for the previous six fiscal years is documented in Table 12.

TABLE 12. TRANSIT FUNDING LEVELS BY SOURCE

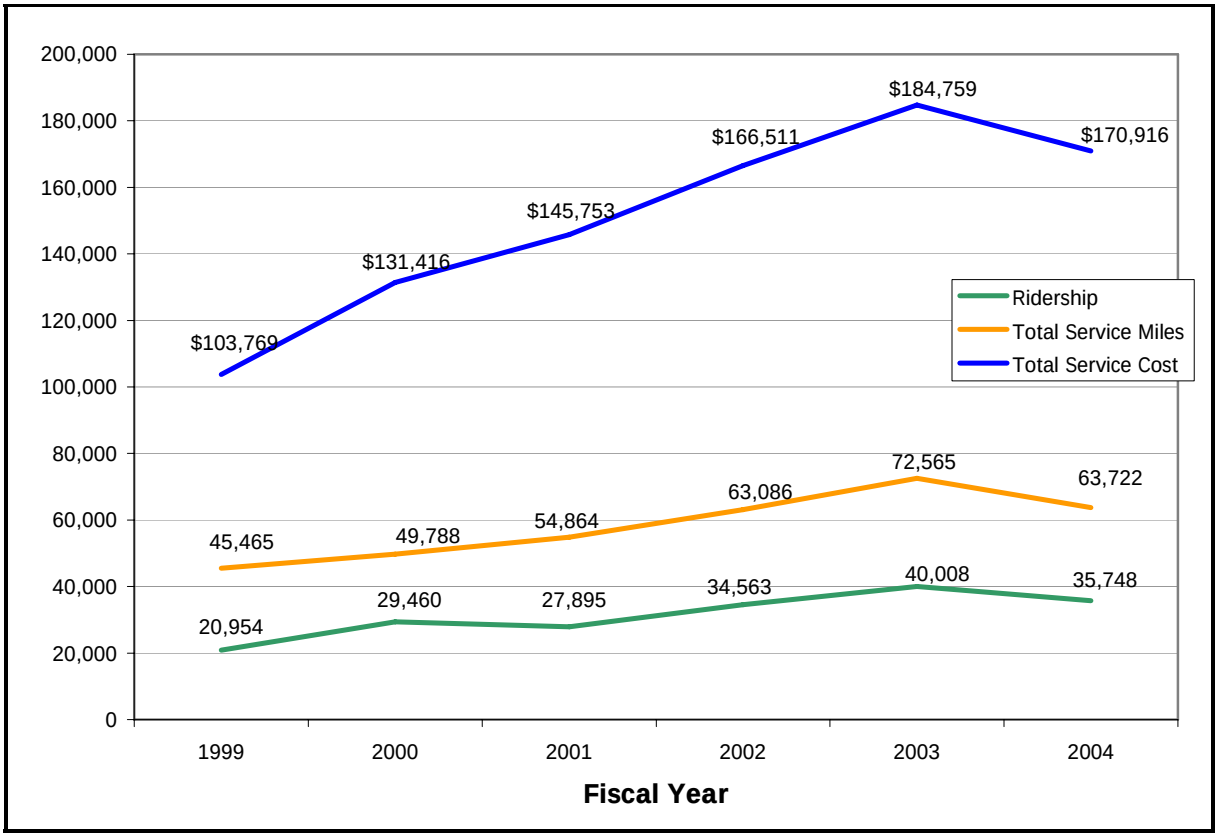
Funding Source	1999	2000	2001	2002	2003	2004
Federal Funds	$39,973	$46,101	$55,406	$59,174	$68,618	$96,981
Title III-B Federal Funds	$6,808	$7,012	$7,012	$7,138	$7,638	$7,867
State Funds	$9,700	$11,003	$11,003	$11,269	$13,437	$14,680
Local Match	$47,288	$67,300	$69,433	$88,930	$95,066	$89,163
Totals	$103,769	$131,416	$142,854	$166,511	$184,759	$208,691

Source: SDDOT, Office of Air, Rail and Transit

The agency operates a fleet of four buses and one van, all wheelchair compatible. The service does not currently run on a fixed route, instead offering door-to-door service to riders. Fares for one-way trips within most of the city are $1.50, with fares to the Kampeska Lake area at $2.50. WAT offers service outside of the study area within Codington County for higher fares. The service is offered Monday through Friday, 6:00 AM to 6:30 PM and Saturdays 8:30 AM to 5:00 PM, with hours somewhat flexible according to the needs of their riders.

System operating statistics were available for the period from 1999 to 2004. The operations data indicate a steady growth in ridership, system mileage and costs over the previous five years of operation. The ridership, mileage and cost trends are illustrated in Figure 10. System performance measures are documented in Table 13.

FIGURE 10. TRANSIT RIDERSHIP, SERVICE MILES AND COST, 1999 TO 2004



Source: SDDOT, Office of Air, Rail and Transit

TABLE 13. TRANSIT PERFORMANCE MEASURES

Trip Purpose	1999	2000	2001	2002	2003	2004
Service Miles per Trip	2.17	1.69	1.97	1.83	1.81	1.78
Operating Cost per Passenger	$ 3.61	$ 3.25	$ 3.72	$ 3.35	$ 3.15	$ 2.99
Total Service Cost per Passenger	$ 4.95	$ 4.46	$ 5.23	$ 4.82	$ 4.62	$ 4.78

Source: SDDOT, Office of Air, Rail and Transit

As shown in Table 13, the general trend would indicate that the system mileage per trip and cost per trip has declined somewhat between 1999 and 2004.

More detailed ridership information is available from WAT by two different general categories:

- *Trip purpose*: Ridership by trip purpose for 2004 is documented in Table 14. As shown in the table, travel to jobs was the most frequent reason that riders used the WAT service, accounting for 60 percent of all trips.

TABLE 14. TRANSIT RIDERSHIP BY TRIP PURPOSE (2004)

Trip Purpose	One-Way Trips	Percentage
Medical	2,564	7%
Employment	21,529	60%
Nutritional/Senior Center	1,411	4%
Social/Recreational	3,273	9%
Education	3,442	10%
Shopping/Personal	1,238	3%
Total	35,748	100%

Source: SDDOT, Office of Air, Rail and Transit

- *Ridership Classification*: Ridership by rider age and classification is shown in Table 15. As shown in Table 15, approximately 63 percent of the riders are under the age of 60.

TABLE 15. TRANSIT RIDERSHIP BY RIDER CLASSIFICATION (2004)

Ridership Group	One-Way Trips	Percentage
Elderly (Age 60 and over)	13,328	37%
Under Age 60		
Disabled	15,626	44%
Youth	3,530	10%
General Public	3,264	9%
Total	35,748	100%

Note: Disabled group includes both ambulatory and non-ambulatory riders.

Source: SDDOT, Office of Air, Rail and Transit

NON-MOTORIZED SYSTEM

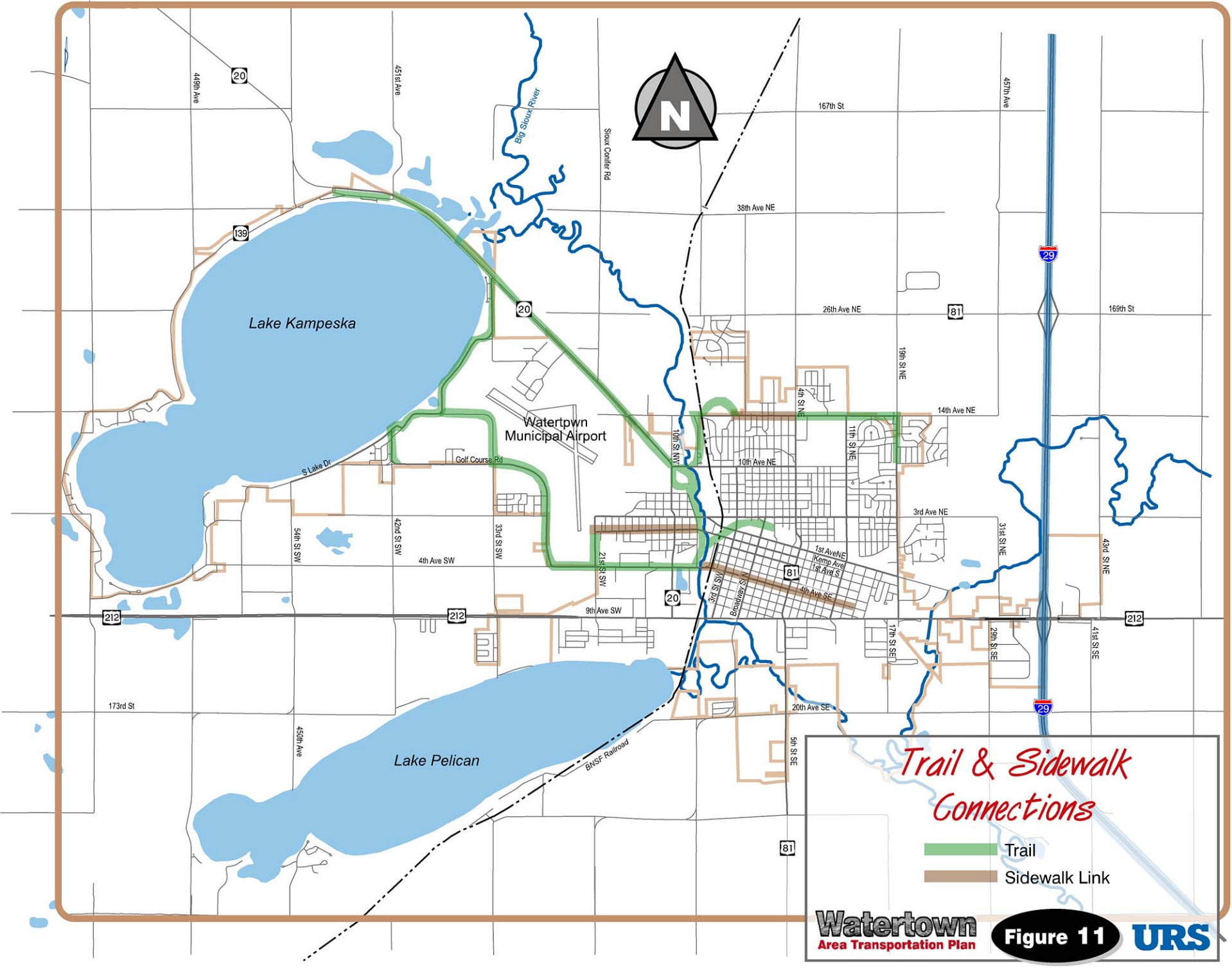
The current Watertown trail system includes approximately 15 miles of trails and 3 miles of identified "sidewalk connections". A large portion of the city is served by an extensive sidewalk system, located adjacent to most city streets in the area bounded by 8th Ave South, 14th Avenue North, 4th Street West and 11th Street East.

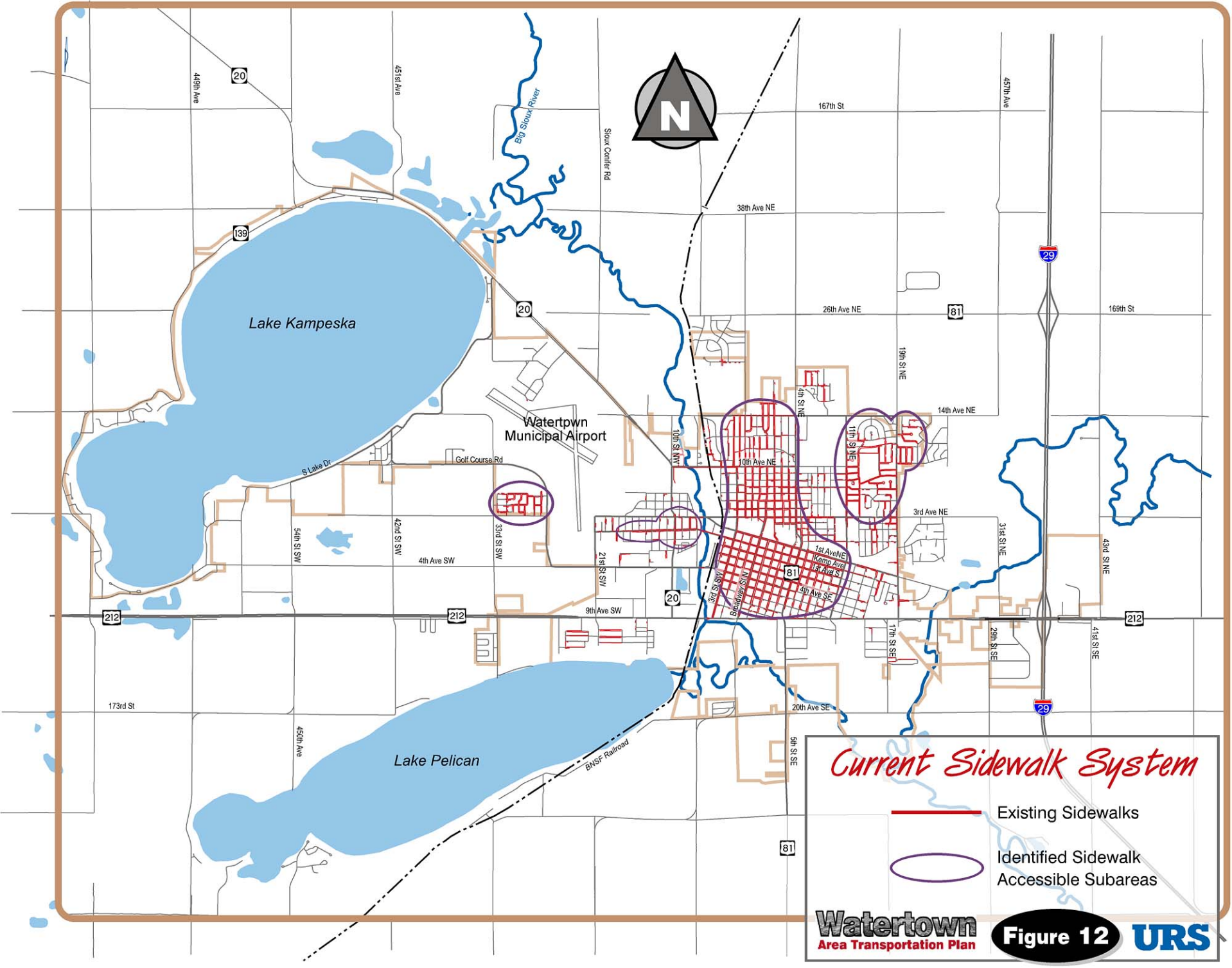
The current multi-use trail system effectively connects the sidewalk system of the central city to areas on the northwest fringe of the city, including several destinations such as the Lake Kampeska area, the airport and adjacent employment locations, Forsberg Park, Municipal Golf Course, Derby Downs and the Bramble Park Zoo. The current trail system and major sidewalk connections, as designated by the Watertown Parks and Recreation Department, are illustrated in Figure 11.

A significant share of community origins/destinations is within a short distance of the trail and sidewalk system identified in Figure 11. Based on Geographic Information System (GIS) data assembled by the study team, it was estimated that:

- Approximately 39 percent of study area employment (5,100 jobs) is within ¼ mile of the trail and sidewalk connector system.
- Approximately 43 percent of study area households (3,900 households) are within ¼ mile of the trail and sidewalk connector system.

In addition to the main trail and sidewalk connector corridors identified in Figure 9, several parts of the study area have sidewalk systems in place. The current sidewalk system is identified in Figure 12. As illustrated in Figure 12, there are several gaps in the current sidewalk system that create discontinuities in pedestrian accessibility between subareas within the larger Watertown study area.


Trail & Sidewalk Connections
Trail
Sidewalk Link
Watertown Area Transportation Plan
Figure 11
URS
N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
449th Ave
451st Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
19th St NE
14th Ave NE
4th St NE
10th St NW
11th St NE
10th Ave NE
S Lake Dr
Golf Course Rd
3rd Ave NE
31st St NE
43rd St NE
54th St SW
42nd St SW
33rd St SW
4th Ave SW
21st St SW
1st Ave NE
Kemp Ave
1st Ave S
4th Ave SE
3rd St SW
Broadway St
9th Ave SW
17th St SE
29th St SE
41st St SE
173rd St
20th Ave SE
450th Ave
5th St SE
20
139
81
29
212


Current Sidewalk System
Existing Sidewalks
Identified Sidewalk Accessible Subareas
Watertown Area Transportation Plan
Figure 12
URS
N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
S Lake Dr
Golf Course Rd
4th Ave SW
9th Ave SW
173rd St
167th St
169th St
38th Ave NE
26th Ave NE
14th Ave NE
10th Ave NE
3rd Ave NE
20th Ave SE
4th Ave SE
1st Ave NE
Kemp Ave
1st Ave S
Broadway St N
3rd St SW
10th St NW
11th St NE
19th St NE
4th St NE
31st St NE
43rd St NE
41st St SE
29th St SE
17th St SE
5th St SE
21st St SW
33rd St SW
42nd St SW
54th St SW
Sioux Conifer Rd
451st Ave
449th Ave
450th Ave
457th Ave
20
139
81
212
29

The current trail and sidewalk networks are supported by local and collector street system that provides a relatively high level of continuity throughout much of the city on relatively low volume streets (which provide acceptable opportunities for bicycling across a large portion of the city). The established roadway grid that lies between 9th Avenue South, 14th Avenue North, 10th Street West and 19th Street East is effective in dispersing vehicular traffic volumes and maintaining relatively low vehicular travel speeds on non-arterial streets. Thus, much of the city is accessible by bicycle. However, no defined bicycle routes are currently in place.

The Master Sidewalk Plan (2001), Master Trail Plan (2002) and Comprehensive Plan (2004) all document recommended sidewalk and trail improvements that would provide connections through current gaps in the existing non-motorized network. The plans include recommendations for approximately 35 miles of new trail, including design standards and implementation policies for the new trails.

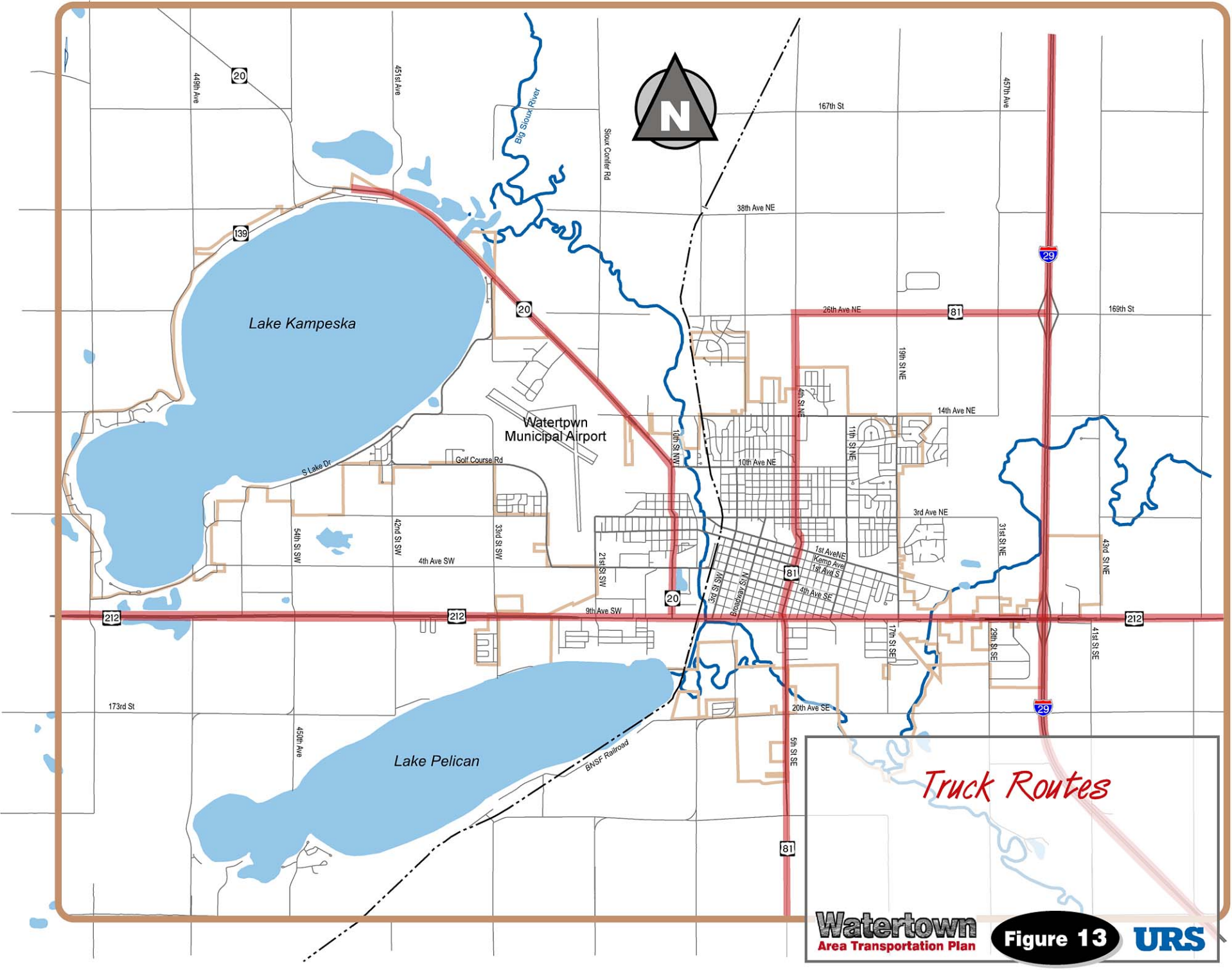
Freight Movement

Trucks

There are approximately 10 commercial trucking companies, six moving companies and five trucking services companies within the study area. The majority of the trucking companies are adjacent to a designated truck route or are located within an industrial park. In addition to the trucking companies, there are also several manufacturing and agricultural sector establishments in the Watertown area that generate high levels of truck freight movement. The current truck routes in and around Watertown are illustrated on Figure 13.

Watertown is positioned at the junction of three National Highway System (NHS) corridors that carry freight to/from and through the region: Interstate 29, US Highway 212 and US Highway 81. All three roadways are also identified as part of South Dakota's Preferential Truck Network, defined as roadways that are the best routes for truck traffic[2]. In addition to the highways through Watertown, the area also has two intermodal freight facilities served by trucks: a truck terminal connection to the Williams pipeline and grain elevator terminal served by rail and trucks. Both facilities are located adjacent to designated truck routes.

[2] SDDOT, *Statewide Intermodal Long Range Plan*, 1999.


N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
S Lake Dr
Golf Course Rd
449th Ave
451st Ave
450th Ave
Sioux Conifer Rd
167th St
169th St
173rd St
38th Ave NE
26th Ave NE
14th Ave NE
10th Ave NE
3rd Ave NE
4th Ave SW
9th Ave SW
4th Ave SE
20th Ave SE
54th St SW
42nd St SW
33rd St SW
21st St SW
10th St NW
3rd St SW
Broadway St N
4th St NE
11th St NE
19th St NE
31st St NE
43rd St NE
17th St SE
29th St SE
41st St SE
5th St SE
457th Ave
1st Ave NE
Kemp Ave
1st Ave S
20
139
81
212
29
Truck Routes
Watertown
Area Transportation Plan
Figure 13
URS

Train Service

The Burlington Northern-Santa Fe (BNSF) railroad serves the Watertown Area on a line that runs from Yale, SD to Appleton, MN. The segment between Watertown and Yale connects directly to the Dakota, Minnesota and Eastern Railroad (DM&E) rail line between Yale and Huron. The rail line through Watertown offers direct access to several regional markets including Minneapolis and Rapid City.

Rail freight on the BNSF line from Watertown to Appleton was estimated at 1.5 Million tons of freight in 1997[3]. Figure 14 shows the BNSF railroad line through Watertown. According to the US DOT, on average this rail line carries one train per day[4].

Air Service

The Watertown Municipal Airport is located on the northwest side of the city. The airport has 33 aircraft based in Watertown, which include:

- 26 single-engine airplanes
- 4 multi-engine airplanes
- 1 jet airplane
- 2 gliders

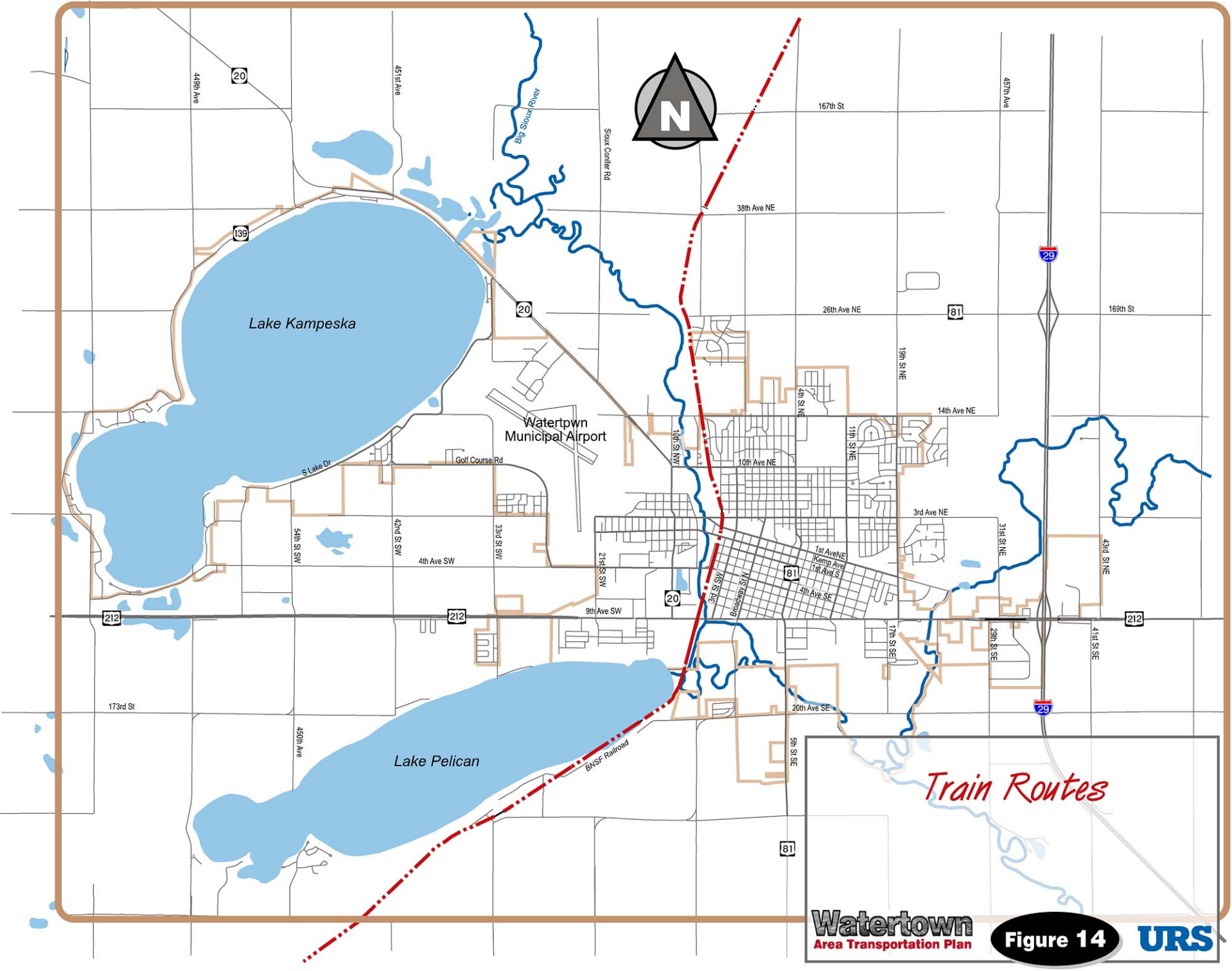
There is an average of 45 operations a day, which are composed of:

- 46% local general aviation
- 20% commercial aviation
- 18% itinerant general aviation
- 16% air taxi service
- <1% military operations[5]

The airport has two runways, each approximately 6,900 feet long and 150 feet wide. Commercial aviation service is offered to Minneapolis-St. Paul through Northwest Airlines' partner Mesaba Airlines. As shown in Table 14, the Watertown Municipal Airport had approximately 17,400 riders (one-way trips) in 2004, to rank fifth in the state in passenger volume. The typical number of daily commercial flights is three departures and three arrivals.

The airport also ranked fifth in air freight transportation for South Dakota airports by weight, with significantly smaller shares of statewide totals compared to Sioux Falls and Rapid City.

[3] SDDOT, *Statewide Intermodal Long Range Plan*, 1999.
[4] US Department of Transportation, *Rail Crossing Inventory*, August 2005
[5] Federal Aviation Administration (FAA), *Airport Data (5010) Reports*, July 2005.



Watertown Area Transportation Plan

Figure 14

URS

TABLE 14. AIR PASSENGER TRAFFIC, SOUTH DAKOTA CITIES (2004)

City	Commercial Passengers	Share of Statewide Passengers
Aberdeen	54,700	4.4%
Brookings	1,500	0.1%
Huron	2,700	0.2%
Pierre	30,700	2.5%
Rapid City	476,600	38.5%
Sioux Falls	654,400	52.9%
Watertown	**17,400**	**1.4%**
Statewide Total	1,238,000	100%

Source: US DOT, Bureau of Transportation Statistics, *T-100 Domestic Market Database*

INTERCITY BUS

Interstate bus service is provided to the Watertown area by Jefferson Bus Lines. The route that serves Watertown runs along I-29 between Sioux Falls and Fargo, and in addition to Watertown the route includes stops at Sisseton and Summit. The Watertown bus stop, located at Stones Truck Stop adjacent to the I-29 / US 212 interchange, is the only full-service stop between Sioux Falls and Fargo, offering on-location ticketing between 8:00 AM and 5:00 PM Monday through Friday. Typical daily bus service to Watertown includes two northbound buses and two southbound buses.

2030 Population, Employment and Traffic Projections

Overview

This chapter summarizes the population and employment forecasting process carried out as part of the transportation plan development. The population and employment forecasts were required input data to the Watertown regional travel demand model. The forecasts were developed to be consistent with the *City of Watertown Comprehensive Land Use Plan*, October 2004. The input data required for the regional travel model include:

- Households by geographic location in the study area.
- Retail sector employment by geographic area in the study area.
- Service sector employment by geographic area in the study area.
- Other sector employment by geographic area in the study area.

The methods and guidelines used in developing the transportation plan socio-economic projections included preparation of:

- Study area-wide control totals for households through 2030.
- Study area-wide control totals for employment through 2030 (divided into retail, service and other sectors.[6])
- Geographic placement of the households and employment increments throughout the study area.

Control Total Population and Employment Projections (2030)

Historical population and traffic flow information were reviewed as part of the overall transportation system assessment. In each of the census counts from 1970 through 2000, population within the city of Watertown and Codington County has increased. The census population totals for 1970, 1980, 1990 and 2000 are documented in Table 15. Over the 30-year period from 1970 through 2000, population within the city grew by approximately 1.4 percent per year (compounded annual rate) and by approximately 1.0 percent per year in the county.

[6] Retail sector employment includes retail and auto sales, grocery store and restaurant employment. Service sector employment includes health care, finance, insurance, real estate, lodging, recreation and auto repair employment. Other sector employment includes industrial, construction, agriculture, communication and government employment.

TABLE 15. HISTORICAL POPULATION LEVELS, WATERTOWN AND CODINGTON COUNTY

Area	Census Reported Population				Percentage Growth, 1970 to 2000
	1970	1980	1990	2000	
City of Watertown	13,388	15,649	17,592	20,237	51%
Codington County	19,140	20,855	22,698	25,929	35%

Sources: *1990 CPH-2-1*, US Census Bureau
Census 2000 Summary File 1, US Census Bureau

Summary-level employment data that dated back to 1980 were available from the South Dakota Department of Labor (SDDOL) for Codington County, but were not available for just the city of Watertown. The county data were summarized to include annual average employment, which is documented in Table 16. As shown in Table 16, Codington County has seen a relatively steady increase in employment since 1980.

TABLE 16. HISTORICAL EMPLOYMENT LEVELS, CODINGTON COUNTY

Year	Average Annual Employment
1980	9,411
1981	9,477
1982	9,380
1983	9,446
1984	10,612
1985	10,624
1986	10,854
1987	11,237
1988	11,576
1989	11,954
1990	11,555
1991	11,605
1992	12,080
1993	12,465
1994	13,205
1995	13,695
1996	14,090
1997	14,185
1998	14,555
1999	14,235
2000	14,460
2001	14,325
2002	14,370
2003	14,530

Source: South Dakota Department of Labor, Labor Market Information Center.

Watertown accounts for the majority of the existing development in Codington County, accounting for approximately:

- 91 percent of Codington County's population
- 93 percent of Codington County's households
- 93 percent of Codington County's employment

Several sources of data were used in preparing the population, household and employment projections. These data sources included:

- US Census Bureau
- *City of Watertown Comprehensive Land Use Plan*, October 2004
- Woods and Poole Economics, Inc
- South Dakota Department of Labor

These various sources were summarized and compared at the city and/or county level. As shown previously in Figure 1, the transportation plan study area boundary lies outside of the Watertown city limits, but does not encompass all of Codington County. A complete summary of the control total population and employment projection assessments and recommendations are presented in Appendix D. Based on the assessments of the various sources, the consultant developed a recommended set of 2030 population and employment projections for the study area, which were approved by the Steering Committee. These projections are documented in Table 17.

TABLE 17. STUDY AREA POPULATION, HOUSEHOLD AND EMPLOYMENT PROJECTIONS

Variable	Base Year (2004)	2030	Growth
Population	22,182	32,800	10,618
Households	9,053	13,700	4,647
Persons/Household	2.45	2.39	
Employment			
Service	5,660	9,940	4,280
Retail	2,245	3,230	985
Other	5,288	6,970	1,682
Total Employment	13,193	20,140	6,947

Sources: City of Watertown Comprehensive Plan, Woods and Poole, Inc., SDDOL (2004), US Census Bureau (2000), URS Corp.

Allocation of the Dwelling Units and Employment Growth, 2000 to 2030

A key input to the transportation planning process was the development concept. The development concept represents a likely scenario of where new development will be added to the study area through 2030 (termed the "increment" of development). The development concept was an important input into the transportation planning process because the growth areas it identified the primary sources of *new* travel demand within the study area through 2030.

The development concept was produced by working with local planning and development staff to distribute the increment of development forecasted in Table 17. The development increment was allocated to various locations within the study area based on the following general factors:

- Allocation consistent with the environmental constraints and growth areas identified in the city's Comprehensive Plan.
- Identification of local growth trends and development densities.
- Areas of likely infill development or currently platted land.
- Identification of areas were developable land would most efficiently be served by urban services.

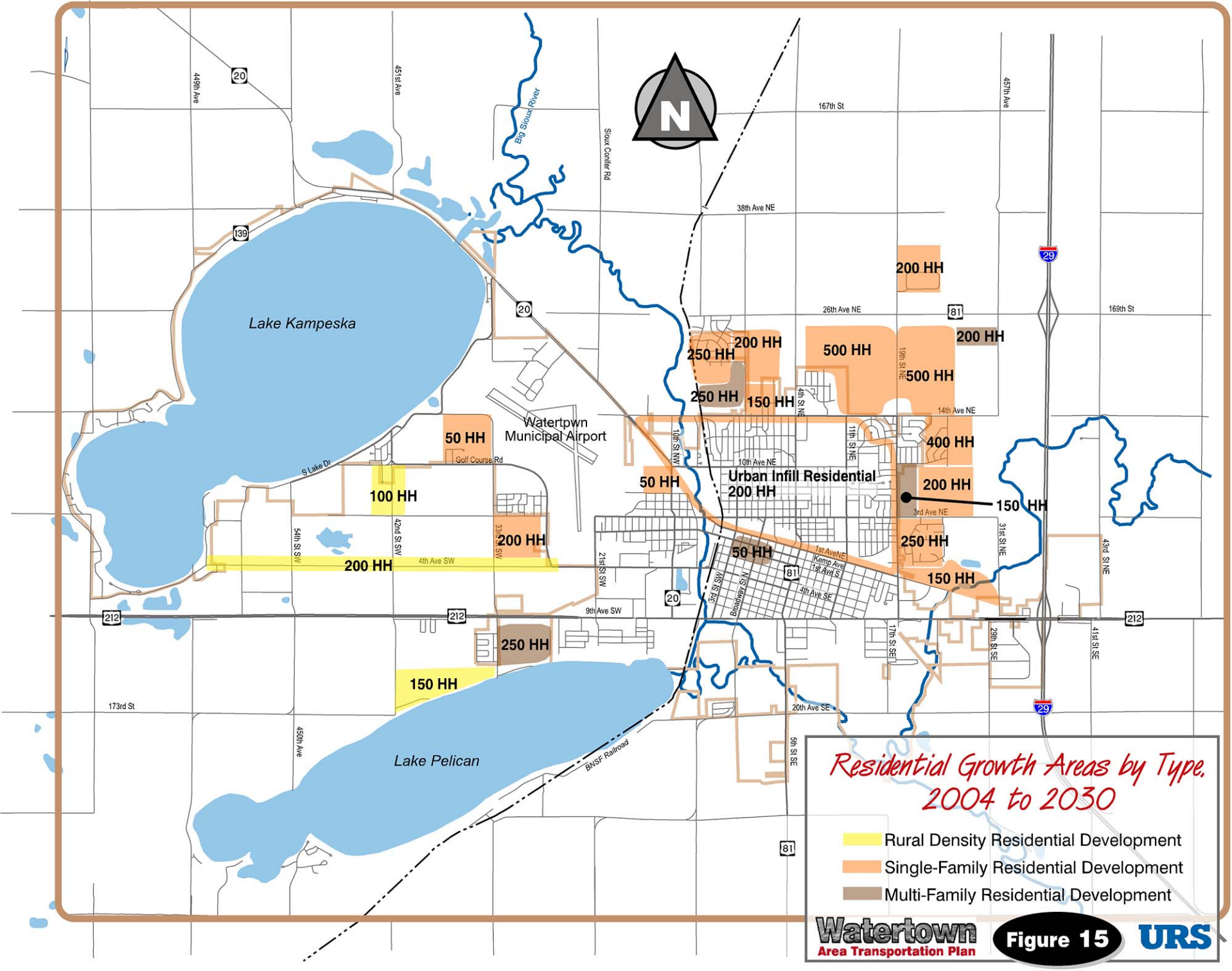
For the purposes of the development concept, housing growth was allocated in the following categories:

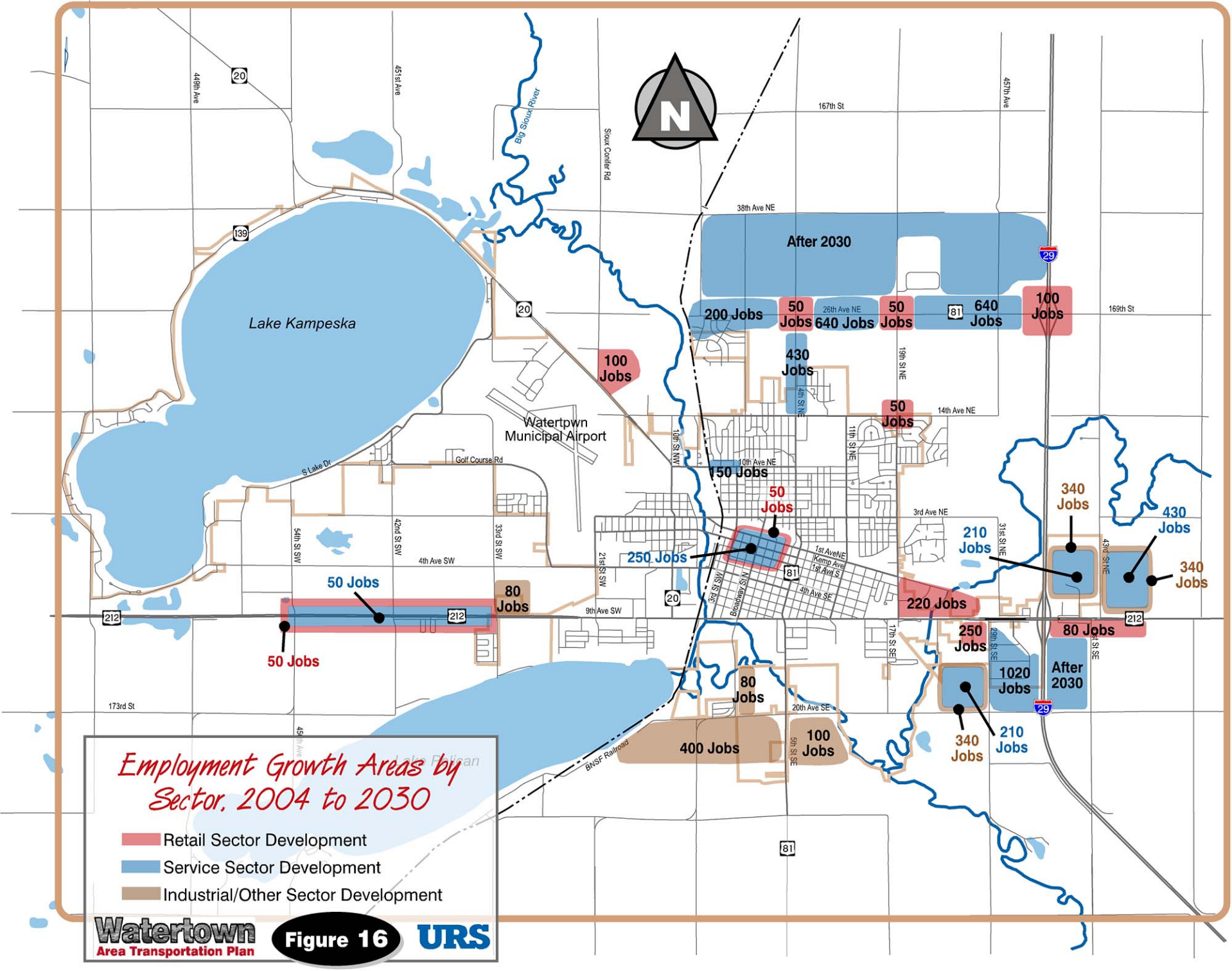
- Rural Density Residential
- Single-Family Residential
- Multi-Family Residential

Employment growth was allocated in the following categories:

- Retail Employment
- Service Employment
- Other/Industrial Employment

The development concept is documented in Figures 15 and 16, and intends to show general growth areas, not specific parcels. The number of new households added to each growth area by 2030 is shown in Figure 15. The number of new jobs added to each growth area by 2030 is shown in Figure 16.


Residential Growth Areas by Type, 2004 to 2030
Rural Density Residential Development
Single-Family Residential Development
Multi-Family Residential Development
Watertown Area Transportation Plan
Figure 15
URS
N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Urban Infill Residential
200 HH
150 HH
250 HH
500 HH
400 HH
100 HH
50 HH
Big Sioux River
BNSF Railroad
449th Ave
451st Ave
457th Ave
450th Ave
Sioux Conifer Rd
167th St
169th St
173rd St
38th Ave NE
26th Ave NE
14th Ave NE
10th Ave NE
3rd Ave NE
4th Ave SW
9th Ave SW
20th Ave SE
4th Ave SE
1st Ave NE
Kemp Ave
1st Ave S
S Lake Dr
Golf Course Rd
54th St SW
42nd St SW
33rd St SW
21st St SW
10th St NW
4th St NE
11th St NE
19th St NE
31st St NE
43rd St NE
3rd St SW
Broadway St N
17th St SE
29th St SE
41st St SE
5th St SE
20
139
81
212
29


Employment Growth Areas by Sector, 2004 to 2030
Retail Sector Development
Service Sector Development
Industrial/Other Sector Development
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
N
After 2030
200 Jobs
50 Jobs
640 Jobs
50 Jobs
640 Jobs
100 Jobs
430 Jobs
50 Jobs
150 Jobs
50 Jobs
250 Jobs
100 Jobs
50 Jobs
50 Jobs
80 Jobs
210 Jobs
340 Jobs
430 Jobs
340 Jobs
220 Jobs
80 Jobs
250 Jobs
1020 Jobs
After 2030
80 Jobs
400 Jobs
100 Jobs
340 Jobs
210 Jobs
167th St
169th St
38th Ave NE
26th Ave NE
14th Ave NE
10th Ave NE
3rd Ave NE
4th Ave SW
9th Ave SW
20th Ave SE
173rd St
S Lake Dr
Golf Course Rd
Sioux Conifer Rd
1st Ave NE
Kemp Ave
1st Ave S
4th Ave SE
Broadway St N
3rd St SW
10th St NW
11th St NE
19th St NE
4th St NE
31st St NE
43rd St NE
17th St SE
28th St SE
21st St SE
5th St SE
54th St SW
42nd St SW
33rd St SW
21st St SW
449th Ave
451st Ave
457th Ave
Watertown Area Transportation Plan
Figure 16
URS

EXISTING PLUS COMMITTED IMPROVEMENTS NETWORK

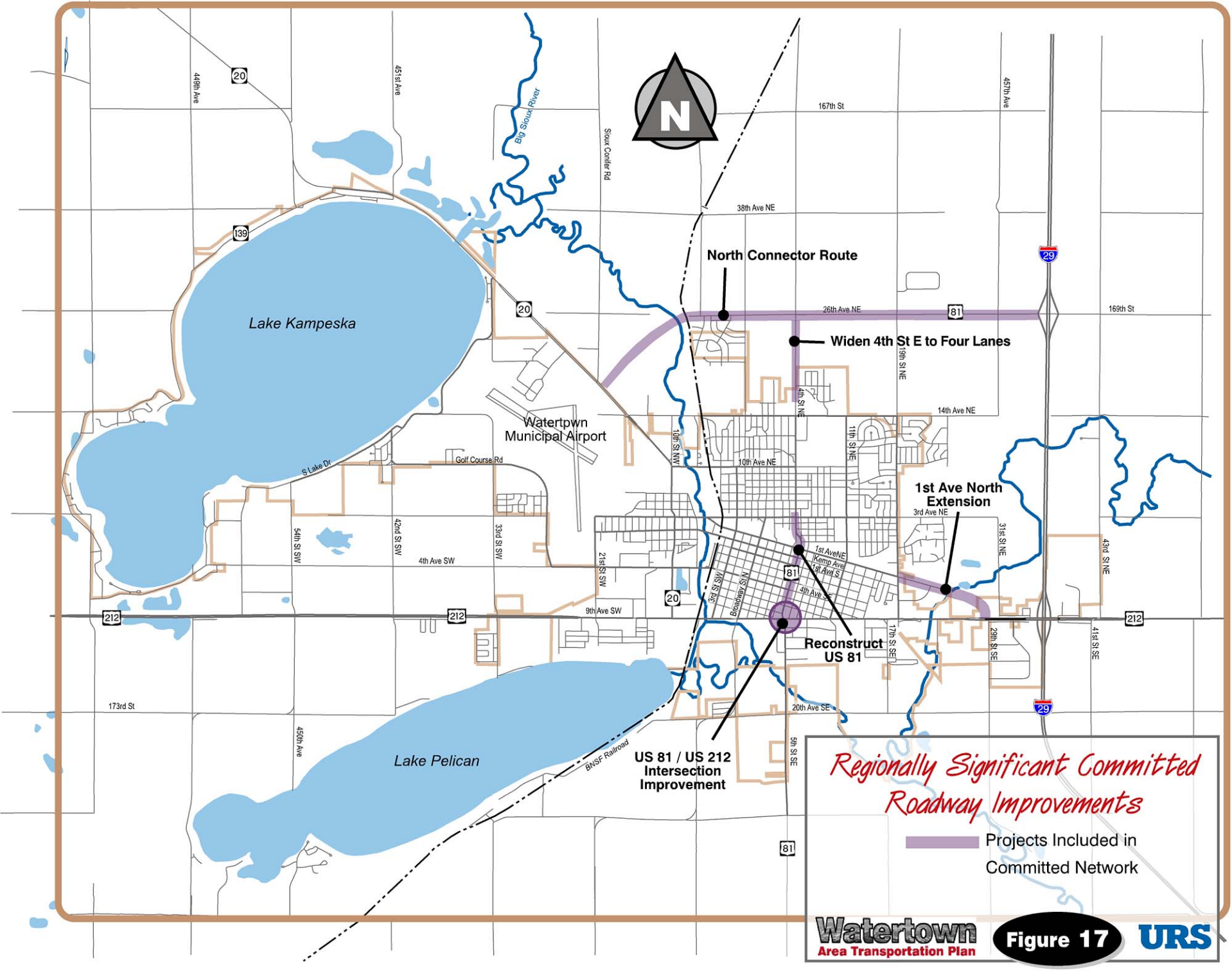
The existing-plus-committed transportation network is the "base" future year (2030) roadway scenario for the transportation plan. This roadway scenario was developed to assume that the existing roadway system was maintained through the 2030 planning horizon, and that regionally significant *committed* roadway improvements were in place. Regionally significant committed improvement projects were those that met the first criterion and either the second or third criterion listed below:

1. The project was included in the most current SDDOT Transportation Improvement Program (STIP) projects list (2005-2009). These projects were those that have identified funding sources and will initiate construction by 2009.
2. The project would result in increased capacity through an existing corridor, such as the construction of additional travel lanes. Projects that were not incorporated in the committed project list were those on the TIP list that were corridor maintenance projects or reconstruction projects (pavement overlays, pavement rehabilitation, etc.) that did not result in additional intersection turn lanes or segment travel lanes.
3. The project was a new roadway corridor. These projects were included in the regionally significant committed project list because they would provide access to potential development areas and possibly result in the re-distribution of traffic from current travel patterns.

The regionally significant committed projects included in the existing-plus-committed roadway network were:

- Improvement of the US 212/US 81 intersection
- North Connector Route (SD 20 to US 81 Arterial)
- Widen 4th Street East (US 81) south of 26th Avenue North
- 1st Avenue North Extension
- Reconstruction of US 81 (north of US 212 intersection to C Avenue)

Figure 17 shows the committed projects included in the 2030 existing-plus-committed regional travel model network.


N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
North Connector Route
Widen 4th St E to Four Lanes
1st Ave North Extension
Reconstruct US 81
US 81 / US 212 Intersection Improvement
449th Ave
451st Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
14th Ave NE
10th Ave NE
19th St NE
4th St NE
11th St NE
10th St NW
S Lake Dr
Golf Course Rd
54th St SW
42nd St SW
33rd St SW
4th Ave SW
21st St SW
3rd St SW
Broadway St N
1st Ave NE
Kemp Ave
1st Ave S
4th Ave S
3rd Ave NE
31st St NE
43rd St NE
9th Ave SW
17th St SE
29th St SE
41st St SE
20th Ave SE
5th St SE
173rd St
450th Ave
20
139
81
212
29
Regionally Significant Committed Roadway Improvements
Projects Included in Committed Network
Watertown Area Transportation Plan
Figure 17
URS

2030 Daily Traffic Forecasts

Travel Forecasting Overview

The Watertown area regional travel demand model is an integral tool that was established in support of the Watertown Area Transportation Plan. The travel demand model is essentially a computer-based simulation of the Watertown area roadway system, its land uses and its socioeconomic characteristics. The impacts of both transportation system changes and land development scenarios can be evaluated with the model. Roadways functionally classified as a collector or higher were included in the network. Attributes used to define every segment in the network include travel speed, segment length and estimated roadway capacity.

The traffic analysis zone (TAZ) was the base geographic unit established for trip-making data in the Watertown traffic model. The TAZ structure was developed based on several factors, including:

- *Watertown's Census Geography*: 2000 U.S. census data was the primary source of household data for the traffic model. Where the other geography constraints allowed, TAZ boundaries were developed along census block and block group geography.
- *Roadway Network*: TAZ boundaries were developed along streets classified as a collector or higher.
- *Rivers and Lakes*: The Big Sioux River and both lakes represent barriers to access and in many cases defined TAZ boundaries.
- *Railroad*: The BNSF rail line through the city is also a barrier to access was used to define many TAZ boundaries.

The Watertown traffic model was developed to include 197 TAZs. Consultant staff developed the planning horizon socioeconomic data (households and employment) levels by TAZ based on the development concept increment.

The model application developed for Watertown is a sequential, four-step model summarized in the following components:

- *Trip Generation*: The Watertown trip generation module was utilized to estimate the number of trips that are produced within and attracted to each TAZ in the study area. The number and location of dwelling units and employment were the variables used to generate trips in the Watertown model.

  Household data was the primary independent variable used to calculate trip productions in the model. The trip production calculations were based on a cross-classification approach that estimate the number of

trips productions for each dwelling unit within each TAZ. The trip production calculations utilized household automobile ownership rates (from Census data) to estimate the trip production rate per household.

Employment data was the main variable used to calculate trip attractions in the model. Employment was categorized into retail, service and other sector jobs for the trip attraction module, using a regression equation to estimate trip attractions.

The product of the trip generation module was a summary of the estimated number of person trips produced and attracted to each TAZ. In the Watertown model, trip productions and attractions were classified by one of three trip purposes:

- *Home-based work trips (HBW):* Trips between the home-place and work-place, or the work-place and the home-place, without an intermediate stop.
- *Home-based non-work trips (HBNW):* Trips for any purpose besides work that begin or end at the home place (i.e. a shopping trips).
- *Non home-based trips (NHB):* Trips for any purpose that do not start or end at the home-place.

- *Trip Distribution*: The trip distribution module was used to estimate traffic flows between TAZs across the Watertown area. A Gravity Model was utilized for the Watertown trip distribution. Through application of the gravity model, the number of trips between two TAZs can be estimated to be in proportion to:
  - The relative number of trips generated in each TAZ (as estimated through the trip generation module).
  - The relative travel time between each TAZ.

  The product of the trip distribution module was a separate origin-destination matrix of person trips, or a trip table, for each of the trip purposes. Each trip table summarized the estimated number of trips between all 197 TAZs in the Watertown area.

- *Auto Occupancy*: Auto occupancy factors were developed to transform the person trip tables into vehicle trip tables. These occupancy rates were developed from 2000 Census journey-to-work information, the external station travel survey and published information summarizing small urban areas across the country. The auto occupancy factors employed by trip purpose were:
  - Home-based work trips: 1.11 persons per vehicle
  - Home-based non-work trips: 1.56 persons per vehicle
  - Non home-based trips: 1.66 persons per vehicle

  The product of the auto occupancy application was a vehicle trip table for the Watertown area.

- *Traffic Assignment*: The Watertown traffic assignment module was used to estimate the traffic flow on the roadway network. The assignment module used an equilibrium assignment method. With this method, traffic was loaded onto the roadway network through an iterative process that minimized the travel time between each TAZ pair. Capacity restraint was estimated and considered in the equilibrium assignment method; when a link is approaching or exceeding its capacity, estimated travel delay was added to the link. The product of the traffic assignment module, the final step in the travel model application, was a set of estimated traffic flows for all roadway segments included within the travel model.

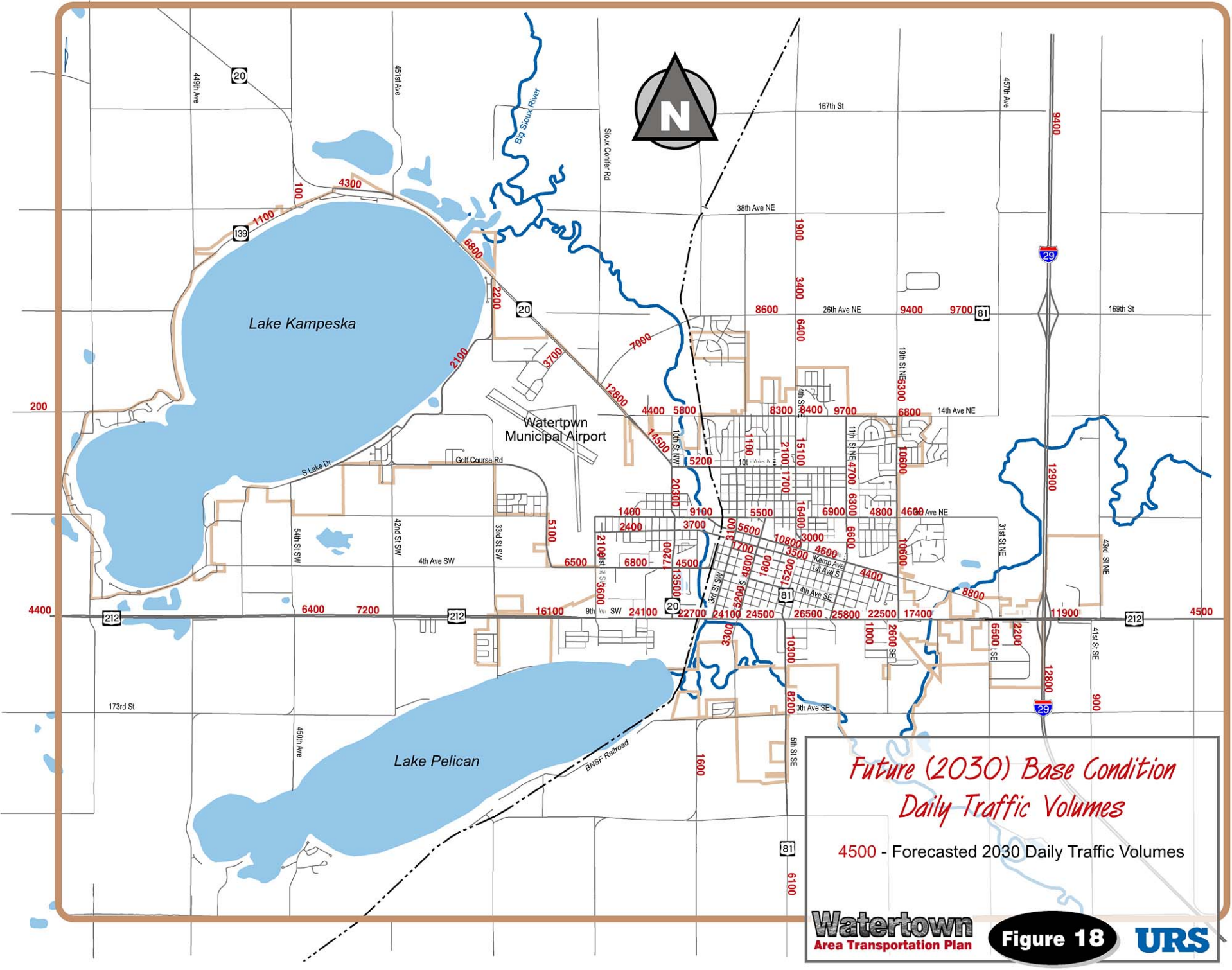
The first step in developing the travel model was to construct an existing conditions travel model[7], which attempted to replicate the existing housing, employment and roadway conditions for Watertown. The model parameters were adjusted through an iterative process to bring the model to a point where it did a reasonable job of simulating existing traffic conditions in the Watertown area. This iterative process is called "validation". The Watertown traffic model validation was completed by the consultant and reviewed by SDDOT staff. Based on the validation, it was determined that the model reasonably replicated existing traffic volumes and patterns. The validation of the model is documented in Appendix E.

The validation step was important because a model that meets its validation benchmarks gives its users confidence that they can use the model to reasonably forecast future traffic demands on the local roadway system. Thus, utilizing the model with future year roadway network scenarios developed from this 2004 validated model should reasonably estimate the traffic levels and patterns associated with the 2030 development concept.

FORECASTED 2030 DAILY TRAFFIC VOLUMES

Consultant staff developed daily traffic assignments reflecting the 2030 development concept. The assigned traffic volumes produced through application of the travel model were modified to account for any error observed between the base year model assignments and the base year daily traffic volumes. The products of this step (referred to as post-processing) were the 2030 daily traffic forecasts for the region. The 2030 daily traffic forecasts were developed on the existing-plus-committed roadway network, to forecast travel conditions in Watertown if no improvements were made beyond those currently programmed in the TIP. The forecasted 2030 daily traffic volumes on the existing-plus-committed roadway network are displayed in Figure 18.

[7] The existing conditions travel model utilizes data that was collected between 2000 and 2004.



Future (2030) Base Condition Daily Traffic Volumes

4500 - Forecasted 2030 Daily Traffic Volumes

Watertown Area Transportation Plan

Figure 18

URS

The area-wide travel impacts associated with the development concept were assessed through review of trip generation and vehicle miles of travel (VMT) indices. Table 18 documents the trip generation and VMT summary of the development concept.

TABLE 18: TRIP GENERATION AND VEHICLE MILES TRAVEL (2004 AND 2030)

Development Scenario	HBW	HBNW	NHB	External-to-External	Total Vehicle Trips
2004 Base Year	32,600	58,200	17,200	3,400	111,400
2030 Development Concept	49,400	88,100	25,300	5,600	168,400
Percentage Change	52%	51%	47%	65%	**51%**

Development Scenario	VMT by Functional Classification				Total VMT
	Interstate	Principal Arterial	Minor Arterial	Collector	
2004 Base Year	63,000	141,600	160,700	10,900	376,200
2030 Development Concept, E+C Network	123,300	195,200	284,400	14,500	617,400
Percentage Change	96%	38%	77%	33%	**64%**

Source: URS Corporation

As shown in Table 18, the level of trip generation was projected to increase by 51 percent over the planning horizon. This level of trip generation growth was consistent with the projected percentage of housing and employment growth, as shown previously in Table 17. The forecasted change in VMT, also shown in Table 18, was projected to grow by approximately 64 percent over the planning horizon. Some general trends indicated in this table are:

- Overall VMT was forecasted to grow proportionally more than the number of trips between 2004 and 2030. A forecasted growth in VMT that exceeds forecasted growth in trips indicates that the average trip lengths will increase over the planning horizon, by approximately 25 percent in this case. This should be expected given the orientation of new jobs and housing projected in the development concept, where the majority of new development was anticipated to occur on the periphery of Watertown.
- Traffic volumes on the interstate were expected to grow by a greater percentage than other roadway types. This was due to a combination of two factors:

- Traffic volumes entering the study area on Interstate 29 from the north and south were predicted to increase by 63 percent and 80 percent, respectively. The percentage of traffic entering the study area on I-29 that travels through the area without stopping was expected to remain constant over the planning horizon at approximately 40 percent.
- Traffic volumes between the US Highway 212 (exit 177) and 26th Avenue North (exit 180) interchanges was projected to increase nearly three times over the planning horizon, from 4,500 vpd in 2004 to 12,900 in 2030. Much of this increase was due to projected increase in development adjacent to both interchanges, both trip producing development (residences) and trip attracting development (employment and commercial areas). A significant portion of this traffic growth were trips entering I-29 at Exit 180 and leaving I-29 at Exit 177 (and vice versa), which is an infrequent travel path today since there is very little development within three or four miles of Exit 180.

AIR SERVICE FORECASTS

As part of the *Watertown Municipal Airport Master Plan,* completed in 1999, forecasts of airport utilization were completed. A summary of the forecasts is presented in Table 19. The forecasts were completed approximately six years ago, so both the forecasts and the actual data for 2003 are presented.

TABLE 19. SUMMARY OF AIR PORT UTILIZATION FORECASTS

Forecast Category	Actual 2003	Forecast Data				Forecasted 2003-2018 Change
		2003	2008	2013	2018	
Airline Enplanements	7,963	11,224	13,126	15,350	17,951	60%
Based Aircraft	33	39	40	43	45	15%
Air Cargo (pounds)	7,900	24,145	24,154	26,204	27,255	13%
Total Aircraft Operations	16,400	22,113	25,142	29,272	33,222	50%

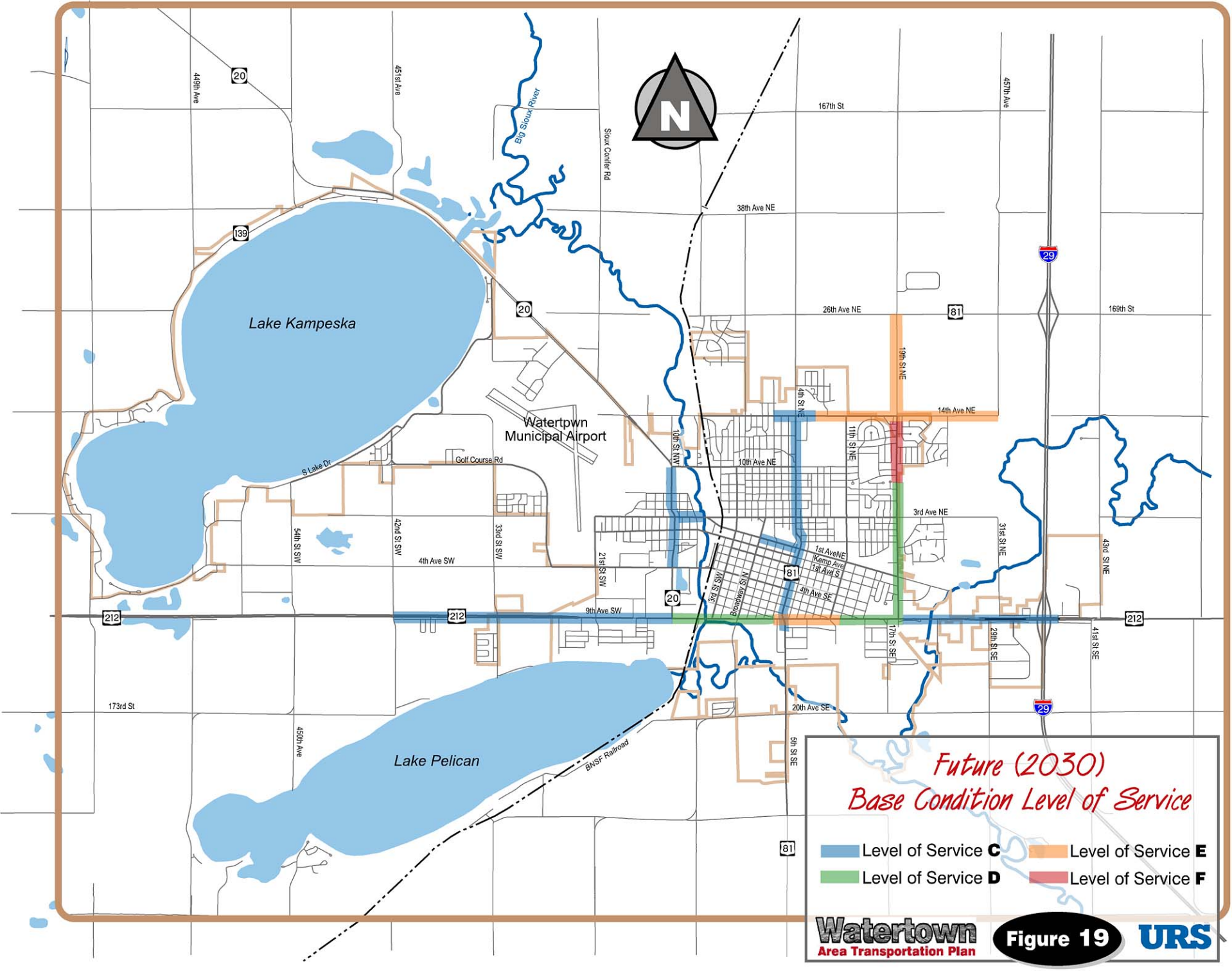
Sources: *Watertown Municipal Airport Master Plan*, 1999.
US DOT, *T-100 Domestic Market Database*

As shown in Table 19, the actual utilization levels for 2003 were lower than the 2003 forecasts prepared in the 1999 plan. This is likely a reflection of when the forecasts were completed, which was at the end of long national economic expansion and the resulting downturn in the air industry seen during the front end of the forecast period since 1999.

2030 Roadway Capacity Deficiencies

Figure 19 displays locations forecasted to carry daily traffic volumes at levels approaching or exceeding the acceptable corridor capacities. As with the evaluation of existing conditions, the acceptable link capacities were representative of level-of-service C operations. The following segments were anticipated to operate at level of service "C" or worse in the 2030 Base E+C scenario:

- *LOS "F":* 19th Street E from 8th Avenue North (end of 3-lane cross-section) to 14th Avenue North
- *LOS "E":*
  - US 212 from west of US 81 to 13th Street East
  - 14th Avenue North from US 81 to east of 19th Street East
  - 19th Street East from 14th Avenue N to 26th Avenue N
- *LOS "D":*
  - US 212 from SD 20 to west of US 81
  - US 212 from 13th Street East to 19th Street East
  - 19th Street East from 8th Avenue North to US 212
- *LOS "C":*
  - US 212 from 42nd Street West to SD 20
  - US 212 from 19th Street East to the I-29 interchange
  - US 81 from US 212 to 14th Avenue North
  - SD 20 from 4th Avenue South to 10th Avenue North
  - 3rd Avenue North from SD 20 to 1st Avenue North
  - 14th Avenue North adjacent to US 81 intersection
  - 1st Avenue North between Broadway and US 81


Future (2030)
Base Condition Level of Service
Level of Service C
Level of Service D
Level of Service E
Level of Service F
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
BNSF Railroad
N
449th Ave
451st Ave
Sioux Conifer Rd
167th St
457th Ave
38th Ave NE
26th Ave NE
169th St
14th Ave NE
10th Ave NE
3rd Ave NE
4th Ave SW
9th Ave SW
173rd St
20th Ave SE
S Lake Dr
Golf Course Rd
54th St SW
42nd St SW
33rd St SW
21st St SW
10th St NW
4th St NE
10th St NE
11th St NE
31st St NE
43rd St NE
1st Ave NE
Kemp Ave
1st Ave S
4th Ave SE
3rd St SW
Broadway St N
17th St SE
29th St SE
41st St SE
5th St SE
450th Ave
20
139
81
212
29
Watertown Area Transportation Plan
Figure 19
URS

Alternatives Analysis

Overview

The transportation system improvement alternatives developed and tested for the Watertown Area Transportation plan were developed based on information gathered primarily through two different means:

- Input and issues received through Steering Committee meetings, the stakeholders group, public feedback and meetings with local civic groups.
- Technical analyses performed by URS of existing and future system conditions in the Watertown area.

The transportation system improvements identified were classified into three general categories:

- *Transportation System Management (TSM) Alternatives:* These alternatives include intersection improvements such as additional turn lanes, traffic signal improvements and access management activities. These concepts are relatively small-scale, low-cost improvements that do not attract/divert traffic to a corridor, but improve roadway capacity, traffic flow and/or corridor safety.
- *Transportation System Expansion:* Examples of these alternatives include construction of new facilities and addition of new lanes to existing facilities. These concepts are larger-scale improvements that have the potential to divert traffic to the "expansion" corridor.
- *Non-motorized Facilities*: These alternatives include new pedestrian and bicycle facilities in dedicated (non-motorized only) corridors and identification of on-street bicycle routes.

Evaluation Criteria

Each of the system improvement alternatives addressed through the transportation planning process were evaluated relative to a set of criteria which allowed review of the alternative from the following "perspectives":

- Engineering/Traffic Perspective
- Social/Land Use Perspective
- Environmental Perspective
- Public Support/Consistency Perspective
- Cost/Economic Impact Perspective

The evaluation criteria used for each perspective included:

Engineering / Traffic Perspective

- Reduction in accident rates / fatalities / injuries
- Traffic congestion reduction / Improved traffic flow
- Improved freight flow
- Change in transit ridership
- Change in access points/driveways
- Accommodation of pedestrian needs in new designs and proposals

Environmental Perspective

- Reduction in vehicle miles of travel (VMT)
- Reduction in vehicle hours of travel (VHT)
- Connectivity to existing and planned system
- Additional miles of bicycle / pedestrian facilities
- Number of activity centers connected by trails and transit
- Traffic noise impacts
- Use of design / mitigation elements to address environmental concerns

Public Support / Consistency Perspective

- Consistent with Comprehensive Plan / Completed Studies
- Improve Agency / Department / Private Sector Coordination

Social / Land Use Perspective

- Number of impacted residential units
- Number of impacted commercial/industrial sites
- Acres of undeveloped land needed for improvement
- Aesthetic impacts
- Design elements consistent with / enhance community character

Cost / Economic Impact Perspective

- Cost ($) in relation to:
  - A: Congestion relief
  - B: Reduction in accidents
  - C: Reduction in travel time
  - D: Reduction in VMT
  - E: Reduction in vehicle trips
- Existing sites served by system improvements
- Developable site served by system improvements

GENERALIZED ALTERNATIVES SCREENING PROCESS

Following determination and documentation of the current and horizon year 2030 transportation system issues / deficiencies, the focus of the planning process turned to identification of alternatives that reduce / eliminate the identified deficiencies and addressing the identified issues in the study area. The process employed by the study team was based on a multi-level approach of developing a list of improvement concepts to evaluate, screening the list to narrow it to the most promising, combining the alternatives into a prioritized plan based on the needs identified, potential for an alternative to address the issues / deficiencies identified, the impacts associated with the alternative and the dollar cost of the improvement.

The general screening process was to start with a broad range of potential improvement concepts for all of the identified issue areas and address each of the individual issues by mode. As the extent of alternatives within each

mode was narrowed, the mode-specific alternatives were combined into a coordinated multimodal transportation improvement plan.

The alternatives screening process involved the Steering Committee, with reviews by the transportation plan Stakeholders Committee and the public. The following bullets outline the general process employed in the alternatives screening:

- The consultant initiated the First Level Screening process by documenting a preliminary set of improvement alternatives to consider. The concepts were organized by issue to be addressed (i.e., Congestion on US 212) in a memorandum to the Steering Committee prior to the First Level Screening workshop, held on April 14, 2005. The roadway alternatives were organized and evaluated using the tools available, including application of the regional travel demand model and review of environmental constraints mapping available in the Comprehensive Plan. A list of potential non-motorized improvements, including off-street trails and on-street bicycle routes, was also distributed prior to the April 14 workshop. The focus of the First Level Screening was to complete an initial screening of the broad range of alternatives within individual modes, not to develop one solution to each issue.
- At the April 14 workshop, the Steering Committee worked with the consultant in a workshop setting at which a broad range of alternatives for addressing issues identified through the public process and through the technical analyses were discussed. The purposes of the workshop were to discuss each of the issues, to discuss the alternatives developed to address each issue, to determine whether there were other alternatives that need to be added, and to screen out those alternatives identified that did not reasonably address the transportation issues. The definition of "did not reasonably address" would include:
  - Would result in substantial impacts to the adjacent uses/environment relative to the level of issue relief provided.
  - Cost relative to the transportation budget and relative to the level of issue relief provided.
  - The concept was inconsistent with local land use, environmental or transportation practices and/or policies. The community would not likely support concepts that fall under this category.
- Due to time constraints during the First Level Screening workshop, some of the relatively "low-impact" roadway alternatives (such as TSM-type improvements) and the non-motorized alternatives were not discussed at this time. To get some input on these concepts prior to the Second Level Screening workshop, the study team:
  - Submitted the preliminary trails / on-street bicycle route concepts to the Parks and Recreation Department for review and input.

  - Documented the impacts associated with the concept to convert Kemp Avenue and 1st Avenue South to two-way operation. This document was submitted to the Urban Renewal Board for comment.
  - Coordinated with WAT regarding the potential implementation of fixed-route transit service for WAT, which had been brought up as an issue during the course of the study. In discussions with WAT staff, the study team learned that WAT was planning a near-term implementation of a single fixed route on a trial basis. It was decided that the study team would monitor (and assist as requested) the fixed-route implementation.

- Following the First Level Screening Workshop, the consultant documented the discussions held, adjusted alternatives per discussion at the workshop, added selected alternatives for review and initiated the Second Level Screening analysis.
- The consultant completed additional analysis and submitted documentation for the Steering Committee members to review prior to the next workshop. This additional documentation included:
  - Refined evaluations of the South Connector and US 212 reconstruction concepts based on revised phasing and segmentation of alternatives.
  - Preliminary planning-level cost estimates for the remaining alternatives.
  - Preliminary prioritization approach and ranking for the remaining alternatives.
- The Second Level Screening workshop was held on June 2, 2005 with the Steering Committee. The primary purpose of this workshop was to assess the revised set of alternatives/concepts, including reviews of the preliminary cost estimates and alternatives prioritization. The non-motorized alternatives (revised based on parks department comments) were also discussed at this meeting.
- The consultant documented the results of the Second Level Screening Workshop.
- A public meeting was held June 9, 2005, with an open house format following a brief presentation. At the meeting, the remaining alternatives were displayed for public review and comment, including revised cost estimates and non-motorized elements.
- A meeting was held on July 19, 2005 with the Steering Committee to finalize the list of alternatives that would be part of the plan.
- Following the Second Level Screening workshop with the Steering Committee, the Stakeholders Committee was invited to a meeting and presentation to discuss/present the results of the alternatives analysis.

Those in attendance provided feedback that was relatively consistent to that received from the Steering Committee and the public meeting.

A detailed summary of the alternatives assessment is documented in Appendix F of this document. Figure 20 documents the range of roadway improvement alternatives considered throughout the alternatives analysis.

For each system (e.g., roadway, trails), the evaluation tools available controlled how the impacts of various alternatives were quantified. The regional travel demand model developed through this study was the most significant tool available to the study team. However, the roadway-oriented model could complete only a limited level of analysis on the non-motorized system. The model was designed principally as an application for addressing the regional roadway system, but can be used for more macro-scale analysis (not route-level) for transit and non-motorized systems. As a result, the non-motorized evaluations employed a much more macro-scale assessment of travel demand in the development of alternatives.

Outlined in the following sections are the screening processes followed for the transit and non-motorized systems.

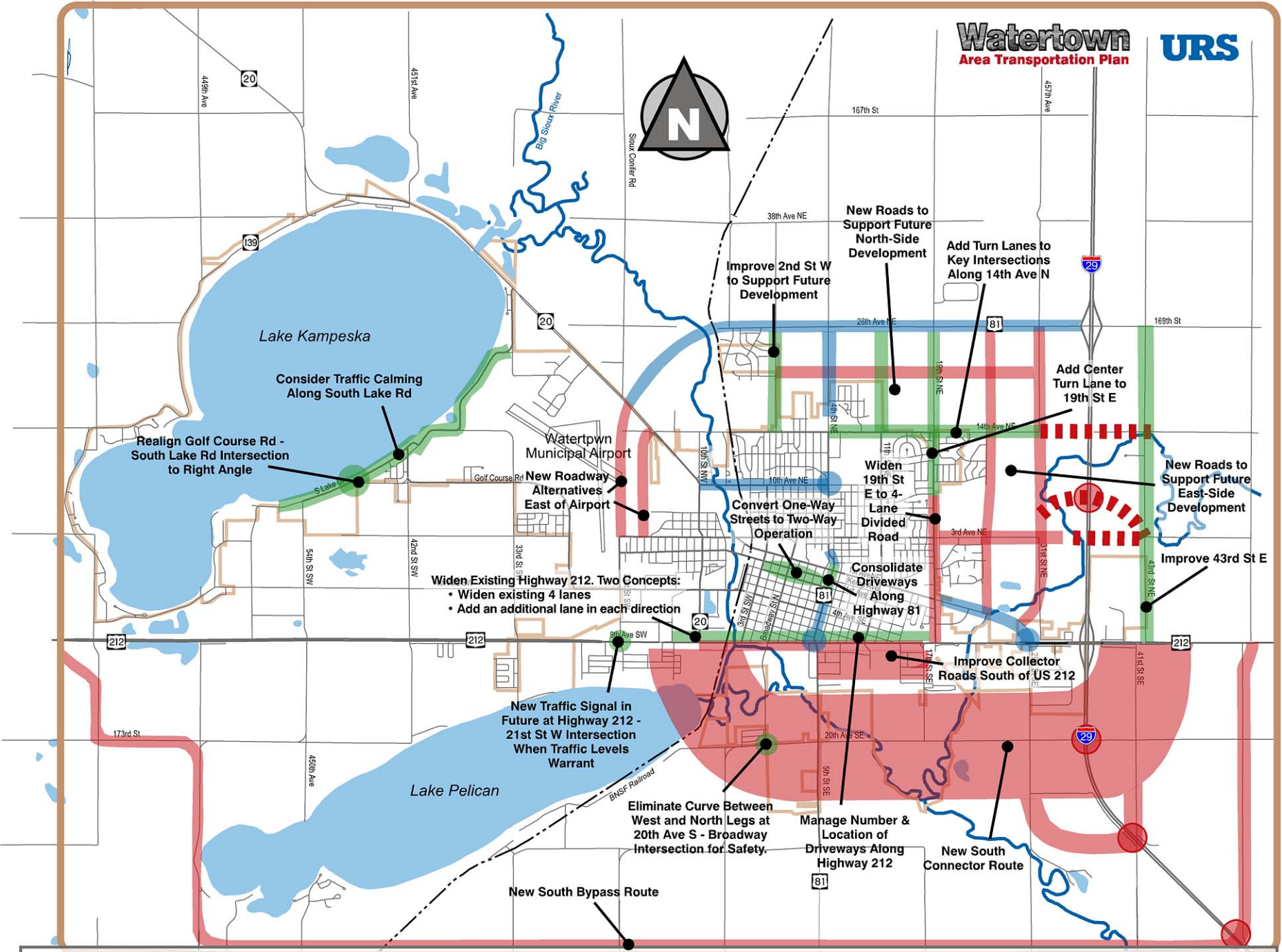
Non-Motorized System Screening

The provision of a more balanced transportation system, including improving the Watertown area's non-motorized network, provides the following benefits:

- Increases the portion of trips made without an automobile, which will, to some extent:
  - Reduce overall traffic congestion on roadway facilities.
  - Benefit air quality.
- Bicycling, walking and jogging, whether for recreational or transportation purposes, improves and maintains the health of Watertown citizens.

A more balanced and flexible transportation system will give greater choice and independence to more members of the community. An expanded non-motorized system will enhance personal mobility.

The major components of the existing non-motorized system in the Watertown area are multi-use trails and sidewalks. The alternatives evaluated for the future non-motorized system included an additional component: on-street bicycle routes. In the past few years, there have been local planning efforts (documented in the Comprehensive Plan) that included plans for expansion of both the area trail and sidewalk systems.


Watertown
Area Transportation Plan
URS
N
Lake Kampeska
Lake Pelican
Watertown Municipal Airport
Big Sioux River
Consider Traffic Calming Along South Lake Rd
Realign Golf Course Rd - South Lake Rd Intersection to Right Angle
New Roadway Alternatives East of Airport
Improve 2nd St W to Support Future Development
New Roads to Support Future North-Side Development
Add Turn Lanes to Key Intersections Along 14th Ave N
Add Center Turn Lane to 19th St E
Widen 19th St E to 4-Lane Divided Road
New Roads to Support Future East-Side Development
Convert One-Way Streets to Two-Way Operation
Consolidate Driveways Along Highway 81
Improve 43rd St E
Widen Existing Highway 212. Two Concepts:
• Widen existing 4 lanes
• Add an additional lane in each direction
Improve Collector Roads South of US 212
New Traffic Signal in Future at Highway 212 - 21st St W Intersection When Traffic Levels Warrant
Eliminate Curve Between West and North Legs at 20th Ave S - Broadway Intersection for Safety.
Manage Number & Location of Driveways Along Highway 212
New South Connector Route
New South Bypass Route
BNSF Railroad
Preliminary Roadway Alternatives Considered
New Alternatives
Committed Network Projects
Transportation Sys. Mgmt. Alternatives
I-29 Interchange Alternatives
Figure 20

The non-motorized alternatives developed and evaluated in this transportation plan considered these other efforts, including the planned "sidewalk collector network system" and planned trail system, as documented in the Comprehensive Plan. Thus, the concepts presented in the plan were developed as a supplement to those already planned for the Watertown area.

Trail and Bicycle Route Concepts

Trail and pedestrian system interests were represented on the study's Steering Committee. However, during the screening process it was apparent that the screening workshop was not as effective a venue for screening individual non-motorized alternatives as it was for individual roadway concepts. Thus, to supplement the discussions with and documentation submitted to the Steering Committee, the City Parks and Recreation Department staff provided feedback / input in developing the non-motorized alternatives screening.

On-street bicycle routes were included in the alternatives analysis to supplement the planned multi-use trail system. The bicycle routes were developed to connect many of the activity centers within the study area, located within corridors that do not have sufficient right-of-way to allow for development of multi-use trails. Thus, the recommendations included in this memorandum focus on developing multi-use trails for (pedestrian and bicycle use) and on street bicycle routes.

Outlined below are the general steps followed in conducting the non-motorized screening:

- Using information gathered through the issues documentation phase of the study and information included in the Comprehensive Plan the non-motorized needs/wants in the region were identified.
- The study team prepared a list of potential system improvements to the non-motorized system. The primary focus was to identify non-motorized alternatives that improve the linkages between components of the existing and planned system.
- The study team submitted the preliminary trails and on-street bicycle route concepts to the Parks and Recreation Department for review and input.

The narrowed list of concepts was documented for presentation for public comment. The list of improvement concepts considered for Watertown's non-motorized system is described in Table 20.

TABLE 20. UNIVERSE OF TRAIL AND BICYCLE ROUTE CONCEPTS CONSIDERED

Concept Number	Facility Description	Facility Type
1	2nd St W from 8th Ave S to 26th Ave N	On-Street Bike Route
2	2nd St E from 6th Ave S to 14th Ave N	On-Street Bike Route
3	6th St E from 5th Ave S to 10th Ave N, 5th Ave S from 6th St E to 11th St E	On-Street Bike Route
4	13th St E & 11th St E from US 212 to the East-West rail trail	On-Street Bike Route
5	13th St E from East-West rail trail to 14th Ave N	On-Street Bike Route
6	Skyline Dr from 3rd St W to 14th Ave N	On-Street Bike Route
7	4th Ave S from Kampeska Blvd (4th Ave trail) to 2nd St W	On-Street Bike Route
8	2nd Ave S from 5th St W to 13th St E	On-Street Bike Route
9	Kemp Ave & 1st Ave S from 21st St W to Kampeska Blvd	On-Street Bike Route
10	Arrow Ave & Park View Trail from US 81 to Lewis & Clark Ave	On-Street Bike Route
11	9th Ave N from Skyline Dr to 25th St E	On-Street Bike Route
12	1st Ave N from 2nd St E to 6th St E	On-Street Bike Route
13	East-West rail trail extension from US 81 to 11th St	Trail
14	East-West trail extension along abandoned rail from 11th St to 19th St along Bouge Ave	Trail
15	Diagonal rail trail from 13th St to US 212 and 19th St and then continues down to the Anza soccer complex	Trail
16	19th St trail from soccer complex to 14th Ave E	Trail
17	14th Ave trail from SD 20 to 19th St E	Trail
17a	On-Street connection between 14th Ave trail and SD 20 trail	On-Street Bike Route
18	Willow Creek Trail extension to Anza soccer complex	Trail
19	10th Ave from Skyline Dr to current SD 20 trail	On-Street Bike Route
20	South Connector Trail	Trail
20a	Pelican Lake - South Connector Trail Link	Trail

The City of Watertown has several favorable characteristics for travel by bicycle, such as:

- The relatively flat terrain found across most of the community, which provides opportunities for routes / corridors that are conducive to efficient travel by bicycle.

- The majority of Watertown residence and activity centers fall within a relatively compact area, allowing for trip lengths (< 5 miles) that are favorable for bicycle travel.
- The grid street system found in much of Watertown provides several relatively low traffic volume street options for on-street bicycle travel.

The on-street bicycle route alternatives were evaluated based on the following items:

- *Level of Route Continuity*: Continuous on-street corridors were preferred for bicycle routes because they avoid excessive "jogs" for bicyclists' travel paths.
- *Level of Motorized Traffic*: Streets that have lower volumes of motorized vehicles are safer for bicycle operations, and were considered for bike routes. Higher volume streets were considered for bike trails if they had wide sidewalks.

The street-routes and multi-use trail alternatives were developed to address system connectivity, so that the residential areas and major activity centers were connected. These activity centers included:

- Commercial Districts, including the Uptown central business district and the US 212 corridor (in particular the Watertown Mall).
- Recreational areas, including parks and ball fields.
- Institutional facilities, including schools.

Sidewalk Concepts

As documented in the *Existing Transportation Systems* chapter, the study team identified several gaps in the current sidewalk system that create discontinuities in pedestrian accessibility between developed subareas of the larger study area, most often in outlying areas. The City's *Master Sidewalk Plan* documents a system of "Sidewalk Collectors" that would fill most of these gaps by providing continuous pedestrian connections across the existing sidewalk network. No timetable for implementation or funding mechanism was established for the plan. Many of the sidewalk improvements will likely coincide with adjacent street reconstructions.

It is recommended that sidewalk construction be included as part of those roadway expansion projects included in this plan that are not adjacent to a planned multi-use trail improvement. The roadway improvement projects that should include sidewalks are:

- Improved Collector / Backage Roadways south of US 212 (Project C)
- Eastern Grid Improvements (Project E)
- 19th Street Widening, 8th Avenue N to 26th Avenue N (Project F)

- Northern Grid Improvements (Project H)

The reconstruction of US 212 (Project A) is the only roadway expansion alternative included in this plan for which sidewalks are not recommended. If sidewalks were provided along this segment, the required width of the combined roadway/sidewalk cross-section would have significant right-of-way impacts to adjacent businesses. These impacts are described in more detail in the alternatives assessment documentation in Appendix F.

Watertown Public Works staff completed a separate study of the US 212 corridor to determine the feasibility of incorporating sidewalks. In their study, they determined that given right-of-way constraints providing sidewalks along US 212 between 19th Street East and the BNSF railroad (at approximately 7th Street West) was not feasible.

There was a vote held in the Fall of 2004 on a resolution to enact a city-wide sidewalk plan which would have included sidewalks one block north of US 212, effectively offering a continuous east-west pedestrian corridor within a few hundred feet of US 212 and with access to US 212 via the intersecting cross-streets. The resolution was defeated.

For corridors such as US 212 that do not have sidewalks and are part of the Federal Aid Highway System, sidewalks are typically constructed on both sides of corridor when there are any significant improvements to a roadway corridor (i.e., widening and/or reconstruction). This determination is made as part of a Federal Highway Administration (FHWA) review at the time of project development, where the costs and impacts to the built environment (including existing businesses) would be weighed against pedestrian accessibility and safety considerations. When US 212 is reconstructed and the project is designed, the circumstances might be such that FHWA would make a sidewalk exception in the US 212 corridor.

Funding the Plan

Some transportation plans are "needs" based analyses that have little or no consideration given to the amount of local / regional available transportation funding. Through passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, the authorization of TEA-21 in 1998 and recent 2005 transportation bill reauthorization (SAFETEA-LU), metropolitan areas with populations over 50,000 are required to demonstrate that projects and activities included in the long-range transportation plan are reasonably fundable over the planning horizon. Watertown is not a metropolitan area, as defined by this population threshold. Thus, while the Watertown area maintains a cost-constrained 5-year TIP, it is not required that the Watertown area transportation plan be

cost-constrained. However, a plan that is merely a "wish list", one that does not consider project costs or the area's capability to fund projects could not be reasonably implemented. Therefore, the Watertown area transportation plan considered project costs and local funding levels, to the extent possible.

In South Dakota, there are two general categories of roadways that receive funding through the SDDOT:

- The first are those on the state highway system, which include:
  - Interstate 29
  - US Highway 212
  - US Highway 81
  - South Dakota Highway 20
  - South Dakota Highway 139
- The second are those on the local Federal-Aid roadway system. These roadways are functionally classified, but are not a part of the state highway system. Roadways in this category are allocated monies through urban systems funding.

Over the past several years, Watertown has received approximately $460,000 annually in urban systems funds for the local federal aid system. There is no reason to assume that this funding level will change significantly (in terms of 2005 dollars) through the planning horizon. Thus, for the purposes of the transportation plan it was assumed that the available urban systems funding through 2030 will be approximately $11.5 Million ($460,000 x 25 years) in 2005 dollars.

The state of South Dakota funds projects on the state highway system based on the needs of each project relative to the need for projects identified in other communities across the state. There is no set allocation or earmarked portion by city, district or region for this source of funding. Thus, it was difficult to establish an anticipated 25-year funding level for state-maintained roadways within the study area. As noted previously in this document, there were several state roadway system improvement projects programmed for construction between 2005 and 2009 in the study area, including:

- SD 20 – US 81 North Connector Route
- US 81 – US 212 Intersection Improvement
- 1st Avenue North Extension (19th Street East to 29th Street/US 212 Intersection)
- US 81 Reconstruction (US 212 to C Ave)

The level of state highway system project funding included in the study area's current 5-year program represents a relatively large portion of state roadway improvement funds, and is not typical of past funding levels. Therefore,

current funding levels for state routes in the Watertown area TIP are most likely not representative of future state roadway system funding.

Funding levels for the Watertown area through the planning horizon of 2030 cannot be reasonably projected. However, costs and urban systems funding levels were considered during the alternatives evaluation process. Thus, the outcome of the Watertown area transportation planning process was considered a "needs"-based improvement constrained plan.

Roadway Alternatives Prioritization

An important step in developing this constrained plan that can be feasibly implemented, not just a list of identified transportation needs, was to prioritize the concepts that were advanced through the alternatives analysis phase of the study. The remaining concepts following the alternatives analysis were scored based on seven criteria consistent with objectives established earlier in the study. Each of the alternatives was scored on a 0 to 2 scale, with the following general scoring method:

- "0" points awarded if the alternative completely met the criterion.
- "1" point awarded if the criterion was partially met.
- "2" points awarded if the concept did not meet the criterion.

Alternatives with lower point totals met more of the criteria, and were ranked as a higher priority. Table 21 summarizes each prioritization criterion and the scoring applied.

TABLE 21. PRIORITIZATION CRITERIA AND SCORING FOR ROADWAY ALTERNATIVES

Criterion 1: *Does the alternative address a current capacity deficiency?*
0 points if it improves to LOS C or better operations in the target corridor. 1 point if it improves operations somewhat in the target corridor. 2 points if it has no significant effect on operations in the target corridor.
Criterion 2: *Does the alternative address a projected future capacity deficiency?*
0 points if it improves to LOS C or better operations in the target corridor. 1 point if it improves operations somewhat in the target corridor. 2 points if it has no significant effect on operations in the target corridor.
Criterion 3: *Does the alternative directly serve anticipated future land development or promote orderly economic development?*
0 points if "Yes". 2 points if "No".
Criterion 4: *What is the alternative's estimated cost relative to Watertown's annual urban systems transportation funding ($460,000 annually)?*
0 points if 1 year or less funding ($460,000 or less). 1 point if 10 years or less funding ($4,600,000 or less). 2 points if more than 10 years of funding (more than $4,600,000).
Criterion 5: *Does the alternative address an identified safety concern?*
0 points if it directly benefits identified corridor (i.e., improvements in identified corridor). 1 point if it indirectly benefits identified corridor through traffic diversion. 2 points if it has little or no safety benefit.
Criterion 6: *Does the alternative enhance or maintain the existing transportation system?*
0 points if entire alternative improves existing system. 1 point if only part of concept improves/uses the existing system. 2 points if alternative does not improve/use the existing system.
Criterion 7: *Does the alternative have the potential for environmental or social issues?*
0 points if no significant environmental issues are anticipated during project development. 1 point if potential social and environmental issues are present, but have not been previously identified.[a] 2 points if significant environmental issues have been identified by previous studies in the area.[b]

[a] Potential environmental / social issues include roadway development within floodplain or wetlands, potential for significant traffic noise increases, or significant property acquisition.
[b] Previously identified significant issues could include threatened and endangered species, historic properties or archeological sites.
Source: URS Corporation

The cumulative scores for each of the alternatives were then compared and the concepts were grouped into three different categories with relatively equal numbers. In this prioritization approach, the concepts with the lower scores were assumed to have a higher priority. The results of this prioritization exercise are shown in Table 22.

TABLE 22. PRIORITIZATION RANKING FOR ROADWAY ALTERNATIVES

Alternative		Criterion 1: Addresses Existing Capacity Deficiency	Criterion 2: Addresses Future Capacity Deficiency	Criterion 3: Directly Serves Future Development	Criterion 4: Cost Relative to Annual Funding	Criterion 5: Addresses Safety Concern	Criterion 6: Enhances Existing System (TSM)	Criterion 7: Potential for Environment / Social Impacts	Total Score
Highest Priority									
South Connector Study	Corridor Study and Environmental Document.[1]	-	-	-	-	-	-	-	**-**
G	Add left-turn lanes along 14th Avenue N	2	0	0	0	2	0	0	**4**
K	Improve 2nd St W north of 14th Ave N.	2	2	0	1	0	0	0	**5**
B – Segment 1[b]	South connector route, Hwy 81 to 29th St E.	1	1	0	2	1	0	1	**6**
C	Improved collector / backage road system south of US 212.	1	1	2	1	1	0	0	**6**
D	Implement US 212 access management plan.	2	2	2	0	0	0	0	**6**
F	Add center left-turn lane to 19th Street E north of 8th Ave N.	2	1	0	1	2	0	0	**6**
J	TSM measures between C Ave and 1st Ave S.	2	2	2	0	0	0	0	**6**
L	Realign Golf Course Rd - S Lake Drive intersection	2	2	2	0	0	0	0	**6**
M	Eliminate curve on west and north legs at 20th Ave S / Broadway.	2	2	2	0	0	0	0	**6**
N	Add signal at 21st Street W / US 212 intersection.	2	2	2	0	0	0	0	**6**

Alternative		Criterion 1: Addresses Existing Capacity Deficiency	Criterion 2: Addresses Future Capacity Deficiency	Criterion 3: Directly Serves Future Development	Criterion 4: Cost Relative to Annual Funding	Criterion 5: Addresses Safety Concern	Criterion 6: Enhances Existing System (TSM)	Criterion 7: Potential for Environment / Social Impacts	Total Score
Medium Priority									
E	New eastern roadway grid east of 19th Street E and north of US 212.	2	0	0	2	2	1	0	**7**
I	Improve 43rd Street E / 458th Ave from US 212 to 26th Ave N.	2	2	0	1	2	0	0	**7**
B - Segment 2[b]	South connector route, Hwy 20 to Hwy 81.	1	1	0	2	1	1	1	**7**
E2	Extend 3rd Ave N to connect Alternative E with 43rd St E via I-29 overpass.	2	1	0	1	1	2	1	**8**
H	New collector / arterial grid to support future development north of 14th Avenue N.	2	0	0	2	2	2	0	**8**
Low Priority									
A	Widen / reconstruct US 212.	2	2	2	2	0	0	1	**9**
B2	New I-29 interchange at 41st St E with roadway connection to South Connector Route.	2	1	0	2	1	2	1	**9**

[a] Includes determining preferred alignment and preparing appropriate level of environmental documentation.

[b] Both South Connector Segments were evaluated based on ultimate (Phase 2) 4-lane roadway conditions.

Source: URS Corporation

The prioritization rankings presented in Table 22 were not interpreted as a strict grading by which projects with a certain score would be or would not be included in the plan recommendations; or *if* the project were included in the plan, *when* it necessarily should be implemented. This flexibility was built into the project recommendations and prioritization for two reasons:

- While the prioritization considered both existing and future traffic congestion relief, the projects with the highest prioritization ranking were not necessarily the projects that serve the most immediate needs. Thus, the projects with the highest prioritization ranking (i.e., has the lowest score) were not necessarily the projects that should be implemented first.
- As noted in the previous chapter, the prioritization scoring evaluated how well each project achieves the study goals/objectives. However, the prioritization scoring itself did not reflect local and state priorities, and local and state input must be an important factor in determining project phasing.

Thus, the prioritization scoring was used as a tool to focus the study team on which projects should be the study's higher priorities and which should be lower priorities. Projects with relatively low prioritization rankings were not necessarily precluded from the recommended project list, but were not included as a short-term improvement.

Recommended Plan

Overview

The Watertown Area Transportation Plan provides a multi-modal program for addressing current and forecasted future transportation needs for roadways and non-motorized facilities across the region. The plan addresses transit and aviation needs on a limited basis.

A key goal in the planning process was to provide an integrated system of multimodal transportation improvements, rather than a series of standalone, isolated transportation improvements. This integrated approach to project development offered a more efficient use of limited transportation dollars, because numerous projects can be combined to better address a specific issue. General descriptions of the elements that make up the 25-year transportation improvement plan are provided in this chapter. Recommended non-motorized improvements are documented in Figure 21. Recommended roadway improvements are documented in Figure 22.

Recommended Improvements

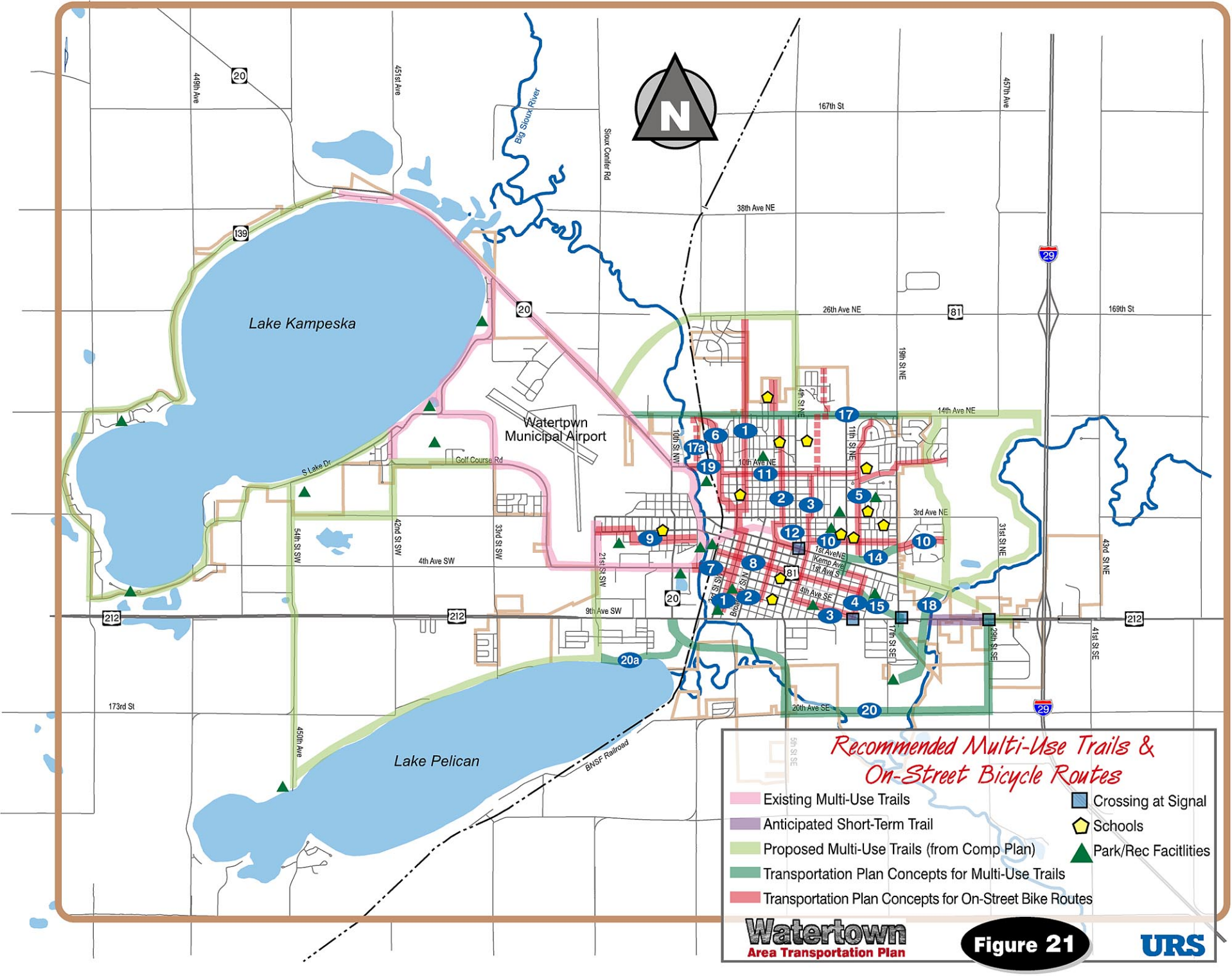
The purpose of the long-range transportation planning process was to identify a system-wide strategy for addressing the Watertown area's needs that:

- Met the locally identified transportation goals and objectives.
- Supported the mobility desires of the region and the state.
- Identified recommended projects by balancing impacts and benefits of each.

The following sections provide summaries of how each of these elements was addressed through the planning process.

Recommended Non-Motorized System Improvements

The recommended 25-year non-motorized improvements are documented in Figure 21. The recommended multi-use trail improvements are shown in dark green and the on-street bicycle routes are shown in red.



Watertown Area Transportation Plan

Figure 21

URS

RECOMMENDED ROADWAY SYSTEM IMPROVEMENTS

The recommended roadway improvement plan contains the following categories of projects:

- *Committed Projects*: Committed projects were those included in the Watertown area's 5-year transportation improvement program. These projects had an identified funding source and will begin construction by 2009.
- *Recommended Plan Projects*: These were transportation system improvements that addressed an identified issue or need within the 25-year planning period. These might have been immediate or longer-term needs such as congestion relief or provision of missing trail links.
- *Projects to Consider Beyond 2030*: Two roadway projects were identified that likely have significant long-term utility for the Watertown area, but did not significantly address an identified need over the 25-year planning period. It was believed that by including these concepts as elements, but not 25-year recommendations of the plan, the corridors will be identified as viable elements of the long-range (beyond 2030) transportation system and will be considered in the course of future regional land use and transportation planning activities.

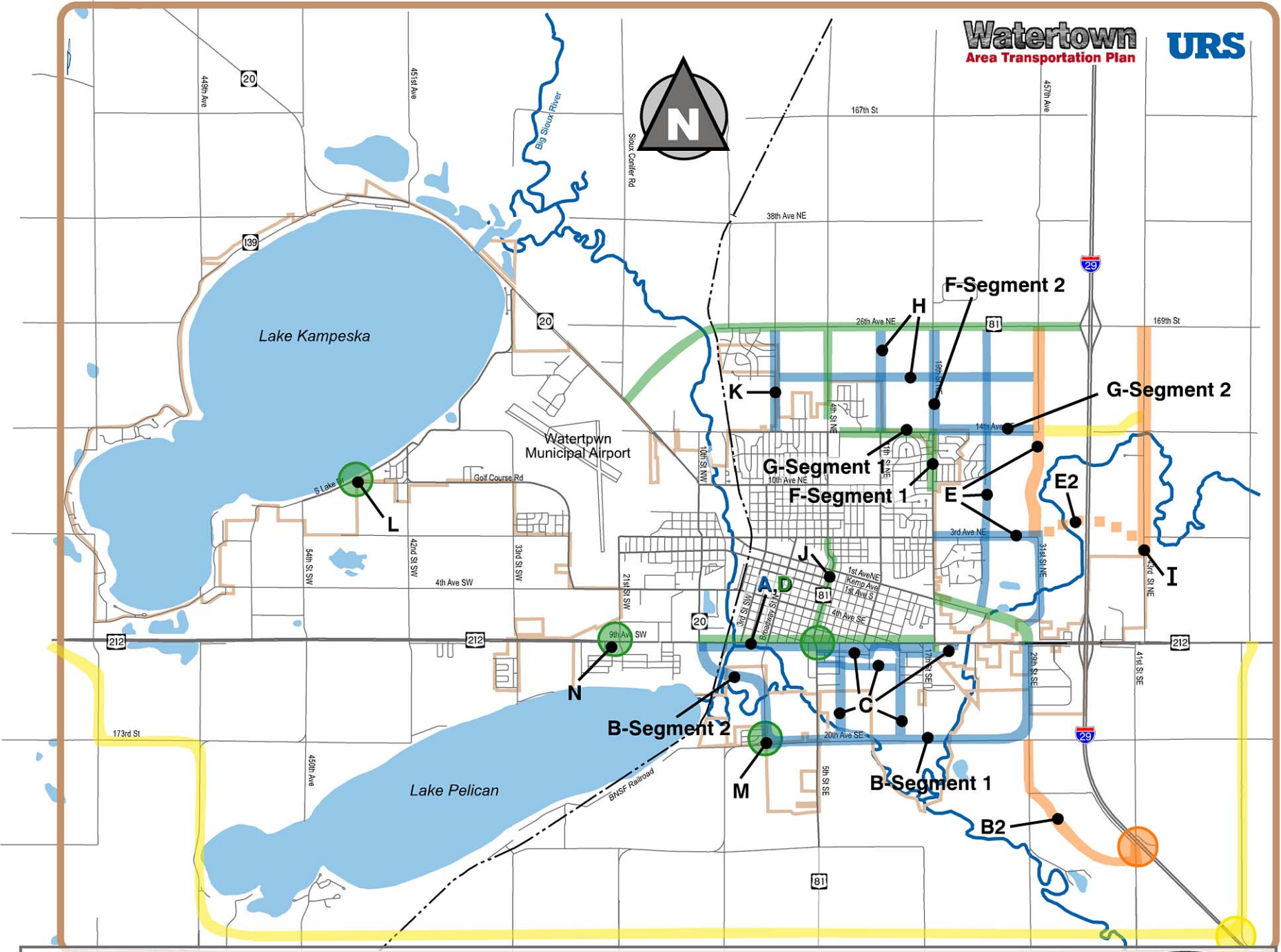
Roadway projects were assigned an implementation phase according to:

- The project prioritization relative to other projects.
- Whether the project addresses an existing or future (forecasted) need.
- Local input.

As documented in the previous chapter, the recommended phasing was not necessarily dictated strictly by the prioritization ranking. The prioritization was used as a tool to focus the study team on which projects, based on needs, should be higher priorities and which should be lower priorities. The phasing of recommended improvements was placed in three categories:

- Short-Range Projects (0 to 5 years)
- Mid-Range Projects (5 to 15 years)
- Long-Range Projects (15 to 25 years)

The recommended 25-year roadway improvements for the Watertown area and their recommended implementation phase are documented in Figure 22, including the phasing of committed projects. Table 23 documents each of the recommended roadway projects, including planning-level cost estimates.



Phasing of Recommended Roadway Projects

Short-Range Projects (within 5 yrs.)

Mid-Range Projects (5 to 15 yrs.)

Long-Range Projects (15 to 25 yrs.)

Projects After 2030 (not in plan)

Figure 22

TABLE 23. RECOMMENDED ROADWAY PROJECTS

Project Description		Planning-Level Cost Estimate
A	Widen existing lanes on US 212 from 10th St W to 19th St E.	$11,000,000
B	New south connector route along existing 20th Ave S. South connector would likely be built in phases.	
Phase 1	**Segment 1:** Two-lane south connector route, Highway 81 to 29th St E. Acquire sufficient right-of-way to accommodate future four-lane corridor.	$3,600,000
	Segment 2: Two-lane south connector route, Highway 20 to Highway 81. Acquire sufficient right-of-way to accommodate future four-lane corridor.	$5,000,000
Phase 2	**Segment 1:** Widen south connector route to four-lane divided roadway, Highway 81 to 29th St E. Improve 17th St E and 23rd St E north of South Connector for improved access to US 212 and adjacent development. Signalize US 81 / South Connector intersection.	$9,900,000
	Segment 2: Widen south connector route to four-lane divided roadway, Highway 20 to Highway 81.	$8,000,000
B2	I-29 interchange at 41st St E underpass that would connect to south arterial concept via new alignment west of I-29.	$5,900,000
C	Improved collector/backage road system south of US 212.	$2,600,000
D	Implement Highway 212 access management plan from 14th St W to 19th St E.	Part of Project A.
E	As development warrants, construct grid of 2-lane collectors and minor arterials to support future land development east of 19th Street and north of US 212. 6.7 miles of improvements include: 25th St E and 31st St E from 1st Ave N to 26th Ave N, 3rd Ave N from 19th St E to 31st S	$15,100,000
E2	3rd Ave N connection between Alternative E and 43rd St E via I-29 overpass. Include sidewalks and/or trail to accommodate non-motorized access across I-29.	$4,000,000
F	Add center left-turn lane to 19th St E from 8th Ave N (end of current center left turn lane) to 26th Ave N. Construct sidewalks.	
	Segment 1: Add center left-turn lane from 8th Ave N to 14th Ave N.	$975,000
	Segment 2: Add center left-turn lane from 14th Ave N to 26th Ave North.	$1,625,000
G	Add left-turn lanes along 14th Ave N at major intersections.	
	Segment 1: Left Turn Lanes at 19th St E and 11th St E	$180,000
	Segment 2: Left Turn Lanes at future 25th St E	$90,000
H	Develop grid of 2-lane collector and arterial streets to support future development north of 14th Ave N. 3.5 miles of improvements include: 20th Ave N and 11th St E.	$7,700,000
I	Surface and improve 43rd St E/458th Ave from US 212 to 26th Ave N	$3,000,000
J	Implement access management measures on US 81 between C Ave and 1st Ave S	Part of US 81 TIP Project (2009)
K	Improve 2nd St W north of 14th Ave N to serve future development.	$2,100,000
L	Realign Golf Course Rd - South Lake Dr Intersection	$50,000
M	Eliminate curve between west and north legs at 20th Ave S/Broadway. Make 20th Ave through movement.	$150,000
N	Add traffic signal to intersection of 21st St W/US 212.	$120,000

WATERTOWN MUNICIPAL AIRPORT RECOMMENDED IMPROVEMENTS

The current Master Plan for the Watertown Municipal Airport was adopted in 1999[8]. The goals of the Airport Master Plan are:

- To provide guidelines for future airport development and modernization.
- To meet future aviation demands in a financially feasible manner.
- To resolve local aviation, environmental and socio-economic issues.

The objectives of the Airport Master Plan were phased to upgrade current substandard airport infrastructure to bring the facility to minimum standards and to maintain the existing facilities. Recommendations included in the financial element of the Master Plan included:

- Land acquisition of approximately 60 acres within runway protection zone, south and east of current airport land.
- Acquire equipment, including aircraft rescue and fire fighting vehicle and passenger lift device.
- Complete pavement overlays and rehabilitations of runways and aprons.
- Replace existing hangers.
- Construction of taxiway adjacent to runway.
- Implement new approach lighting system.

WATERTOWN AREA TRANSIT RECOMMENDED IMPROVEMENTS

As documented in the "existing transportation systems" chapter, system usage has grown significantly over recent history. It is anticipated that the current demand responsive service offered by WAT will continue to be the primary service method employed through the planning horizon. In discussions with the study team, WAT staff identified three activities for implementation over the planning horizon:

- *Implementation of Limited Fixed Route Service*: A fixed route service would operate on a specific route with established, repetitive stops and schedules. The route would likely require two buses to run with approximately 30 to 45 minute headways. Two benefits cited by WAT staff in establishing a single fixed route were:
  - Increased ridership by attracting new riders that did would not typically "schedule" a demand-responsive service trip.
  - Improve WAT service efficiency by combining multiple rider-trips into a single bus-trip and by decreasing the amount of non-revenue time the buses would spend driving to and from demand-responsive trips.

[8] Watertown Municipal Airport, *Airport Master Plan*, 1999.

- *Construction of New Watertown Bus Facility*: A proposed administration, maintenance and parking facility for WAT would consolidate their currently dispersed operations. The proposed location for the facility is adjacent to City Hall and would include additional downtown parking. A downtown location would also serve as a fixed stop, acting as a central drop-off and pick-up location for riders with many trip destinations nearby. Construction is tentatively scheduled for Spring 2006.
- *Expansion of the bus fleet*: Staff anticipates increasing the current fleet from 4 buses to 8 buses. Increasing its rolling stock would allow the agency to effectively serve a fixed route while offering enhanced demand responsive services to the growing Watertown community.

CORRIDOR PRESERVATION

The *Watertown Area Transportation Plan* includes a list of recommended projects that represent either: 1) new routes or significant widenings along existing routes, or 2) represent concepts (both roadway and non-motorized) in corridors that require acquisition of additional right-of-way. Right-of-way acquisition for future system expansions could have been made easier if past planning efforts had placed more emphasis on identifying corridors and acting on reserving potential future right-of-way needs. Corridor preservation is the application of measures to prevent or minimize development within the right-of-way of a planned transportation facility. Included are corridors, both existing and future, in which a wide array of transportation improvements may be constructed including roadways, sidewalks and multi-use trails. Many of the land use tools discussed in the *Watertown Comprehensive Plan*, such as setbacks, street right-of-way standards and the subdivision ordinance, enable Watertown to effectively address this transportation need.

Corridor preservation is important because current efforts will help to ensure that a transportation system will effectively and efficiently serve existing and future development. Corridor preservation policies, programs and practices can provide numerous benefits to the community, adjacent property owners, freight haulers and travelers using all modes. An American Association of State Highway and Transportation Officials (AASHTO) report[9] provides documentation of the potential benefits of corridor preservation, including:

- Reducing property damage and displacement of homes and businesses to accommodate needed transportation system expansion.
- Minimizing environmental, social and economic impacts of corridor development or expansion.

[9] Report of the AASHTO Task Force on Corridor Preservation, AASHTO, 1990.

- Preventing driveway closures at desirable access locations.
- Promoting orderly development of transportation facilities concurrent with land development.
- Preventing the loss of desirable corridor locations.
- Reducing the costs of developing and maintaining an efficient and interconnected transportation system.

A key consideration in the long-range transportation planning process is the need for and potential costs/benefits of a transportation corridor management ordinance. Transportation corridor management ordinances are vehicles for establishing regulations and procedures to preserve and acquire needed right-of-way and protect future transportation, including the following:

- Criteria to manage land uses within and adjacent to transportation corridors in expanding areas or adjacent to corridors that are approaching capacity. For uses adjacent to corridors targeted for widening in the transportation plan, this includes establishing guidelines for minimum setbacks for redeveloped properties.
- Restrictions on or guidelines for coordinating residential and nonresidential construction within the corridor.
- Identification of uses that are permitted within the corridor, such as interim uses that allow some economic use of land until it is needed for construction.
- Documentation of a public notification process for notifying affected property owners of the corridor designation, and for notifying the city, county and SDDOT of development activities that would substantially impair the viability of a future transportation corridor.
- Creation of a process for intergovernmental coordination to facilitate consistency and collaboration among jurisdictions that share the facility.

Unlike state transportation agencies, local governments have authority to guide and manage land development, and can apply a variety of measures to avoid unnecessary hardship on property owners. Thus, local governments play a leadership role in establishing and carrying out a corridor management program. The first step in planning for corridor preservation is to identify potential long-range corridors and determine that there is a need to preserve them. The *Watertown Area Transportation Plan* is the key source for information on determining corridors that may need to be addressed.

Following identification of the appropriate long-range corridors, the next step is to develop criteria that will be applied in evaluating and prioritizing acquisition of right-of-way in the selected corridors. There are a variety of

corridor planning and preservation tools that can be used to accomplish these tasks. These tools basically fall into three categories:

1. Acquisition of property.
2. Exercise of planning and zoning powers.
3. Voluntary agreements and governmental inducements.

The second and third tools typically are lower cost, as they may not require outright fee simple acquisition of properties. Some examples of tools that offer interim corridor protection are:

- Option for public purchase of all or part of the right-or-way.
- Official mapping of future corridors in open space plans.
- Comprehensive Plan designation of future corridors.
- Concurrency ordinances requiring transportation and other infrastructure elements/plans to be in place and approved, many times along with a developer's financial commitment to constructing the facilities, prior to final plat approval.
- Zoning and subdivision controls.
- Development agreements.
- Annexation agreements.
- Voluntary developer reservation.
- Access management and control.
- Density transfers within the parcel for which development is proposed.

Examples of permanent preservation tools include:

- Fee simple acquisition of parcels in need for transportation corridors.
- Development easements for future corridors in open space or in redevelopment areas.
- Landowner donations for future corridor right-of-way.
- Exchange of public property in another area of the city/county for replacement of a designated future transportation corridor.
- Private land trusts.
- Impact fees, exactions, and recoupment ordinances.
- Setback ordinances.
- Transfer of development rights.
- Development agreements.

These would supplement the existing tools already in place in Watertown, such as setback requirements, roadway width, right-of-way width, etc. The right-of-way widths documented in Table 24 are recommended for the

Watertown area, and include existing standards used in Watertown for comparison. The wider right-of-way width ranges documented in Table 24 for arterial facilities offer flexibility in providing sufficient medians and the opportunity to include boulevard separated multi-use trail/sidewalk facilities.

TABLE 24. RECOMMENDED RIGHT-OF-WAY WIDTHS BY FUNCTIONAL CLASSIFICATION

Functional Class	Current City of Watertown Standard	Transportation Plan Recommendation
Principal Arterial	100'	120'-150'
Minor Arterial	100'	100'-120'
Major Collector	80'	80'
Minor Collector	75'	75'
Local	50'-60'	50'-60'

Sources: City of Watertown Comprehensive Plan, URS Corporation

ACCESS MANAGEMENT RECOMMENDATIONS

Access management is a key element to providing capacity and safety conditions within roadway corridors. Access management is primarily accomplished by controlling adjacent land uses and the locations of property access (driveways) and local street connections. The concept was developed for use in improving the flow in new corridors or planned facilities, but also has application as a "retrofit" application (i.e., establishing an access management / consolidation plan) in developed corridors through commercial areas. Access management along state and national routes in South Dakota is regulated by the following state regulations:

- SDCL 11-3-12.2: State legislation giving the DOT the authority to approve access to / from property adjacent to a state highway.
- Section 70:09 of the State Administrative Rules.

These rules apply to situations where new access is being requested within a corridor and should be applied when considering retrofitting an existing corridor. Implementing access management plans for roadway corridors includes the following benefits:

- *Access management minimizes access-related accidents.* Increasing access point spacing allows motorists more time to anticipate and recover from slowing and turning traffic.
- *Access management preserves mobility and extends the serviceable life of the roadway.* Increasing the number and density of access points reduces the capacity of a corridor, which results in higher congestion levels and decreased mobility through a corridor. Improving access management in an existing corridor reduces the economic costs of travel delays within the corridor and might delay or supplant the need for more costly investment in system expansion.

- *Access management preserves opportunities for economic development.* Customers recognize and often avoid corridors with safety and congestion problems related to poor access management. Access management enhancements along roadways improve traffic operations and reduce crashes. As a result, customers tend to be more comfortable frequenting commercial properties along the corridor.

A set of access management recommendations for retrofitting the US 212 corridor between 14th Street West and 19th Street East were developed and included as a recommendation as a part of this plan. The recommendations made for the Highway 212 corridor are included in Appendix F.

Access management is a more effective tool (both in terms of costs and impacts) when applied to corridors before they are fully developed, rather than attempting to retrofit a developed corridor. It is recommended that the access location criteria included in the SDDOT Road Design Manual be used to establish access guidelines for corridors in Watertown that have not yet been developed. The access location criteria for state-maintained roadways are documented in Table 25.

TABLE 25. SOUTH DAKOTA ACCESS LOCATION CRITERIA

Access Classification	Signal Spacing Distance (Mile)	Median Opening Spacing (Mile)	Minimum Unsignalized Access Spacing (feet)	Preferred Access Density	Denial of Direct Access When Other Available
Interstate	N/A	N/A	N/A	N/A (via interchanges at 1 to 2 mile spacing)	Yes
Expressway	1/2	1/2 F, 1/2 D	2640	At half-mile increments	Yes
Free Flow Urban	1/2	1/2 F, 1/4 D	1320	At quarter-mile increments	Yes
Intermediate Urban	1/2	1/2 F, 1/4 D	660	1 access / block face, right-in / right-out preferred	Yes
Urban Developed	1/4	1/4	100	2 accesses / block face	Yes
Urban Fringe	1/4	1/4	1000	5 accesses / side / mile	Yes
Rural	N/A	N/A	1000	5 accesses / side / mile	Yes

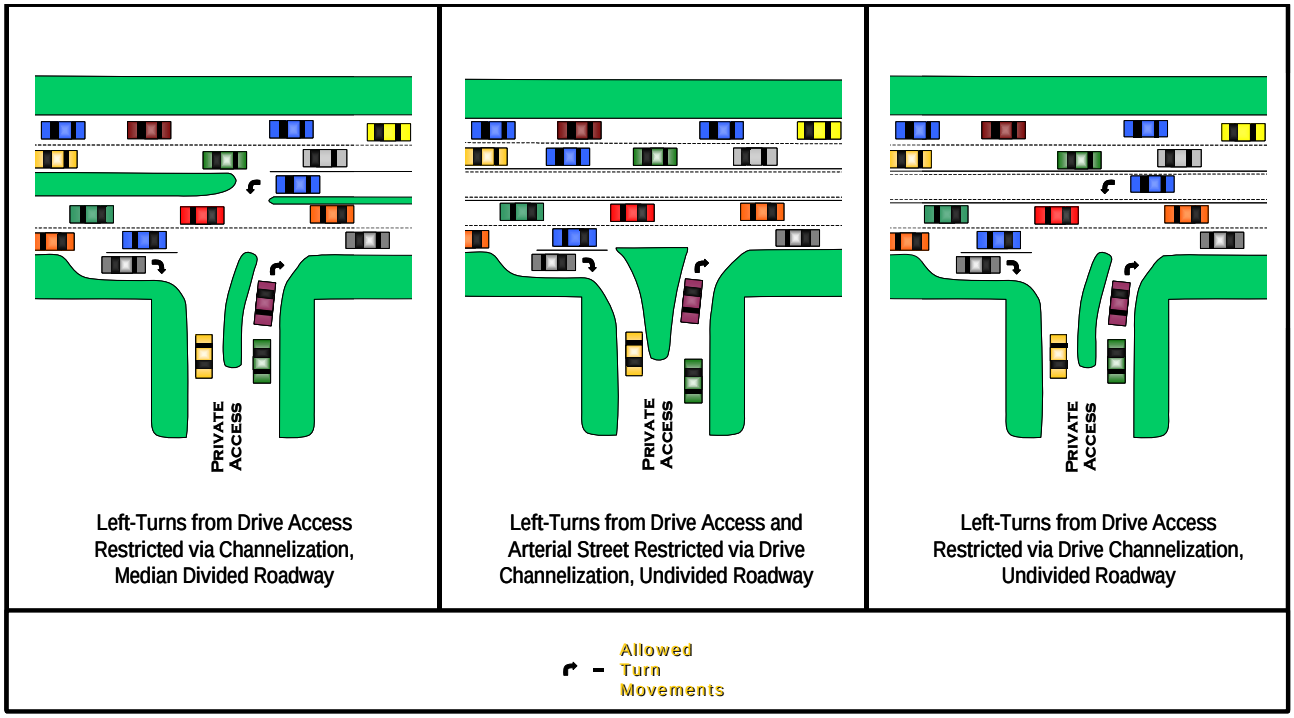
Notes:

1. Access to the Interstate system is governed by SDDOT interchange policy. No access shall be provided on non-interstate routes within ¼ mile of interstate ramp terminals.
2. N/A = Not Applicable, F = Full Movement – all turns and through movements provided, D= Directional Only – certain turning and through movements not provided.
3. SDDOT may defer to stricter local standards.
4. SDDOT will seek opportunities to reduce access density wherever possible.

Source: South Dakota Department of Transportation, *Road Design Manual*

The access location table describes "Directional Only" median openings for Expressway, Free-Flow Urban and Intermediate Urban corridors. Examples of geometric treatments that restrict turns along both median divided and undivided streets, creating directional only accesses, are illustrated in Figure 23.

FIGURE 23. EXAMPLES OF DIRECTIONAL TURN-MOVEMENT RESTRICTIONS



Source: URS Corporation

The study team has identified six primary corridors that are anticipated to experience significant levels of new development over the planning horizon. Three of the corridors are currently part of a state-maintained route and three are currently locally maintained. The general access management recommendations for each corridor are included in the bullets below.

- *US Highway 212 between 19th Street East and 43rd Street East*: This segment is on a state route and classified as a free flow urban roadway. Along this segment, there are currently traffic signals located at the intersections of 19th Street and 29th Street, approximately 0.9 miles apart. It is recommended that a corridor operation and traffic signal plan be developed and implemented to provide acceptable traffic operations though this part of the US 212 corridor.
  - The plan should analyze where additional signals would be warranted through this corridor and balance those considerations with the mobility needs of the corridor. Recent and projected future development adjacent to the corridor will increase the demand for land access. This increased turning traffic, in

combination with the forecasted growth of traffic traveling through this segment of US 212, will likely warrant future signalization at one or more intersections along this segment.

– The plan should also be developed so that acceptable traffic progression is provided through the corridor (i.e., minimize delays at signals and provide acceptable travel speeds). Potential changes in the posted speed will need to be evaluated to maintain progression in both directions given any changes to the spacing between traffic signals.

In addition to conducting the operational study of the corridor, there are opportunities for some access consolidation. There are currently five residential driveways located along the 700 lineal feet of US 212 east of 23rd Street. If these residences are converted to commercial uses, the accesses to US 212 should be removed and the primary access placed on 23rd Street.

- *South Connector Route (20th Avenue South)*: 20th Avenue South is currently a rural, locally maintained route. When the roadway is improved, it will transition from a rural, low-volume road to an arterial roadway with traffic volumes projected as high as 9,000 vehicles per day by 2030. To maintain this corridor as a high-mobility facility, it is recommended that this roadway be designated a free flow urban roadway for the purposes of access management (regardless of whether the roadway is locally-maintained or state-maintained). This limited level of access will support the locally identified desire to utilize the corridor as a high-mobility roadway that will divert some traffic (including commercial trucks) from the US 212 corridor.
- *North Connector Route (26th Avenue North)*: This roadway, included in the TIP, is designated a free flow urban roadway. Application of free flow urban classification standards will ensure that the roadway will support higher speed traffic operations. Access to future land development in the corridor would be oriented to signalized intersections every half-mile and unsignalized accesses every quarter mile.
- *US Highway 81 (4th Street East) between 14th Avenue North and 26th Avenue North*: This segment is currently designated as an urban fringe roadway for access purposes. The intent of this designation is to regulate access to provide future through-traffic priority[10]. Two additional access points (per side), including an additional signalized intersection, would be allowed between 18th Avenue North (subdivision entrance) and 26th Avenue North / North Connector Route with this designation.
- *19th Street East between 1st Avenue North and 26th Avenue North*: This roadway segment is currently locally maintained. The segment south

[10] SDDOT, *Road Design Manual*, Page 17-5

of 14th Avenue North functions similarly to an urban developed corridor, typically with cross-street and driveway access points every 200 to 300 feet along the west side of the street. The segment north of 14th Avenue North currently functions as a rural corridor. Due to the density of accesses currently along developed portions of the corridor, it is recommended that currently undeveloped portions of the 19th Street corridor have access managed as an intermediate urban corridor.

- *1st Avenue North Extension*: This roadway is a committed project currently in the TIP. The 1st Avenue North Extension will be approximately one mile long and locally maintained. The roadway will serve both through traffic and will provide access to future development adjacent to the corridor. To maintain this corridor as a relatively high-mobility facility that would divert some traffic from Highway 212, it is recommended that this roadway be designated an intermediate urban corridor, which allows moderate access density while serving through traffic.
  - With this access designation, one traffic signal would be allowed between the 19th Street East and Highway 212 intersections. The signalized intersection should likely be reserved for the proposed 1st Avenue North / 25th Street East intersection. The 25th Street East corridor would serve as a major collector route for the east grid improvement project (Project E in Figure 22.)
  - A maximum of six (6) unsignalized accesses per side (preferably offset from one another) should be provided in this corridor.

PROJECT DEVELOPMENT AND IMPLEMENTATION

The goal of the transportation planning process is to develop a logical, locally supported program for addressing needs for the Watertown area transportation system. The plan document to this point has set the groundwork required to document needs, alternatives and recommended improvements through the 2030 horizon. This section of the document provides the process for creating a living document by establishing orderly and logical steps for moving recommended projects and programs from the planning sage to implementation.

Implementation of the projects and programs included in the long range transportation plan requires on-going evaluation of the recommendations from both capital funding and detailed engineering perspectives. Through the capital funding process, a line item representing the project capital cost or a program's annual cost is incorporated into the local or state budgets.

CAPITAL FUNDING PROJECT PROGRESSION

The process of progressing a transportation plan recommendation from the planning stage to construction or program initiation requires incorporation of the item in local and/or state capital programming documents, including:

- Watertown Capital Improvement Program (CIP): This document represents an annually updated listing of projects, programs and purchases the city anticipates for the next for the next four years.
- Statewide Transportation Improvement Program (STIP): The annually updated STIP is a list of transportation projects that the SDDOT plans to construct over the next five years. Through the STIP process, all proposed/potential projects and programs from across the state are evaluated against one another and ranked. Based on available transportation funding, the projects that were ranked the highest during the STIP process are promoted to the STIP. All of the state-funded projects that are included in this plan are subject to the competitive STIP process, and are not guaranteed promotion to the STIP within the timeframes recommended by this plan. The recommended roadway projects that are located on the state system, or those that are potential candidates for state funding are:
    - US 212 Reconstruction (Project A)
    - South Connector Route (Project B)
    - I-29 interchange with linkage to South Connector Route (Project B2).
    - US 212 Access Management Improvements (Project D)
    - US 81 Access Management Improvements (Project J)
    - Traffic Signal at US 212 – 21st Street West Intersection (Project N)

It is recommended that the transportation plan Steering Committee continue to be an active, coordinated body for the community. Prior to the annual capital budgeting period, the committee should discuss the projects included in the transportation plan recommendations and determine which of the remaining projects/programs should be moved from the plan stage to the committed stage, which would require that the project be included in either the Watertown CIP, the SDDOT STIP or both.

The annual, or even more frequent, discussion of the projects in the plan is critical to orderly implementation of the recommendations, because there is a limited level of public and private transportation funding available to the Watertown and Codington County area. As many of the projects/programs will require more capital funding than is reasonably available in one year and transportation is only one of the competing needs in the community, a continued effort by the local community representatives and the SDDOT is critical for implementation of the plan.

DETAILED PROJECT/PROGRAM DEVELOPMENT

In addition to identifying the capital funding source for projects, there are several actions that must be completed in progressing a transportation plan project/program from the planning stage to implementation. This portion of the overall process of progressing a project/program from the planning stages to implementation is tied to the capital funding portion of the process because of the need to expend public dollars at each stage. These dollars must be included in the annual budgeting process. These actions include:

- *Preliminary Design:* At this stage, the project corridor is selected and preliminary horizontal and vertical alignments are established. Refined cost estimates are produced based on the design established in this stage.
- *Environmental Review and Permitting*: The procedural regulations of the National Environmental Policy Act (NEPA) must be addressed for transportation projects that use Federal Funds or require Federal agency permits or actions. NEPA guidelines require documentation of the environmental impacts due to the proposed transportation project, including impacts to sensitive resources and to the surrounding social and economic environment. The level of NEPA documentation required varies according to the amount of impacts from the facility. Contingent upon the level of NEPA documentation required, the NEPA process itself may take anywhere from a few months to several years to complete.
- *Final Design*: At this stage, all detailed designs needed to construct the project are completed. Design details will comply with federal and state regulations for signing, traffic control, access management standards, etc.
- *Right-of-Way / Property Acquisition*: If the proposed transportation project requires additional land beyond the current right-of-way limits, additional property will need to be acquired. This process involves meetings with affected property owners and often requires negotiations over sale price.
- *State / Local Funding and Jurisdiction Agreements:* For projects that will receive state funding, details concerning project funding (city/county/state shares) and maintenance jurisdiction will need to be established prior to project construction.

For some of the more minor projects, such as new turn lanes or traffic signals, the amount of time it will take for a project to move from the transportation plan to construction could be relatively short. However, significantly more time will be required to complete the pre-construction actions for some of the more major roadway expansion projects, particularly those on the state routes. In general, projects that receive state funding will

require more time for project development due to NEPA requirements and the necessary funding and jurisdiction agreements.

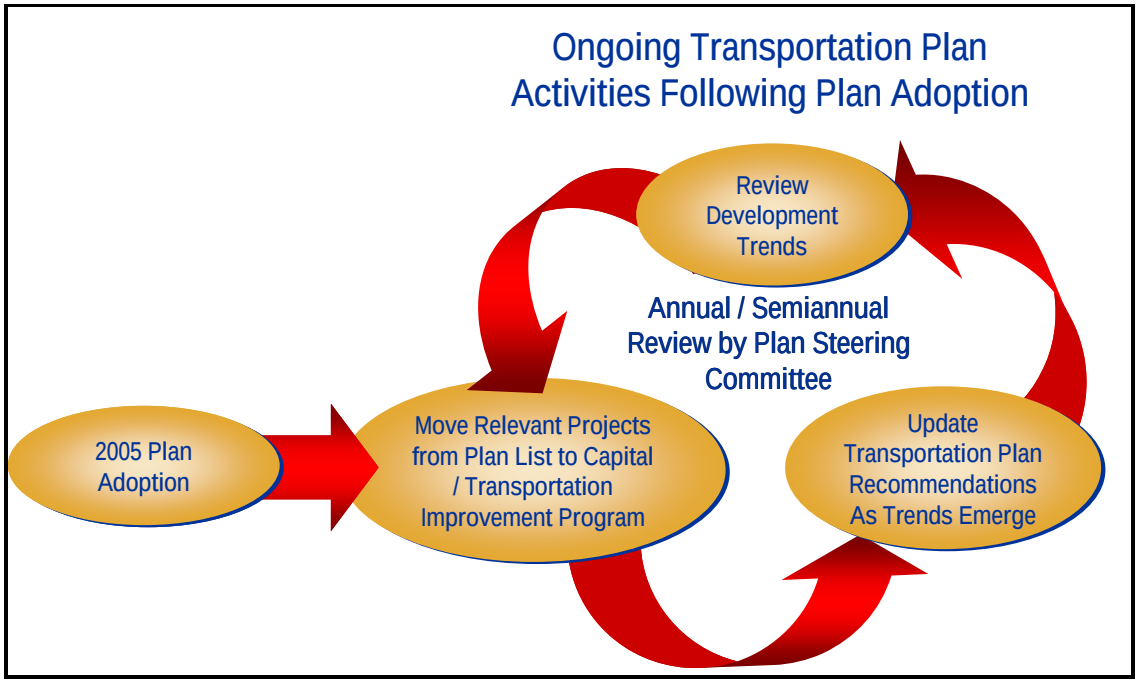
The South Connector Route (Project B) is an example of a project that has to go through all of these steps prior to construction. Although the project might be considered a high-priority project, it likely cannot be feasibly planned, designed, subjected to environmental documentation and review, agreements completed and constructed within the next five years. Therefore, the project has been designated as a "mid-range project" for the 2011 to 2020 timeframe. Although several contingencies are still present, it is likely that the project can be constructed closer to 2011 than 2020. In addition to the steps listed above, construction of a new I-29 interchange that would link to the South Connector Route (project B2) will require completion of an *Interstate Access Modification Request*, a document required by the Federal Highway Administration to document the justification for a new/modified interchange prior to receiving FHWA approval.

ON-GOING TRANSPORTATION PLANNING ACTIVITIES

The *Watertown Area Transportation Plan* should not be viewed as a static document. This document presents an opportunity to formally establish an ongoing, collaborative transportation planning process for the Watertown area. To keep the plan current, it is recommended that the transportation plan Steering Committee meet annually or semiannually (as determined by city and state officials) to keep the project development and planning process current.

It is likely that some development projects will emerge in the intermediate period between adoption of this plan and the next plan update. To address any changes in development or transportation trends that occur over the intervening period, the plan Steering Committee should be maintained beyond plan adoption into the future to ensure that the list of projects in the plan stays current. The continual transportation planning process of implementing, maintaining and updating the Watertown Area Transportation Plan is documented in Figure 24. While it is not required that a project originate in the long range plan to be implemented, the intent of the long range planning process is to identify and periodically update an assessment of the transportation needs in the Watertown area.

FIGURE 24. PLAN IMPLEMENTATION PROCESS



Source: URS Corporation

The Watertown area is not part of a federally designated metropolitan area and thus has no formal requirements for development or periodic updates of the long range transportation plan. However, it recommended that the transportation plan be updated, to some extent, every five years. Thus, in approximately 2010, the long range transportation plan should be updated for the period from 2011 through approximately 2035. The scope of this transportation plan update will vary according the extent of the transportation and development changes that occurred over the period in between plan updates. Regardless of the scope of the update required, the elements included in the plan update should be:

- Review the long range plan projects that have and have not been implemented. This review includes looking at which projects have been promoted from mid-term implementation into the TIP.
- Review and recalibrate the area-wide travel model
- Update socio-economic projections and the development concept.
- Update the plan goals and objectives as a result of shifts in local development, transportation or funding capabilities / philosophies.
- Update the roadway, transit and trials elements of the plan.