

***Bismarck-Mandan***



**METROPOLITAN PLANNING ORGANIZATION**

# **2013 MONITORING REPORT**

Annual Transportation Surveillance and Monitoring Report

**Adoption:**  
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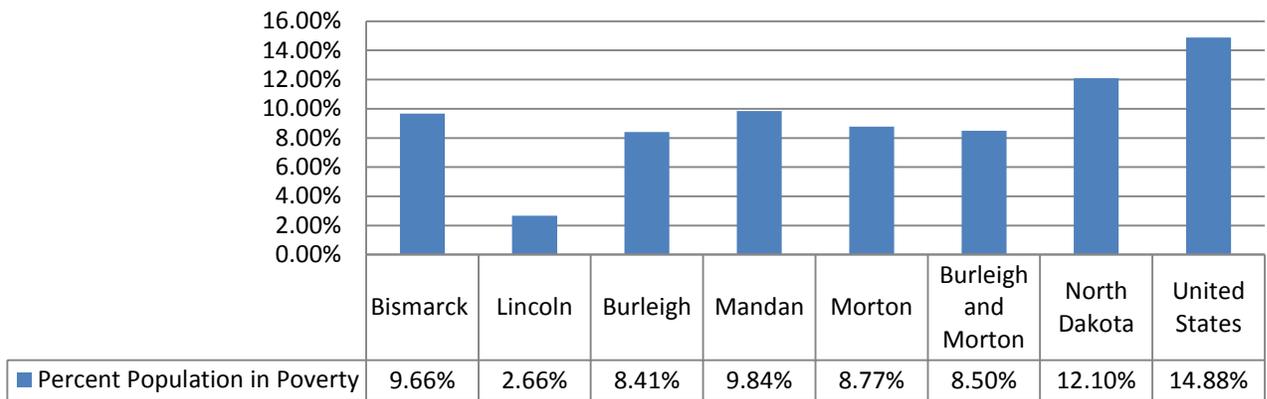
# Executive Summary

The Bismarck-Mandan MPO collects a variety of data, on an annual basis, within the region for transportation planning purposes. The study area has experienced significant growth over the past few years. It is believed that this growth was precipitated by energy development in western North Dakota and is now sustained by diverse local economic growth. The following information provides a brief summary of select trends that have been updated since the 2012 Monitoring Report in the Bismarck-Mandan MPO area. A more detailed description of trends related to people, housing, employment, and travel can be found in the following respective chapters of this document.

## PEOPLE

**Figure 2.7:** There has been a decrease in the percent of the population below the poverty level for residents in the cities of Bismarck and Lincoln and Burleigh County. There has been an increase for City of Mandan and Morton County residents. Changes between the 2012 and 2013 report range between +1% to -1% across all observed jurisdictions. These trends are also reflected on the map on page 10, of the 2013 Monitoring Report document, showing percent of households in Poverty by census block groups within the MPO boundary area. (*\*The 2012 monitoring report examined 2011 data and the 2013 report examined 2012 data*).

**Figure 2.7 Percent of Population Below the Poverty Level Comparing Bismarck-Mandan MPO Jurisdictions to North Dakota and the United States, 2012\***



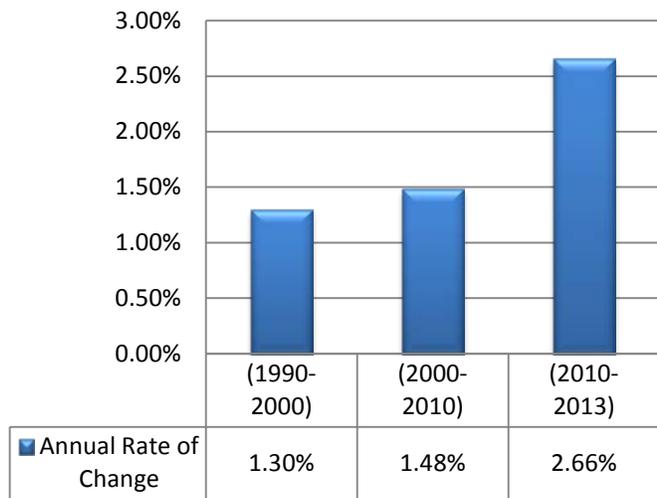
*Based on the 2008-2012 US Census Bureau Decennial Census American Community Survey Tables B17001 and S1701*

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**Figure 2.9: Simple Annual Rate of Change in Burleigh and Morton County 1990-2013.** Based off US census bureau estimates, the simple annual rate of change calculated between 2010 and 2012 was 2.34% growth. The simple annual rate of change calculated between 2010 and 2013 was 2.66% growth.

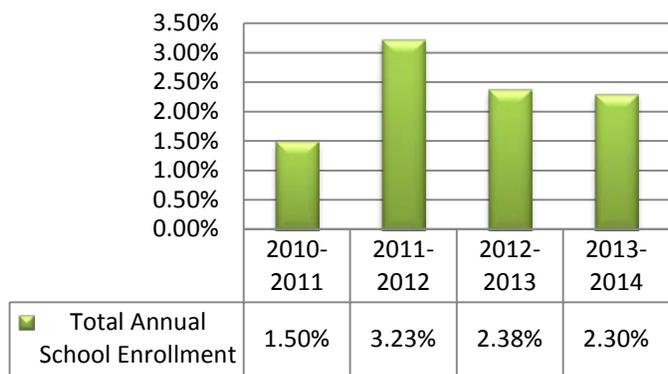
**Figure 2.10: Annual Rate of Change for All Public Schools Combined in Bismarck-Mandan MPO Area.** The 2012 report pulled data that was gathered from each individual school and proved to be inconsistent because student enrollment counts were taken at different dates from each school. The 2013 Report pulled data directly from the North Dakota Department of Public Instruction which counts enrollment levels for all public schools on the same day every year. The simple annual rate of change noted in the 2012 report between 2010 and 2013 was 2.65%. The 2013 report indicates a slight decrease between 2010 and 2014 as the simple annual rate of change is 2.44%. Due to the change in school enrollment level data sourcing it may be problematic to compare the 2012 Monitoring Report information to the 2013 Monitoring Report information.

**Figure 2.9: Simple Annual Rate of Population Change in Burleigh and Morton County, 1990-2013**



*Based on population counts from the US Census Bureau (1990, 2000, 2010, and population estimates 2013)*

**Figure 2.10: Annual Rate of Change for All Public Schools Combined in the Bismarck-Mandan MPO Area 2010-2014**



*Based on school enrollment data obtained from the North Dakota Department of Public Instruction (2010, 2011, 2012, 2013 and 2014)*

# Executive Summary

## HOUSING

**Figure 3.1: Existing Housing Conditions for the Bismarck-Mandan MPO Area, North Dakota, and the United States – 2012\*** (\*The 2012 monitoring report examined 2011 data and the 2013 report examined 2012 data). Small percent changes occurred in comparison of the 2012 and 2013 Monitoring Report. Overall these are less than 1% in difference. Median home value increased between 5K and 13K across all jurisdictions within the MPO. The most significant estimated increase in median home value was in Mandan.

Figure 3.1: Existing Housing Conditions for the Bismarck-Mandan MPO Area, North Dakota, and the United States – 2012

|                           | Bismarck         | Lincoln          | Mandan           | *Bismarck-Mandan MSA (2010) | North Dakota     | United States    |
|---------------------------|------------------|------------------|------------------|-----------------------------|------------------|------------------|
| Vacancy Rate              | 5.60%            | 0.00%            | 6.42%            | 6.22%                       | 11.52%           | 12.47%           |
| Owner Occupied            | 66.25%           | 98.80%           | 73.44%           | 73.23%                      | 66.36%           | 65.51%           |
| Renter Occupied           | 33.75%           | 1.20%            | 26.56%           | 26.77%                      | 33.64%           | 34.49%           |
| <b>Units in Structure</b> |                  |                  |                  |                             |                  |                  |
| 1 Detached                | 47.68%           | 95.55%           | 60.31%           | 58.55%                      | 61.45%           | 61.70%           |
| 1 Attached                | 7.15%            | 3.25%            | 5.06%            | 5.71%                       | 5.27%            | 5.79%            |
| 2                         | 5.67%            | 0.00%            | 4.24%            | 4.22%                       | 2.31%            | 3.80%            |
| 3 or 4                    | 3.68%            | 0.00%            | 5.39%            | 3.21%                       | 3.60%            | 4.44%            |
| 5 to 9                    | 6.34%            | 0.00%            | 5.51%            | 4.93%                       | 4.18%            | 4.78%            |
| 10 to 19                  | 7.25%            | 0.00%            | 3.77%            | 5.16%                       | 5.46%            | 4.49%            |
| 20 to 49                  | 9.08%            | 0.00%            | 1.46%            | 5.74%                       | 7.25%            | 3.52%            |
| 50 or more                | 3.97%            | 0.00%            | 1.08%            | 2.57%                       | 2.81%            | 4.88%            |
| Mobile Home               | 9.18%            | 1.20%            | 13.18%           | 9.90%                       | 7.64%            | 6.52%            |
| Boat, RV, Van, etc.       | 0.00%            | 0.00%            | 0.00%            | 0.00%                       | 0.03%            | 0.08%            |
| <b>Median Value</b>       | <b>\$156,900</b> | <b>\$139,800</b> | <b>\$133,500</b> | <b>\$157,800</b>            | <b>\$123,900</b> | <b>\$181,400</b> |
| <b>Persons/Household</b>  |                  |                  |                  |                             |                  |                  |
| 1 Person                  | 32.88%           | 14.80%           | 29.99%           | 28.43%                      | 31.66%           | 27.45%           |
| 2 Person                  | 37.16%           | 31.17%           | 32.81%           | 36.93%                      | 36.69%           | 33.49%           |
| 3 Person                  | 14.92%           | 18.17%           | 16.52%           | 15.30%                      | 13.76%           | 15.86%           |
| 4 Person                  | 9.45%            | 19.98%           | 13.40%           | 12.19%                      | 10.75%           | 13.35%           |
| 5 Person                  | 4.46%            | 8.66%            | 5.02%            | 5.39%                       | 4.88%            | 6.08%            |
| 6 Person                  | 0.77%            | 6.62%            | 2.08%            | 1.29%                       | 1.50%            | 2.31%            |
| 7 Person                  | 0.36%            | 0.60%            | 0.18%            | 0.48%                       | 0.77%            | 1.46%            |
| Average Household Size    | 2.2              | 3                | 2.34             | 2.35                        | 2.3              | 2.61             |
| Owner Occupied            | 2.39             | 3                | 2.55             | 2.53                        | 2.48             | 2.68             |
| Renter Occupied           | 1.83             | 2.9              | 1.76             | 1.86                        | 1.95             | 2.48             |

Based on Tables B11016, B25002, B25003, B25010, B25024, and B25077 of the 2008-2012 US Census Bureau American Community Survey

\*The Bismarck, ND MSA (2010) is comprised of all of Burleigh and Morton Counties

# Executive Summary

**Figure 3.2 New Dwelling Units.** New dwelling units increased 4.27% between 2011 and 2012. The rate of change between 2012 and 2013 slowed, growing only 3.42%.

Figure 3.2: \*Bismarck, ND Metropolitan Statistical Area 2011 to 2013 New Dwelling Unit Permits

| Total Dwelling Units 2010 | New Dwelling Units 2011 | Total Dwelling Units 2011 | 2010-2011 % Change | New Dwelling Units 2012 | Total Dwelling Units 2012 | 2011-2012 % Change | New Dwelling Units 2013 | Total Dwelling Units 2013 | 2012-2013 % Change | 2011-2013 Simple Annual Rate of Change |
|---------------------------|-------------------------|---------------------------|--------------------|-------------------------|---------------------------|--------------------|-------------------------|---------------------------|--------------------|--|
| 47,833                    | 893                     | 48,726                    | 1.87%              | 2,079                   | 50,805                    | 4.27%              | 1,738                   | 52,543                    | 3.42%              | 3.28%                                  |

*Total dwelling units 2010 based on the 2010 US Census Bureau data. New dwelling unit's data obtained from the Cities of Bismarck and Mandan, and Morton County Building Inspections Divisions*

*\*The Bismarck, ND MSA (2010) is comprised of all of Burleigh and Morton Counties.*

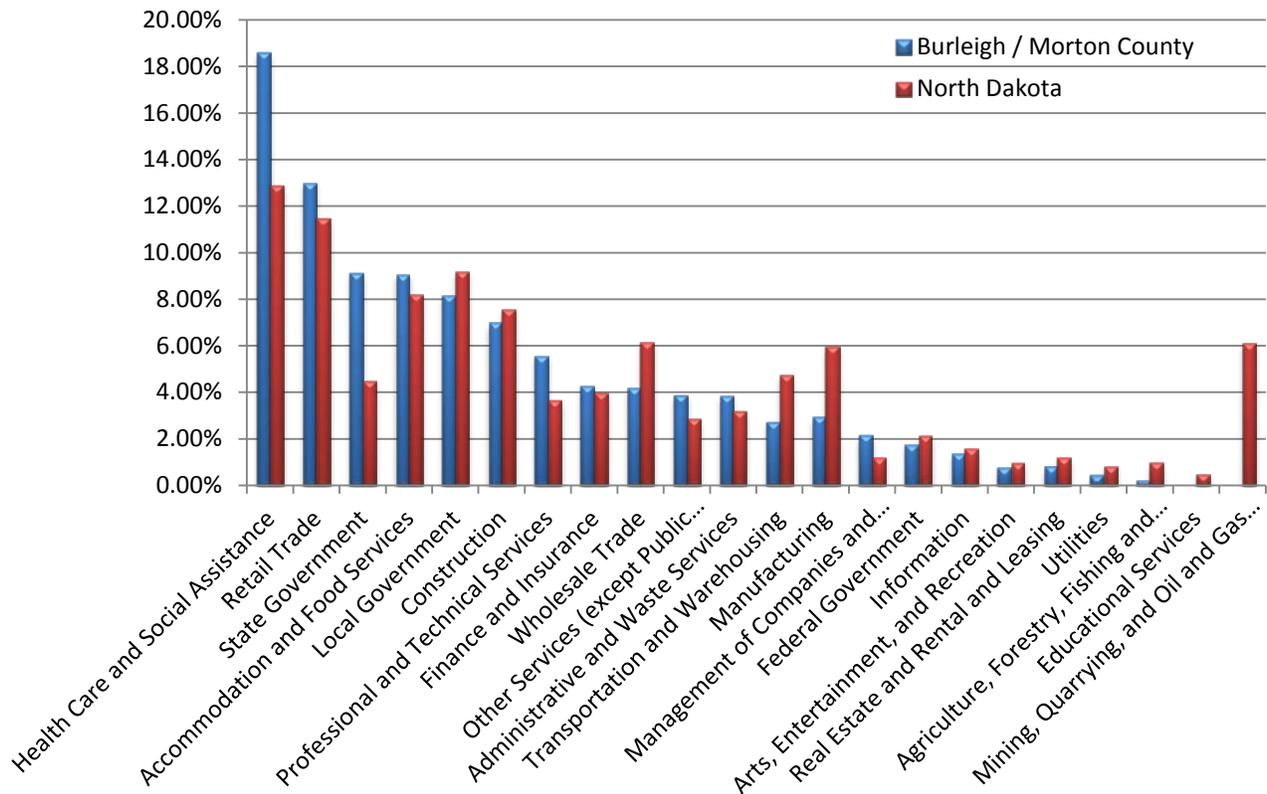
**Significant Dwelling Unit Growth per Transportation Analysis Zone.** In general the distribution of projected housing units by the Bismarck-Mandan MPO has been consistent with recent building permit activity. However, there was more residential growth in 2011-2013 than the 2010-2040 projections would have concluded for this time period for the following TAZ areas: 44; 45; 52; 177; 194; 274; 289; 322; and 344. At this time the differences identified between actual and projected growth patterns are not drastic enough to warrant modifications to the socio-economic data associated with the Bismarck-Mandan MPO transportation model. However, the projected distribution of households in the Bismarck-Mandan MPO area will continue to be monitored in comparison to residential building permit activity. (Trends are depicted on the maps on pages 21-25 in the Monitoring Report)

# Executive Summary

## EMPLOYMENT

**Figure 4.1: Jobs by North American Industrial Classification (NAICS) Sector for Burleigh and Morton County in Comparison to North Dakota.** The Bismarck-Mandan MPO monitors the largest employment sectors by NAICS category. Companies are grouped into sectors and those employing the greatest number of people are identified as top sectors in our region. Between the 2012 and 2013 Monitoring Reports there are some changes in the five leading industries for Burleigh and Morton County – They are now Health Care and Social Assistance, Retail Trade, State Government, Accommodation and Food Services, and Local Government. The 2012 report grouped all government employees in a category titled Public Administration and the 2013 report breaks these into federal state and local separate categories. There is also a slight reduction in percentage for all categories listed.

**Figure 4.1: Jobs by NAICS Industry Sector for Burleigh & Morton County in Comparison to North Dakota, First Quarter 2013**

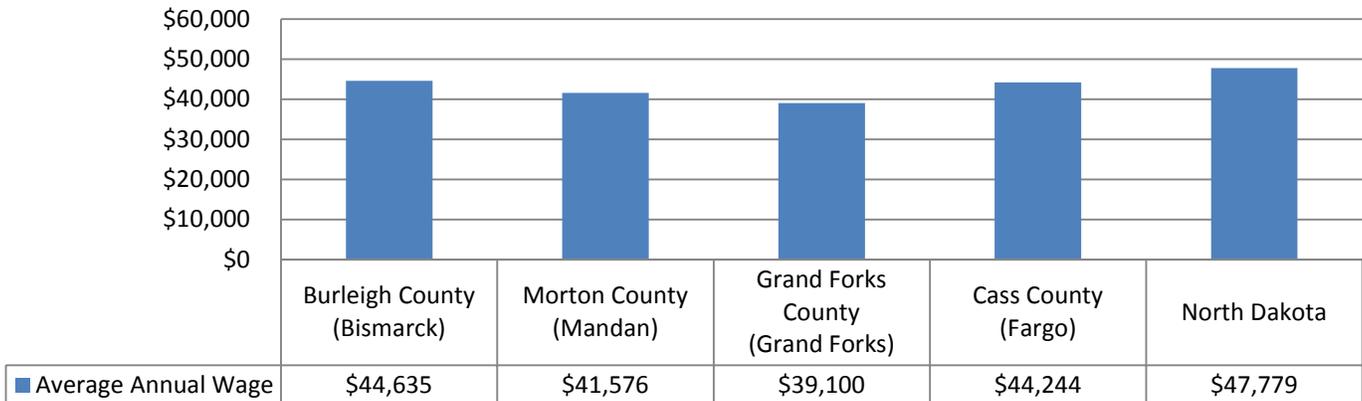


Labor Market Information Center, Job Service North Dakota

# Executive Summary

**Figure 4.2: Average Annual Wage for Bismarck Mandan MPO Counties** – Average Annual Wages across populated counties in North Dakota have increased between 2012 and 2013 approximately \$1000 - \$2000.

**Figure 4.2: Average Annual Wage for the Bismarck - Mandan MPO Counties in Comparison to Other North Dakota Populated Counties and Statewide, First Quarter 2013**



Labor Market Information Center, Job Service North Dakota

**Top 10 Employment Sites in the Bismarck-Mandan Area** – Growth in specific government and school employers has increased nominally between April 2013 and April 2014. Specific healthcare employers had a relatively low increase in number of employees. The following Figure 4.3 shows the number of employees for the MPO's largest employers.

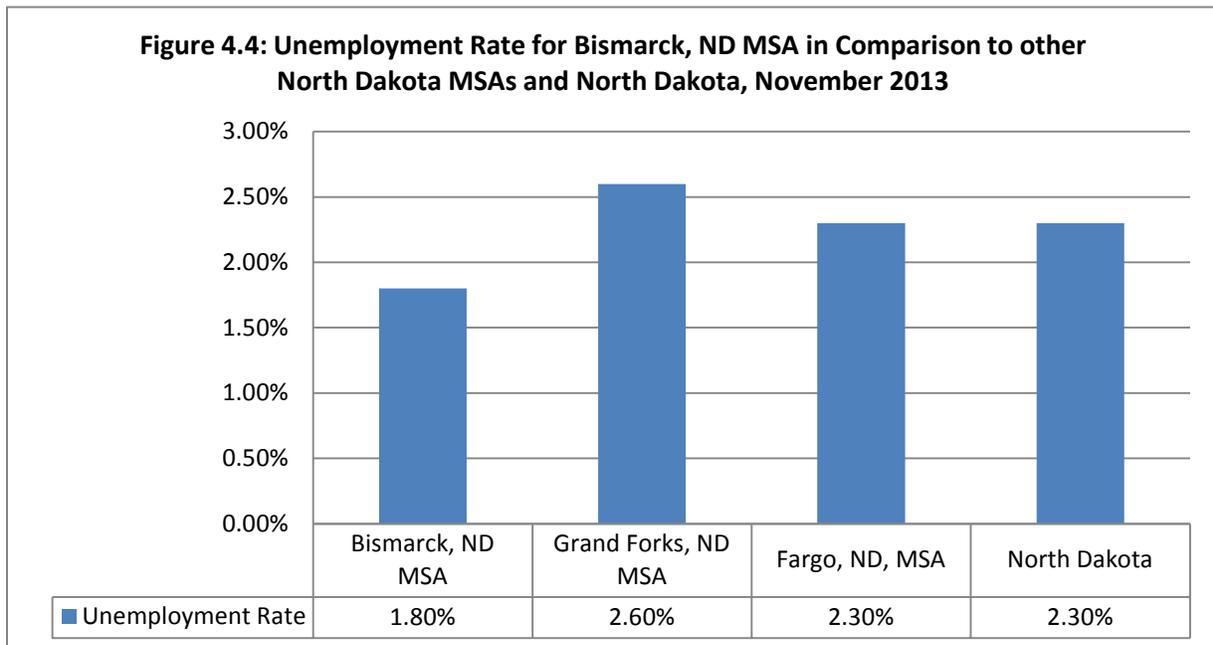
**Figure 4.3: Top 10 Employment Sites in Bismarck-Mandan Area, April 2014**

| Employer                        | Number of Employees |
|---------------------------------|---------------------|
| State of North Dakota           | 4,600               |
| Sanford Health                  | 3,110               |
| St. Alexius Medical Center      | 2,305               |
| Bismarck Public School District | 1,970               |
| Aetna                           | 880                 |
| City of Bismarck                | 862                 |
| MDU Resources Group             | 780                 |
| Bismarck State College          | 779                 |
| Mandan Public School District   | 600                 |
| Housing Industry Training (HIT) | 586                 |

Based on data obtained from the Bismarck-Mandan Development Association web-site: [www.bmda.org/workforce/employers.asp](http://www.bmda.org/workforce/employers.asp)

# Executive Summary

**Figure 4.4 Unemployment Rate for Bismarck ND MSA 2013:** Unemployment Rate for Bismarck ND MSA dropped from 2.4% in 2012 to 1.8% in 2013.



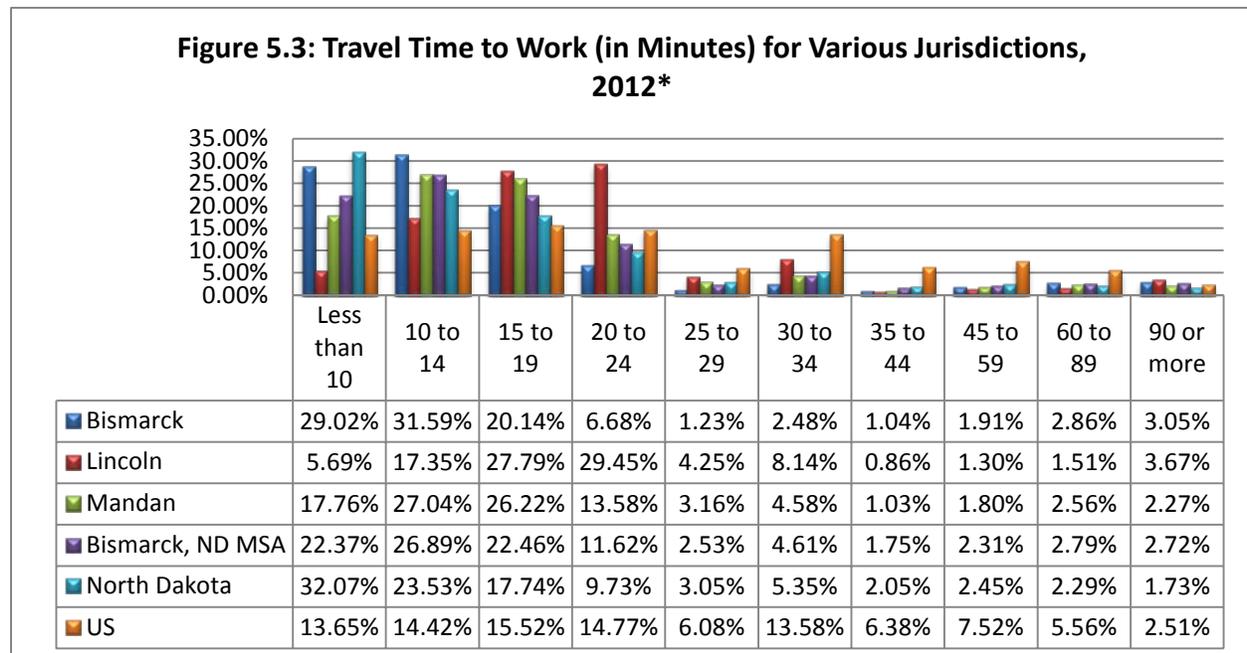
*Labor Market Information Center, Job Service North Dakota  
 \* Bismarck ND MSA denotes Burleigh and Morton Counties*

**Building Permits Issues by Employment Type 2010-2013 Maps 1- 4:** Between 2010 and 2013, 372 “Service” related building permits, 91 “Retail Building permits and 111 “Other” building permits were issued within the MPO jurisdictions. Considerable “Service” Employment Building Permits issued for areas along State Street North of 1-94, Pinehurst Square area in North Bismarck, and Downtown around Main Ave in Bismarck. Considerable “Other” building permits by employment type have been issued for areas along and around Bismarck Expressway in eastern Bismarck. Considerable “Service” and “Other” permits in Mandan have been issued for areas along in Old Red Trail in the NW portion of Mandan, Memorial Highway and Main St.

# Executive Summary

## TRAVEL

**Figure 5.3: Travel Time to Work** – Although estimated reported commute times appear to be decreasing slightly, the majority of individuals in the Bismarck-Mandan MPO generally take less than 20 minutes to travel to work. A greater percentage of individuals in Lincoln and Mandan travel more than 20 Minutes. (\*The 2012 monitoring report examined 2011 data and the 2013 report examined 2012 data).

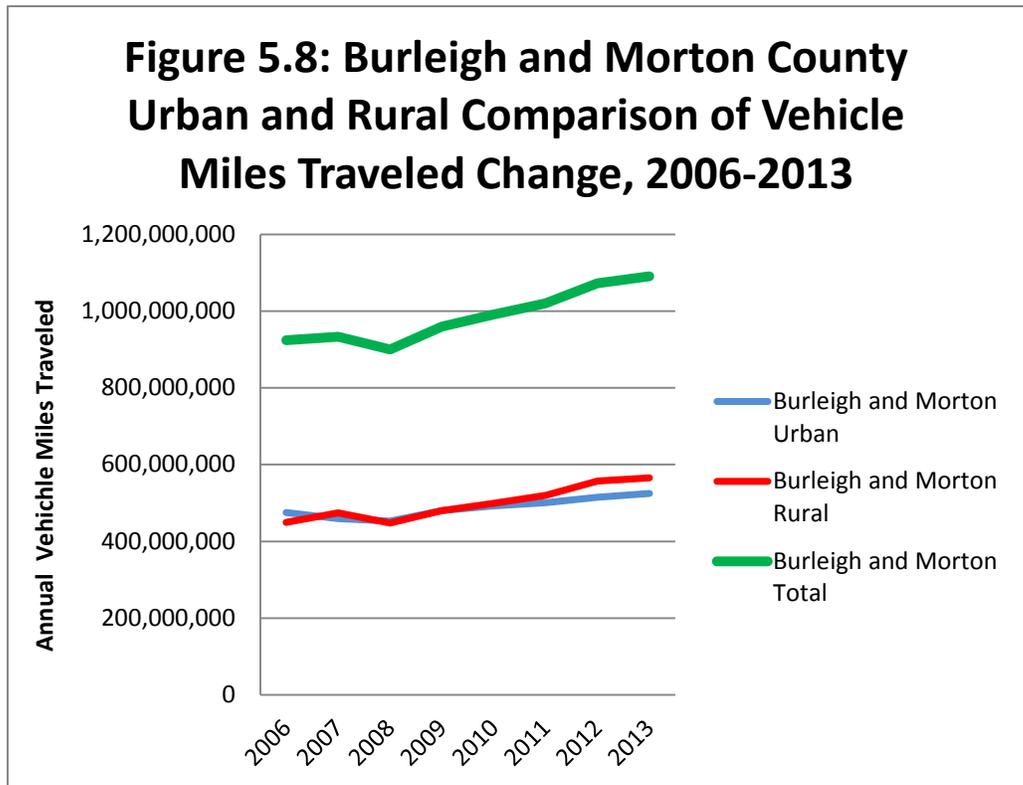


Based on US Census Bureau American Community Survey 2008-2012 Means of Transportation to Work data

# Executive Summary

**Figure 5.8**  
**Burleigh and Morton County Urban and Rural Comparison of VMT change from 2006-2013.**

Both Burleigh and Morton Rural and Urban VMT have been increasing steadily since 2006. VMT has grown faster in rural areas than VMT in urbanized areas. This could be due to an increase in housing units outside of the urbanized areas of Bismarck or Mandan or an increase in the amount of travel passing through the counties.



**Figure 5.14 Functionally Obsolete and Structurally Deficient Bridges** – The number of structurally deficient and functionally obsolete bridges in the Bismarck Mandan MPO area has been reduced by 1 bridge for each category between 2012 and 2013.

**Figure 5.14: Functionally Obsolete and Structurally Deficient Bridges in the Bismarck-Mandan MPO Area in 2013**

| Status                 | Number of Bridges | % of Total (119) |
|------------------------|-------------------|------------------|
| Functionally Obsolete  | 5                 | 4.2%             |
| Structurally Deficient | 6                 | 5.0%             |

*Bridge Sufficiency data was obtained from the NDDOT GIS Shapefile: Bridge Inventory, MPO Area 2013.*

*\* The Bismarck-Mandan MPO area includes Bismarck, Mandan and Lincoln, as well as portions of Burleigh and Morton Counties.*

# *Executive Summary*

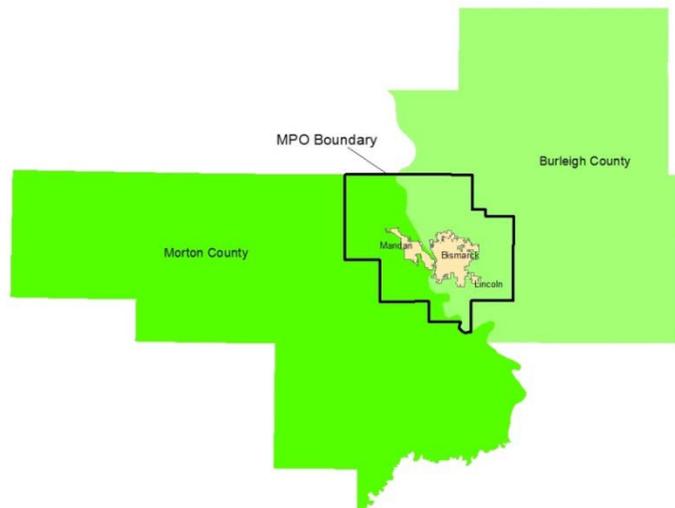
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# 1: Introduction

The purpose of this document is to provide a comprehensive understanding of existing conditions and recent trends influencing transportation within the region. The geographic scope of this document generally includes the five member jurisdictions of the Bismarck-Mandan Metropolitan Planning Organization (MPO), including Bismarck, Lincoln, Mandan, and Burleigh and Morton Counties. The intent is that this document will be updated on an annual basis so changes in various trends impacting the transportation system can be monitored on a regular basis. The document currently considers four primary topic areas including: people, housing, employment, and travel. It is envisioned that staff from the Bismarck-Mandan MPO, staff and policy makers from local member jurisdictions, state and federal agencies, and the general public may utilize this document in understanding issues facing the region and to make more informed decisions which enhance the region's transportation system.

## THE BISMARCK-MANDAN MPO

The Bismarck-Mandan MPO is responsible for the transportation planning and programming of projects, utilizing federal transportation funds, within the region. The Bismarck-Mandan MPO is approximately 394 square miles with the geographic coverage including the Cities of Bismarck, Lincoln, Mandan, and portions of Burleigh and Morton Counties as indicated in the map to the right.



The Highway Act of 1962 required the formation of MPOs for urbanized areas with populations of 50,000 or more in the United States in order to receive federal transportation funds. The intent of MPOs are to provide a continuing, comprehensive, and cooperative planning process. As transportation needs extend beyond jurisdictional boundaries and captivate interest from multiple levels of government (local, state, and federal) MPOs serve an important role in conducting and facilitating transportation planning and programming within an urbanized area. The Bismarck-Mandan MPO is one of three MPO's in the state of North Dakota. In addition to other planning efforts the Bismarck-Mandan MPO is involved with it must also develop and regularly update the following for the Bismarck-Mandan MPO area:

- A Long Range Transportation Plan (LRTP);
- A Transportation Improvement Program (TIP); and
- A Unified Planning Work Program (UPWP)

# *1: Introduction*

The Bismarck-Mandan MPO receives direction from the Technical Advisory Committee (TAC) and the Policy Board. The TAC is comprised primarily of planning and engineering staff members from the MPO's member jurisdictions, as well as, the public transit provider, North Dakota Department of Transportation, Federal Highway Administration, and an individual representing freight interests. The TAC provides recommendations based on professional judgment for the MPO's Policy Board. The Policy Board is a five member board comprised of the Mayors of Bismarck, Lincoln, and Mandan, as well as, a commissioner from Burleigh and Morton Counties. The Policy Board is the decision making body of the Bismarck-Mandan MPO.

## Current Policy Board Members:

Bismarck – Mayor Mike Seminary  
Lincoln – Mayor Bob Johnston  
Mandan – Mayor Arlyn Van Beek  
Burleigh County – Commissioner Doug Schonert  
Morton County – Commissioner Andy Zachmeier

## Current Technical Advisory Committee Members:

North Dakota Department of Transportation (NDDOT) – Michael Johnson  
City of Bismarck Engineering Department – Mel Bullinger  
City of Bismarck Planning Department – Carl Hokenstad  
City of Lincoln – Roberta Unterseher  
City of Mandan Planning/Engineering Department – Justin Froseth  
Burleigh County Engineering Department – Marcus Hall  
Morton County Engineering Department – Mike Aubol  
Morton County Planning Department – Daniel Nairn  
Freight Interest – Chuck Peterson  
Public Transportation Provider – Robin Werre  
Bismarck-Mandan MPO – Steve Saunders

## Current Staff:

Director – Carl Hokenstad  
Transportation Planner – Steve Saunders  
Transportation Planner – Rachel Drewlow  
Transportation Planner – Will Hutchings  
Office Assistant – Kim Riepl

# 1: Introduction

## Changes to the 2013 Monitoring Report

The previous 2012 Monitoring Report relied heavily on US Census Data, including statistics for the Bismarck-Mandan MSA. An MSA, or Metropolitan Statistical Area, is established to reflect areas of urban population along with surrounding areas, which contribute to the local workforce and economic vitality of the urban center. Population statistics are estimated for an MSA area by the US Census Bureau based on American Community Survey responses.

*In 2012, the Bismarck-Mandan MSA was composed of Burleigh and Morton County. After completion for the 2012 Monitoring Report, the MSA boundary was expanded to include Sioux and Oliver County. Population statistics for the updated MSA boundary now include all four counties, an area far beyond the MPO area. In an effort to maintain consistent and relevant growth statistics for communities within the MPO area, staff has decided to utilize county data instead of MSA data. Both data sets are supplied by the US Census Bureau, but differ in coverage area. Using county population data preserves the statistical area introduced in the 2012 report and more accurately shows population changes within the Bismarck-Mandan MPO.*

*All references to an MSA boundary in the current document indicate the older MSA (Burleigh and Morton County), not the 2013 extended boundary. Data referenced in any other way denotes county boundaries.*

# *1: Introduction*

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# 2: People

The amount, concentration, and character of population have an influence on travel behavior. This chapter examines a variety of existing characteristics, recent trends and population projections.

## EXISTING CHARACTERISTICS

The US Census Bureau conducts an official count of the population once every 10 years throughout the United States. The last official US Census count was conducted in 2010. Annually, however the US Census Bureau produces estimates of population throughout the United States, although these are based on a sample of the population and not 100% count efforts.

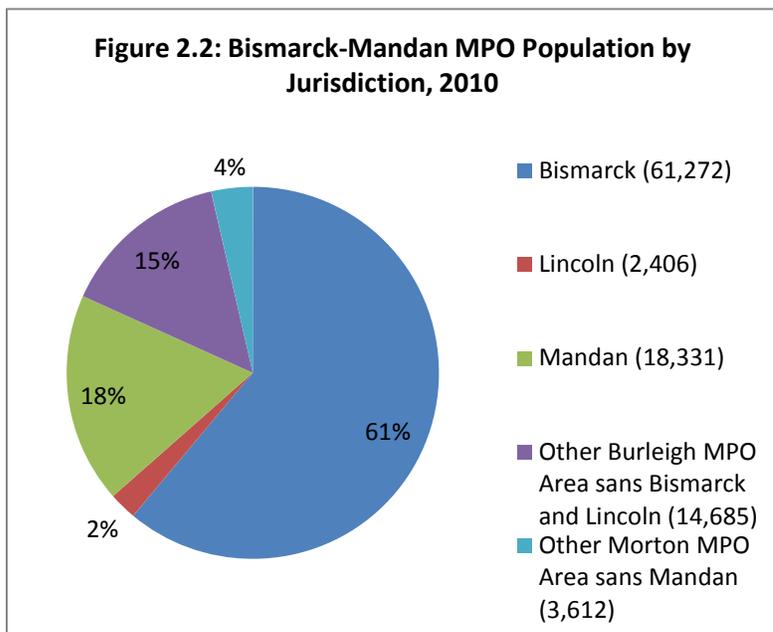
**Figure 2.1: Bismarck-Mandan MPO and Bismarck, ND MSA Population**

| Jurisdiction           | 2010 Population | % of Bismarck, ND MSA Population |
|------------------------|-----------------|----------------------------------|
| Bismarck               | 61,272          | 56.33%                           |
| Lincoln                | 2,406           | 2.21%                            |
| Mandan                 | 18,331          | 16.85%                           |
| Bismarck-Mandan MPO    | 100,306         | 92.21%                           |
| Burleigh Total         | 81,308          | 74.75%                           |
| Morton Total           | 27,471          | 25.25%                           |
| Bismarck, ND MSA Total | 108,779         | 100.00%                          |

*Based on the 2010 US Census Bureau Decennial Census*

As previously indicated the Bismarck-Mandan MPO is comprised of the jurisdictions of Bismarck, Lincoln, Mandan, and portions of Burleigh and Morton Counties. The Bismarck-Mandan MPO is located within the Bismarck, ND Metropolitan Statistical Area (MSA), which as of 2010 included all of Burleigh and Morton Counties. **Figure 2.1** represents the 2010 population by jurisdiction within the region. Population within the Bismarck-Mandan MPO accounted for approximately 92% of the total population in Burleigh and Morton County, in 2010.

**Figure 2.2** provides a more detailed percentage breakdown of the jurisdictional populations which make up the Bismarck-Mandan MPO. Bismarck comprises the largest percentage of population at approximately 61%.

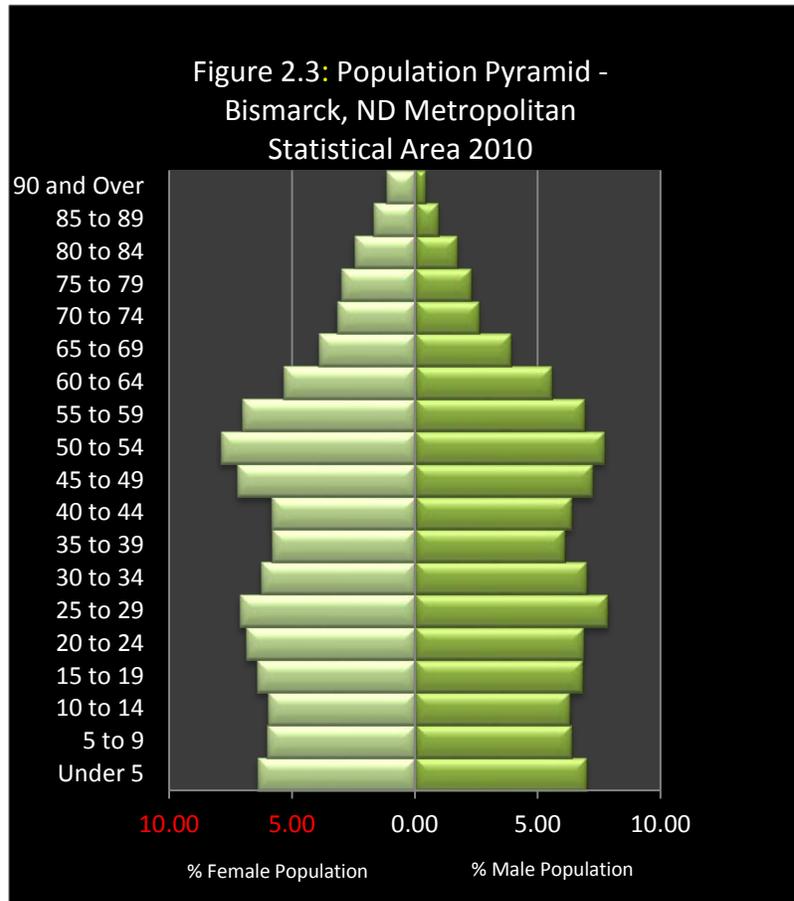


*Based on the 2010 US Census Bureau Decennial Census*

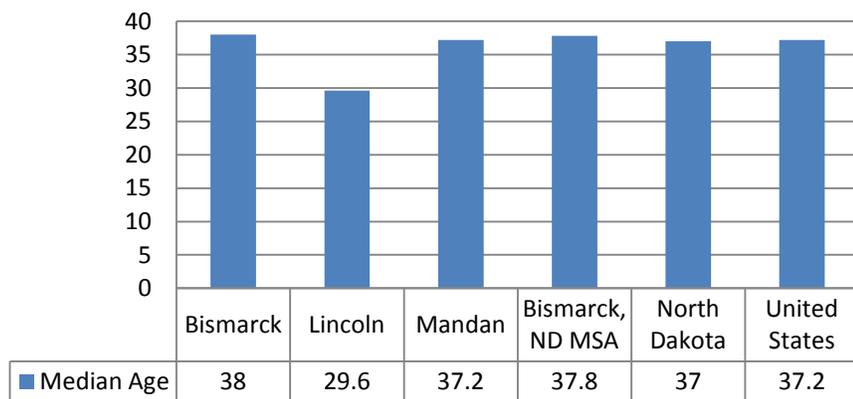
# 2: People

The following **Figure 2.3** represents the age structure in 2010 for the Bismarck, ND MSA through a “population pyramid”. The Bismarck, ND MSA population pyramid is representative of an area with low infant mortality, slow natural population increase (only considering births and deaths), and long life expectancies. This age structure would be consistent with that of the United States as a whole.

The median age of the Bismarck, ND MSA and various jurisdictions in comparison to North Dakota and the United States is represented in **Figure 2.4**. The median age of the Bismarck, ND MSA is slightly higher than the median ages of North Dakota and the United States as a whole. The jurisdiction with the youngest median age in the Bismarck MPO area was Lincoln at 29.6 and the oldest in Bismarck at 38. The following Map depicts concentrations of “Elderly” persons in the Bismarck-Mandan MPO area.



**Figure 2.4: Median Age of Bismarck-Mandan MPO Jurisdictions in Comparison to North Dakota and the United States, 2010**



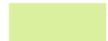
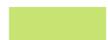
Based on the 2010 US Census Bureau Decennial Census Table PCT4

Concentration of "Elderly"  
Persons in the Bismarck-Mandan  
MPO Area by Census Block - 2010

 MPO Boundary

 Corporate Limits

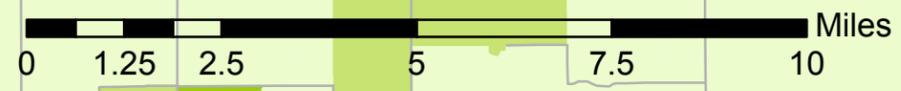
**Percent "Elderly"  
(By Census Block)**

-  15% or Less
-  15% - 25%
-  25% - 50%
-  50% - 75%
-  75% - 100%

Map created by B.J.E. May 2013. Based on data maintained by the Bismarck-Mandan MPO, the City of Bismarck, Morton County, and the US Census Bureau. This map is for representation use only and does not represent a survey. No liability is assumed as to the accuracy of the data delineated heron.

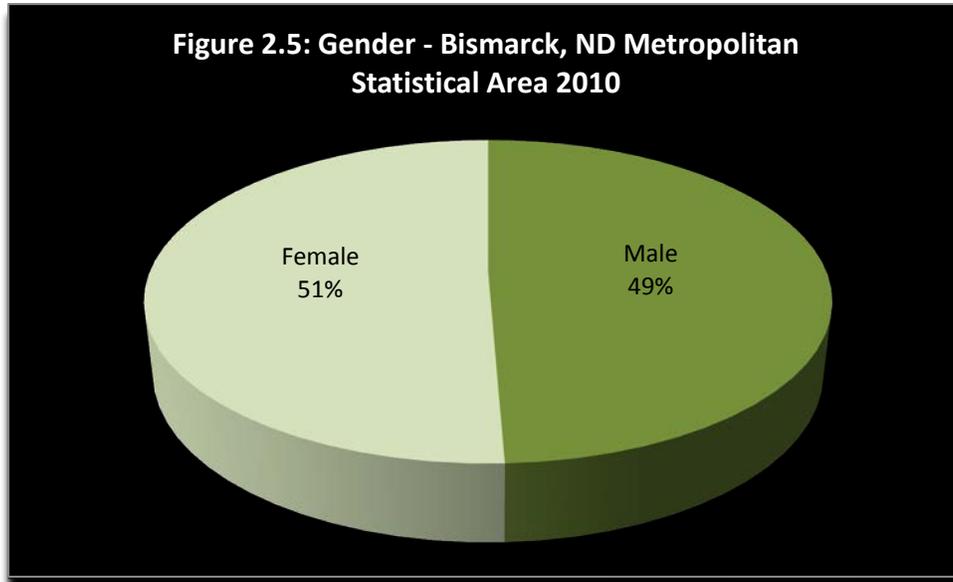
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\*For purposes of this effort "Elderly" is considered 60 years of age or older. Data based on table P12 of the 2010 US Census Summary File 1.



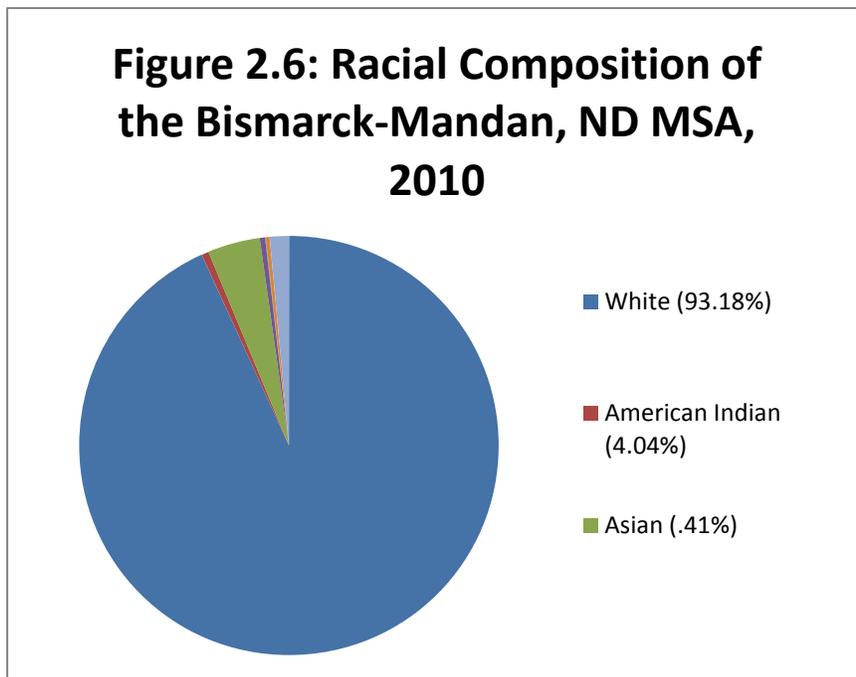
# 2: People

In 2010, the Bismarck, ND MSA was comprised of a slightly higher percentage of females compared to males, as represented in **Figure 2.5**.



*Based on the 2010 US Census Bureau Decennial Census*

The following **Figure 2.6** represents the racial composition of the Bismarck, ND MSA. In 2010, approximately 93% of the Bismarck, ND MSA population was comprised of White individuals. The largest minority racial category was American Indian at 4.04%. The following map depicts concentrations of minority populations within the Bismarck-Mandan MPO area.

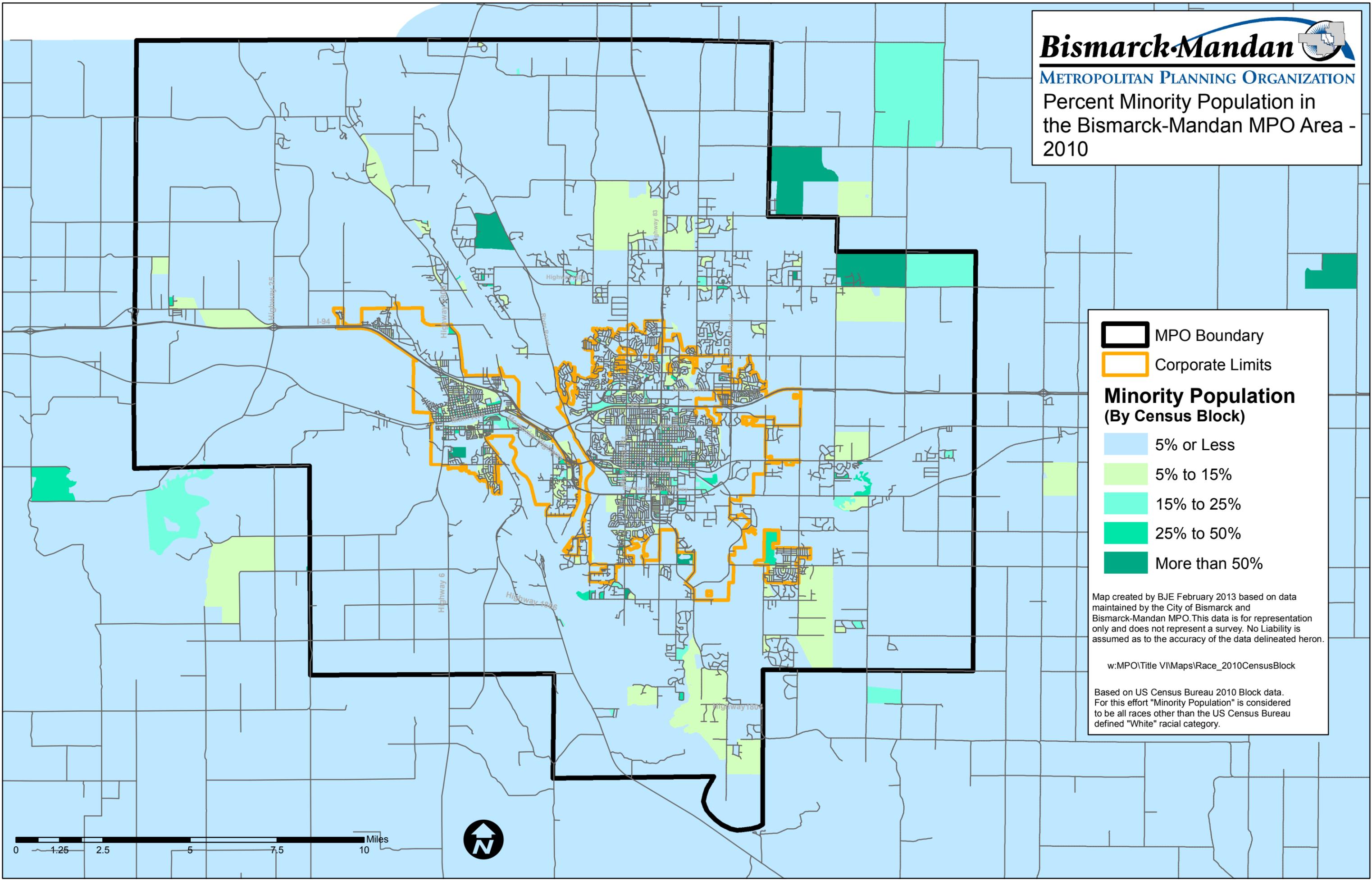


*Based on the 2010 US Census Bureau Decennial Census*

# *2: People*

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### Percent Minority Population in the Bismarck-Mandan MPO Area - 2010



MPO Boundary  
 Corporate Limits

**Minority Population (By Census Block)**

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

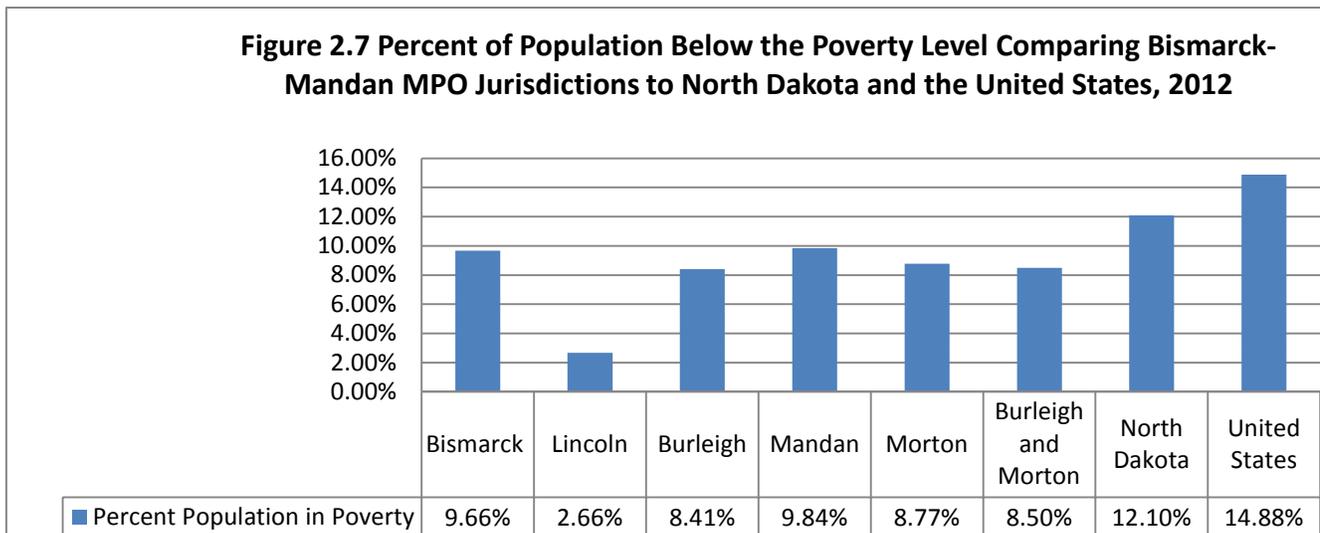
Map created by BJE February 2013 based on data maintained by the City of Bismarck and Bismarck-Mandan MPO. This data is for representation only and does not represent a survey. No Liability is assumed as to the accuracy of the data delineated hereon.

w:\MPO\Title VII\Maps\Race\_2010CensusBlock

Based on US Census Bureau 2010 Block data. For this effort "Minority Population" is considered to be all races other than the US Census Bureau defined "White" racial category.

# 2: People

**Figure 2.7 Percent of Population Below the Poverty Level Comparing Bismarck-Mandan MPO Jurisdictions to North Dakota and the United States, 2012**



Based on the 2008-2012 US Census Bureau Decennial Census American Community Survey Tables B17001 and S1701

**Figure 2.7** represents percent of population in poverty (as defined by the US Census Bureau) of various Bismarck-Mandan MPO jurisdictions in comparison to North Dakota and the United States, based on the 2008-2012 US Census Bismarck-Mandan MPO had lower rates of poverty in comparison to North Dakota and the United States however this data may not be representative of current trends. This data is based on a sample of the population between 2008 and 2012. The following map on page 9 depicts concentrations of households in poverty in the Bismarck-Mandan MPO area.

The following **Figure 2.8** represents population densities of various Bismarck-Mandan MPO jurisdictions in relation to North Dakota and the United States. The following map on page 10 represents population density within the Bismarck-Mandan MPO area.

**Figure 2.8: Population Density of Bismarck-Mandan MPO Jurisdictions, North Dakota and the United States, 2010**

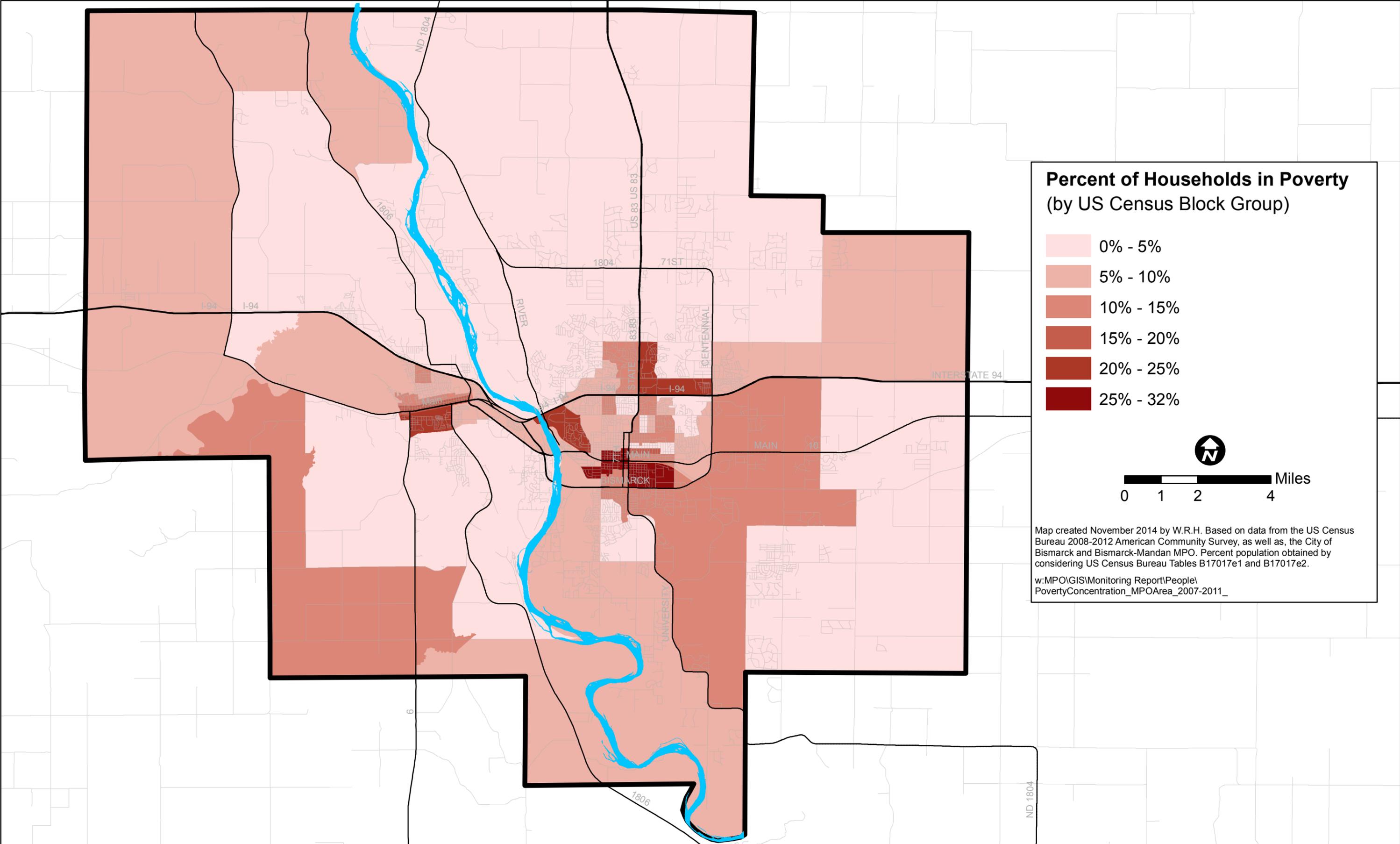
|                         | Population  | Land Area (Square Miles) | Population Density by Land Area (persons/square mile) |
|-------------------------|-------------|--------------------------|---|
| <b>Bismarck</b>         | 61,272      | 30.84                    | 1,986.77  |
| <b>Lincoln</b>          | 2,406       | 1.12                     | 2,148.21  |
| <b>Burleigh County</b>  | 81,308      | 1,632.65                 | 49.80   |
| <b>Mandan</b>           | 18,366      | 11.03                    | 1,665.10  |
| <b>Morton County</b>    | 27,471      | 1,926.27                 | 14.26   |
| <b>Bismarck, ND MSA</b> | 108,779     | 3,559                    | 30.57   |
| <b>North Dakota</b>     | 672,591     | 69,000.80                | 9.75  |
| <b>United States</b>    | 308,745,712 | 3,531,905.43             | 87.42   |

Based on US Census 2010 Tables GCT-PH1

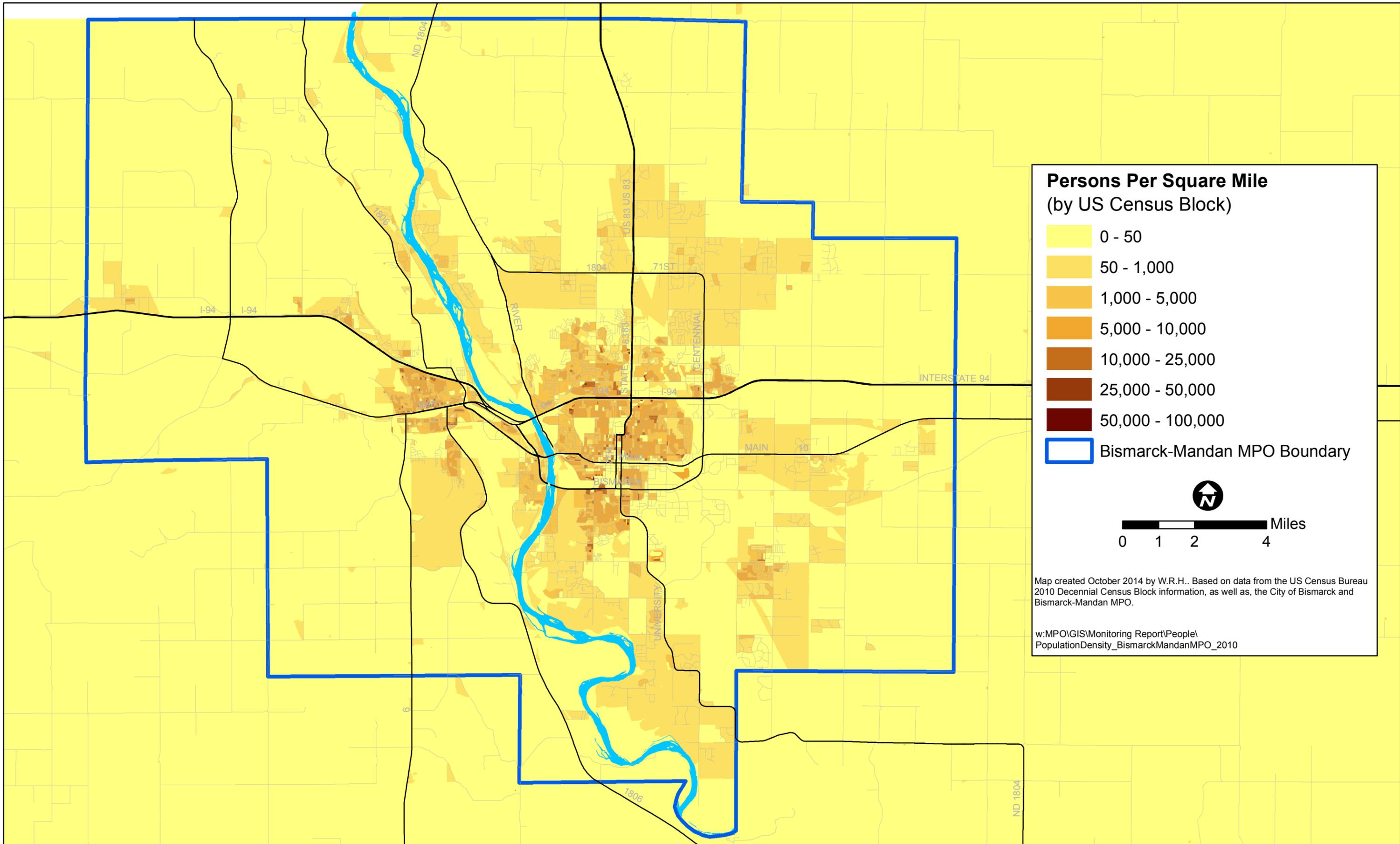
# *2: People*

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# Concentration of Households in Poverty in the Bismarck-Mandan MPO Area, 2008-2012



# Population Density of the Bismarck-Mandan MPO Area, 2010



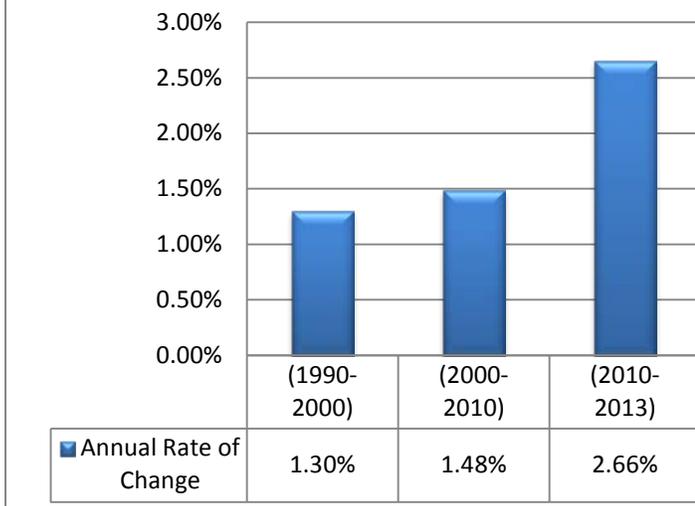
# 2: People

## RECENT TRENDS

Historically the Bismarck-Mandan area has seen annual growth rates between 1% to 1.5%. Recent US Census Bureau population estimates for Burleigh and Morton County indicate a significantly heightened level of growth compared to previous decades. The latest available US Census Bureau estimates as of July 1, 2012 indicate a population of 113,875 individuals in Burleigh and Morton County. **Figure 2.9** indicates the simple annual rate of change by time period for Burleigh and Morton County. The simple annual rate of change was significantly heightened between 2010 and 2013 compared to the previous decades. This estimate may also be conservative as some of the data the US Census Bureau utilizes for establishing population estimates on an annual basis may be as much as three years old.

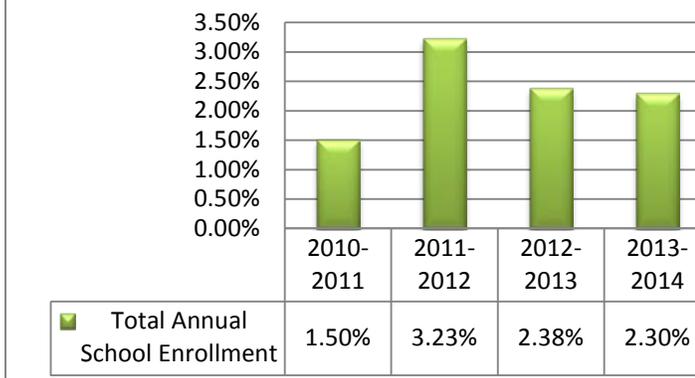
Annually the Bismarck-Mandan MPO collects school enrollment information for all public schools in the Bismarck-Mandan MPO area. The school enrollment figures have been collected from the North Dakota Department of Public Instruction. The following **Figure 2.10** identifies the annual rate of change, in student enrollment, for all public schools in the Bismarck-Mandan MPO area combined from 2010-2014. The simple annual rate of change from 2010-2014 is 2.44%.

**Figure 2.9: Simple Annual Rate of Population Change in Burleigh and Morton County, 1990-2013**



*Based on population counts from the US Census Bureau (1990, 2000, 2010, and population estimates 2013)*

**Figure 2.10: Annual Rate of Change for All Public Schools Combined in the Bismarck-Mandan MPO Area 2010-2014**



*Based on school enrollment data obtained from the North Dakota Department of Public Instruction (2010, 2011, 2012, 2013 and 2014)*

# 2: People

## PROJECTIONS

In the development of household and employment projections for the Bismarck-Mandan MPO, Woods & Poole Economics data was acquired in 2012. This information provided population and employment projections to the year 2040. The following **Figure 2.11** represents the US Census Bureau 2010 population, as well as, Woods & Poole population projections for 2025 and 2040 for Burleigh and Morton Counties.

**Figure 2.11: Woods & Poole Population Projections for Burleigh and Morton Counties, 2025 and 2040**

|                 | 2010    | 2025    | 2040    |
|-----------------|---------|---------|---------|
| <b>Burleigh</b> | 81,308  | 97,410  | 113,500 |
| <b>Morton</b>   | 27,471  | 29,597  | 31,633  |
| <b>Total</b>    | 108,779 | 127,007 | 145,133 |

*Based on 2010 US Census Bureau and the Woods & Poole 2012 Data Pamphlet and associated Excel Spreadsheets "BUECO.xlsx" and "MOECO.xlsx"*

**Figure 2.12** identifies the simple annual rate of change for Burleigh and Morton Counties from 2010-2040.

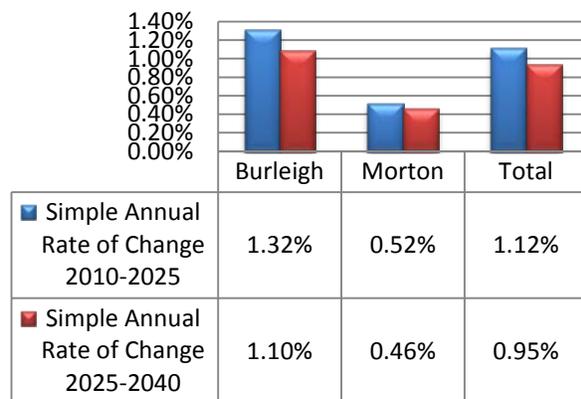
Annually, the City of Bismarck develops population projections for the region to the year 2040, based on annual US Census Bureau population estimates. **Figure 2.13** and **2.14** identifies the projected population and simple annual rate of increase for Burleigh and Morton Counties in 2020 and 2040.

**Figure 2.13: City of Bismarck Population Projections for Burleigh and Morton Counties, 2020 and 2040**

|                 | 2010    | 2020    | 2040    |
|-----------------|---------|---------|---------|
| <b>Burleigh</b> | 81,308  | 105,138 | 152,798 |
| <b>Morton</b>   | 27,471  | 32,582  | 42,658  |
| <b>Total</b>    | 108,779 | 137,720 | 195,456 |

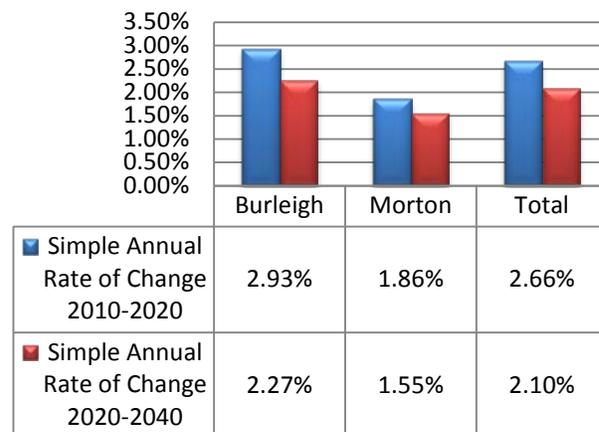
*Based on 2010 US Census Bureau and the City of Bismarck August 2013, "2010-2040 Metropolitan Population Projections"*

**Figure 2.12: Woods & Poole - Bismarck, ND Metropolitan Statistical Area Population Projections, 2025 and 2040**



*Based on 2010 US Census Bureau and the Woods & Poole 2012 Data Pamphlet and associated Excel Spreadsheets "BUECO.xlsx" and "MOECO.xlsx"*

**Figure 2.14: City of Bismarck - Bismarck, ND Metropolitan Statistical Area Population Projections, 2020 and 2040**



*Based on 2010 US Census Bureau and the City of Bismarck August 2013, "2010-2040 Metropolitan Population Projections"*

## *2: People*

As the preceding information indicates there are significant differences between the Woods and Poole population projections compared to the City of Bismarck population projections. A variety of factors may be contributing to the differences. The Woods and Poole projections, used in this report, were developed in 2012 compared to the City of Bismarck projections which were developed in 2014. Since the growth trends have increased significantly the past few years it is possible the recent surge in population may not have been fully accounted for in the Woods and Poole projections as they were two years older than the City of Bismarck projections used. Additionally, projection methodologies are likely different between the two sets of population projections referenced. It is undetermined what variables are used in the Woods and Poole projections, however, the City of Bismarck typically uses a linear regression projection methodology considering the last few years of available US Census Bureau population estimates.

The Bismarck-Mandan MPO did not specifically project population; however future households and jobs were projected and discussed in the following chapters of this document. Recent trends and annual population projections will continue to be monitored for consistency with Bismarck-Mandan MPO socio-economic projections.

# *2: People*

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# 3: HOUSING

Housing characteristics are important considerations in transportation planning as they can provide valuable information regarding transportation and trending data within the region. Characteristics, such as, type of housing and number of persons per household, for instance, can be a determinate in trip generation rates. This chapter identifies a variety of housing information including existing conditions, recent trends, and future projections.

## EXISTING CONDITIONS

The following **Figure 3.1** identifies a variety of existing housing conditions in the Bismarck-Mandan MPO area in comparison to State and national housing data. The information is based on 2008-2012 US Census Bureau American Community Survey data and may not be reflective of the most recent trends.

**Figure 3.1: Existing Housing Conditions for the Bismarck-Mandan MPO Area, North Dakota, and the United States – 2012**

|                        | Bismarck  | Lincoln   | Mandan    | *Bismarck-Mandan MSA (2010) | North Dakota | United States |
|------------------------|-----------|-----------|-----------|-----------------------------|--------------|---------------|
| Vacancy Rate           | 5.60%     | 0.00%     | 6.42%     | 6.22%                       | 11.52%       | 12.47%        |
| Owner Occupied         | 66.25%    | 98.80%    | 73.44%    | 73.23%                      | 66.36%       | 65.51%        |
| Renter Occupied        | 33.75%    | 1.20%     | 26.56%    | 26.77%                      | 33.64%       | 34.49%        |
| Units in Structure     |           |           |           |                             |              |               |
| 1 Detached             | 47.68%    | 95.55%    | 60.31%    | 58.55%                      | 61.45%       | 61.70%        |
| 1 Attached             | 7.15%     | 3.25%     | 5.06%     | 5.71%                       | 5.27%        | 5.79%         |
| 2                      | 5.67%     | 0.00%     | 4.24%     | 4.22%                       | 2.31%        | 3.80%         |
| 3 or 4                 | 3.68%     | 0.00%     | 5.39%     | 3.21%                       | 3.60%        | 4.44%         |
| 5 to 9                 | 6.34%     | 0.00%     | 5.51%     | 4.93%                       | 4.18%        | 4.78%         |
| 10 to 19               | 7.25%     | 0.00%     | 3.77%     | 5.16%                       | 5.46%        | 4.49%         |
| 20 to 49               | 9.08%     | 0.00%     | 1.46%     | 5.74%                       | 7.25%        | 3.52%         |
| 50 or more             | 3.97%     | 0.00%     | 1.08%     | 2.57%                       | 2.81%        | 4.88%         |
| Mobile Home            | 9.18%     | 1.20%     | 13.18%    | 9.90%                       | 7.64%        | 6.52%         |
| Boat, RV, Van, etc.    | 0.00%     | 0.00%     | 0.00%     | 0.00%                       | 0.03%        | 0.08%         |
| Median Value           | \$156,900 | \$139,800 | \$133,500 | \$157,800                   | \$123,900    | \$181,400     |
| Persons/Household      |           |           |           |                             |              |               |
| 1 Person               | 32.88%    | 14.80%    | 29.99%    | 28.43%                      | 31.66%       | 27.45%        |
| 2 Person               | 37.16%    | 31.17%    | 32.81%    | 36.93%                      | 36.69%       | 33.49%        |
| 3 Person               | 14.92%    | 18.17%    | 16.52%    | 15.30%                      | 13.76%       | 15.86%        |
| 4 Person               | 9.45%     | 19.98%    | 13.40%    | 12.19%                      | 10.75%       | 13.35%        |
| 5 Person               | 4.46%     | 8.66%     | 5.02%     | 5.39%                       | 4.88%        | 6.08%         |
| 6 Person               | 0.77%     | 6.62%     | 2.08%     | 1.29%                       | 1.50%        | 2.31%         |
| 7 Person               | 0.36%     | 0.60%     | 0.18%     | 0.48%                       | 0.77%        | 1.46%         |
| Average Household Size | 2.2       | 3         | 2.34      | 2.35                        | 2.3          | 2.61          |
| Owner Occupied         | 2.39      | 3         | 2.55      | 2.53                        | 2.48         | 2.68          |
| Renter Occupied        | 1.83      | 2.9       | 1.76      | 1.86                        | 1.95         | 2.48          |

Based on Tables B11016, B25002, B25003, B25010, B25024, and B25077 of the 2008-2012 US Census Bureau American Community Survey

\*The Bismarck, ND MSA (2010) is comprised of all of Burleigh and Morton Counties

# 3: HOUSING

In comparison to State and national data, the Bismarck-Mandan Metropolitan Statistical Area (MSA) has a significantly lower vacancy rate. The median value of homes in the Bismarck-Mandan MSA is significantly higher than median housing values of North Dakota and significantly lower than median housing values of the United States. The average household size is slightly higher in the Bismarck-Mandan MSA when compared to the State and significantly lower when compared to the Nation. Other existing condition housing characteristics are relatively consistent between the Bismarck-Mandan MSA, the State, and Nation. A higher degree of variability can be noted among the various jurisdictions within the Bismarck-Mandan MSA.

## RECENT TRENDS

The Bismarck-Mandan MPO area is broken down into smaller geographic units identified as Transportation Analysis Zones (TAZs). There are currently 364 TAZs which comprise the MPO area. These TAZs include housing and employment data used in the Bismarck-Mandan MPO transportation model to project future traffic conditions. The Bismarck-Mandan MPO collects building permit data (by TAZ) for all jurisdictions, throughout the MPO area. This data helps to identify growth patterns within the region and serves to provide population estimates between the US Census Bureau Decennial Census collection periods by TAZ. In general Burleigh and Morton County have experienced a heightened level of growth in residential dwelling unit permits since 2010. **Figure 3.2** identifies simple annual growth rate of 3.92% for the past two years. This is significantly higher than historic population growth patterns of approximately 1% to 1.5% annual growth.

Figure 3.2: \*Bismarck, ND Metropolitan Statistical Area 2011 to 2013 New Dwelling Unit Permits

| Total Dwelling Units 2010 | New Dwelling Units 2011 | Total Dwelling Units 2011 | 2010-2011 % Change | New Dwelling Units 2012 | Total Dwelling Units 2012 | 2011-2012 % Change | New Dwelling Units 2013 | Total Dwelling Units 2013 | 2012-2013 % Change | 2011-2013 Simple Annual Rate of Change |
|---------------------------|-------------------------|---------------------------|--------------------|-------------------------|---------------------------|--------------------|-------------------------|---------------------------|--------------------|--|
| 47,833                    | 893                     | 48,726                    | 1.87%              | 2,079                   | 50,805                    | 4.27%              | 1,738                   | 52,543                    | 3.42%              | 3.28%                                  |

Total dwelling units 2010 based on the 2010 US Census Bureau data. New dwelling unit's data obtained from the Cities of Bismarck and Mandan, and Morton County Building Inspections Divisions

\*The Bismarck, ND MSA (2010) is comprised of all of Burleigh and Morton Counties.

The following Maps 1-5 (on pages 21-25) labeled *Bismarck-Mandan MPO Area Dwelling Units by Transportation Analysis Zone (TAZ) – Percent Increase and Total Dwelling Unit Increase: 2010-2012* identify growth of residential dwelling units within the MPO area since 2010 by TAZ. Generally the most significant recent dwelling unit growth has been experienced in the following areas: northwest Bismarck (TAZs 45, 46, 322, 348, 347, and 52); northeast Bismarck (TAZs 44, 343, 344, 52, and 361); south Bismarck (TAZ 152 and 162); Lincoln area (TAZs 177, 178, 190, and 194); southeast Mandan (TAZ 289 and 293); southwest Mandan (TAZ 274); and north Mandan (TAZ 223 and 239)

# Bismarck-Mandan MPO Area Dwelling Units by Transportation Analysis Zone (TAZ) - Percent Increase and Total Dwelling Unit Increase: 2010-2013

(Based on residential building permits issued 2011-2013)

**Map 1**

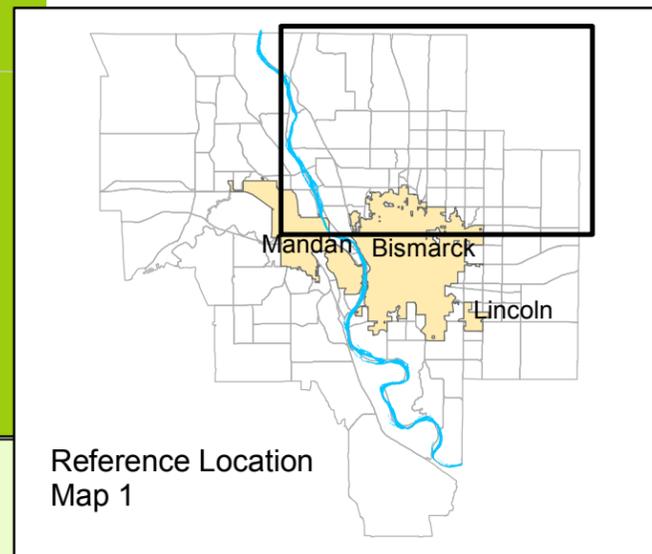
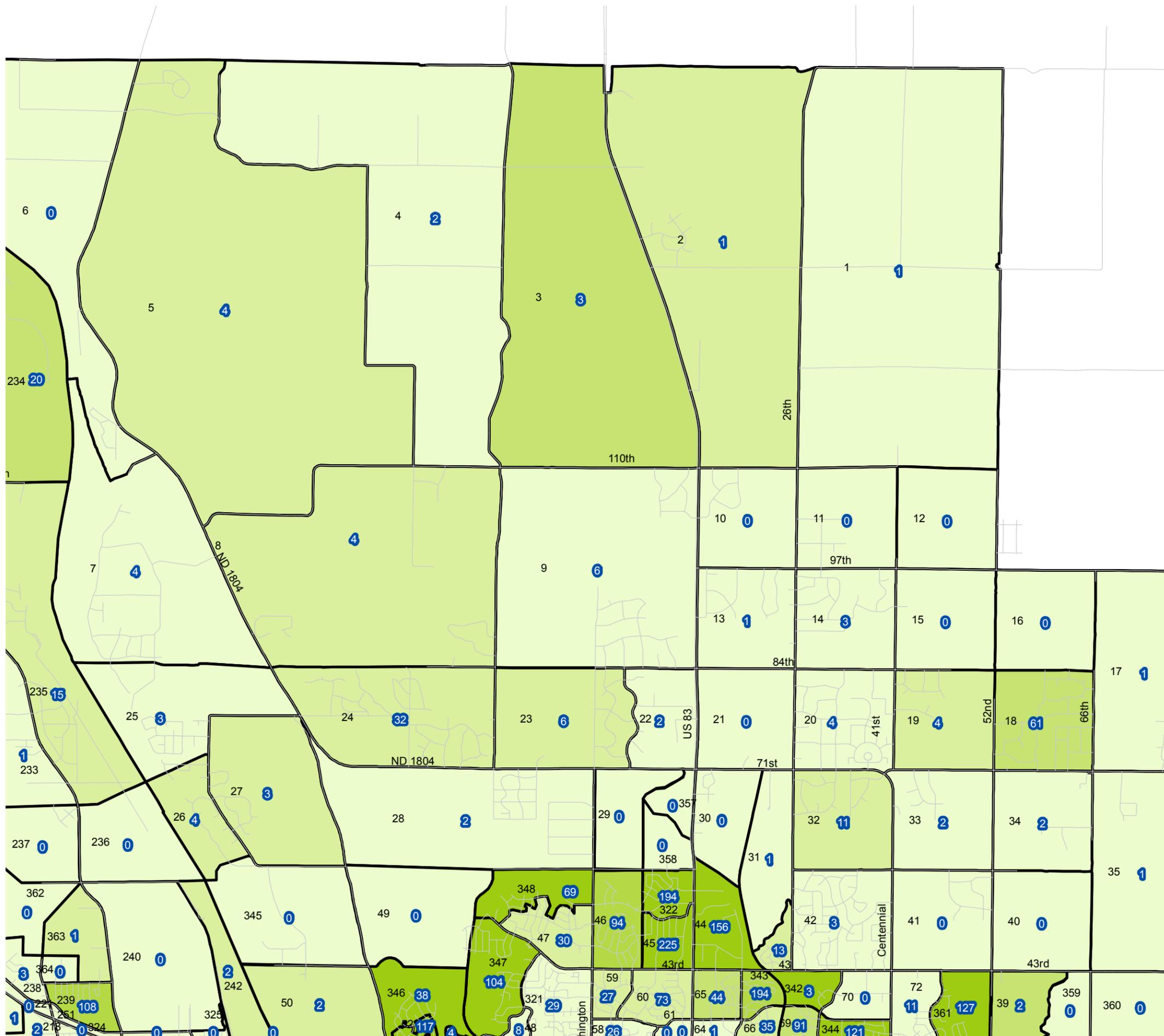


1 = Transportation Analysis Zone Number

**1** = Number of New Dwelling Units in 2011, 2012 and 2013



Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County.  
 w:MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\ "BuildingPermit\_Change2011\_2013\_Map1"



# Bismarck-Mandan MPO Area Dwelling Units by Transportation Analysis Zone (TAZ) - Percent Increase and Total Dwelling Unit Increase: 2010-2013

(Based on residential building permits issued 2011-2013)

Map 2

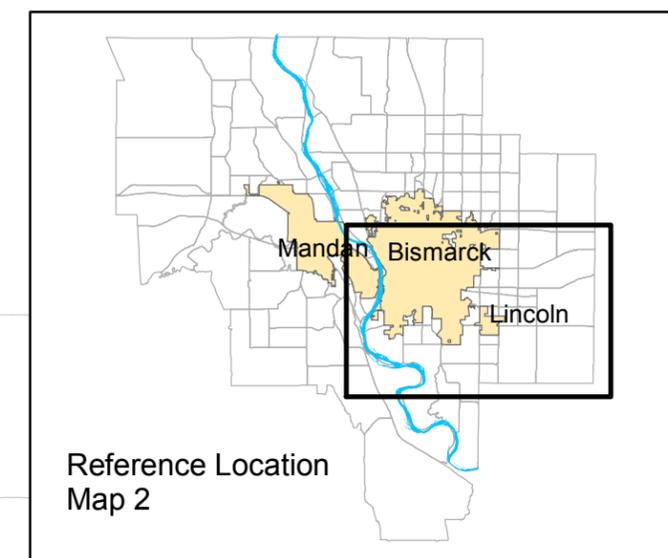
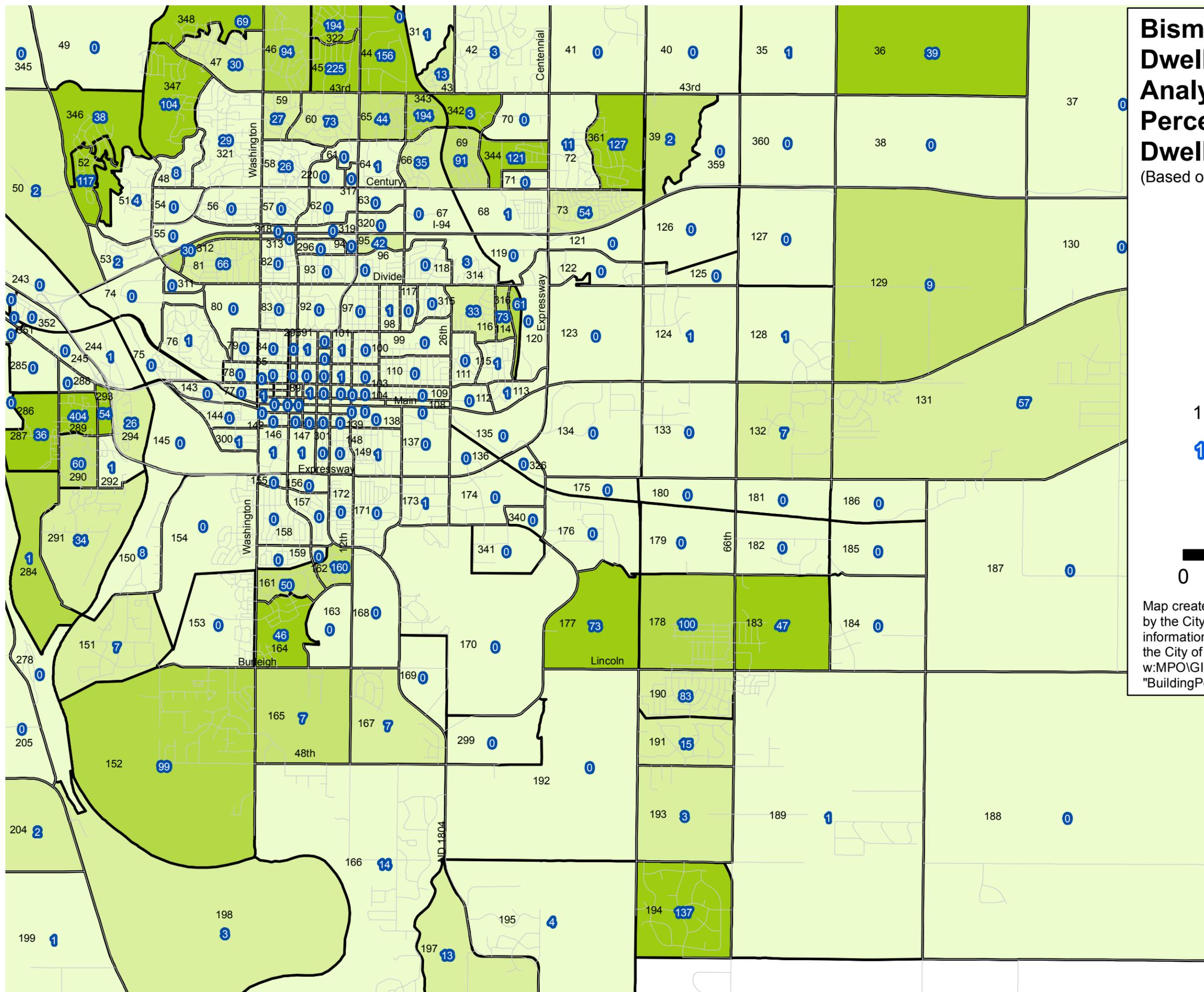


1 = Transportation Analysis Zone Number

**1** = Number of New Dwelling Units in 2011, 2012 and 2013



Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County.  
 w:MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\ "BuildingPermit\_Change2011\_2013\_Map2"



# Bismarck-Mandan MPO Area Dwelling Units by Transportation Analysis Zone (TAZ) - Percent Increase and Total Dwelling Unit Increase: 2010-2013

(Based on residential building permits issued 2011-2013)

**Map 3**

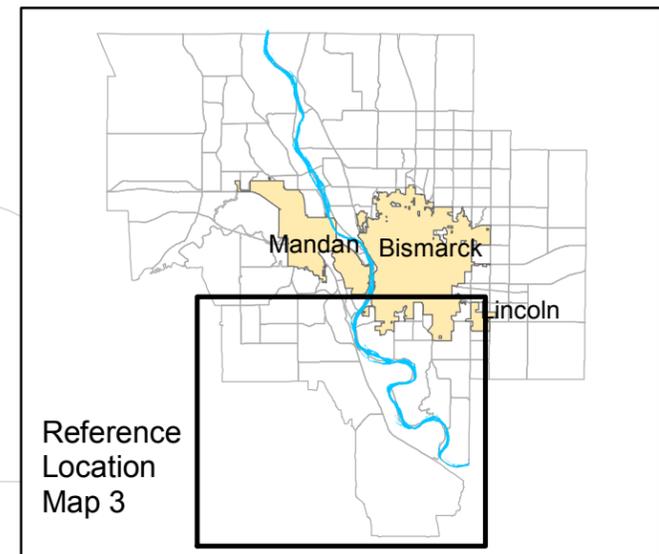
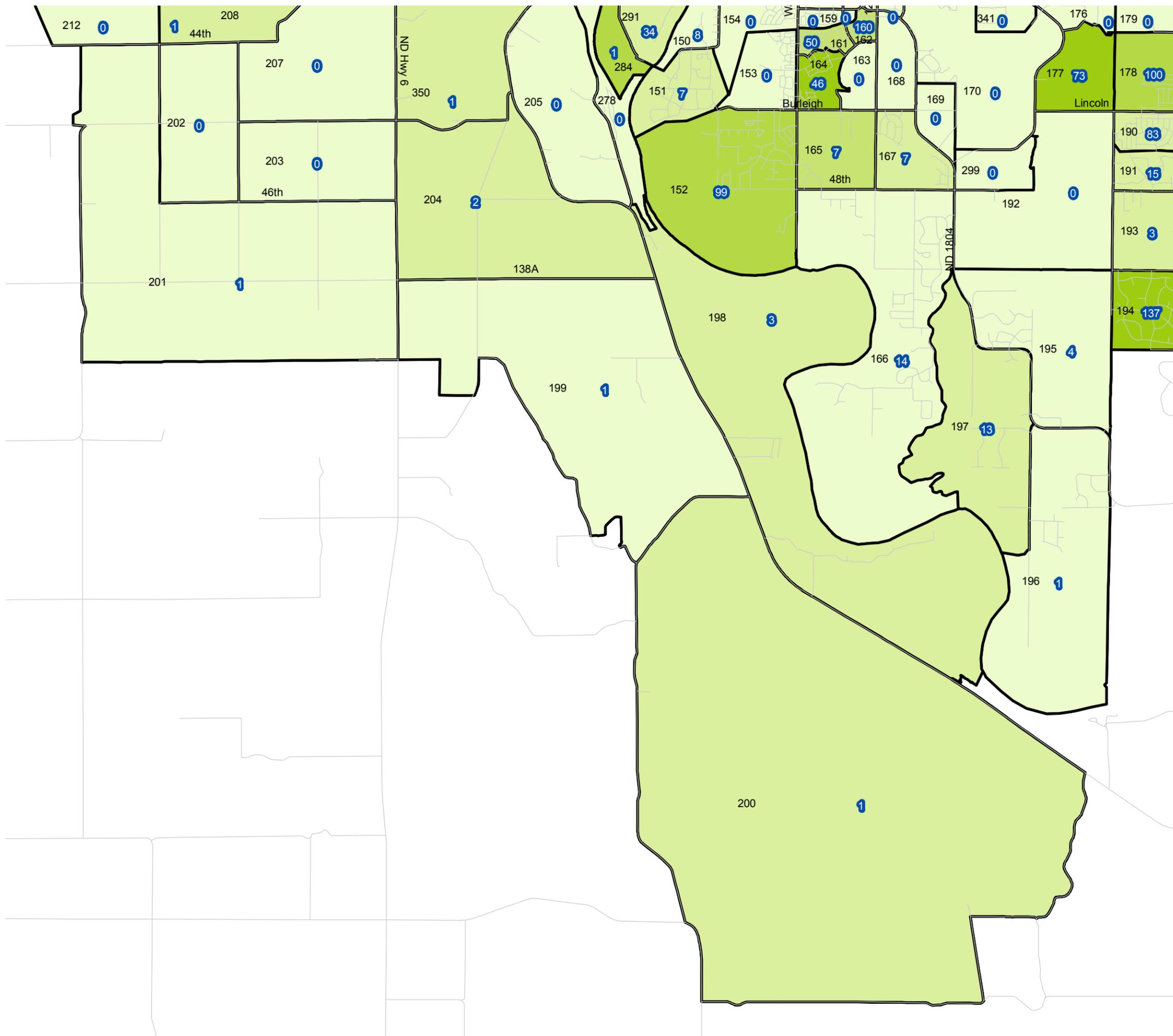


1 = Transportation Analysis Zone Number

**1** = Number of New Dwelling Units in 2011, 2012 and 2013



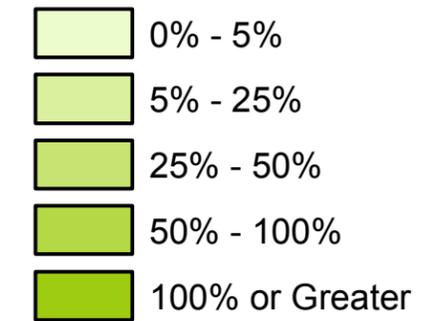
Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County.  
 w:MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\ "BuildingPermit\_Change2011\_2013\_Map3"



# Bismarck-Mandan MPO Area Dwelling Units by Transportation Analysis Zone (TAZ) - Percent Increase and Total Dwelling Unit Increase: 2010-2013

(Based on residential building permits issued 2011-2013)

**Map 4**

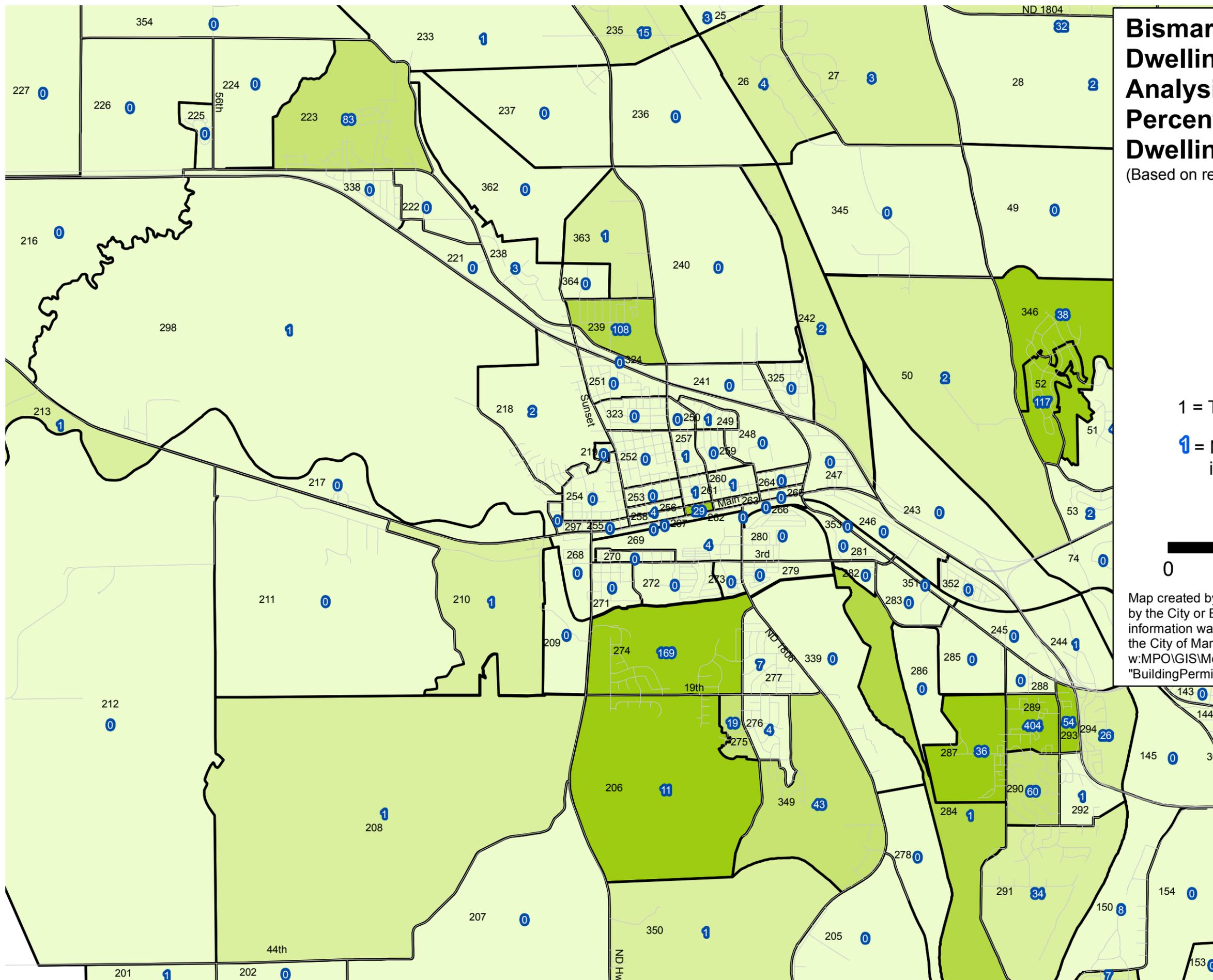
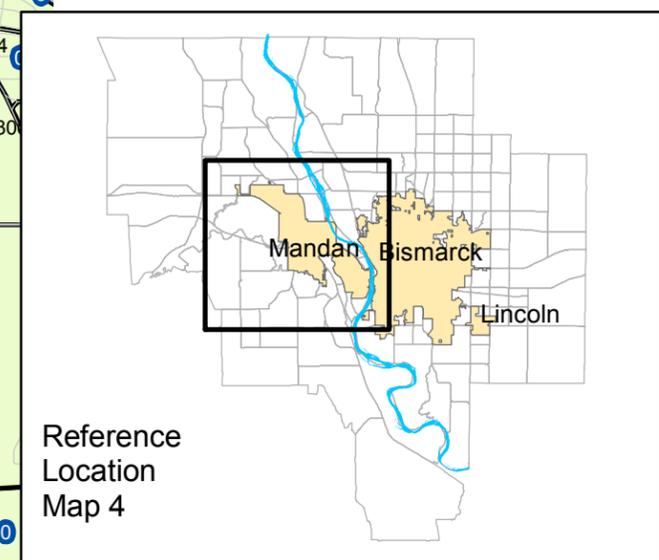


1 = Transportation Analysis Zone Number

**1** = Number of New Dwelling Units in 2011, 2012 and 2013



Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County.  
w:\MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\ "BuildingPermit\_Change2011\_2013\_Map4"



# Bismarck-Mandan MPO Area Dwelling Units by Transportation Analysis Zone (TAZ) - Percent Increase and Total Dwelling Unit Increase: 2010-2013

(Based on residential building permits issued 2011-2013)

**Map 5**

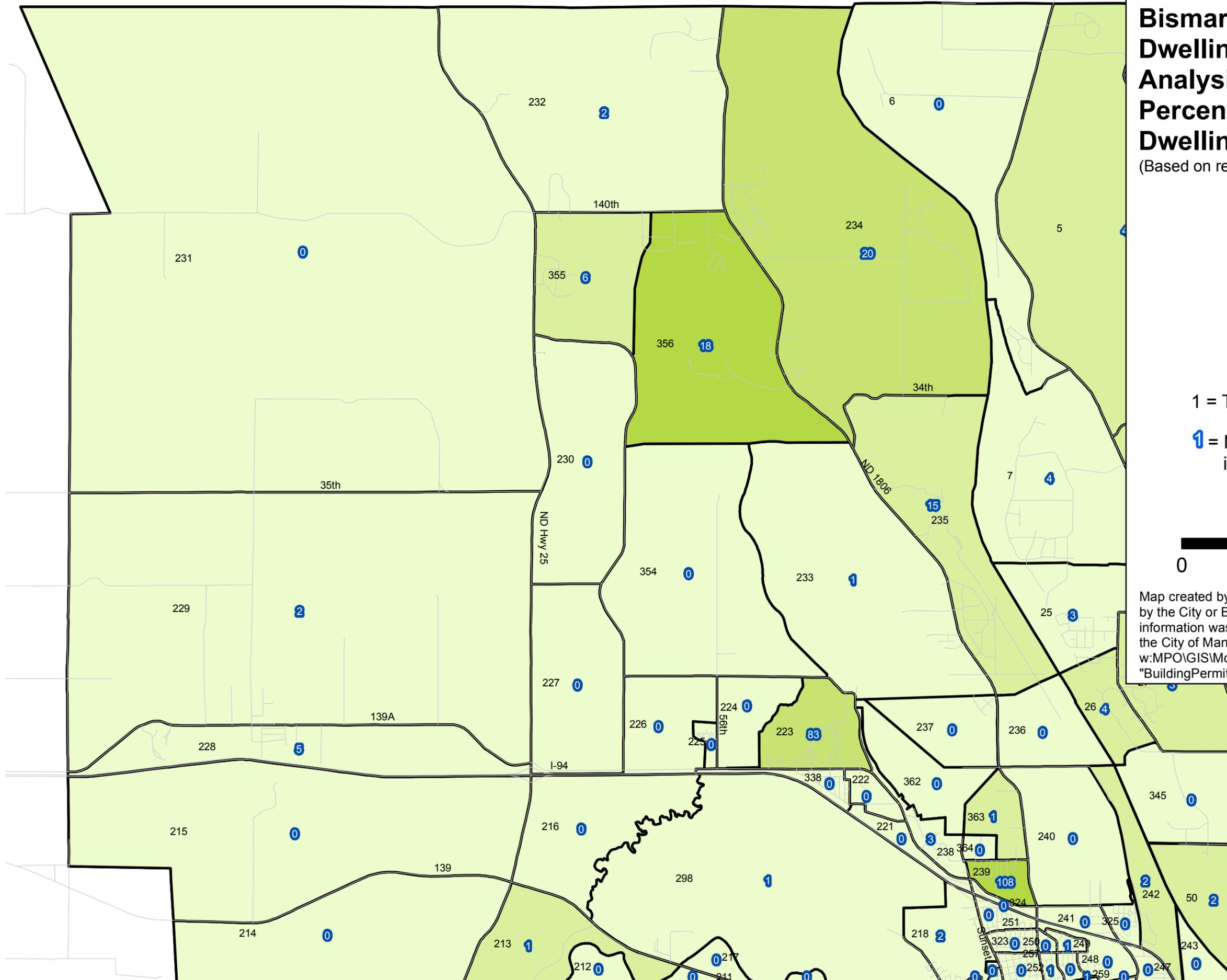
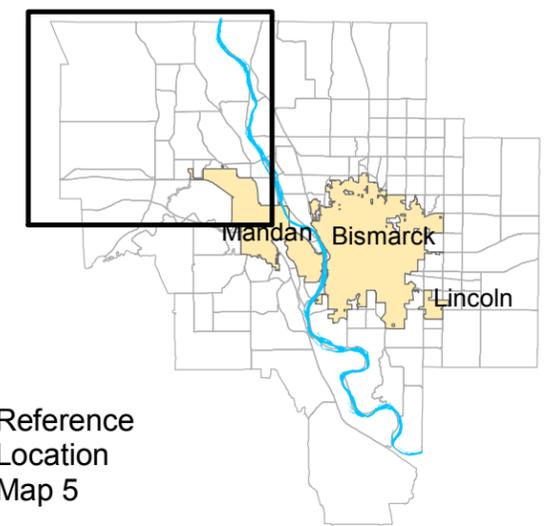


1 = Transportation Analysis Zone Number

**1** = Number of New Dwelling Units in 2011, 2012 and 2013



Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County.  
 w:MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\ "BuildingPermit\_Change2011\_2013\_Map5"



# 3: HOUSING

## AREA HOUSING PROJECTIONS

Recently both the Bismarck-Mandan MPO and the 2012 North Dakota Housing Needs Assessment have developed housing projections for the Bismarck-Mandan MPO area.

### Bismarck-Mandan MPO Projections

The Bismarck-Mandan MPO projects dwelling units for the area to the years 2025 and 2040. The projected dwelling units are distributed throughout the region through a process of computer modeling and staff input from the Bismarck-Mandan MPO member jurisdictions. Population, housing, and employment projections were last developed in 2012 to the horizon years of 2025 and 2040 for the Bismarck-Mandan MPO area. Three scenarios were developed for future housing and employment needs within the Bismarck-Mandan MPO Area which included low growth, moderate growth, and high growth scenarios. The low growth scenario represented a historic growth rate of approximately 1.5 percent annual residential dwelling unit growth between 2010 and 2040. The moderate growth scenario represented a heightened level of growth between 2010 and 2025 of 2.5% annual residential dwelling unit growth then leveling off to approximately 1% growth between 2025 and 2040. The high growth scenario represented a significantly heightened level of growth between 2010 and 2025 of approximately 3.5% annual residential dwelling unit growth then leveling off to approximately 1% growth between 2025 and 2040. Both the moderate growth and high growth scenario were intended to represent varying degrees of influence the recent energy development in Western North Dakota would have on the Bismarck-Mandan MPO area. The Bismarck-Mandan MPO Policy Board opted to adopt the “High Growth” scenario. The following **Figure 3.3** represents the Bismarck-Mandan MPO area “High Growth” scenario. As previously noted these projections represent a simple annual rate of growth of 3.5% between 2010 and 2025 and approximately 1% between 2025 and 2040.

**Figure 3.3: Projected Households for the Bismarck-Mandan MPO Area (High Growth Scenario)**

| 2010   | 2025   | 2040   |
|--------|--------|--------|
| 45,265 | 68,997 | 79,241 |

*Information based on 2010 US Census Bureau and projections developed by the Bismarck-Mandan MPO in 2012.*

The projected household change by TAZ can be viewed on the following map (on page 28) titled *Bismarck-Mandan MPO Household Change: 2010-2040*.

### 2012 North Dakota Statewide Housing Needs Assessment Projections

A North Dakota Statewide Housing Needs Assessment was conducted by the Center for Social Research at North Dakota State University. This assessment for the North Dakota Housing Finance Agency aimed to identify statewide housing needs throughout the State broken down by region. **Figure 4.4** represents housing projections developed by for

**Figure 3.4: 2012 North Dakota Statewide Housing Needs Assessment Projections (Burleigh and Morton Counties)**

| 2010   | 2025   | 2040          |
|--------|--------|---------------|
| 46,386 | 58,927 | Not Conducted |

*Information based on “2012 North Dakota Statewide Housing Needs Assessment” (Table 3 page 86).*

# 3: HOUSING

the North Dakota State Housing Needs Assessment to the year 2025 for Burleigh and Morton Counties. The projections identified in **Figure 4.4** represent a simple annual rate of growth of 1.8% between 2010 and 2025. Projections beyond 2025 were not conducted as part of this study.

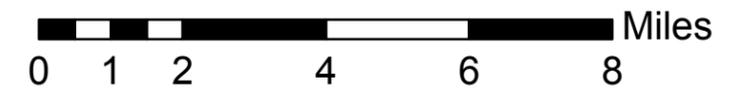
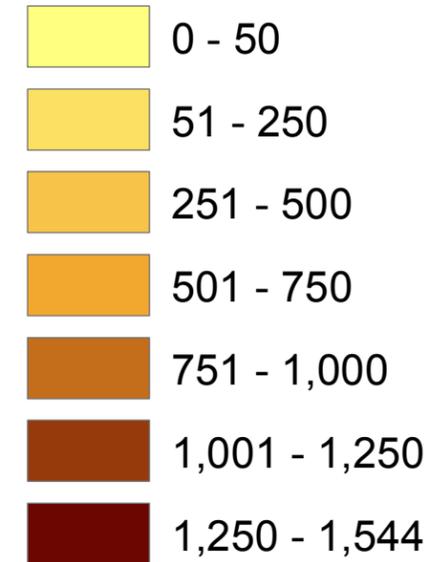
## RECENT TRENDS COMPARED TO AREA PROJECTIONS

Both the Bismarck-Mandan MPO projections and the *2012 North Dakota Statewide Housing Needs Assessment* projections depict a heightened level of growth from historic growth rates. Recent growth trends may be more consistent with the projections adopted by the Bismarck-Mandan MPO Policy Board. However, it is important to note that two years is not sufficient time to determine the accuracy of long term projections. In any given year a high degree of variability may occur. For instance the flooding events which occurred in the Bismarck-Mandan MPO area may have had some influence on residential building permits issued in 2011 and 2012. Building permit activity will continue to be monitored in comparison to area projections.

In general the distribution of projected housing units by the Bismarck-Mandan MPO has been consistent with recent building permit activity. However, there was more residential growth in 2011-2013 than the 2010-2040 projections would have concluded for this time period for the following TAZ areas: 44; 45; 52; 177; 194; 274; 289; 322; and 344. At this time the differences identified between actual and projected growth patterns are not drastic enough to warrant modifications to the socio-economic data associated with the Bismarck-Mandan MPO transportation model. However, the projected distribution of households in the Bismarck-Mandan MPO area will continue to be monitored in comparison to residential building permit activity.

# Bismarck-Mandan MPO Household Change: 2010-2040

(High Growth Assumption)



Map created by B.J.E . May 2013. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. The change in households between 2010-2040 was based on the "High Growth" scenario developed by the Bismarck-Mandan MPO.

w:MPO\GIS\Monitoring Report\Socio-Economic\TAZ 2012\HH\_Change\_by\_TAZ\_2040\_11x17"

# 4: Employment

The location and characteristics of employment influences travel patterns within a region. Employment sites, for instance, are destinations which attract trips not only from employees working at the site but from customers or visitors to the employment site. The type of employment may also influence the number of trips, for example, a retail or service oriented business may attract a greater number of trips per employee when compared to an industrial oriented business. This chapter examines some current characteristics and locations of employment within the region.

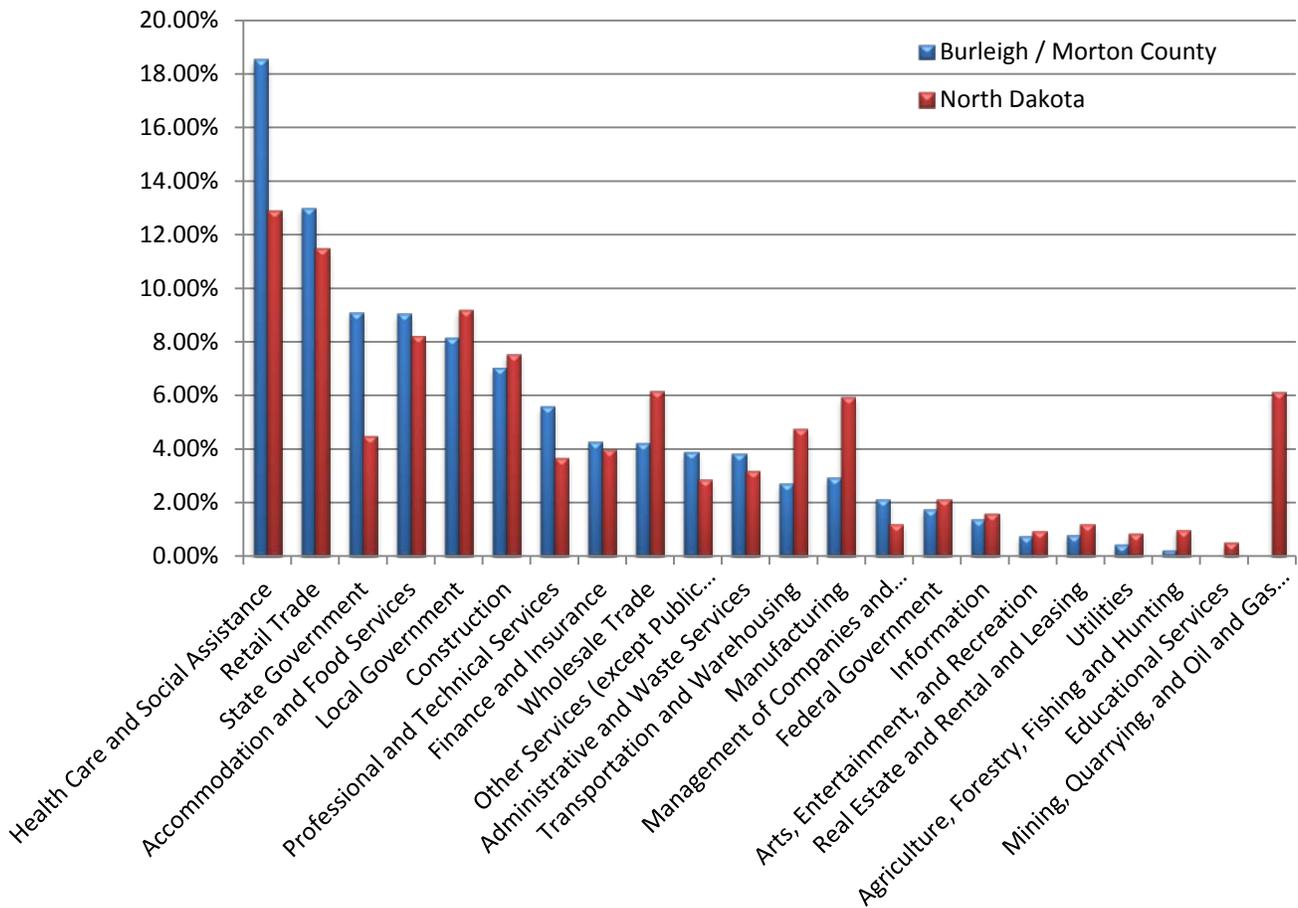
## EXISTING AND PROJECTED EMPLOYMENT CHARACTERISTICS

Labor market information by the North American Industrial Classification System (NAICS) was collected from Job Service North Dakota for the Bismarck, ND MSA and North Dakota. The following **Figure 4.1** compares the percent of employees by the NAICS category for the Bismarck – Mandan MPO Counties of Burleigh and Morton to the State of North Dakota. The five leading industries, by employment, in the Bismarck, ND MSA include Health Care and Social Assistance, Retail Trade, State Government, Accommodation and Food Services, and Local Government. Compared to North Dakota, the Bismarck, ND MSA has a significantly higher percentage of individuals employed in the Health Care and State Government industries. North Dakota has a noticeably higher percentage of individuals involved in the Wholesale Trade, Transportation and Warehousing, and Manufacturing industries. It should be noted that some employment information related to the Educational Services and Mining, Quarrying, and Oil and Gas Extraction industries was considered “Confidential” for Burleigh or Morton County so it is unknown at this time how many individuals are employed in those sectors.

**Figure 4.2** represents the average annual wage for the Bismarck - Mandan MPO counties in comparison to other North Dakota MPO populated counties and statewide.

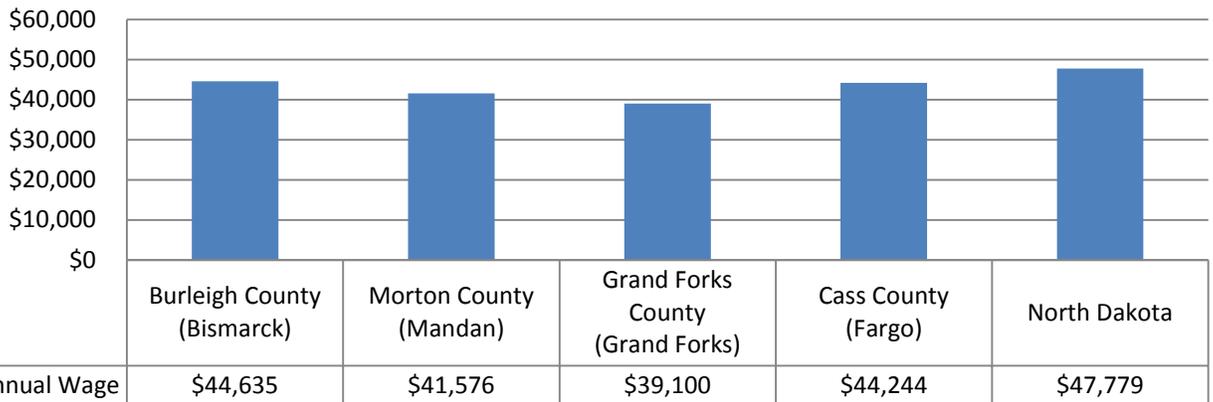
# 4: Employment

**Figure 4.1: Jobs by NAICS Industry Sector for Burleigh & Morton County in Comparison to North Dakota, First Quarter 2013**



Labor Market Information Center, Job Service North Dakota

**Figure 4.2: Average Annual Wage for the Bismarck - Mandan MPO Counties in Comparison to Other North Dakota Populated Counties and Statewide, First Quarter 2013**



Labor Market Information Center, Job Service North Dakota

# 4: Employment

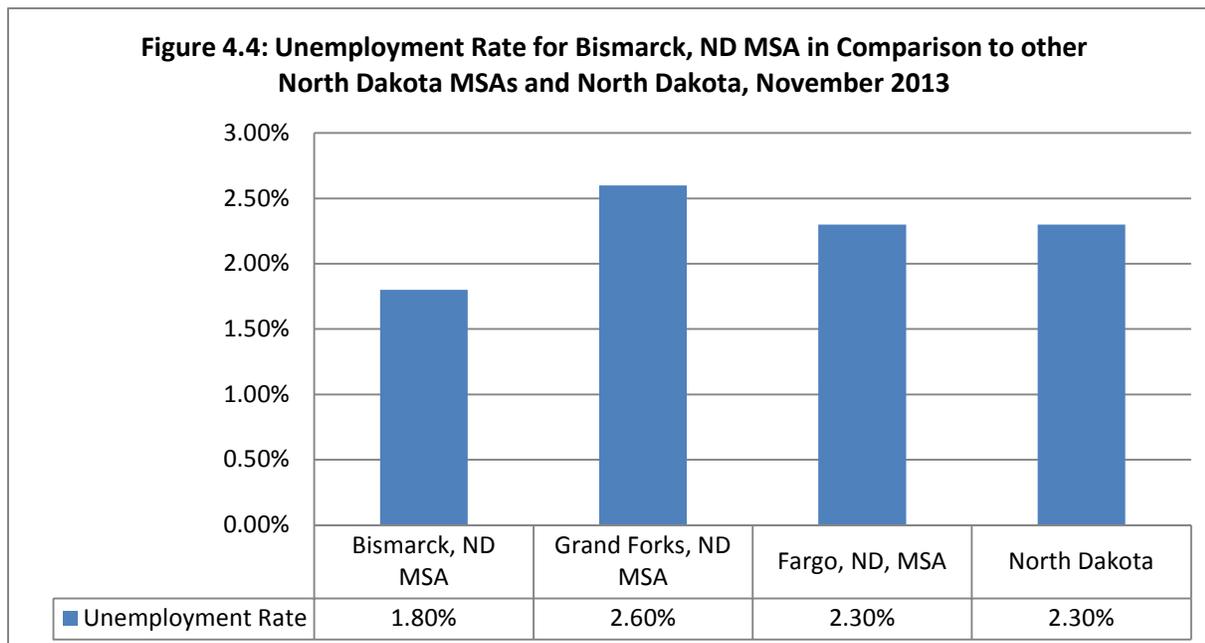
The following **Figure 4.3** is a list of the top 10 employers in the Bismarck-Mandan MPO area by employee size:

**Figure 4.3: Top 10 Employment Sites in Bismarck-Mandan Area, April 2014**

| Employer                        | Number of Employees |
|---------------------------------|---------------------|
| State of North Dakota           | 4,600               |
| Sanford Health                  | 3,110               |
| St. Alexius Medical Center      | 2,305               |
| Bismarck Public School District | 1,970               |
| Aetna                           | 880                 |
| City of Bismarck                | 862                 |
| MDU Resources Group             | 780                 |
| Bismarck State College          | 779                 |
| Mandan Public School District   | 600                 |
| Housing Industry Training (HIT) | 586                 |

*Based on data obtained from the Bismarck-Mandan Development Association web-site:  
www.bmda.org/workforce/employers.asp*

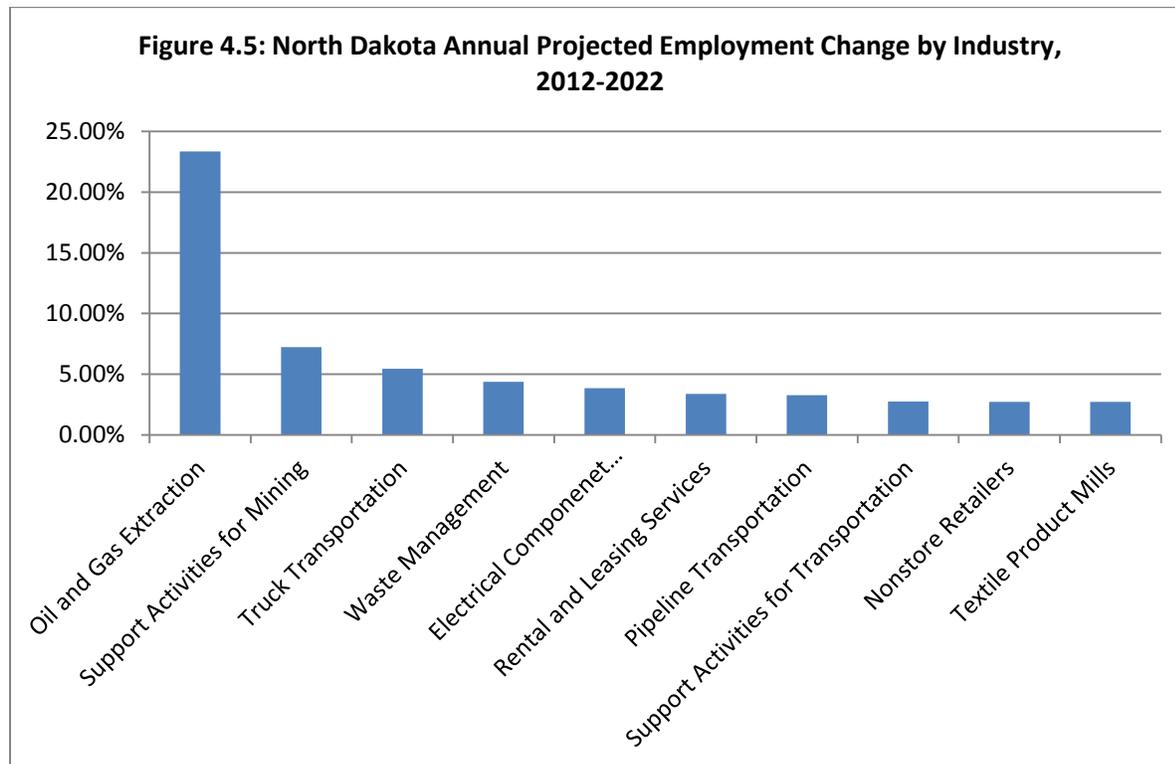
**Figure 4.4** identifies unemployment rates for the Bismarck-Mandan MPO area jurisdictions in comparison to other Metropolitan Statistical Areas, and the State of North Dakota. In general unemployment rates within the Bismarck-Mandan MPO area are lower compared to other North Dakota Metropolitan Statistical Areas and the State of North Dakota. By comparison, the United States Department of Labor Bureau reported a nationwide unemployment rate of 7.0% in November 2013.



*Labor Market Information Center, Job Service North Dakota  
\* Bismarck ND MSA denotes Burleigh and Morton Counties*

# 4: Employment

**Figure 4.5** represents the 10 highest projected growth industries statewide, from 2010 to 2020. As the figure indicates the Oil and Gas Extraction and associated industries are projected to grow significantly statewide from 2012 to 2022.



Labor Market Information Center, Job Service North Dakota

Locally, in 2012 the Bismarck-Mandan MPO updated the socio-economic projections for the areas transportation model. Housing and employment projections were established for the Bismarck-Mandan MPO area to the years 2025 and 2040. Generally, three different employment sectors were considered and include retail oriented jobs, service oriented jobs, and all other jobs. The following **Figure 4.6** represents the jobs projected for the Bismarck-Mandan MPO area. These projections indicate a simple annual rate of change of approximately 3.12% from 2010 to 2040.

**Figure 4.6: Bismarck-Mandan MPO 2012 Employment Projections, 2025 and 2040**

| Employment Sector | 2010          | 2025          | 2040           |
|-------------------|---------------|---------------|----------------|
| Retail            | 11,473        | 17,495        | 21,733         |
| Service           | 26,730        | 46,607        | 60,415         |
| Other             | 25,921        | 35,435        | 42,080         |
| <b>Total</b>      | <b>64,124</b> | <b>99,537</b> | <b>124,228</b> |

*Data based on projections developed for the Bismarck-Mandan MPO in 2012. Employment figures extracted from the Transportation Analysis Zone Structure within the Bismarck-Mandan MPO transportation model.*

# 4: Employment

Additionally, Woods & Poole Economics is a firm which annually projects population and employment trends for regions throughout the United States. Woods & Poole data was acquired in 2012 in preparation for the development of Bismarck-Mandan MPO housing and employment projections. Woods & Poole population and employment projections were also established to the year 2040. It should be noted that the Woods & Poole projections consider the entire two-county area of Burleigh and Morton. The following **Figure 4.7** depicts total Woods & Poole employment estimates and projections for 2010, 2025, and 2040. The Woods and Poole employment projections from 2012 indicate a more conservative simple annual rate of change of approximately 1.89% compared to the Bismarck-Mandan MPO projections. Growth trends within the region will continue to be monitored to ensure the validity of the Bismarck-Mandan MPO housing and employment projections. The Bismarck-Mandan MPO, as well as, the Woods & Poole projections assume jobs will grow at a faster rate than population/households within the region.

**Figure 4.7: Woods & Poole  
Total Employment  
Estimates and Projections  
for Burleigh and Morton  
Counties, 2010, 2025, 2040**

| 2010   | 2025   | 2040    |
|--------|--------|---------|
| 79,414 | 99,279 | 124,388 |

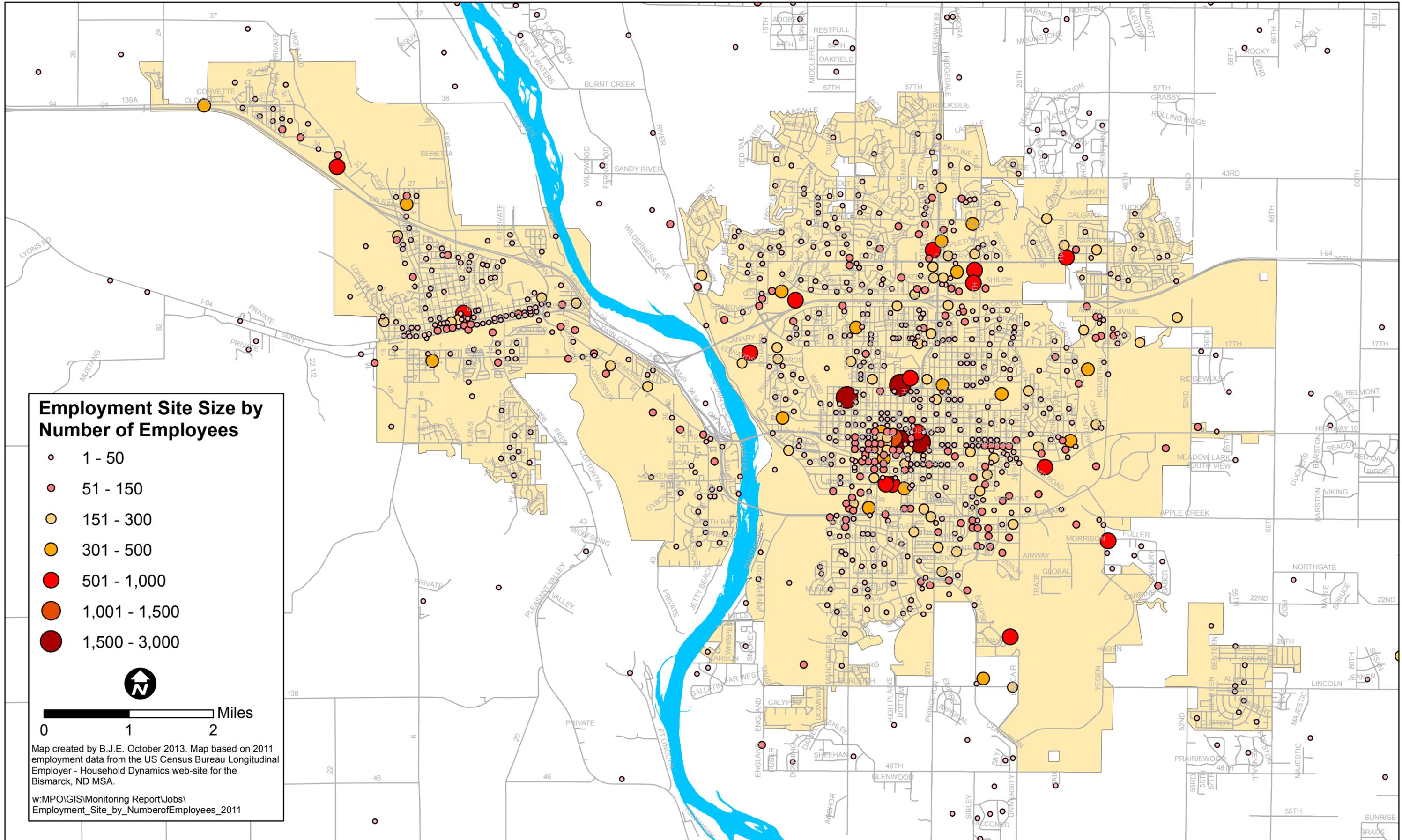
Estimates and projections based on Woods & Poole Excel Spreadsheets associated with the Burleigh County and Morton County 2012 Data Pamphlet.

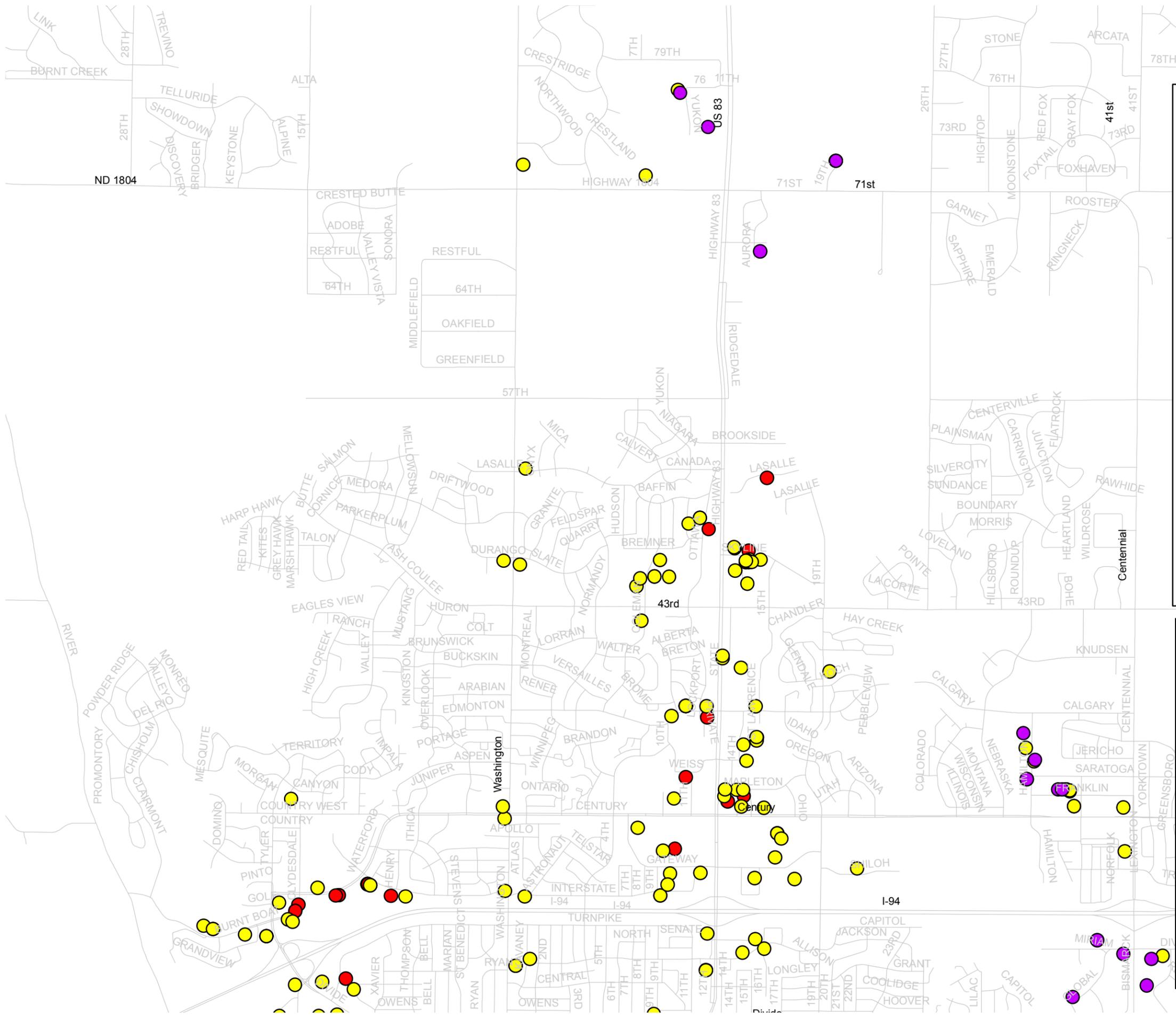
The following series of maps depict the location of existing and projected employment within the region. The first map identifies employment site locations by number of employees based on 2011 data. The next set of maps identifies recent building permit activity for Retail, Service, and (all) Other employment categories. The final series of maps in this chapter identify locations of projected employment between 2010 and 2040 by Transportation Analysis Zone (TAZ). Although the bulk of projected employment is identified on the perimeters of the communities of Bismarck, Lincoln, and Mandan building permits issued over the past two years indicate activity in both the mature parts of Bismarck and Mandan, as well as, the developing areas on the perimeters of the communities. The locations of building permits for businesses, within the region, will continue to be monitored to ensure consistency with projected employment locations.

# *4: Employment*

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# Employment Sites by Size in the Bismarck-Mandan Area, 2011





### Bismarck-Mandan MPO Area Building Permits Issued by Employment Type, 2010-2013 (Map 1)

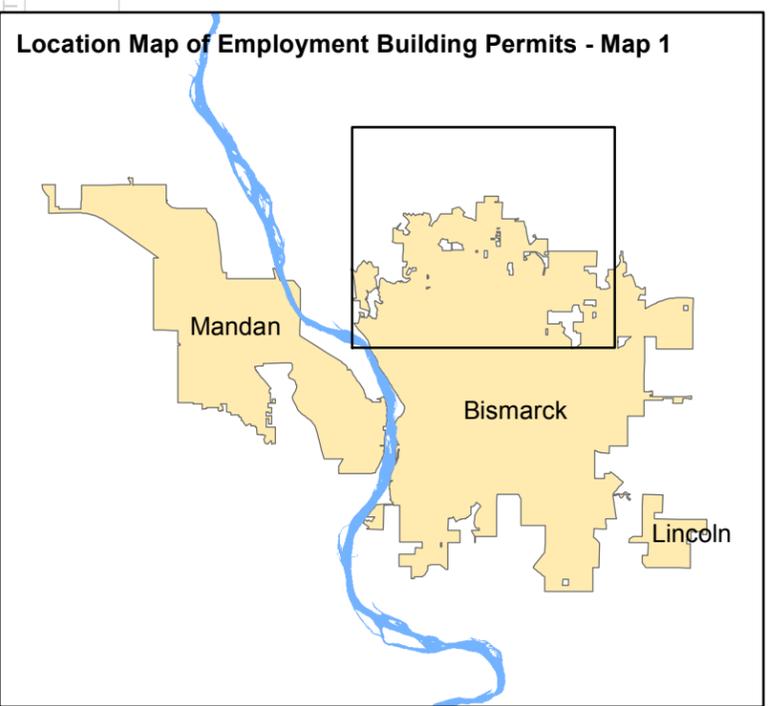
(Based on building permits issued 2011-2013)

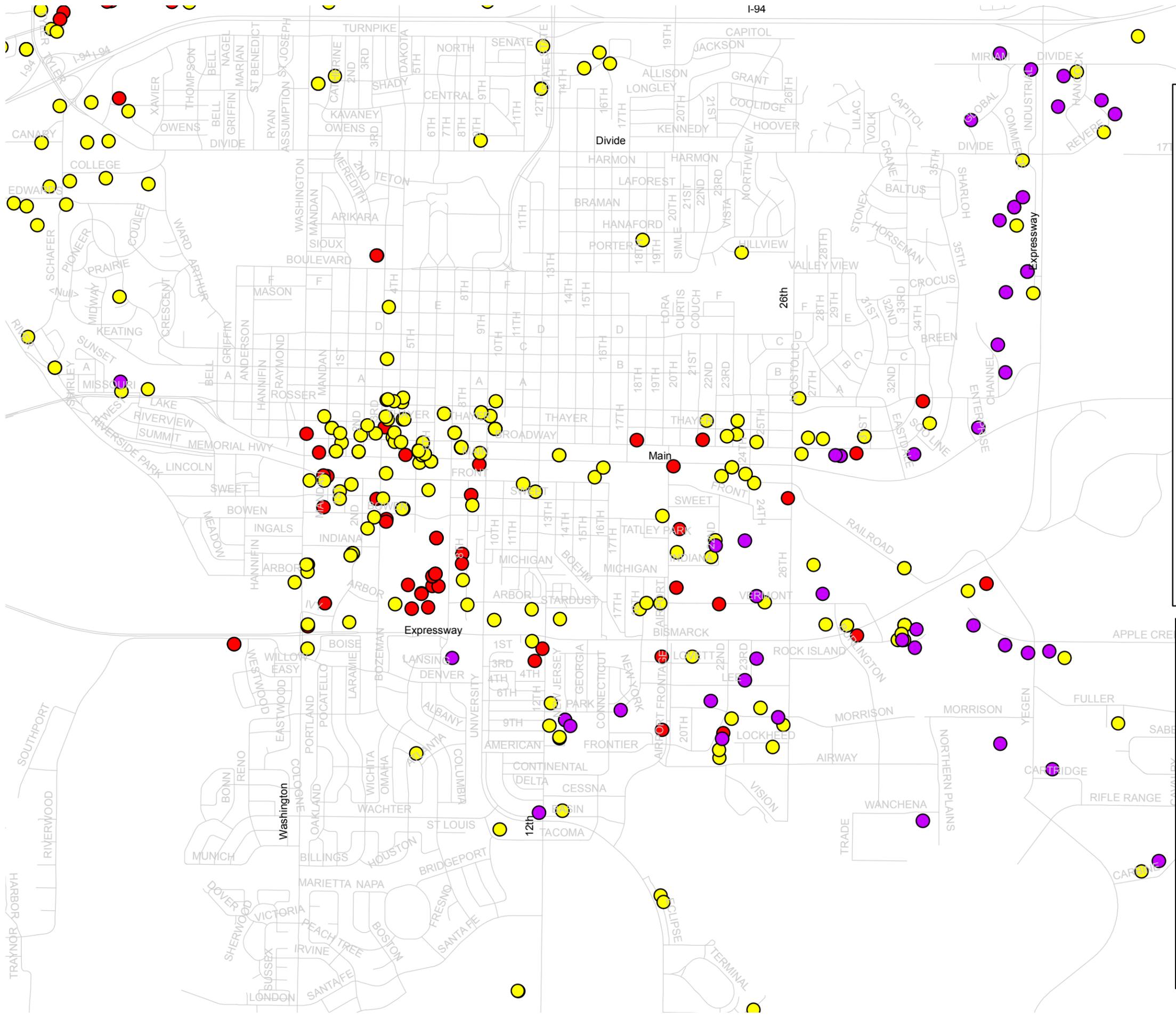
- Service Employment Building Permits
- Retail Employment Building Permits
- Other Employment Building Permits





Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County. w:\MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\Employment\Employment\_BuildingPermits\_Map1

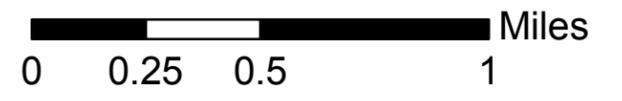




# Bismarck-Mandan MPO Area Building Permits Issued by Employment Type, 2010-2013 (Map 2)

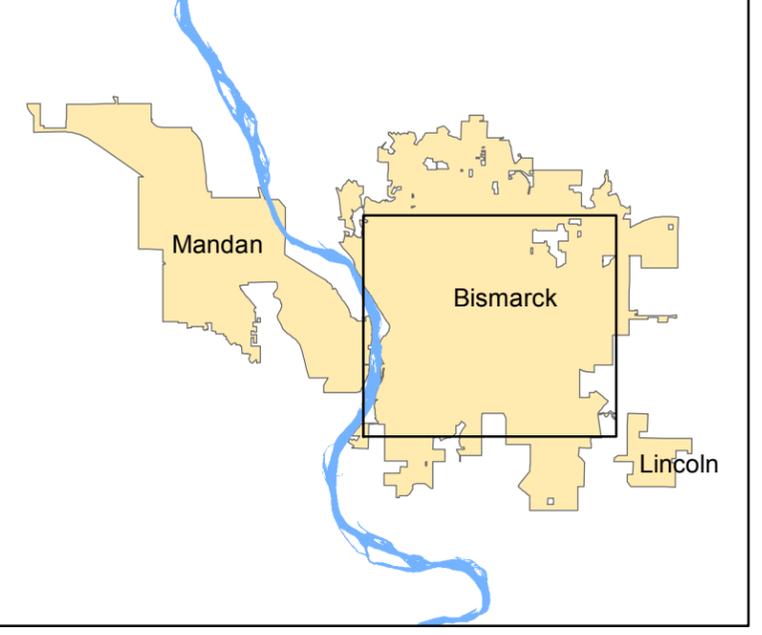
(Based on building permits issued 2011-2013)

- Service Employment Building Permits
- Retail Employment Building Permits
- Other Employment Building Permits

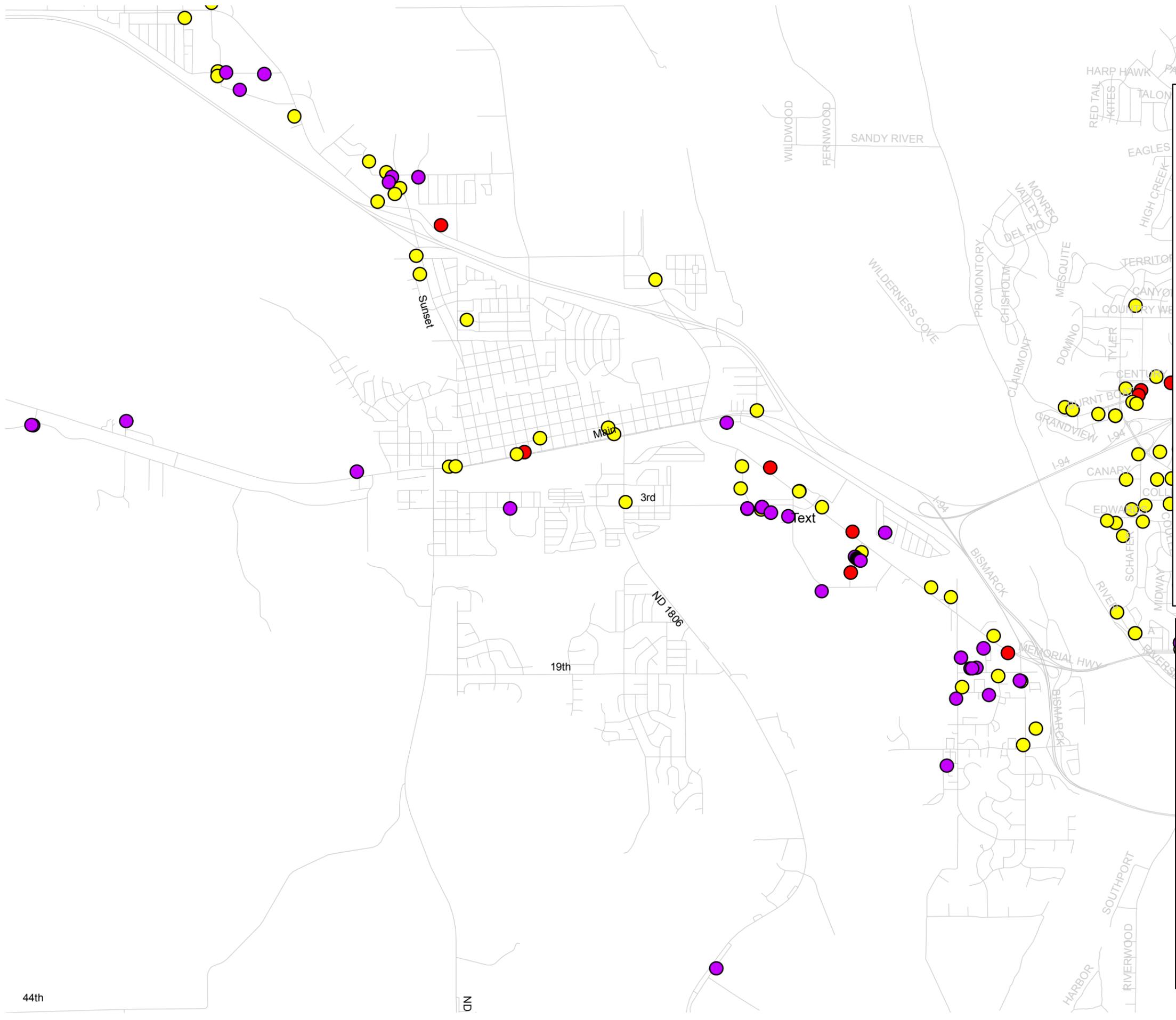


Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County. w:\MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\Employment\Employment\_BuildingPermits\_Map2

**Location Map of Employment Building Permits - Map 2**







### Bismarck-Mandan MPO Area Building Permits Issued by Employment Type, 2010-2013 (Map 4)

(Based on building permits issued 2011-2013)

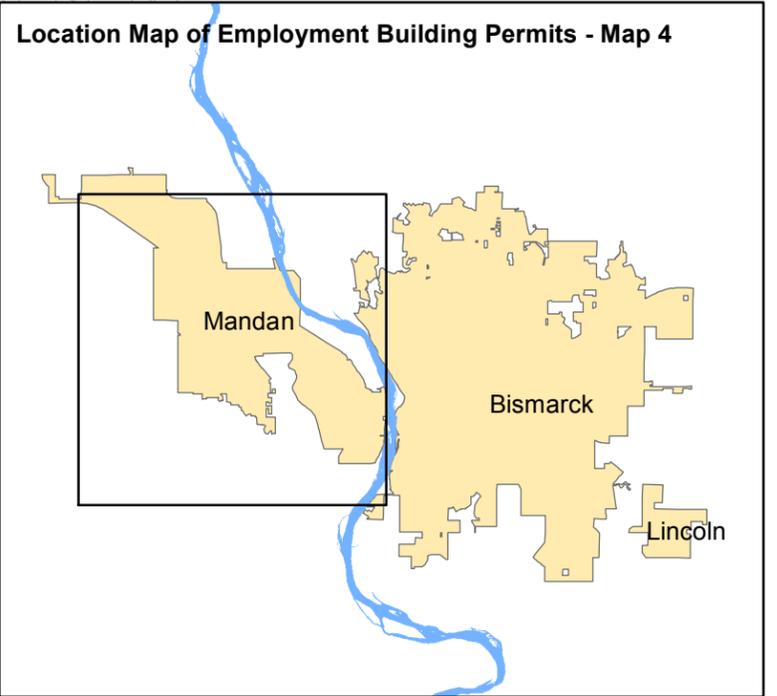
- Service Employment Building Permits
- Retail Employment Building Permits
- Other Employment Building Permits



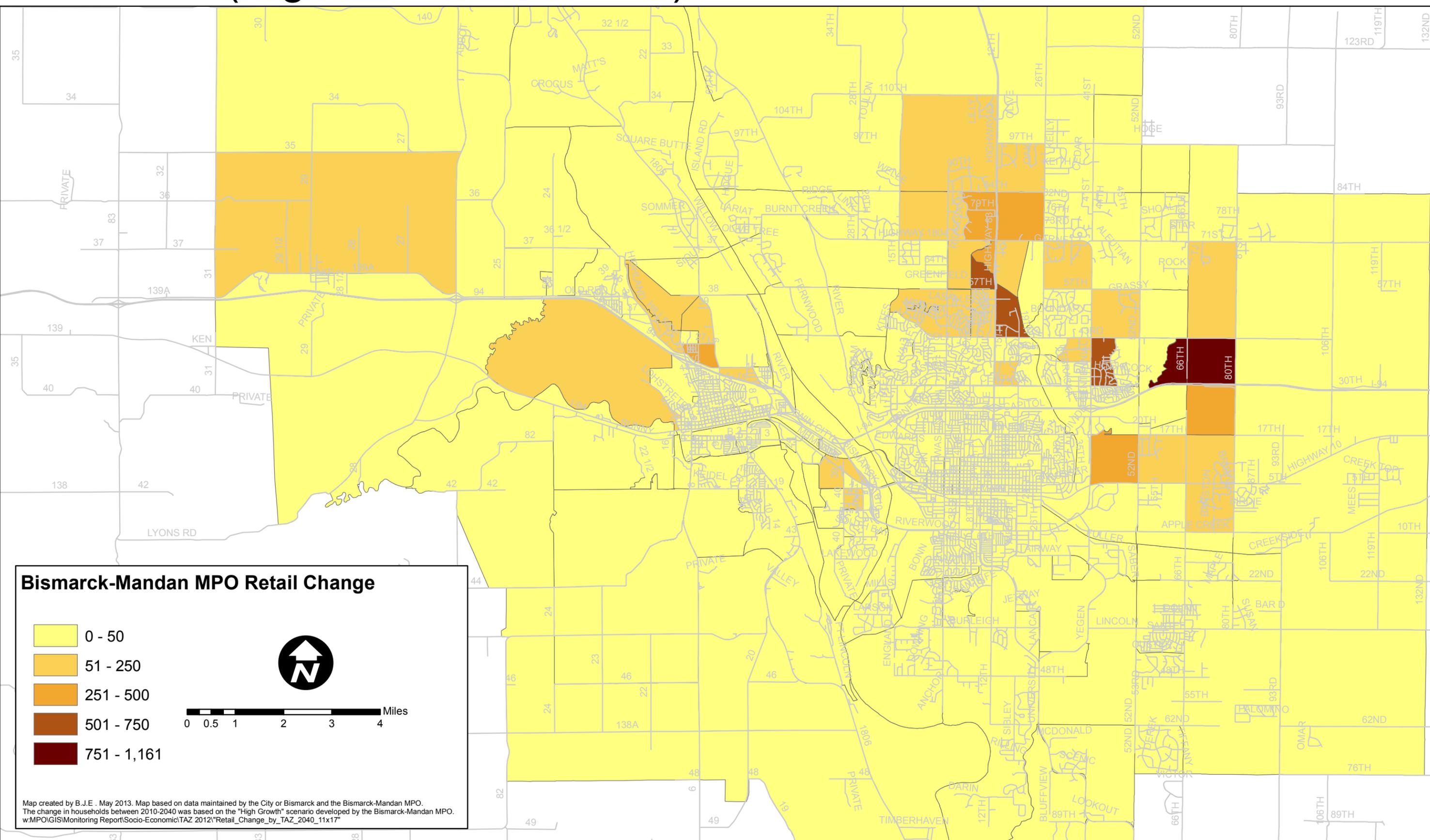


Miles

Map created by W.R.H. December 2014. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. Building permit information was based on data maintained by the City of Bismarck, the City of Mandan, and Morton County. w:\MPO\GIS\Monitoring Report\Socio-Economic\Building Permits\Employment\Employment\_BuildingPermits\_Map4



# Bismarck-Mandan MPO Projected Retail Employment Change by TAZ, 2010-2040 (High Growth Scenario)



## Bismarck-Mandan MPO Retail Change

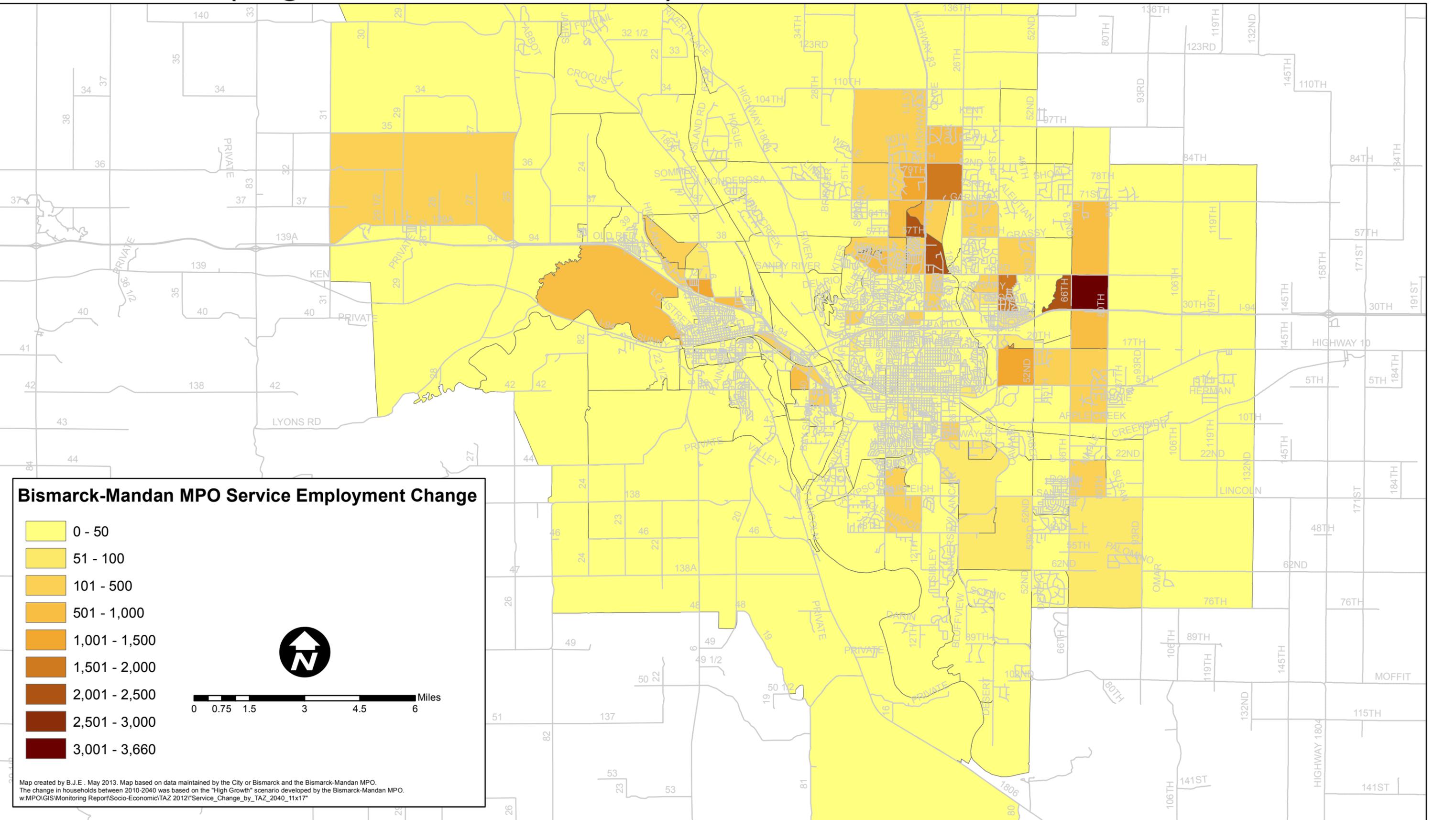
- 0 - 50
- 51 - 250
- 251 - 500
- 501 - 750
- 751 - 1,161



0 0.5 1 2 3 4 Miles

Map created by B.J.E. - May 2013. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. The change in households between 2010-2040 was based on the "High Growth" scenario developed by the Bismarck-Mandan MPO. w/MPOGISIMonitoring Report(Socio-Economic/TAZ 2012)"Retail\_Change\_by\_TAZ\_2040\_11x17"

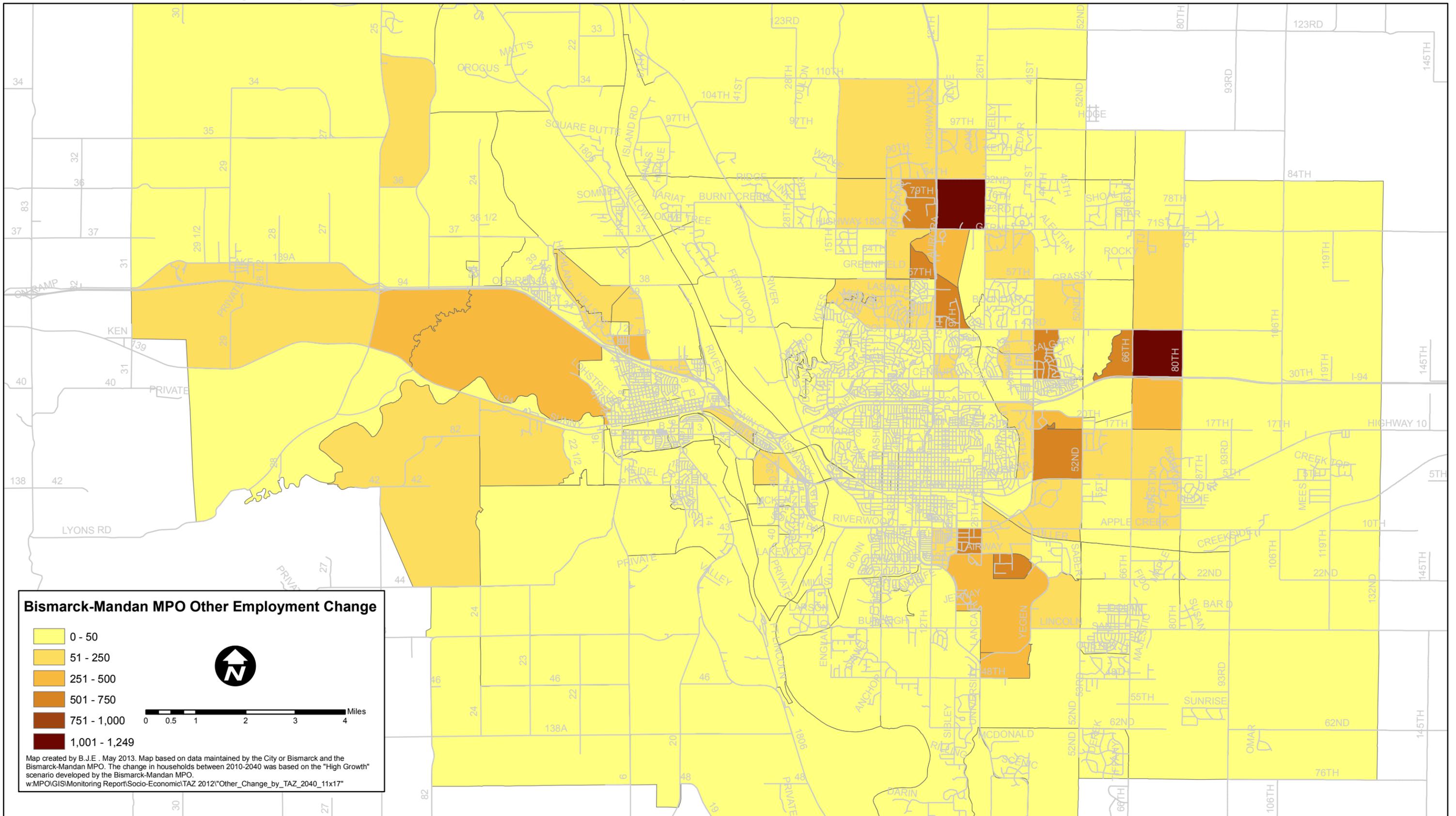
# Bismarck-Mandan MPO Projected Service Employment Change by TAZ, 2010-2040 (High Growth Scenario)



**Bismarck-Mandan MPO Service Employment Change**

Map created by B.J.E. May 2013. Map based on data maintained by the City of Bismarck and the Bismarck-Mandan MPO. The change in households between 2010-2040 was based on the "High Growth" scenario developed by the Bismarck-Mandan MPO. w:\MPO\GIS\Monitoring Report\Socio-Economic\TAZ 2012\Service\_Change\_by\_TAZ\_2040\_11x17"

# Bismarck-Mandan MPO Projected Other Employment Change by TAZ, 2010-2040 (High Growth Scenario)



# 5: Travel

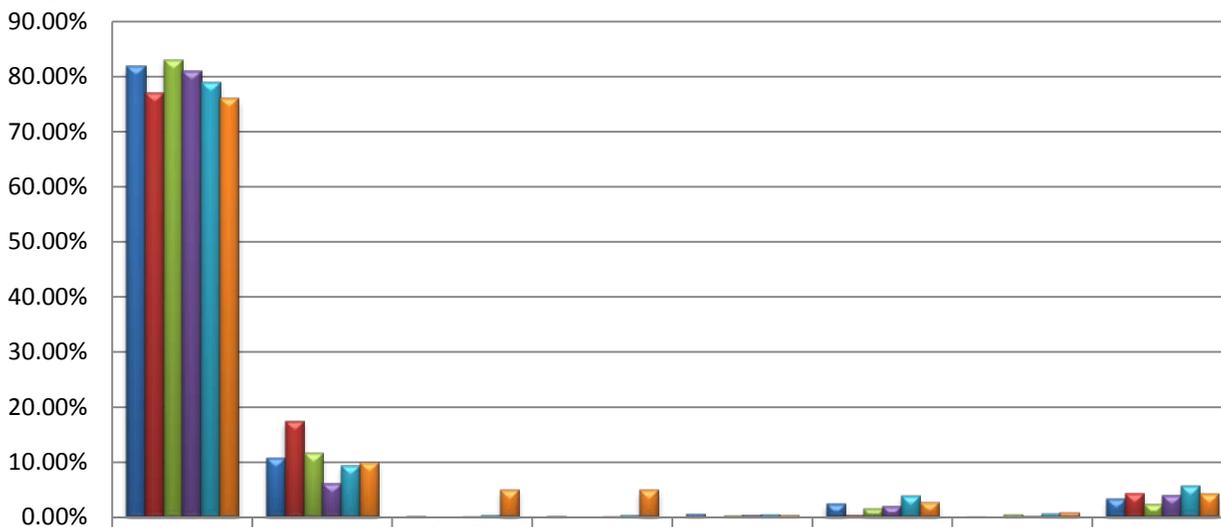
The Bismarck-Mandan Metropolitan Planning Organization is tasked with planning and programming of transportation within the region. Therefore an understanding of transportation conditions and trends is necessary to consider improvements to travel in the area.

## EXISTING CONDITIONS AND RECENT TRENDS

### Means of Transportation

**Figure 5.1** identifies the most commonly used modes of transportation used to get to work for various jurisdictions in the Bismarck-Mandan MPO area, in comparison to North Dakota and the United States. Generally, for all jurisdictions, individuals driving alone is the most common means of transportation to work. It appears that a slightly higher percentage of individuals drove alone in the Bismarck-Mandan MPO area compared to North Dakota and the United States. Considering the United States, a significantly higher percentage of individuals used public transportation in comparison to the Bismarck-Mandan MPO area and North Dakota.

**Figure 5.1: Means of Transportation to Work for Various Jurisdictions, 2012**



|                  | Drove Alone | Carpooled | Public Transportation | Motorcycle | Bicycle | Walked | Other Means | Worked at Home |
|------------------|-------------|-----------|-----------------------|------------|---------|--------|-------------|----------------|
| Bismarck         | 82.08%      | 10.75%    | 0.26%                 | 0.26%      | 0.79%   | 2.46%  | 0.13%       | 3.38%          |
| Lincoln          | 77.17%      | 17.54%    | 0.00%                 | 0.00%      | 0.00%   | 0.55%  | 0.00%       | 4.47%          |
| Mandan           | 83.21%      | 11.72%    | 0.00%                 | 0.00%      | 0.40%   | 1.51%  | 0.60%       | 2.55%          |
| Bismarck, ND MSA | 81.20%      | 6.31%     | 0.18%                 | 0.18%      | 0.55%   | 2.19%  | 0.30%       | 4.21%          |
| North Dakota     | 78.98%      | 9.54%     | 0.50%                 | 0.50%      | 0.58%   | 3.88%  | 0.65%       | 5.66%          |
| US               | 76.14%      | 10.03%    | 4.98%                 | 4.98%      | 0.56%   | 2.82%  | 0.85%       | 4.27%          |

Based on US Census Bureau American Community Survey 2008-2012 Means of Transportation to Work data

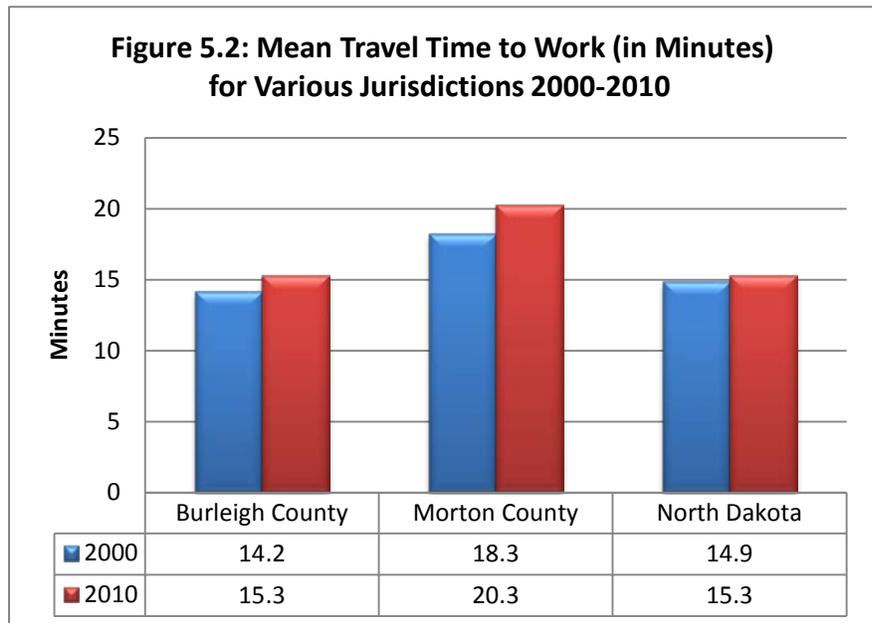
# 5: Travel

## Travel Time to Work

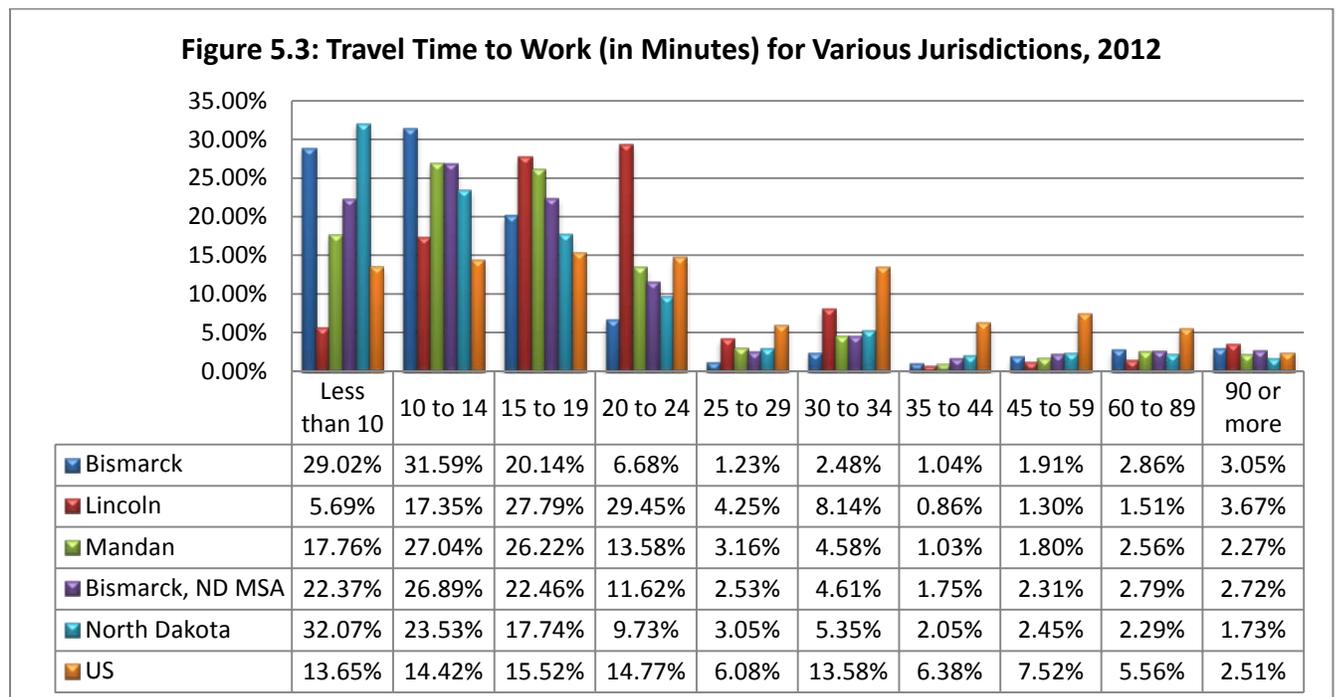
**Figures 5.2 and 5.3** represent various characteristics of travel time in the Bismarck-Mandan MPO area compared to North Dakota and the United States. From 2000 to 2010 the mean travel time has increased by one minute in Burleigh County and in Morton County by two minutes.

It generally takes the majority of individuals in the Bismarck-Mandan MPO area less than 20 minutes to travel to work.

A greater percentage of individuals in Lincoln and Mandan travel more than 20 minutes to work when compared to Bismarck. As the highest concentration of employment in the region is located in Bismarck it is likely that workers living in Lincoln and Mandan are commuting to jobs in Bismarck leading to slightly longer commute times in the respective communities.



Based on US Census Bureau 2000 and 2010 Travel Time to Work data

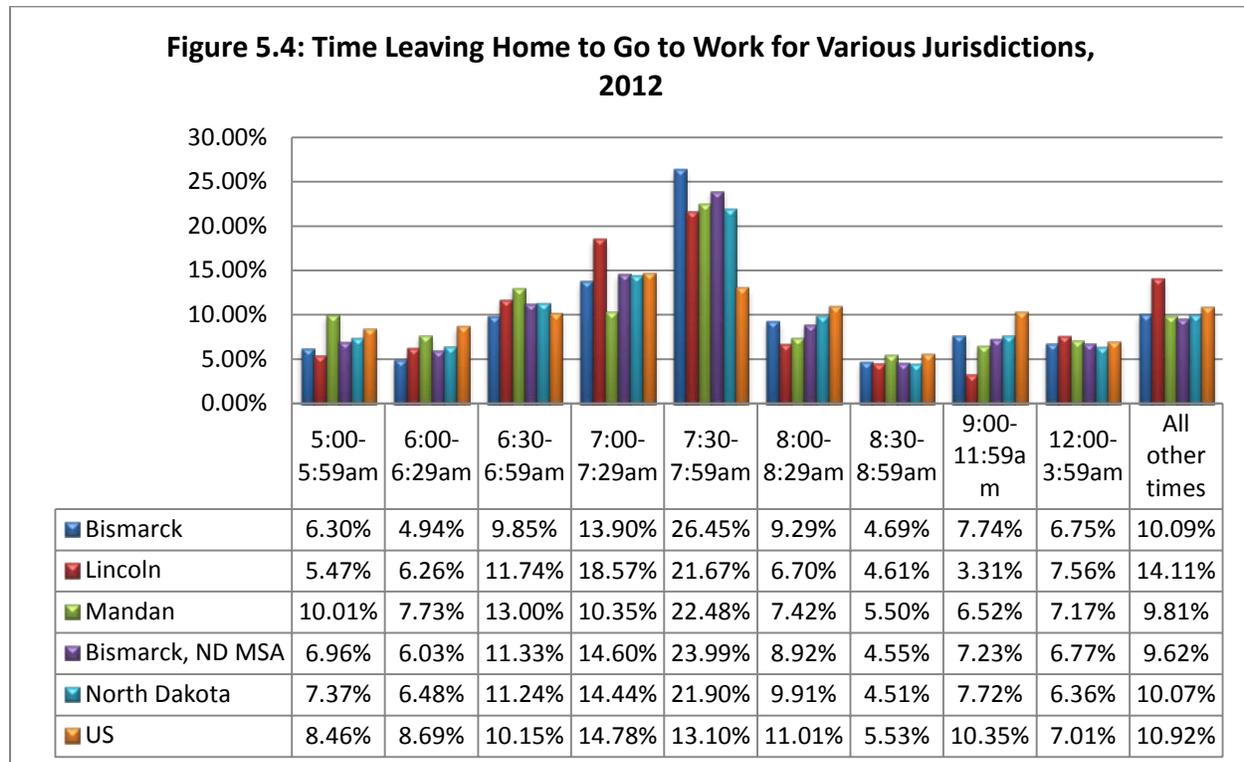


Based on US Census Bureau American Community Survey 2008-2012 Travel Time to Work data

# 5: Travel

## Time Leaving to Go to Work

**Figure 5.4** represents times individuals left their homes to travel to their place of employment in various Bismarck-Mandan MPO jurisdictions compared to the State of North Dakota and the United States. The highest concentration of times leaving to go to work in the Bismarck-Mandan MPO area and the State of North Dakota was between 7:30am-7:59am.



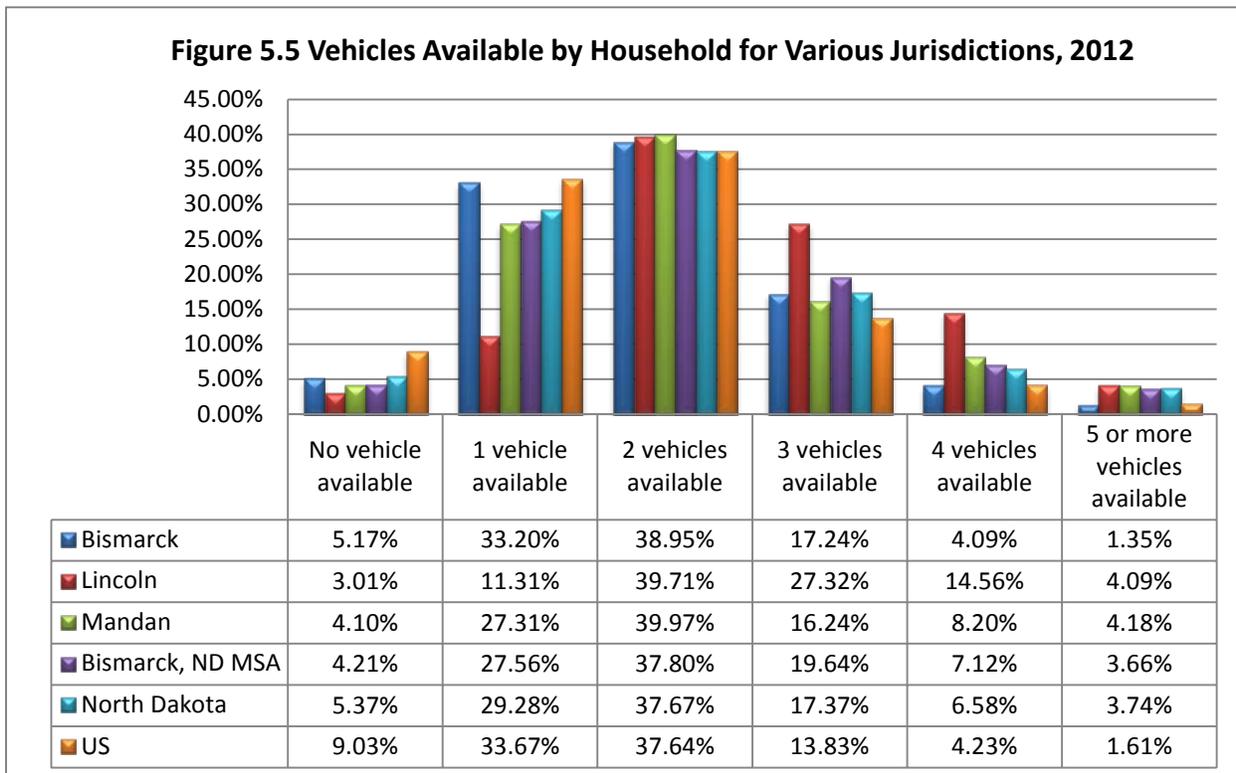
*Based on US Census Bureau American Community Survey 2008-2012 Time Leaving Home to go to Work data*

## Vehicles Available by Household

**Figure 5.5** represents the vehicles available by household for jurisdictions associated with the Bismarck-Mandan MPO compared to the State of North Dakota and the United States. For all locations identified, 2 vehicles available per household represent the highest concentration of vehicles available. The United States, North Dakota, and the City of Bismarck have a higher concentration of 0 vehicle available by household compared to other jurisdictions associated with the Bismarck-Mandan MPO.

# 5: Travel

**Figure 5.5 Vehicles Available by Household for Various Jurisdictions, 2012**



Based on US Census Bureau American Community Survey 2008-2012 Tenure by Vehicles Available data

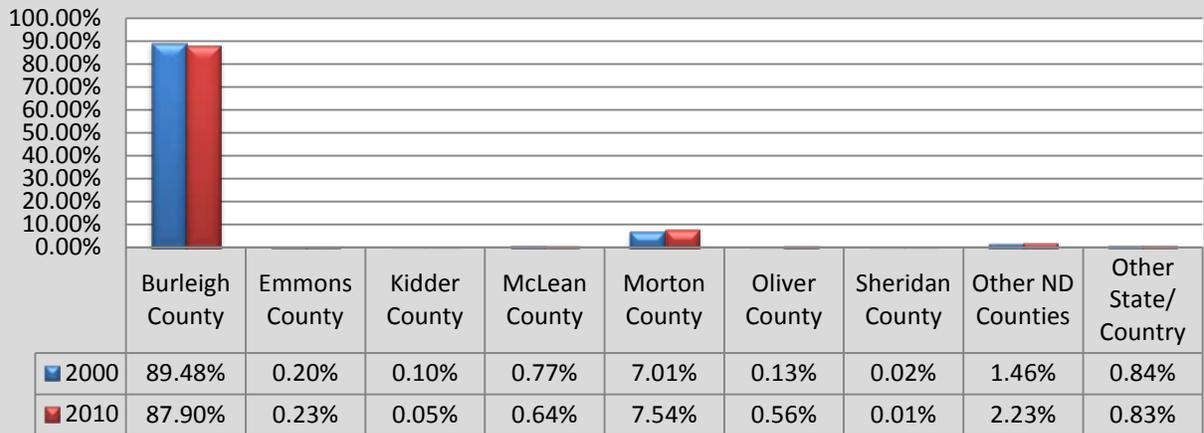
## County to County Commuting Patterns

The following figures represent county to county commuting patterns for residents of Burleigh and Morton Counties from 2000-2010 in comparison to neighboring North Dakota counties, other North Dakota counties, neighboring states, and other states and countries. As the data indicates most Burleigh and Morton County residents are living and working within the two county area. A small percentage of Burleigh and Morton County Residents are commuting to other North Dakota counties, other states, and other countries for work.

**Figure 5.6** depicts the locations that Burleigh County residents are commuting to for work from 2000 to 2010. The majority of Burleigh County residents work within Burleigh County. The number of Burleigh County residents working within Burleigh County reduced slightly from 89.48% in 2000 to 87.90% in 2010 while the number of Burleigh County residents working in Morton County increased slightly from 7.041% in 2000 to 7.54% in 2010.

# 5: Travel

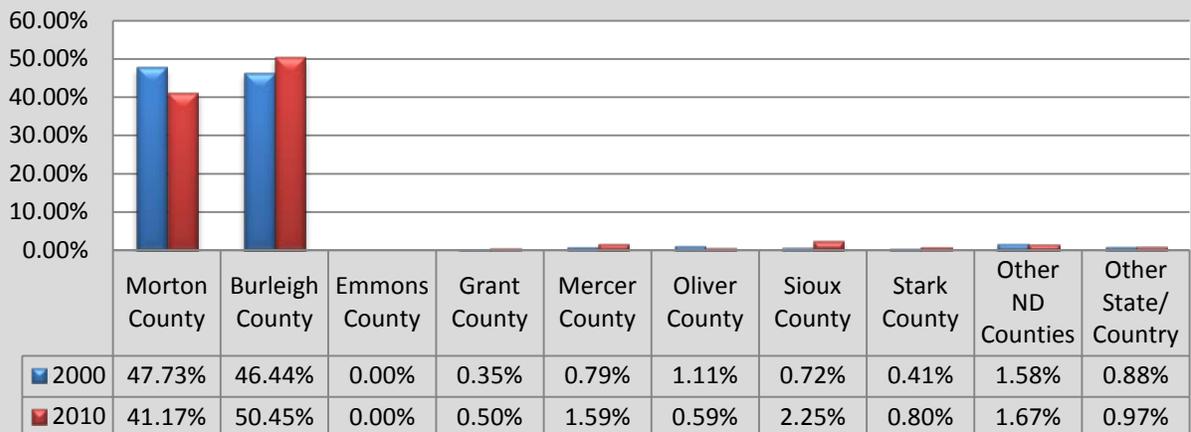
**Figure 5.6: County to County Commuting Patterns of Burleigh County Residents, 2000-2010**



Based on US Census Bureau 2000 and 2006-2010 American Community Survey Residence County to Workplace County Flows for North Dakota Sorted by Residence State and County for Burleigh and Morton Counties

**Figure 5.7** depicts the locations that Morton County residents are commuting to for work from 2000 to 2010. The majority of Morton County residence commuted to Burleigh County for employment in 2010 which was an increase from 46.44% in 2000. The percentage of Morton county residents working within Morton County decreased from 47.73% in 2000 to 41.17% in 2010. The significant percentage of Morton County residents traveling to Burleigh County likely results in eastbound morning travel and evening westbound travel at the Missouri River crossings to be more predominate.

**Figure 5.7: County to County Commuting Patterns of Morton County Residents, 2000-2010**

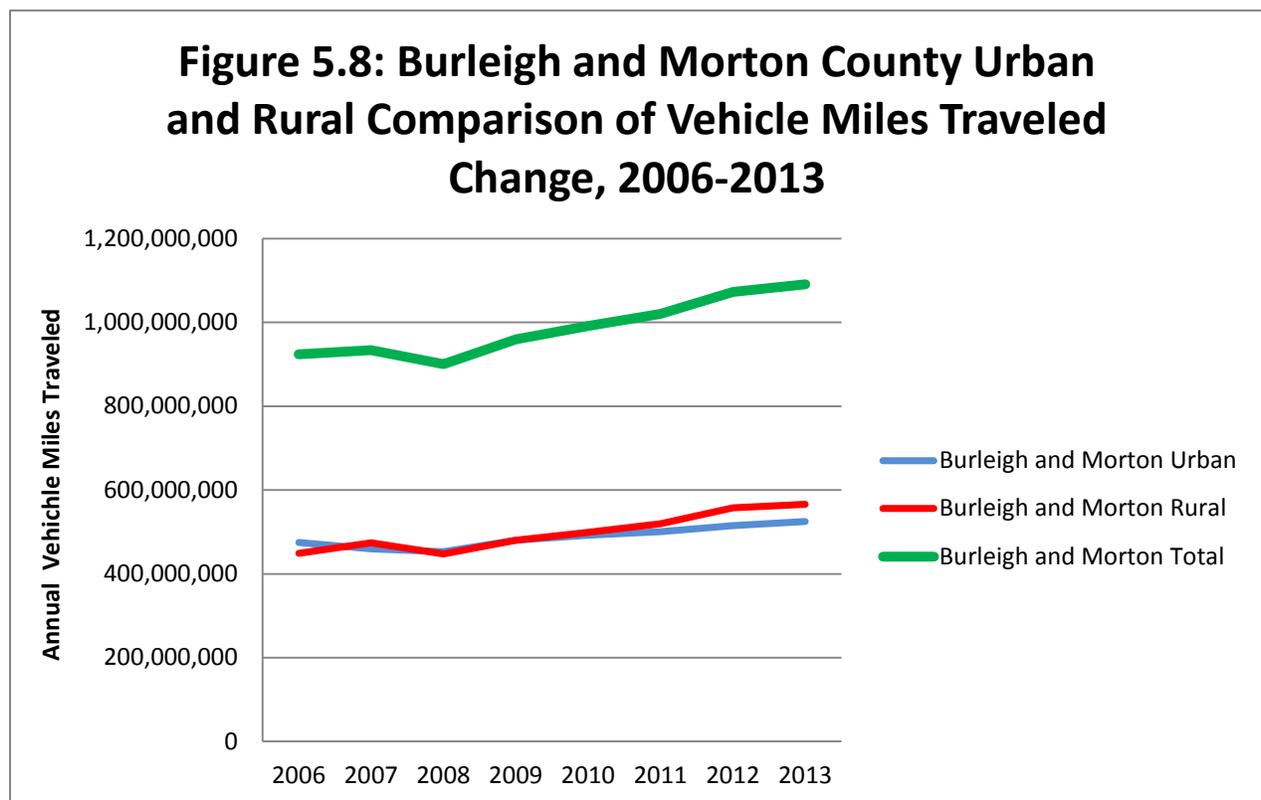


Based on US Census Bureau 2000 and 2006-2010 American Community Survey Residence County to Workplace County Flows for North Dakota Sorted by Residence State and County for Burleigh and Morton Counties

# 5: Travel

## Motorized Travel

Vehicle miles traveled (VMT) are a measure of the total vehicle miles traveled within a given geographic location. They can be used to depict motorized vehicular travel trends within an area. Annually the North Dakota Department of Transportation (NDDOT) calculates vehicle miles traveled information for reporting purposes to the national Highway Performance Monitoring System (HPMS). The North Dakota Department of Transportation utilizes Average Daily Traffic (ADT) counts, which they collect on a periodic basis throughout the State, as a factor in daily and annual vehicle miles traveled. In the Burleigh and Morton County area, recent ADT counts were taken in 2006, 2009, and most recently in 2012, in addition to permanent monitoring stations. Estimates based on projections and permanent monitoring station counts are calculated for VMT during years ADT are not collected. Based on annual vehicle miles traveled in Burleigh and Morton County (reported by the NDDOT) VMT has increased significantly in recent history as shown in **Figure 5.8**. In both Burleigh and Morton County, rural VMT grew faster than VMT in the urbanized areas of Bismarck and Mandan. This could be due to an increase in housing units locating outside of the urbanized areas of Bismarck or Mandan or an increase in the amount of travel passing through Burleigh and Morton County or both.

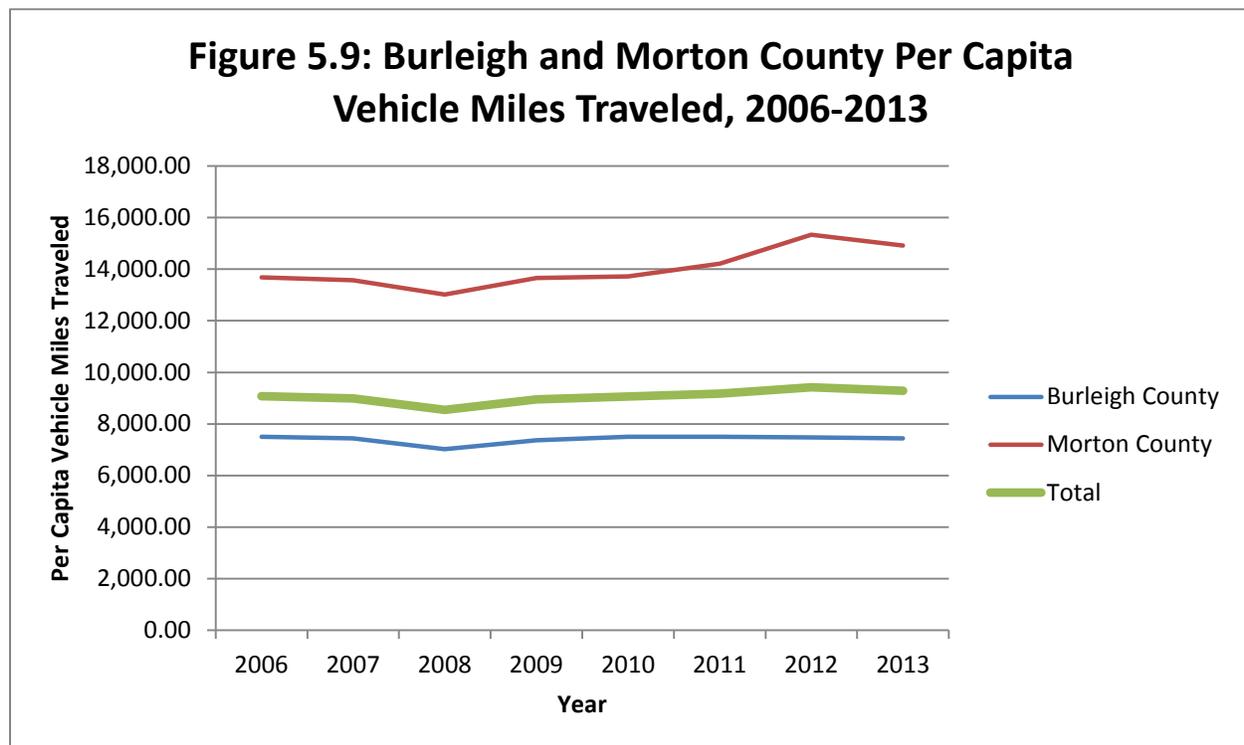


*Based on North Dakota Annual Traffic Reports 2006 - 2013*

# 5: Travel

## Motorized Travel

**Figure 5.9** represents Per Capita Annual VMT in Burleigh and Morton Counties which compares Annual VMT (calculated by the NDDOT) to annual population estimates (developed by the US Census Bureau) from 2006 to 2013. As identified in **Figure 5.9** per capita VMT has remained relatively stable in Burleigh County while it has increased significantly in Morton County between 2006 and 2013. Total per capita VMT in Burleigh and Morton County has increased slightly since 2006 which may indicate that motorists are traveling further from origin to destination within the region or vehicular traffic passing through the region has increased or both.



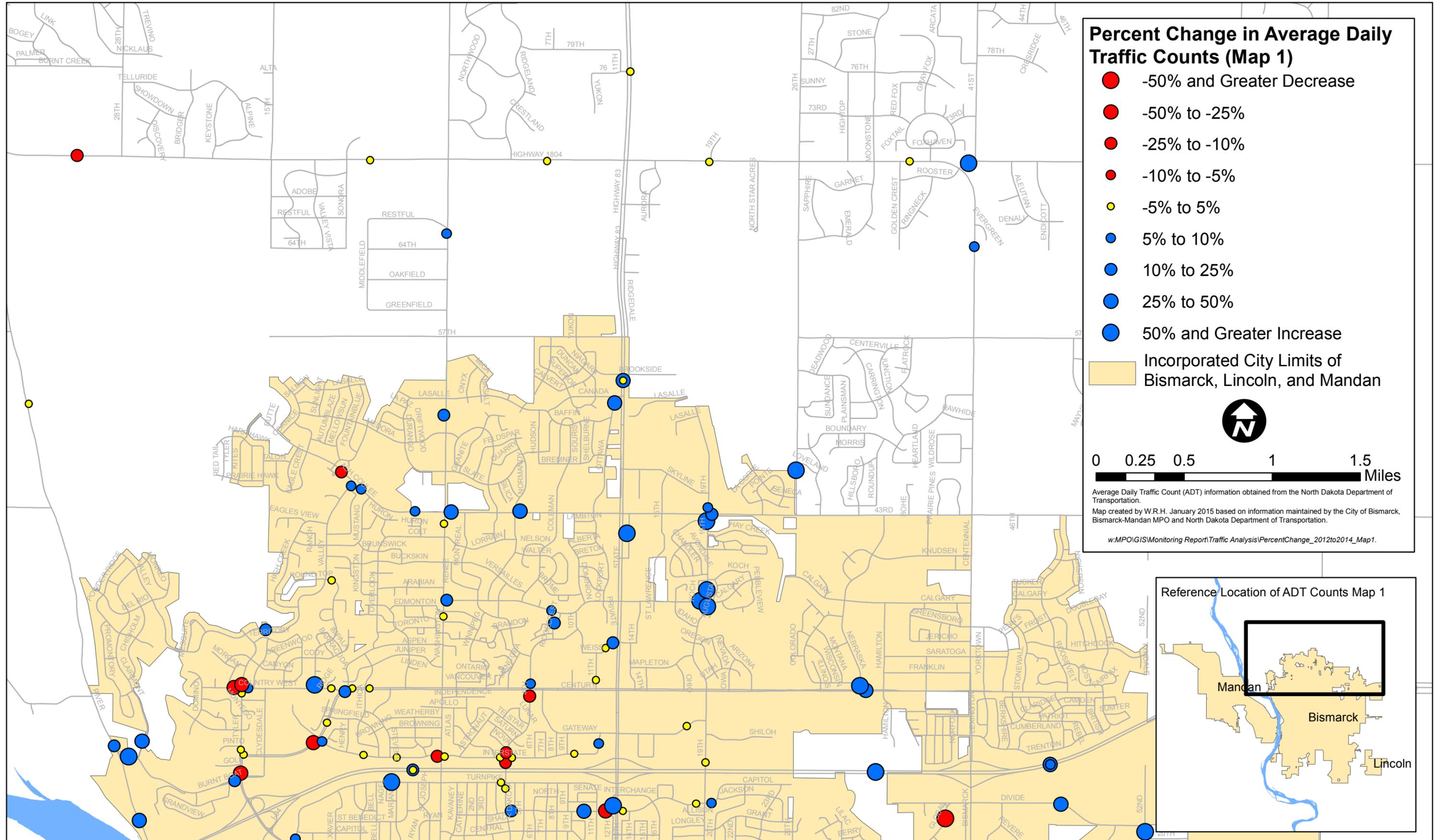
*Based on US Census Bureau annual population estimates and the North Dakota Traffic Reports 2006 - 2013*

Average Daily Traffic (ADT) counts are another tool used to measure traffic pattern change in a given area. The NDDOT collects ADT counts, typically, once every two years in a given location. Recent ADT counts were collected, in the Bismarck-Mandan area, in 2012 and again in 2014. The following maps depict ADT count locations and the percent change in growth from 2012 to 2014. The ADT count information indicates patterns of growth and decline within the area. Generally, the newly developing areas of the communities, such as the northern and southern portions of both Bismarck and Mandan have experienced significant growth in ADT, while the mature centralized locations of the communities have experienced a mixture of growth and decline.

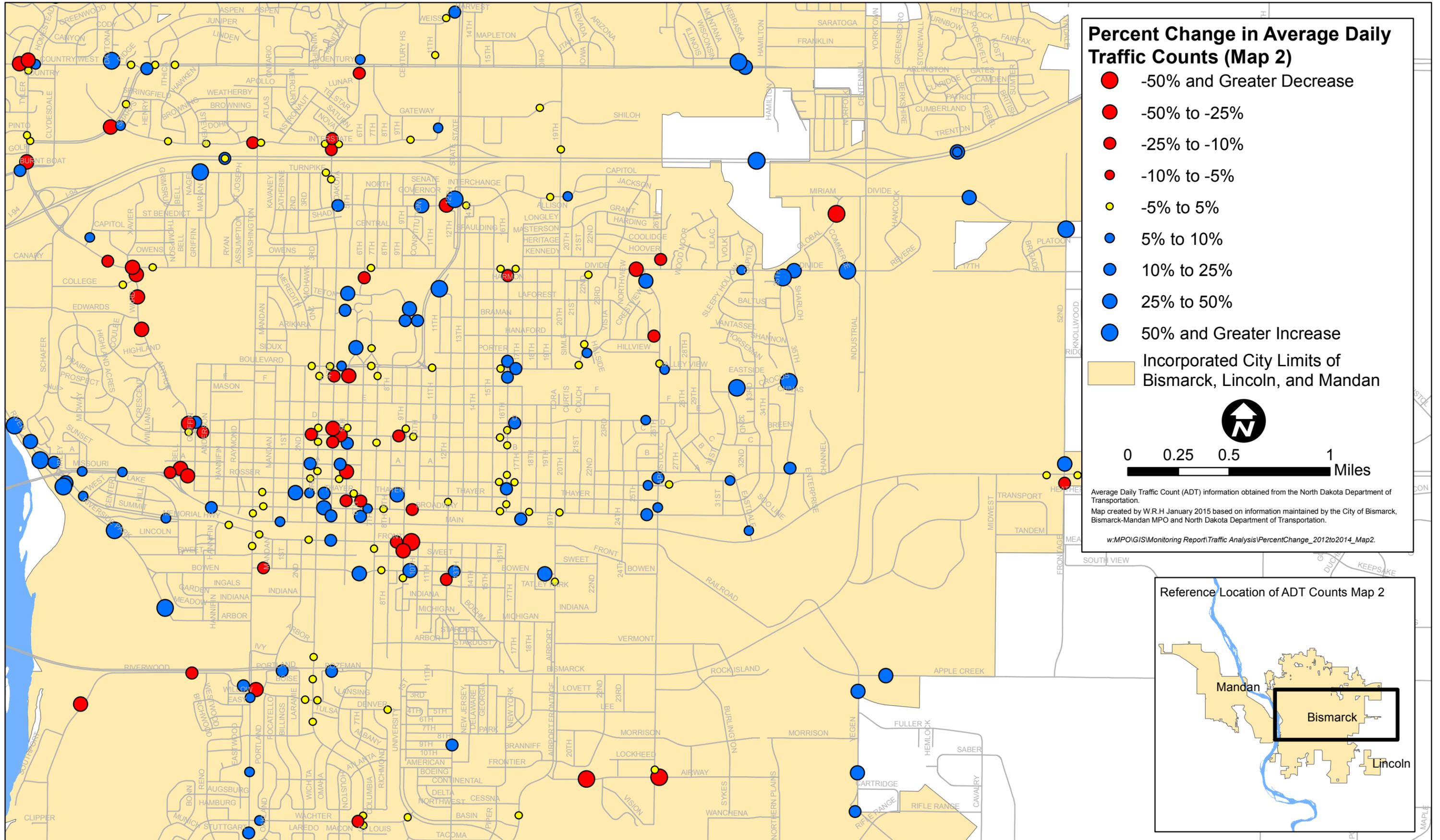
# *5: Travel*

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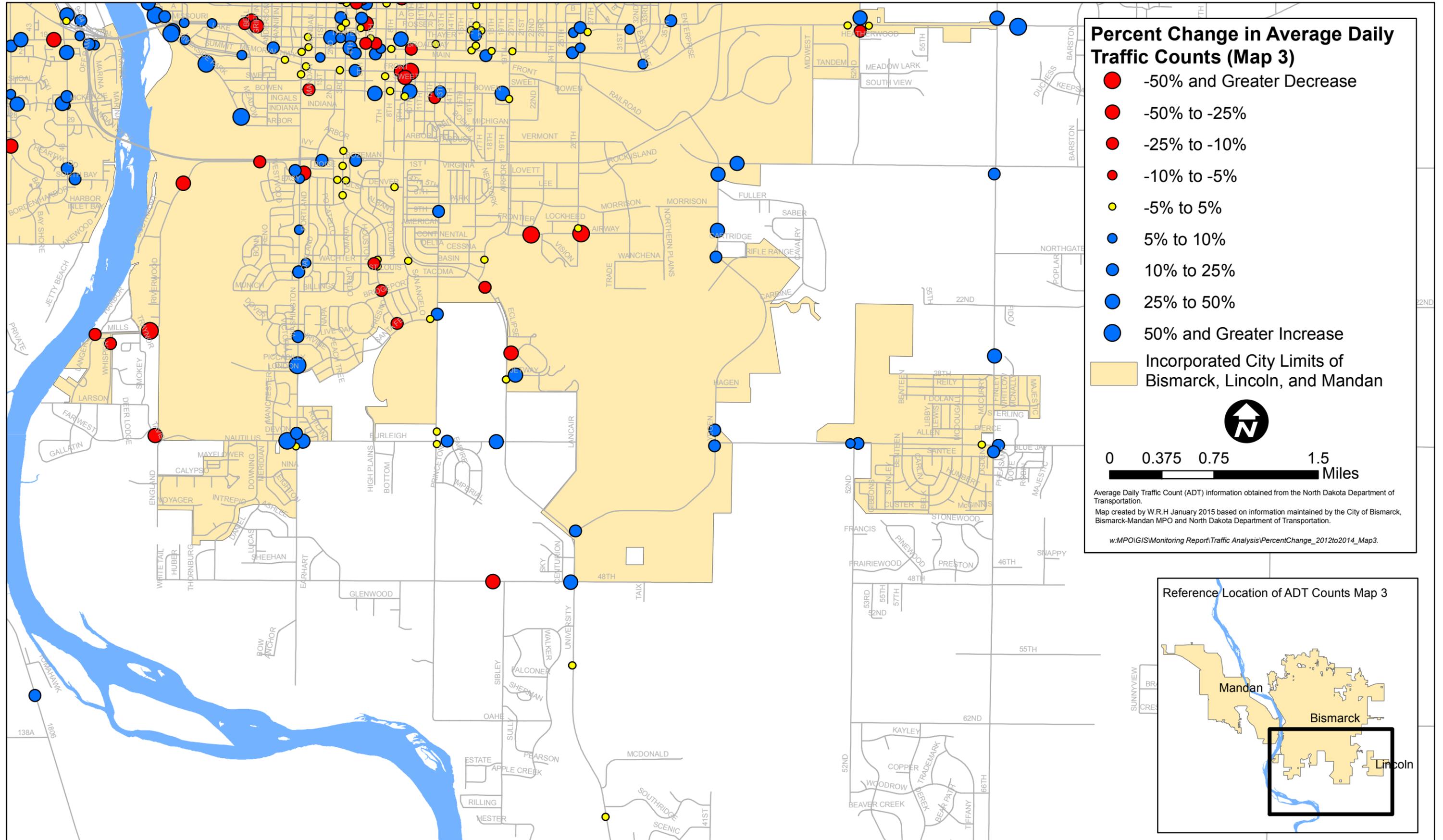
# Percent Change of Average Daily Traffic Counts (ADT) from 2012-2014, Bismarck-Mandan Area



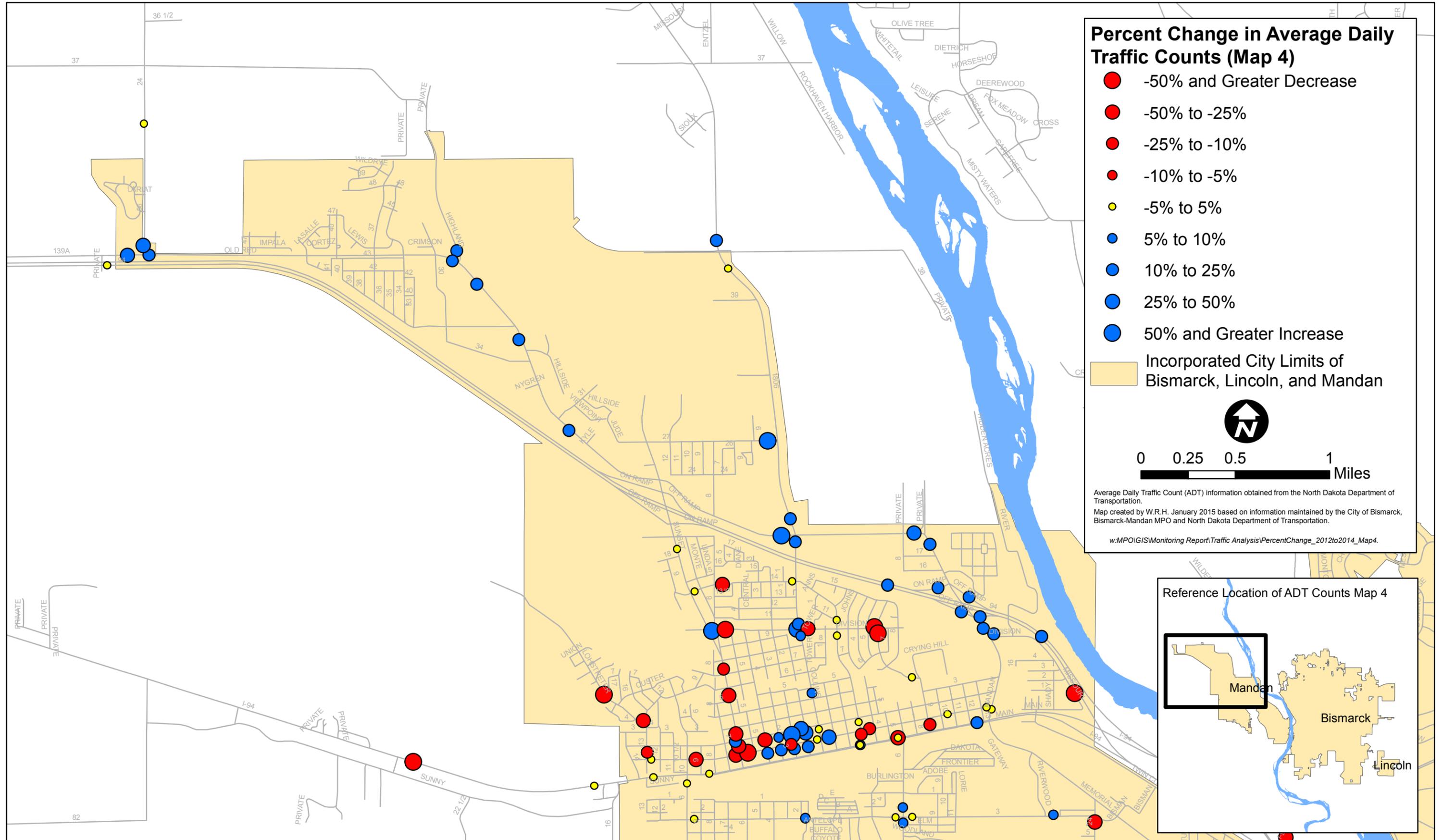
# Percent Change of Average Daily Traffic Counts (ADT) from 2012-2014, Bismarck-Mandan Area



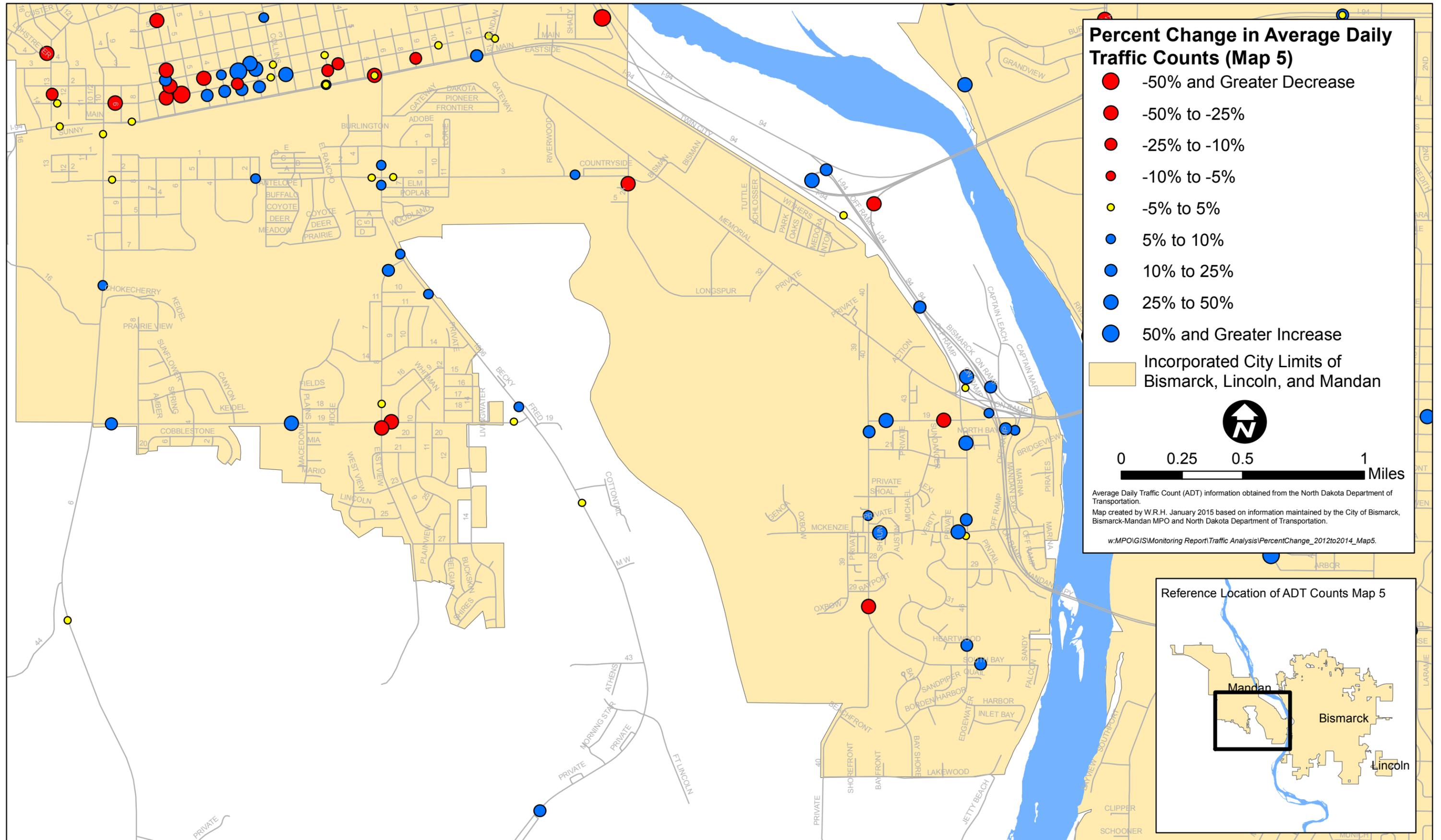
# Percent Change of Average Daily Traffic Counts (ADT) from 2012-2014, Bismarck-Mandan Area



# Percent Change of Average Daily Traffic Counts (ADT) from 2012-2014, Bismarck-Mandan Area



# Percent Change of Average Daily Traffic Counts (ADT) from 2012-2014, Bismarck-Mandan Area



# 5: Travel

## Freight

Goods are transported into, out of, and through the Bismarck-Mandan MPO area generally either by rail, air, truck, or a combination of the aforementioned modes. Often freight “generators” or producers/attractors of freight are considered when analyzing freight movements of a given area. The Bismarck-Mandan MPO area has a variety of freight generators within the region. **Figure 5.10** identifies a general list of industries, classified by the North American Industrial Classification System (NAICS) group, which may have a propensity for freight movements. Businesses associated with the following NAICS groups are also identified in the map on the following page.

The Bismarck-Mandan MPO area also has two primary locations, where differing modes connect to transfer freight. The Northern Plains Commerce Centre is a transload facility where rail and truck freight are exchanged. The Bismarck Municipal Airport provides a link between freight shipped between air and truck movements.

**Figure 5.10: Potential Freight Generators by NAICS in the Bismarck-Mandan MPO Area**

|     |  |
|-----|--|
| 112 | Animal Production  |
| 212 | Mining (Except Oil and Gas)                                  |
| 221 | Utilities  |
| 236 | Construction of Buildings                                    |
| 237 | Heavy and Civil Engineering Construction                     |
| 238 | Specialty Trade Contractors                                  |
| 321 | Wood Product Manufacturing                                   |
| 322 | Paper Manufacturing  |
| 324 | Petroleum and Coal Product Manufacturing                     |
| 325 | Chemical Manufacturing                                       |
| 327 | Nonmetallic Mineral Product Manufacturing                    |
| 332 | Fabricated Metal Product Manufacturing                       |
| 333 | Machine Manufacturing  |
| 335 | Electrical Equipment, Appliance, and Component Manufacturing |
| 337 | Furniture and Related Product Manufacturing                  |
| 423 | Merchant Wholesalers, Durable Goods                          |
| 424 | Merchant Wholesalers, Nondurable Goods                       |
| 425 | Wholesale Electronic Markets and Agents and Brokers          |
| 441 | Motor Vehicle and Parts Dealers                              |
| 442 | Furniture and Home Furnishings Stores                        |
| 444 | Building Material and Garden Equipment and Supplies Dealers  |
| 445 | Food and Beverage Stores                                     |
| 446 | Health and Personal Care Stores                              |
| 451 | Sporting Goods, Hobby, Book, and Music Stores                |
| 452 | General Merchandise Stores                                   |
| 453 | Miscellaneous Store Retailers                                |
| 454 | Nonstore Retailers   |
| 481 | Air Transportation   |
| 484 | Truck Transportation   |
| 485 | Transit and Ground Passenger Transportation                  |
| 487 | Scenic and Sightseeing Transportation                        |
| 488 | Support Activities for Transportation                        |
| 491 | Postal Service   |
| 493 | Warehousing and Storage                                      |
| 562 | Waste Management and Remediation Services                    |

*Based on select sectors of the North American Industrial Classification (NAICS)*

# 5: Travel

The following **Figure 5.11** represents significant freight corridors that were evaluated at 2014 traffic count locations, in the Bismarck-Mandan MPO area, based on the percentage of truck traffic compared to overall traffic. The map on page 59 represents the percent truck traffic compared to the total traffic by location. Truck counts occur every two years in the Bismarck-Mandan area. However member jurisdictions and NDDOT do not evaluate truck traffic at the same ADT locations every count year; therefore this list does not identify all roadways that have been known to carry freight in the Bismarck – Mandan area.

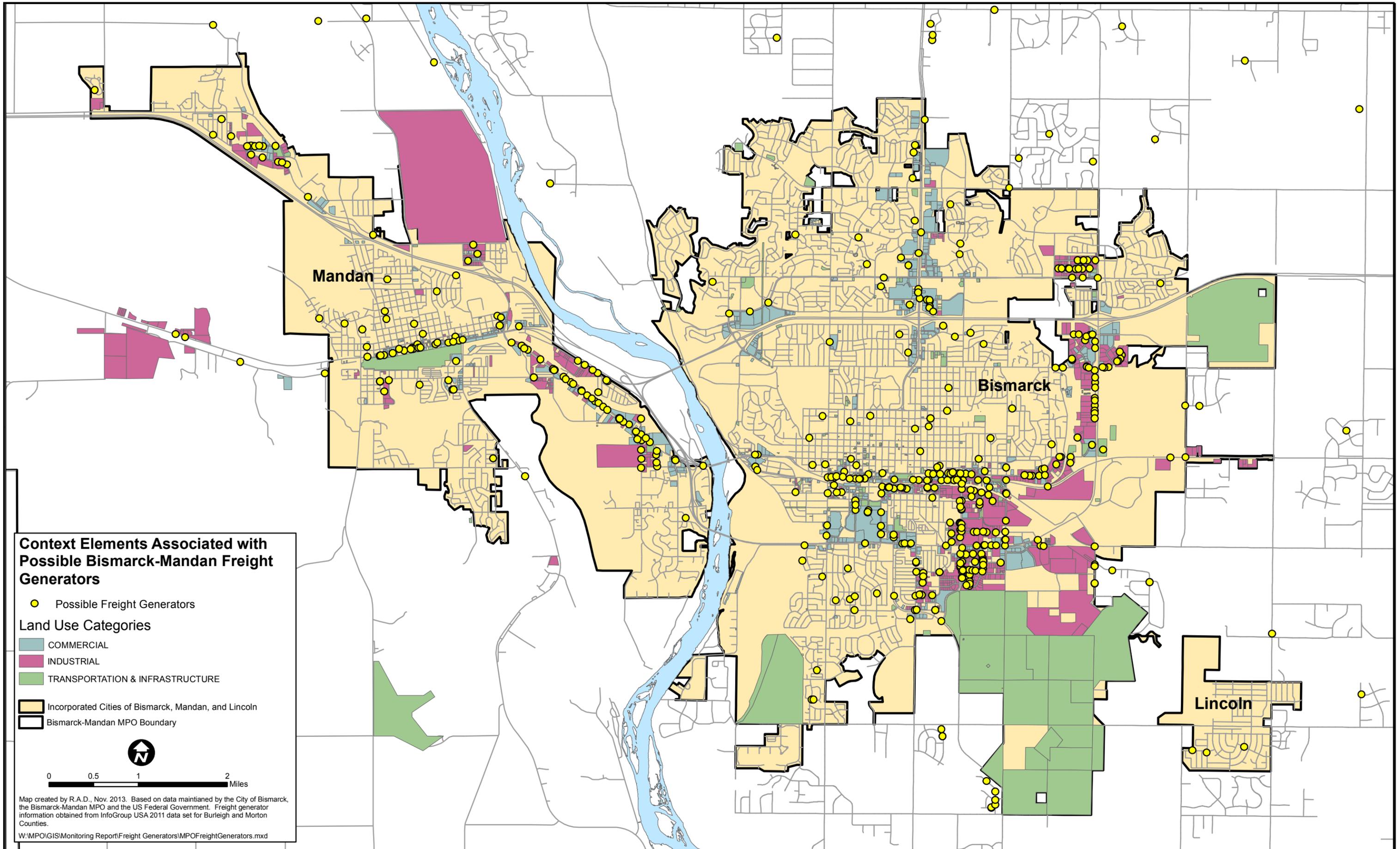
**Figure 5.11: Significant Evaluated Freight Corridors in the Bismarck-Mandan MPO Area, 2013**

| Corridor   | % Range of Truck Traffic Compared to Total Traffic |
|--|--|
| I-94 (through the Bismarck-Mandan MPO Area)                        | 10% - 35%  |
| I-194 (in Mandan/Morton)   | 10% - 25%  |
| Business Loop 94 (in Mandan/Morton)                                | 10% - 25%  |
| Old Red Trail (Mandan)   | 5% - 25%   |
| 46th Ave. SE (in Mandan)   | 5% - 10%   |
| 40 <sup>th</sup> Ave. SE (in Mandan)                               | 10% - 25%  |
| Main Ave (in Bismarck)   | 5% - 25%   |
| 71st/Centennial Road (in Bismarck/Burleigh)                        | 10% - 25%  |
| Calgary Ave (between Washington St. and US Highway 83 in Bismarck) | 5% - 10%   |
| ND Highway 1806 (in Mandan)  | 5% - 25%   |
| ND Highway 6 (in Mandan/Morton)                                    | 10%-25%  |

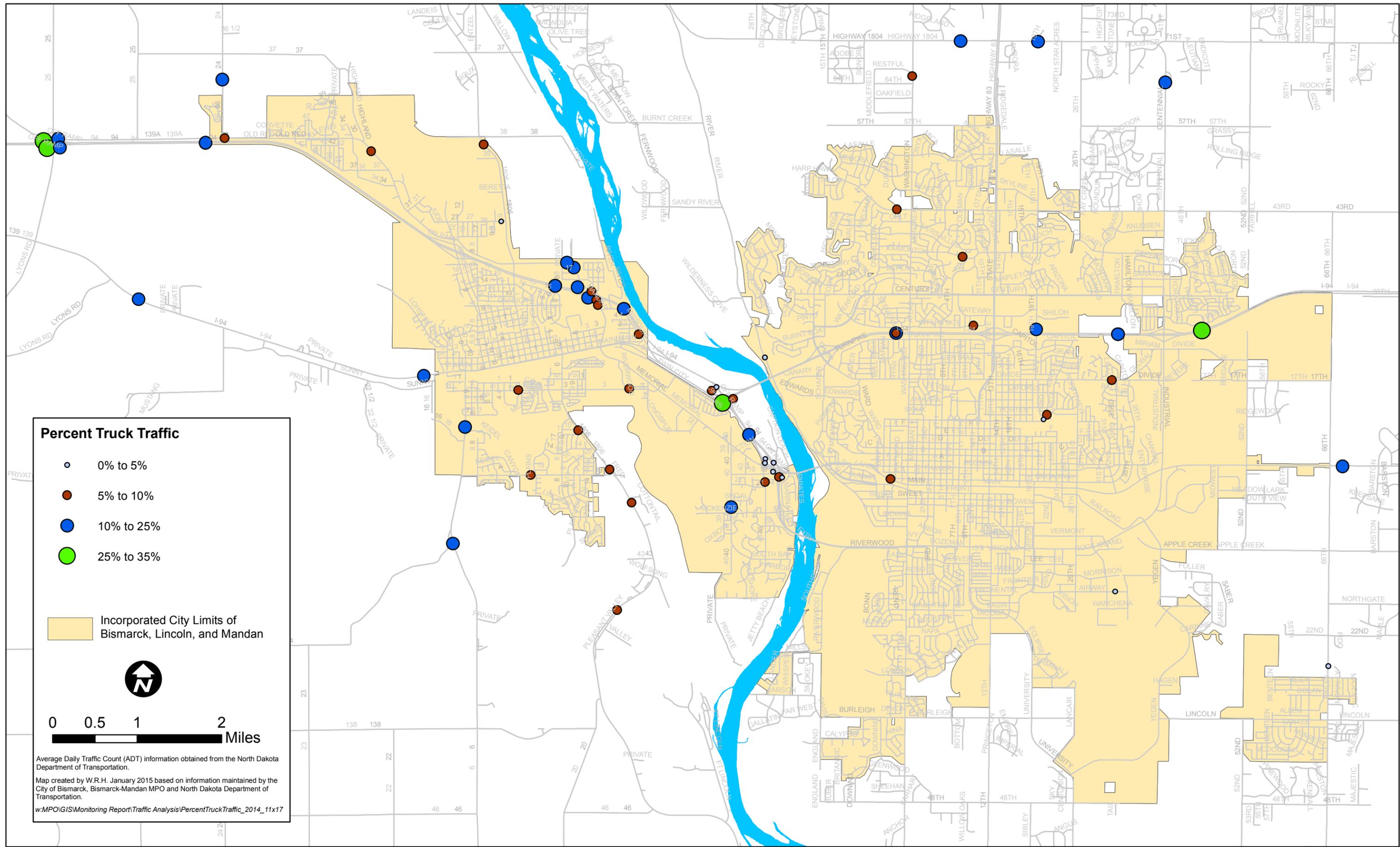
*Based on Average Daily traffic count information obtained from the NDDOT*

The map on page 60 represents the percent change in truck traffic between 2012 and 2014. Corridors within the Bismarck-Mandan MPO area have experienced both growth and decline in truck traffic during this period. Corridors such as I-94, ND 1804, 71<sup>st</sup>/Centennial, North Washington Street, ND Highway 1806, and portions of Old Red Trail have experienced significant growth in truck traffic. Few corridors have experienced significant decline in truck traffic from 2012 to 2014, primarily along the I-194 between Memorial Highway and I-94 Interchange. Due to the lack of truck counts done during the 2014 count year, several corridors that are well known freight corridors have not been evaluated including US Highway 83 and Bismarck Expressway in Bismarck and Main Street and Memorial Highway in Mandan.

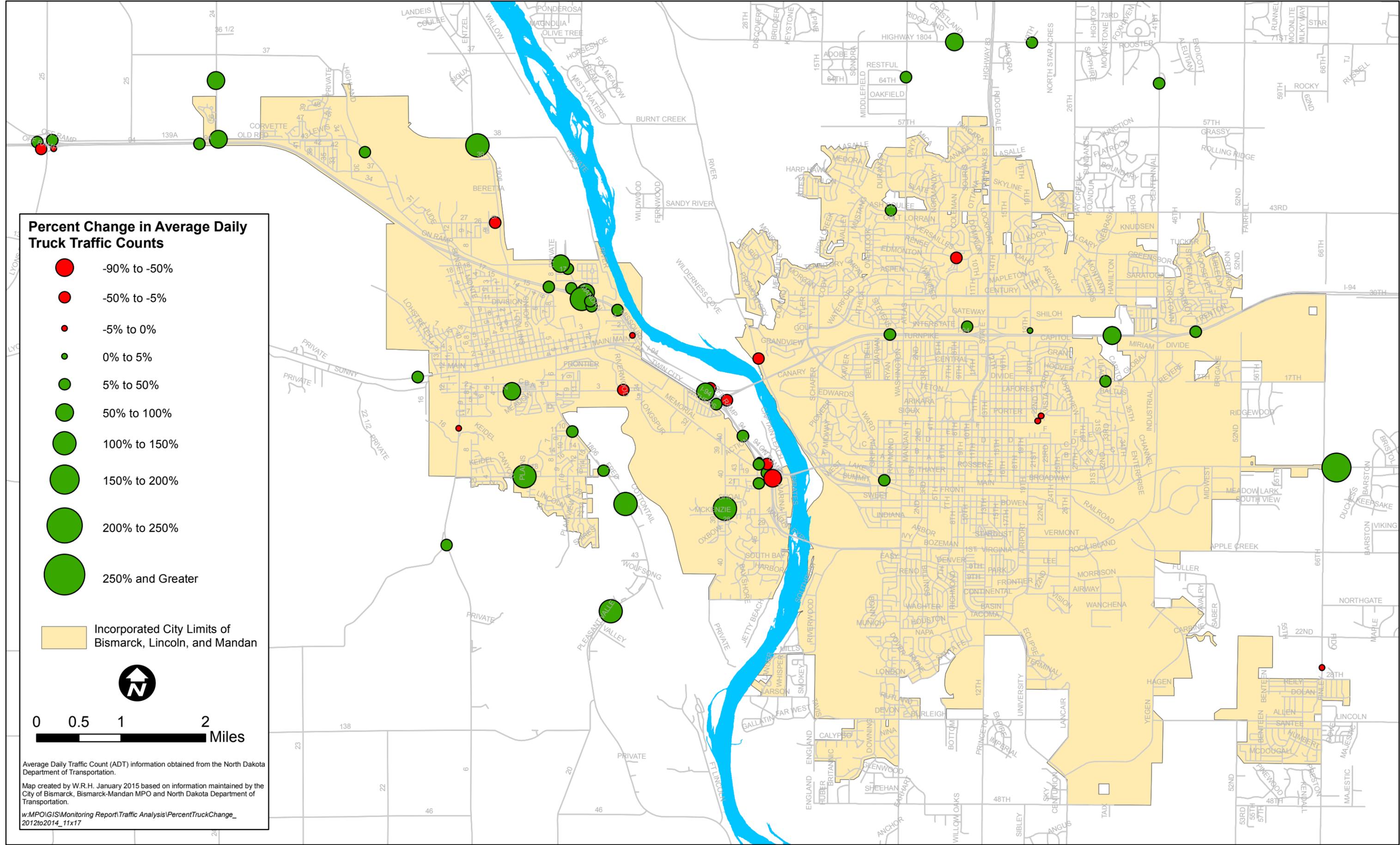
# Possible Freight Generators, Bismarck-Mandan Area, 2011



# Percent Truck Traffic of Total Average Daily Traffic (ADT) in 2014, Bismarck-Mandan Area



# Percent Change of Average Daily Truck Traffic Counts (ADT) from 2012-2014, Bismarck-Mandan Area



# 5: Travel

## Functional Classification of Roadways

The Federal Highway Administration (FHWA) defines roadway classifications and establishes procedures to update these systems at local and state levels. Roadways are generally grouped into the following categories: interstate, arterial, collector or local. Subcategories such as principle, major and minor may be applied to better define the roadway and reflect road usage. Roadways that are functionally classified as an interstate, collector or arterial are eligible to receive federal transportation funds. The following map on page 56 identifies the functionally classified roadways within the Bismarck-Mandan MPO area.

FHWA has established guidelines for the amount of functionally classified mileage permitted within an Urbanized Area. **Figure 5.13** shows the functionally classified centerline mileage of roadways within the Bismarck-Mandan MPO area in comparison to the FHWA recommendations. As indicated in **Figure 5.12** the current functionally classified system of the Bismarck-Mandan MPO complies with the recommended FHWA guidelines.

**Figure 5.12: Bismarck-Mandan MPO Functionally Classified Roadways in Comparison to FHWA Recommended Guidelines**

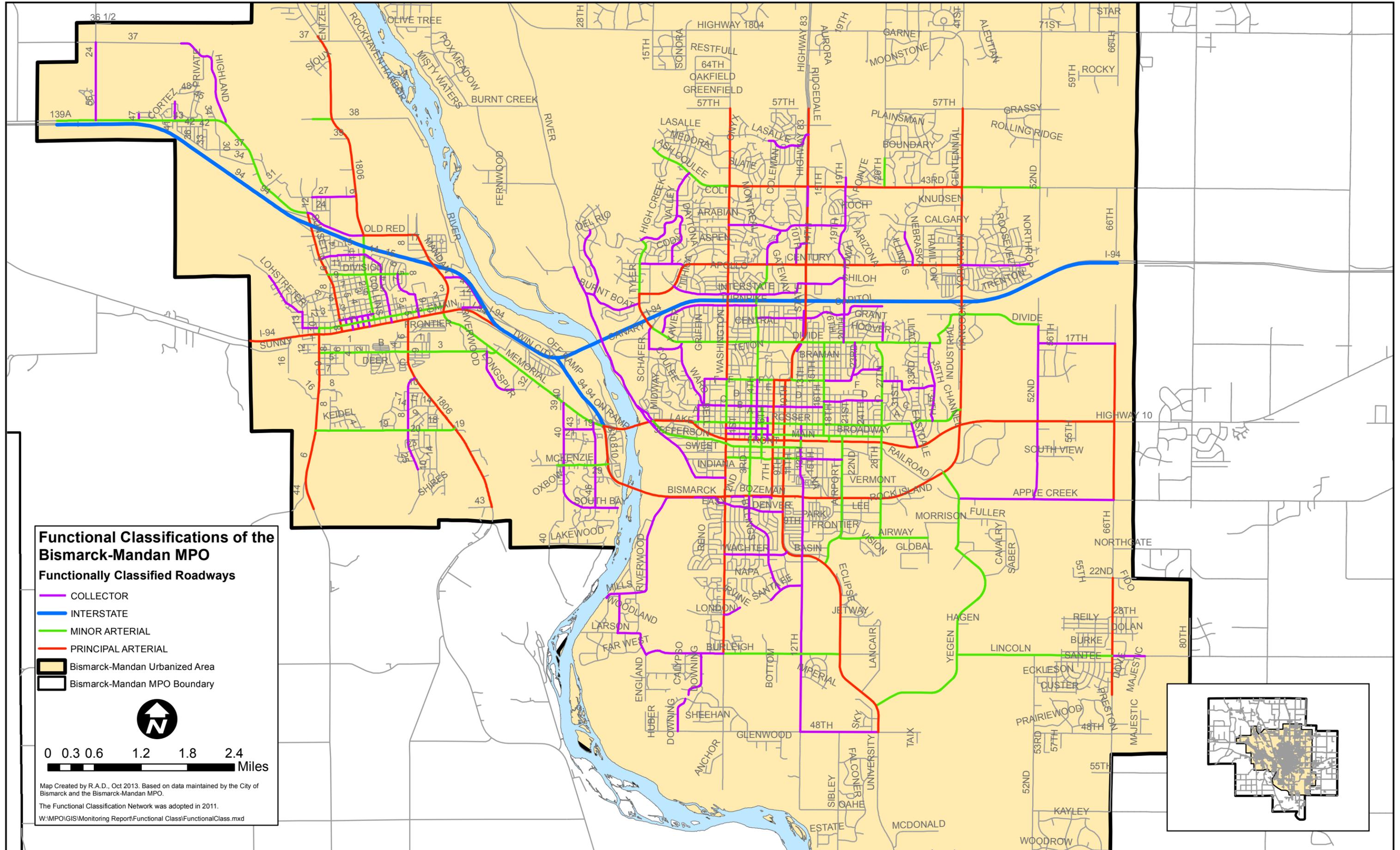
| Network            | Length (in Miles) | % of Total Network | FHWA Recommended % of Total Network Range |
|--------------------|-------------------|--------------------|---|
| Local              | 656.9             | 77.3%              | 65-80%                                    |
| Collector          | 67.2              | 7.9%               | 5-10%                                     |
| Minor Arterial     | 51.4              | 6.0%               | 15-25%                                    |
| Principal Arterial | 59.4              | 7.0%               |   |
| Interstate         | 15.4              | 1.8%               | NA  |
| <b>Total</b>       | <b>850.3</b>      | <b>100.0%</b>      |   |

*Based on centerline and functional classification data maintained by the City of Bismarck, Morton County, and the Bismarck-Mandan MPO and , as well as, recommended Functional Classification ranges from FHWA 1989 guidelines*

# *5: Travel*

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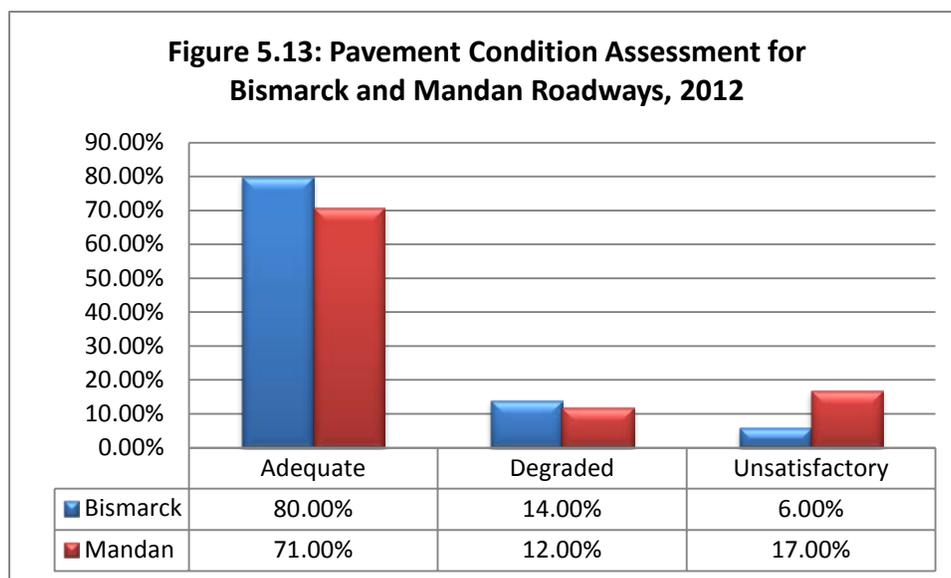
# 2011 Functionally Classified Roadways, Bismarck-Mandan MPO



# 5: Travel

## Pavement Management

Preservation of the existing transportation system is not only a goal in the current Bismarck-Mandan MPO 2010-2035 Long Range Transportation Plan but it is also one of the criteria for prioritizing Urban Road projects in the Bismarck-Mandan MPO Transportation Improvement Program (TIP). Therefore, in 2012, the Bismarck-Mandan MPO helped the cities of Bismarck and Mandan fund a pavement management study to examine the condition of pavement materials in the communities. It was intended that this effort would form a baseline understanding of pavement conditions so future efforts could evaluate the effectiveness of pavement management practices. For this study a vehicle with specialized monitoring equipment was utilized to evaluate every roadway within Bismarck and Mandan. The method for evaluation was based on the Pavement Condition Index (PCI), which is an industry standard methodology for evaluating the condition of paved roadways. Based on PCI values a roadway was considered “Adequate”, “Degraded”, or “Unsatisfactory”. The following **Figure 5.13** represents the general citywide pavement condition assessment for Bismarck and Mandan.

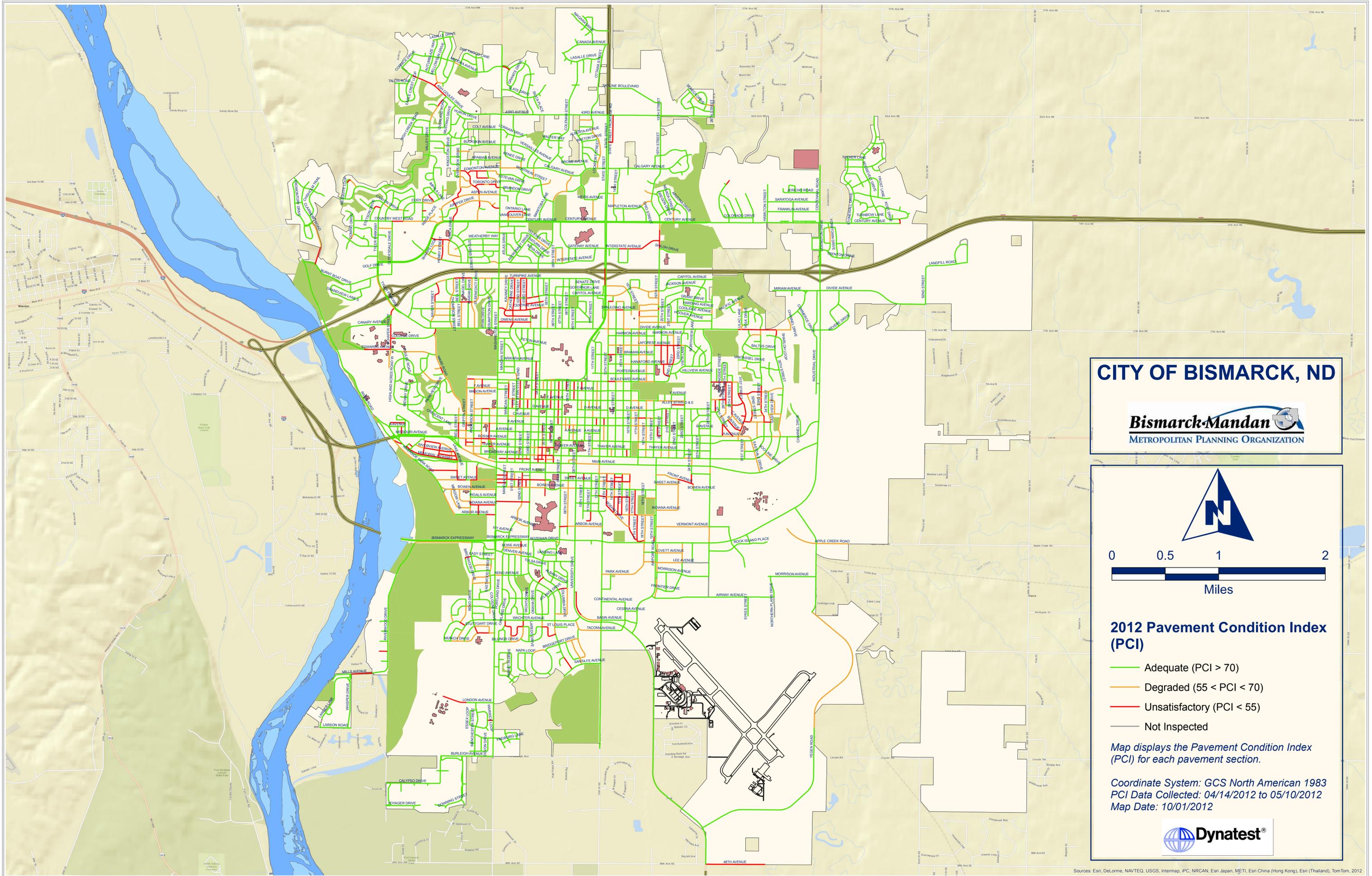


*Based on Bismarck and Mandan State of the Streets Report 2013*

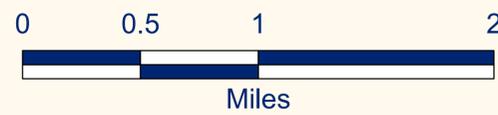
In 2012 the majority of pavement in Bismarck and Mandan was considered Adequate. Both communities now have “Micropaver” pavement management software for future evaluation. The following maps were taken directly from the *Bismarck and Mandan State of the Street Reports*, associated with the Pavement Management Study, and identify the PCI values of specific roadways in the area.

# *5: Travel*

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# CITY OF BISMARCK, ND



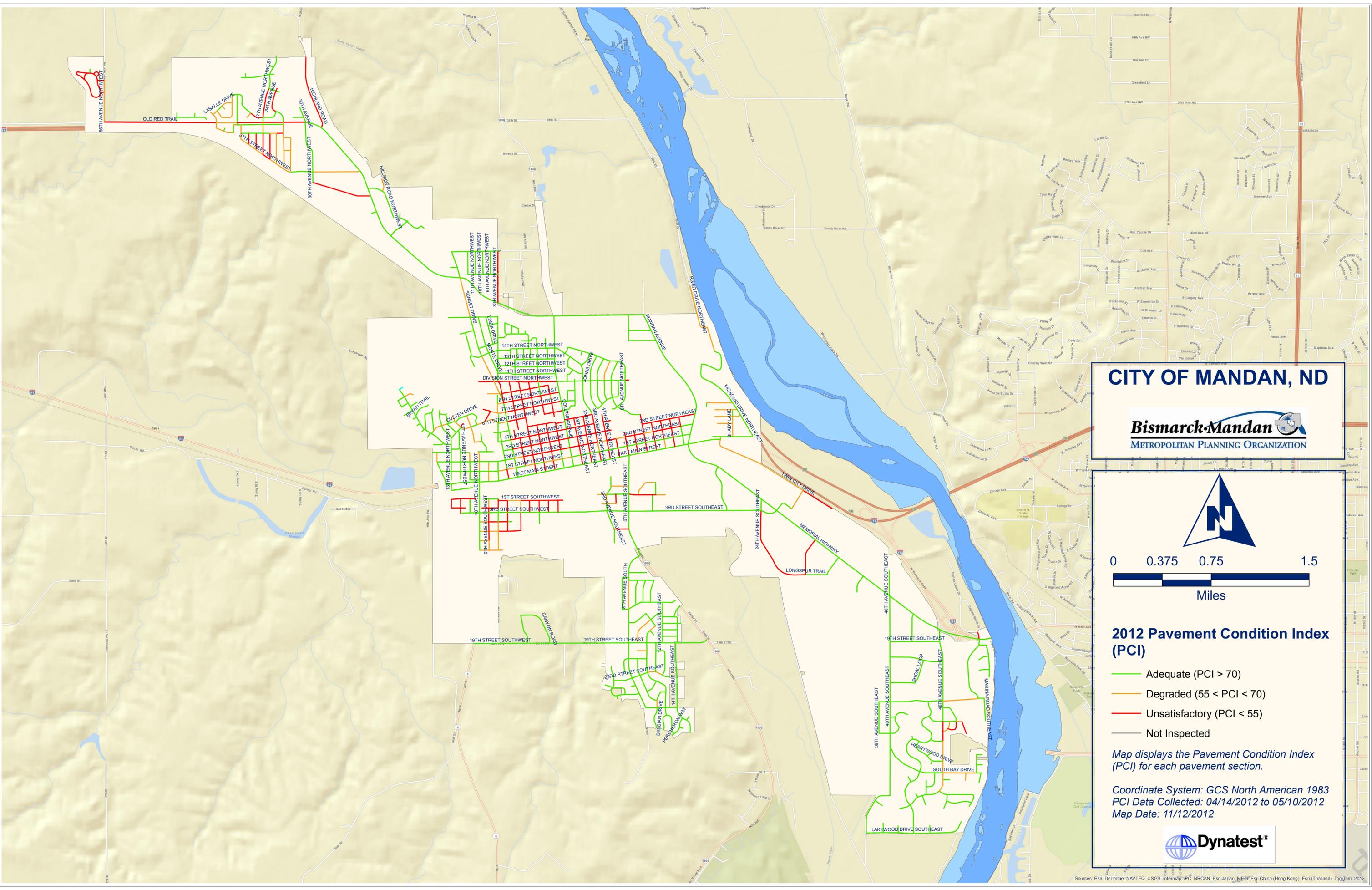
## 2012 Pavement Condition Index (PCI)

- Adequate (PCI > 70)
- Degraded (55 < PCI < 70)
- Unsatisfactory (PCI < 55)
- Not Inspected

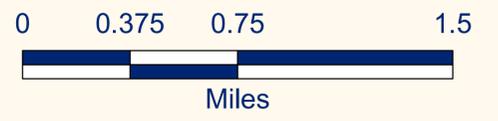
Map displays the Pavement Condition Index (PCI) for each pavement section.

Coordinate System: GCS North American 1983  
 PCI Data Collected: 04/14/2012 to 05/10/2012  
 Map Date: 10/01/2012





# CITY OF MANDAN, ND

## 2012 Pavement Condition Index (PCI)

- Adequate (PCI > 70)
- Degraded (55 < PCI < 70)
- Unsatisfactory (PCI < 55)
- Not Inspected

Map displays the Pavement Condition Index (PCI) for each pavement section.

Coordinate System: GCS North American 1983  
 PCI Data Collected: 04/14/2012 to 05/10/2012  
 Map Date: 11/12/2012



# 5: Travel

## Bridge Structures

The Federal Highway Administration manages and defines bridge sufficiency ratings using the National Bridge Inventory ratings scale. Under these guidelines, bridges are evaluated on multiple factors. A composite of these measurements, known as a Sufficiency Rating, may have a range from 100% (entirely sufficient structures) to 0% (an entirely deficient structure). The percentage relays how well a structure meets current traffic demands.

A Structural Evaluation is one component of the Sufficiency Rating and comments on the condition of a bridge's structural fitness. Poor status is categorized under two themes: 'Functionally Obsolete' or 'Structurally Deficient'. A functionally obsolete classification means that the structure does not meet current design standards. Due to physical limitations (e.g.: lane width, clearance), the structure cannot adequately meet traffic demands and frequently impedes traffic. This status does not imply a safety issue, only functional deficiency. Structural deficiency is a more serious status and indicates the presence of structural defects. A bridge is classified as structurally deficient if one or more of a bridge's main components has been rated in poor condition (0-4 on the NBI Rating Scale), the load carrying capacity has been surpassed, or water frequently overflows the deck and impedes traffic. Though structures with this classification typically need repair, it is not intended to comment on the severity of the bridges deficiency or label the bridge as unsafe. The NDDOT is the agency responsible for evaluating the sufficiency of bridges throughout the State of North Dakota.

**Figure 5.14** shows the number and percentage of functionally obsolete and structurally deficient bridges in the Bismarck-Mandan MPO area. There are 119 bridges within the MPO boundary and 11 have an insufficient rating. According to 2013 inspection reports, roughly 4.2% of these bridges are identified as functionally obsolete and approximately 5% are structurally deficient. This is a slight reduction from previous years calculations.

**Figure 5.14: Functionally Obsolete and Structurally Deficient Bridges in the Bismarck-Mandan MPO Area**

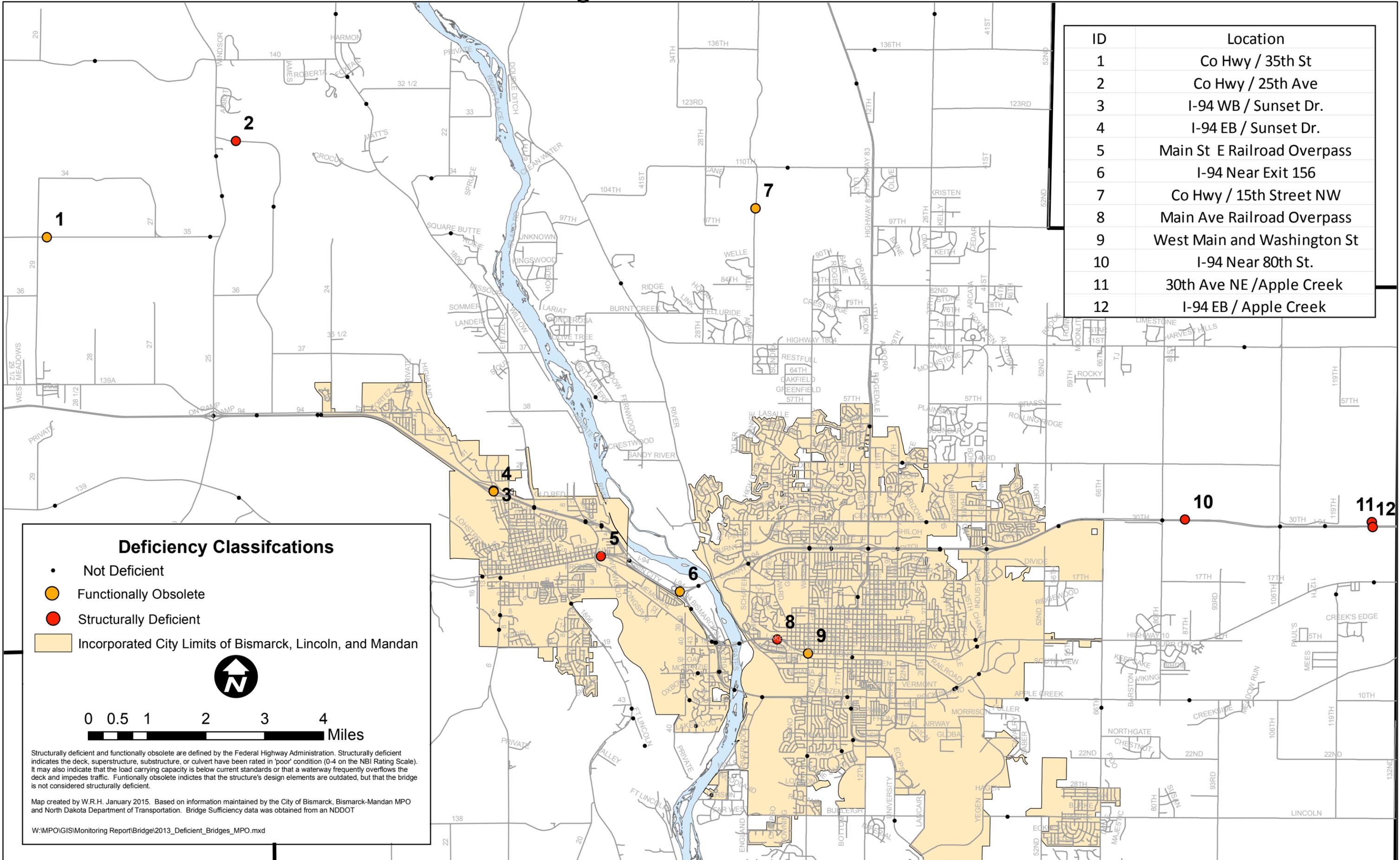
| Status                 | Number of Bridges | % of Total (119) |
|------------------------|-------------------|------------------|
| Functionally Obsolete  | 5                 | 4.2%             |
| Structurally Deficient | 6                 | 5.0%             |

*Bridge Sufficiency data was obtained from the NDDOT GIS Shapefile: Bridge Inventory, MPO Area 2013.*

*\* The Bismarck-Mandan MPO area includes Bismarck, Mandan and Lincoln, as well as portions of Burleigh and Morton Counties.*

The following map identifies the locations of functionally obsolete and structurally deficient bridges within the Bismarck-Mandan MPO area.

# 2013 Deficient Bridge Locations, Bismarck-Mandan Area



| ID | Location                    |
|----|-----------------------------|
| 1  | Co Hwy / 35th St            |
| 2  | Co Hwy / 25th Ave           |
| 3  | I-94 WB / Sunset Dr.        |
| 4  | I-94 EB / Sunset Dr.        |
| 5  | Main St E Railroad Overpass |
| 6  | I-94 Near Exit 156          |
| 7  | Co Hwy / 15th Street NW     |
| 8  | Main Ave Railroad Overpass  |
| 9  | West Main and Washington St |
| 10 | I-94 Near 80th St.          |
| 11 | 30th Ave NE /Apple Creek    |
| 12 | I-94 EB / Apple Creek       |

**Deficiency Classifications**

- Not Deficient
- Functionally Obsolete
- Structurally Deficient
- Incorporated City Limits of Bismarck, Lincoln, and Mandan

0 0.5 1 2 3 4 Miles

Structurally deficient and functionally obsolete are defined by the Federal Highway Administration. Structurally deficient indicates the deck, superstructure, substructure, or culvert have been rated in 'poor' condition (0-4 on the NBI Rating Scale). It may also indicate that the load carrying capacity is below current standards or that a waterway frequently overflows the deck and impedes traffic. Functionally obsolete indicates that the structure's design elements are outdated, but that the bridge is not considered structurally deficient.

Map created by W.R.H. January 2015. Based on information maintained by the City of Bismarck, Bismarck-Mandan MPO and North Dakota Department of Transportation. Bridge Sufficiency data was obtained from an NDDOT

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# 5: Travel

## Safety

Safety is a top priority for the Bismarck-Mandan MPO. The 2013 North Dakota Crash Summary (developed by the NDDOT) indicated that Burleigh County still had the highest crash rate of all counties in the State with 4.22 crashes per million vehicle miles traveled, compared to a State crash rate of 1.88 crashes per million vehicle miles traveled.

**Figure 5.15: Ranking of 3 Year High Crash Locations in Bismarck, ND 2011-2013**

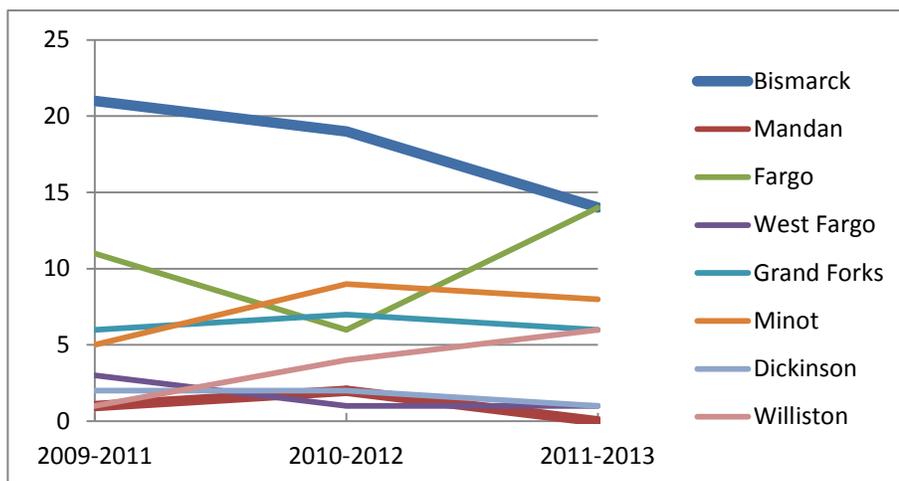
| City     | Location                       | Statewide Rank |
|----------|--------------------------------|----------------|
| Bismarck | State St & Century Ave         | 5              |
| Bismarck | State St & Capitol Ave         | 7              |
| Bismarck | State St & Interstate Ave      | 8              |
| Bismarck | Bismarck Expressway & 7th St   | 12             |
| Bismarck | Bismarck Expwy & Washington St | 16             |
| Bismarck | State St & I-94 WB Ramps       | 20             |

*Based on the NDDOT identified Urban 3-year High Crash Locations 2011-2013*

Annually the NDDOT determines “High Crash” locations for urbanized areas across the state, considering the past three years of crash data. In looking at the “3 Year High Crash Locations” for urbanized areas across the state, 6 of the top 20 locations occurred in Bismarck between 2011 and 2013. - A review of the past reports shows a decrease in the number of high crash intersections in Bismarck have reduced by 4 locations each reporting period since 2011 (2009-2011, 2010-2012, and 2011-2013). **Figure 5.15** shows the identified locations and their associated statewide rank. Mandan has had no severe issues with high urban crash locations. Overall the total number of intersections listed in the MPO area on the complete report has been steadily declining, specifically in Bismarck. The NDDOT Urban High Crash Location Report lists a total of 50 intersections in each 3 year report. **Figure 5.16** shows a trending decline in the number intersections located in Bismarck. However, Bismarck still holds a significant amount of the identified intersections in the latest report.

The locations identified within the top 20 of the NDDOT Urban High Crash Report are identified in the following Map. It should be noted that a variety of projects have either recently been completed or are programed to be completed in the near future that address some of the locations identified.

**Figure 5.16: North Dakota Identified Urban High Crash Location Report Trend**

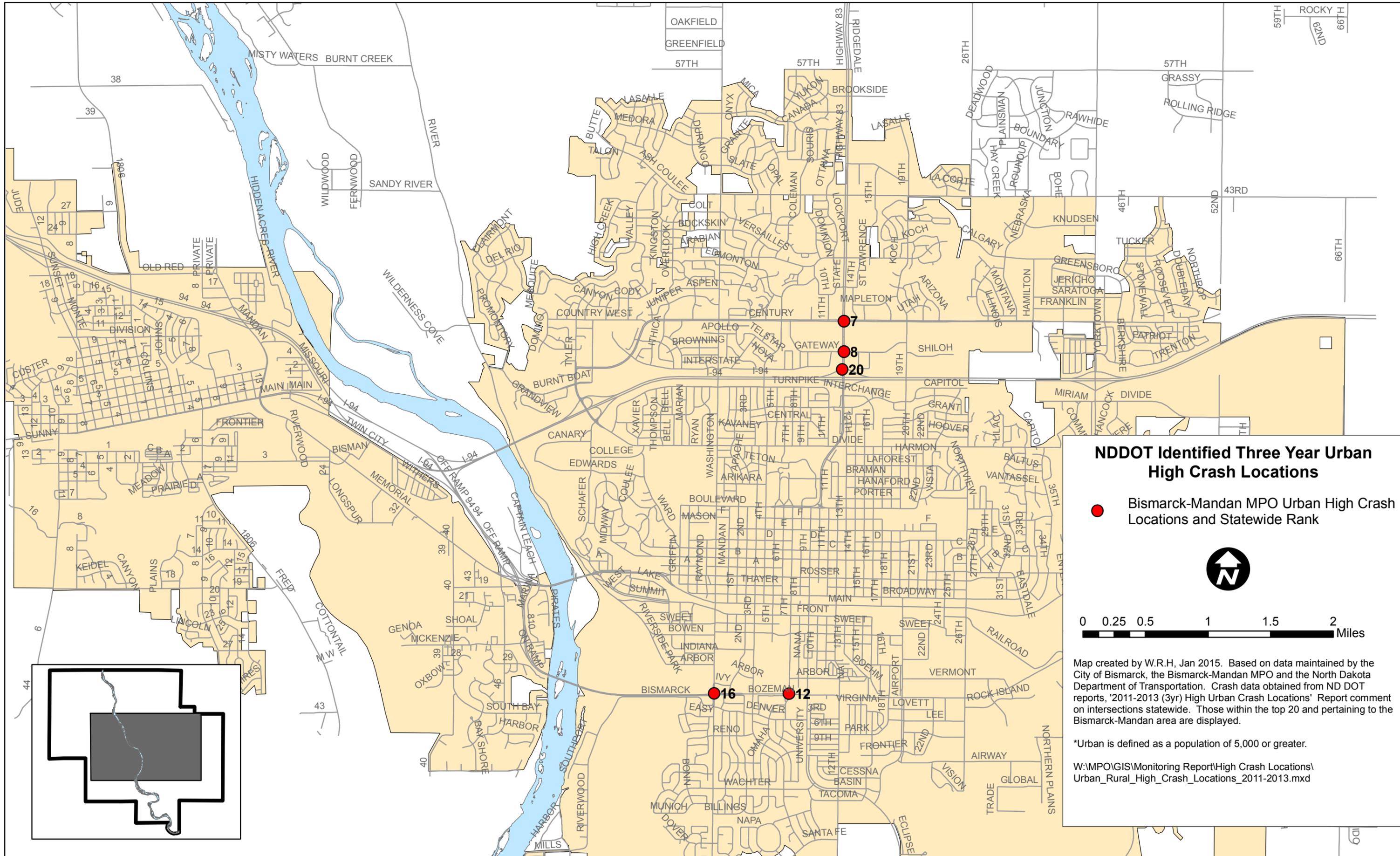


*Based on the NDDOT identified Urban 3-year High Crash Locations 2009-2011 to 2011-2013*

# *5: Travel*

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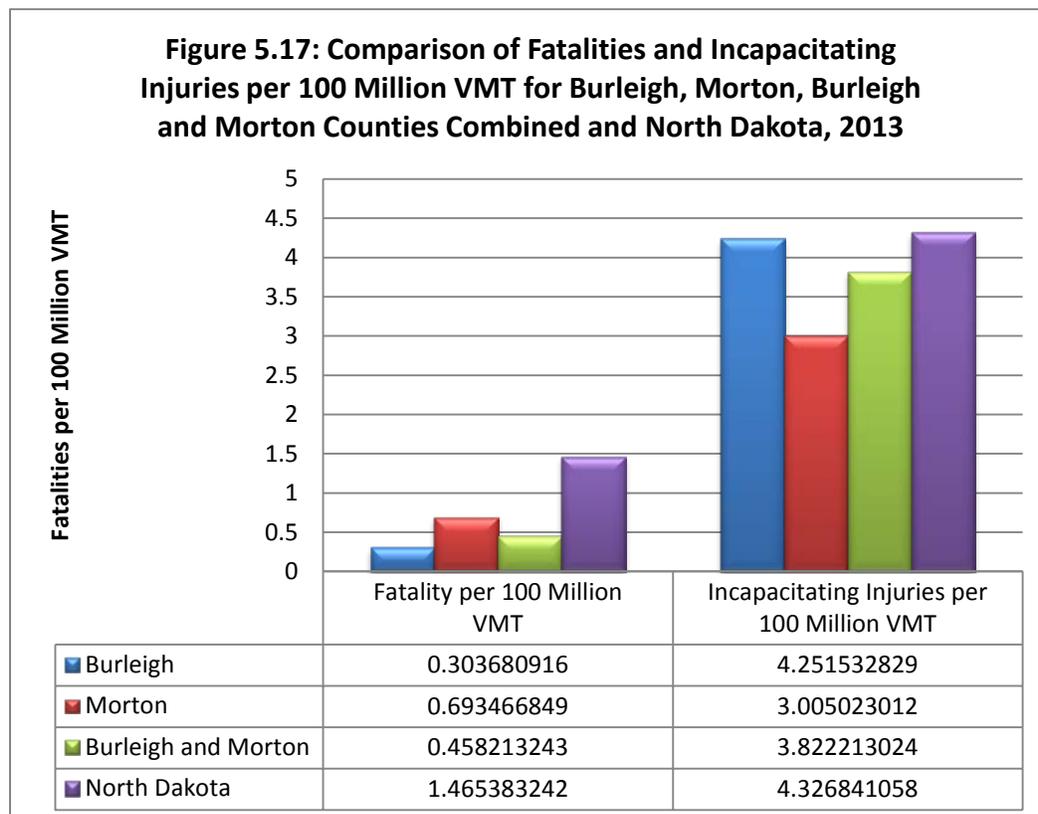
# Bismarck-Mandan MPO Urban High Crash Locations, 2011-2013



# 5: Travel

Between 2011 and 2013 there were 19 automobile collisions involving fatalities and 129 involving incapacitating injuries<sup>1</sup> in Burleigh and Morton Counties. A common measure of fatal and incapacitating injuries is to compare the total number of each type of crash to 100 million vehicle miles traveled (VMT). The following **Figure 5.17** identifies the 2013 fatal and incapacitating injuries per 100 million vehicle miles traveled in Burleigh and Morton County compared to the State of North Dakota. As the figure indicates fatalities per 100 million VMT are slightly higher on a statewide basis compared to Burleigh and Morton Counties. However, Incapacitating Injuries were significantly higher (per 100 Million VMT) in Burleigh County compared to the State in 2013.

<sup>1)</sup> Incapacitating injuries are defined as any serious injury other than fatal which results in one or more of the following: Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood; Broken or distorted extremity, Crush injuries; Suspected skull, chest or abdominal injury other than bruises or minor lacerations; Significant burns (second and third degree burns over 10% or more of the body); Unconsciousness when taken from the crash scene; Paralysis.

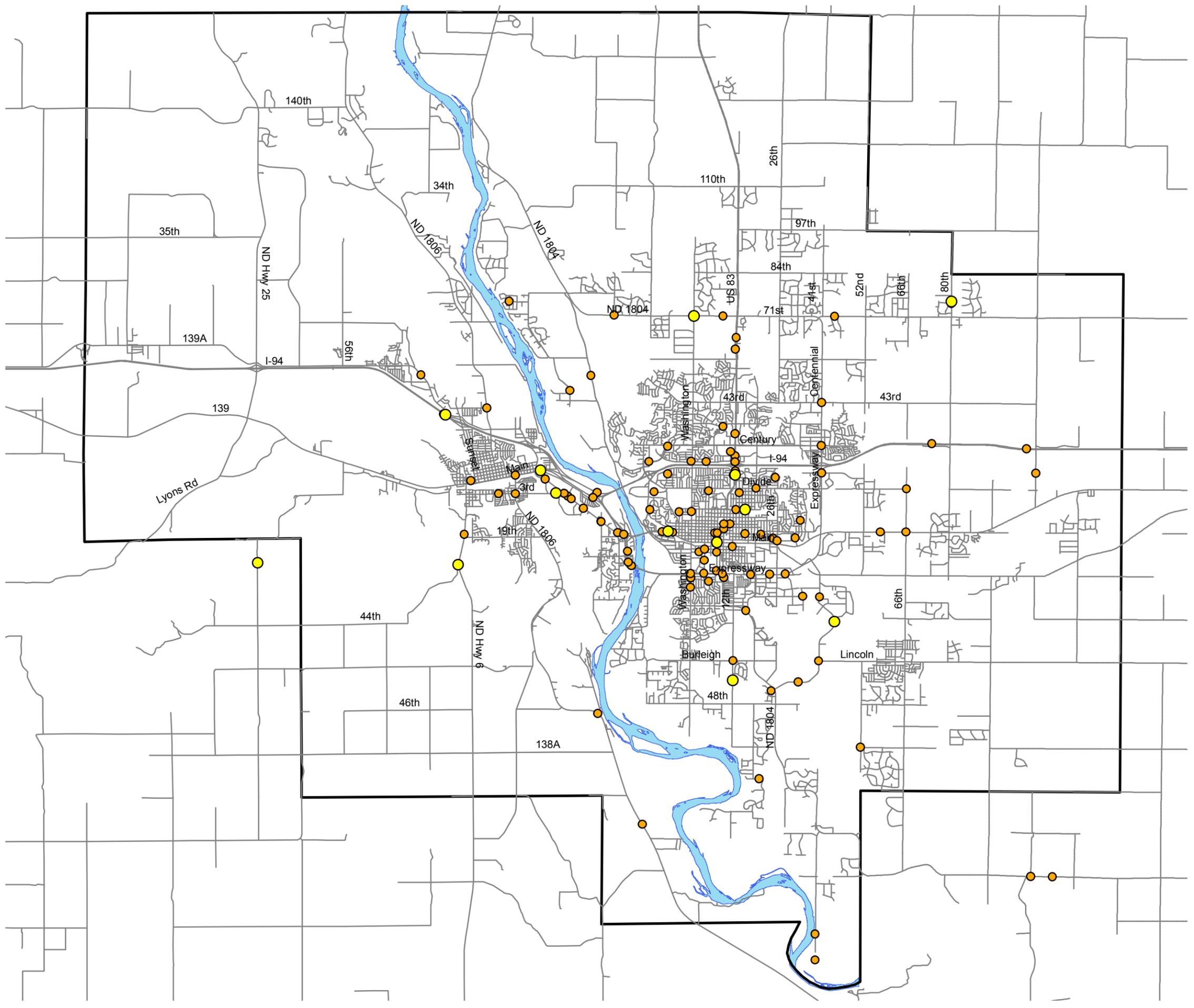


Based on information from the North Dakota Traffic Report and the North Dakota Crash Summary 2013

The following map depicts the locations of incapacitating injuries and fatalities in the Bismarck-Mandan MPO area from 2011 to 2013.

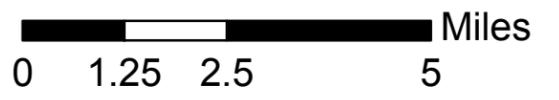
# *5: Travel*

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## Bismarck-Mandan MPO Area Crashes by Severity 2011-2013

- Crashes Involving a Fatality
- Crashes Involving an Incapacitating Injury
- Bismarck-Mandan MPO Boundary

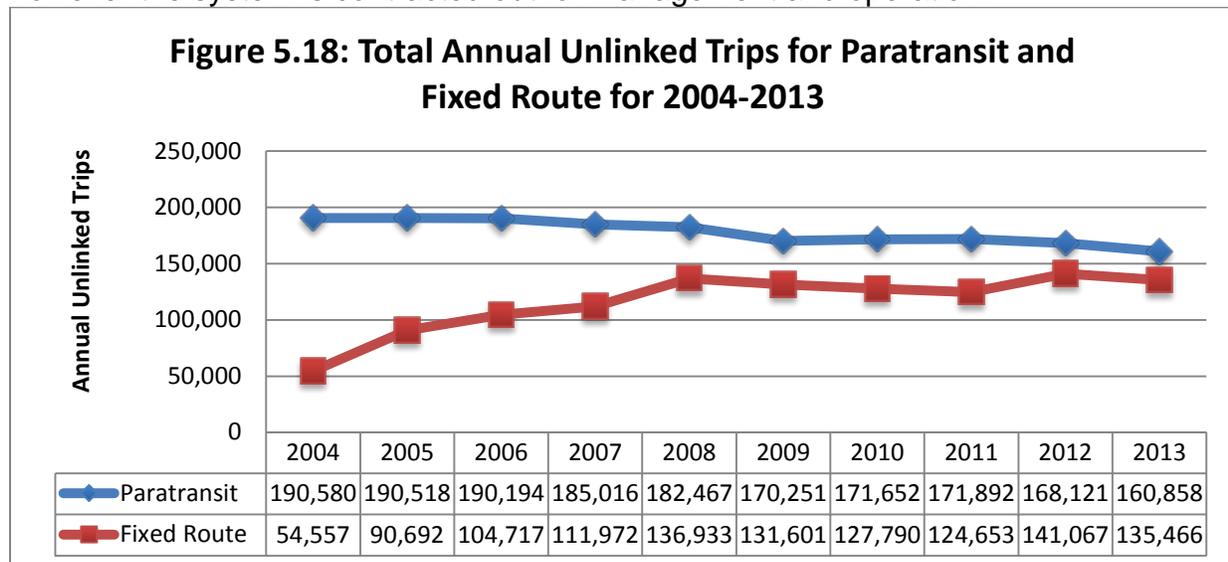


Map created by B.J.E . October 2013. Map based on data maintained by the City of Bismarck, the Bismarck-Mandan MPO, and the NDDOT.  
 W:\MPO\GIS\Monitoring Report\Traffic Analysis\Crash Data\2011-2013 Burleigh-Morton-County

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## Public Transportation

Bis-Man Transit is the Bismarck-Mandan area public transportation provider. It operates both a paratransit (Bis-Man Transit) door to door service and a fixed route bus service (Capital Area Transit or CAT). A rider must qualify to be able to ride the ParaTransit service through various eligibility requirements which generally include a disability or any individual 60 years of age or older. The ParaTransit service operates 24 hours a day 7 days a week. The CAT buses are eligible for all individuals to ride and operate on a route structure identified in the map on page 68. The CAT service generally operates from approximately 6am to approximately 7pm (dependent on route) Monday through Saturday (although not all routes are available on Saturday). The CAT service is a “flag stop” service which means riders can flag the bus down at most points along the route structure to board or depart. The current CAT structure is comprised of a series of one way loops which operate out of two hubs including Gateway Mall and Kirkwood Mall, both located in Bismarck. The current route structure provides relatively comprehensive geographic coverage throughout the Bismarck-Mandan area. Current recommendations from the Mobility 2017 Transit Development Plan suggest locating one central hub in the center part of Bismarck to provide bi-directional routes pulsing in and out of the central hub. This would allow for more convenient round trips, as well as, reduce the number of transfers which may be needed to access different parts of the communities. The City of Bismarck is the designated recipient of Federal Transit Administration (FTA) funds and owns the public transportation related facilities, vehicles, and equipment; however the system is contracted out for management and operation.



*Based on data reported to the National Transit Database from 2004-2013*

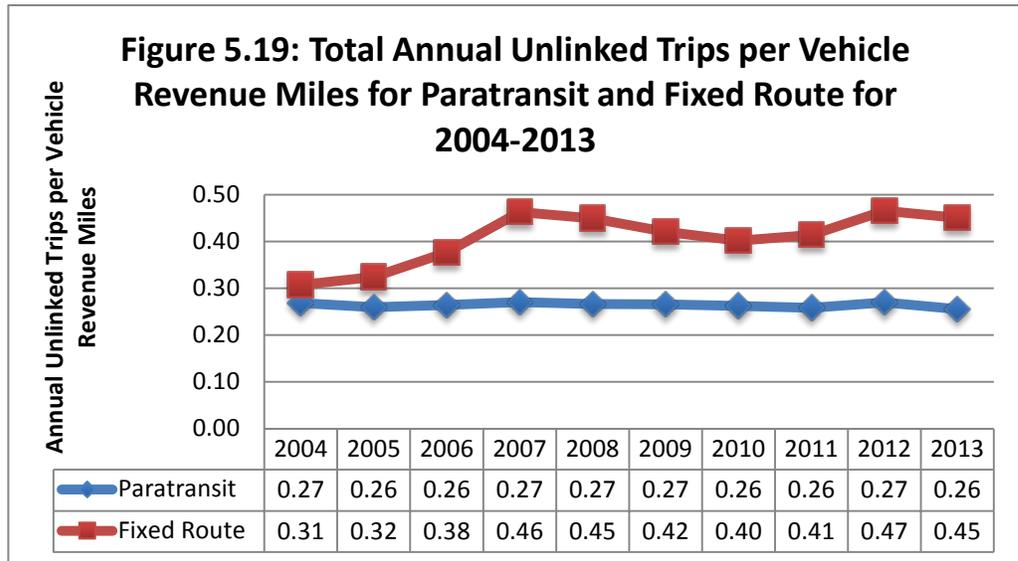
The fixed route bus service began operating in 2004 in the Bismarck-Mandan area. **Figure 5.18** depicts ridership trends comparing paratransit service to fixed route service. Since 2004 annual trips associated with the paratransit service have slightly declined while annual trips associated with the fixed route service have increased.

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However, there are still more annual trips provided by the paratransit service in comparison to the fixed route service.

Vehicle revenue miles are a measure of vehicle miles traveled by a transit vehicle while in service. In attempting to understand the level of efficiency of a service, annual trips per annual vehicle revenue miles traveled may be compared. **Figure 5.19** compares

annual trips per vehicle revenue mile for the paratransit service and the fixed route service. As the figure indicates the fixed route service has consistently provided more trips per vehicle revenue mile in comparison to the paratransit service.

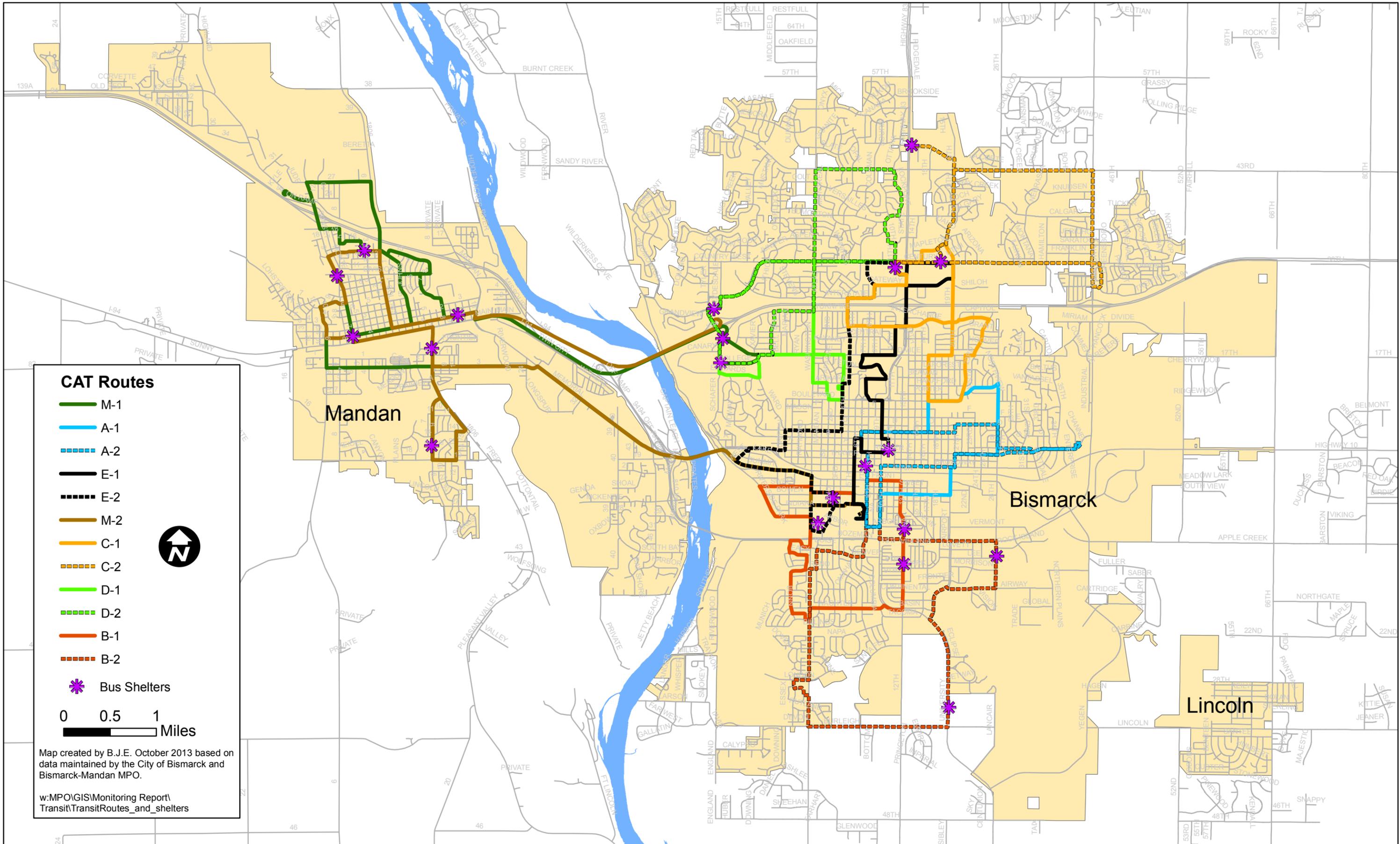


Based on data reported to the National Transit Database from 2004-2013

The 2013 transit fleet of vehicles was comprised of 20 ParaTransit and 10 CAT buses. In assessing the condition of a fleet a comparison can be made to FTA identified “Useful Life Standards”, which indicate the typical useful life of a vehicle based on a variety of characteristics such as length, seating capacity, and average cost. The Bis-Man Transit Fleet was compared to the age and mileage FTA useful life standards in Table 2-8 in the FTA document, “Useful Life of Transit Buses and Vans” April 2007 (Report No. FTA VA-26-7229-07.1). For paratransit Vehicles the FTA useful life standards are generally five years and/or 150,000 miles. As of December 31, 2013, the average age of the Bis-Man paratransit fleet was approximately 6.7 years with an average mileage of 179,458.

Approximately 40% of the Bis-Man paratransit fleet exceeded FTA defined useful life standards in both age and mileage. The useful life standards for fixed route buses are generally 7-10 years and/or 200,000-350,000 miles depending on vehicle characteristics. The average age of the CAT fleet was approximately 7.2 years with an average mileage of 282,353. No CAT vehicles exceeded useful life standards in terms of age however 50% of the CAT fleet exceeded useful life mileage standards.

# Capital Area Transit (CAT) Routes in the Bismarck-Mandan Area, 2013



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## Bicycle and Pedestrian Transportation

The Bismarck-Mandan MPO area has a well-developed bicycle and pedestrian network. This network facilitates movement within each city, offers protected travel across the Missouri River, and allows access to remote recreational areas such as Fort Lincoln State Park. The network is comprised of both on-street and off-street sections. The paved off-street network includes multi-use paths that are at least 8 feet wide. These areas are accessible to pedestrians and cyclists, as well as, other active modes of travel (e.g.: rollerblading, running, etc.). The City of Bismarck has also incorporated on-street bicycle facilities, which include a combination of bicycle lane and “Share the Road” signage and pavement markings. Solid white lines, signs, and painted bike symbols denote protected bike lanes and indicate the correct riding direction (with the flow of traffic). Share the Road signs and pavement markings indicate that motorist should allow adequate space for themselves and cyclists to travel safely. Share the Road signs and Sharrows are used when roadways are too narrow to accommodate a protected bike lane. It should be noted that cycling is allowed on all city streets. However, areas with increased bike usage have been structured to encourage safer travel. The communities of Bismarck and Mandan have relatively extensive sidewalk coverage, throughout the communities. The City of Bismarck has an ordinance requiring the installation of sidewalks as adjacent development occurs. Additionally, the City of Bismarck has a program, which annually focuses on specific parts of the community, to fill “gaps” in the existing sidewalk network.

The following map depicts the paved pedestrian and bicycle network (excluding sidewalks), comprised of 84.55 miles of on and off street facilities. There are 74.5 miles of off-street network, denoted as multi-use trails. This is the largest portion comprising approximately 88% of the bicycle/pedestrian network. There are approximately 4.3 miles or 5% of the system comprised of striped bicycle lanes and signage. Share the Road Signage and pavement markings consist of approximately 5.75 miles or 7% of the network. Striped Routes, at 4.3 miles, compose 5 percent.

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# 2013 Bicycle and Pedestrian Network, Bismarck-Mandan Area

