Twin Cities Area Transportation Study (TwinCATS)

WORKING DRAFT 2045 LONG RANGE TRANSPORTATION PLAN

Principles in Motion >>>
Background
  MPO Organization
  Metropolitan Area Boundaries
  2045 Long Range Plan Overview

Regional Context
  Metropolitan Planning Area

Guiding Principles & Strategies
  Economic Opportunity
  Environment
  Quality of Life
  System Preservation
  Choice
  Safety
  Health
  Equity
  Efficiency

Future Transportation Funding
  Funding Sources
  Financial Forecasts

Road & Bridge Network
  Functional Classification
  Roadway Miles by Classification
  Pavement Condition
  Bridge Condition
  Vehicular Level of Service Existing Roadways
  2045 Vehicular Level of Service—Existing, Committed, & Planned Roadways
  Road and Bridge Infrastructure Challenges
  Strategies for Improving Road & Bicycle Conditions

Non-Motorized Network
  Challenges for Bicycle & Pedestrian
  Strategies for Improving Bicycle & Pedestrian Networks

Fiscally Constrained Road, Bridge, & Non-Motorized Projects
  2018-2025 | 2026-2035 | 2036-2045

Public Transit
  Public Transportation Challenges
  Strategies for Improving

Fiscally Constrained Public Transit Projects
  2018-2025 | 2026-2035 | 2036-2045

Rail
  Passenger Rail
  Freight Rail

Freight Transportation
  Arterials Within MPO
  Freight Vehicle Miles
  Corridors of Significance
  Freight Transportation Trends
  Freight Transportation Challenges
  Commercial Port
  Strategies for Improving Freight Transportation

Aviation
  Aviation Trends
  Challenges
  Strategies for Improving Aviation
**Supporting Documentation**
- Illustrative Project Lists
- Priority Segment List
- Public Participation
- Consultation

**List of Figures & Maps**

**Planning Area**

**Maps**
- Berrien County Land Use
- Cass County Land Use
- NATS Land Cover -2015

**Figures & Tables**
- Berrien County Land Use - Table

**Population and Socioeconomic**

**Maps**
- Population 65 and Older
- Housing and Transportation Social Vulnerability
- Household Composition Social Vulnerability Index
- Minority/Language Social Vulnerability Index
- Overall Social Vulnerability Index
- Median Income
- No Vehicle Households
- Employment and Population Density
- Employment Density and Median Household Income

**Figures & Tables**
- Population Change 1970-2010 - Figure
- Population Shifts 1970-2010 - Table
- Population Forecast -Table
- Population by Age and Gender- Figure
- Population 65 and Older by Jurisdiction -Table

**Travel**

**Maps**
- Commute Mode by Bike, Walking and Public Transit

**Figures and Tables**
- Commute Mode by Community Table
- Inflow and Outflow of Workers – Figure
- Jobs by Distance Home to Work - Figure

**Funding/Projects**

**Maps**

**Figures and Tables**
- Road Funding 2017-2020
- Transit 5307 Funding 2010-2017 - Figure
**Road and Bridge**

**Maps**
- National Functional Classification
- Federal Aid Eligible Roads
- Bridges
- Total Crashes 2006-2015
- Fatal and Serious Vehicle Crashes 2006-2015
- MDOT Controlled Federal Aid Eligible Road
  - Pavement Condition - PASER
- Locally Controlled Federal Aid Eligible Road
  - Pavement Condition

**Figures & Tables**
- National Functional Class Miles Traveled - 2016 Table
- Bridge Ownership - Table
- Bridge Condition by Road Type - Figure
- Pavement Condition All Federal Aid Roads - 2016-2017 Table
- Pavement Condition by Municipality 2016-2017 Figure
- Trends in Pavement Condition Figure
- MDOT Pavement Condition – PASER Figure
- National Highway System Pavement and Bridge Condition 2018 Targets - Table
- Total Crashes 2006-2015 Table
- Crashes Five Year Moving Average Table
- Fatalities and Serious Injuries 2016-2015 Table
- High Crash Road Segments 2006-2015 Table
- Annual Serious and Fatal Injury Vehicle Crashes by Jurisdiction - Table
- Vehicle Fatalities by Road Type Figure - Table
- Fatal and Serious Injury Crash Rate per 100 Million Miles Traveled - Table
- Serious and Fatal Injury 2018 Safety Targets - Table

**Environmental Maps**
- NATS Wetlands
- FEMA Flood
- Impervious Services
- Significant Cultural and Natural Places

**Figures & Tables**

**Bicycle and Pedestrian Maps**
- Bus Stops Accessible by Pedestrian
- Sidewalks and Wide Shoulders
- Pedestrian and Bicyclist Crashes 2006-2015
- Non-Motorized Trails

**Figures & Tables**
- Miles of Non-Motorized Infrastructure by Jurisdiction - Table
- Annual Pedestrian & Bicycle Crashes 2006-2015 - Table
- Roads with Highest Incidence of Pedestrian & Bicycle Crashes 2006-2015 – Table
- Fatal and Serious Injury Safety Targets – Table

**Public Transit**

**Maps**
- TwinCities Area Transportation Authority Service Area
- TwinCities Area Transportation Authority Fixed Routes

**Figures and Tables**
- Twin Cities Area Transportation Authority Ridership 2010 – 2016 - Figure
- Twin Cities Area Transportation Authority System Performance 2010-2016 – Table
- Twin Cities Area Transportation Authority 2016 Transit Assets - Table
- Transit Asset Management 2018 Targets – Table
Principles in Motion >>>
MPO Organization

BACKGROUND

Metropolitan Area Boundaries
The Metropolitan Area

The St. Joseph Benton Harbor Urbanized Area is located in Berrien County Michigan. The southern border of the County abuts the northern Indiana State line. The Cities in the southern portion of the County are strongly influenced by the population and economics of the Indiana cities that lie in close proximity including South Bend, Mishawaka, and Michigan City. Chicago is also a powerful influence on many aspects of life in southwest Michigan.

Benton Harbor and St. Joseph are home to Whirlpool, the world’s largest appliance manufacturer and Leco who manufactures scientific instrumentation. Other large employers include Lakeland Hospital, and Cook Nuclear.
TRANSPORTATION AND LANDUSE

Transportation and land use considered together can respond better to community needs by combining economic vitality and mobility with quality-of-life and environmental issues. A municipality’s land is perhaps its greatest resource. Changes to the way it is used can permanently shape the community’s future.

The Importance of Transportation as Part of Local Land Use

Every local land use decision has a transportation consequence:

- Residential developments may require modifications to existing roadway networks to ensure adequate access for motorists, pedestrians and bicyclists.
- Industrial or commercial facilities may require parking and possible accommodations for public transportation and bicyclists in addition to roadway access enhancements.
- Commercial, industrial, retail or residential uses may have a variety of transportation impacts, including the need for turning lanes and traffic signal installations, and trip generation impacts that extend beyond municipal borders.

Link Land Use and Transportation Planning

- Tax dollars to infrastructure costs necessary to support development, such as roads and sewers
- Costs of emergency services, roadway maintenance and other municipal services
- Lack of coordinated land use and transportation can result in worsening air and water pollution resulting from additional roadway traffic and stormwater runoff into our streams, rivers and lakes.
- Uncoordinated land use and transportation decision-making can result in park and ride facilities with no transit access, greater pedestrian injuries and deaths, and more time spent in the car per day away from our families.
- The conversion of open space or farmland to large residential subdivisions or big box retail or distribution centers can result in decreased air quality and a loss of community character.
As shown on the existing land use map, from the 2015 Berrien County Master Plan, residential areas dominate in the TwinCATS, whereas the surrounding area is largely agricultural. Agriculture, the rural landscape, plays an important cultural and economic value of the whole region. Recognizing the significance of the rural community drives the Plan’s objective to promote higher density infill and redevelopment within the existing urbanized areas. Similarly, other objectives proposed in the Berrien County Master Plan are in direct alignment to address goals of the TwinCATS long-range Plan.

### Land Use *

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>132,573</td>
<td>36.1%</td>
</tr>
<tr>
<td>Commercial</td>
<td>14,202</td>
<td>3.9%</td>
</tr>
<tr>
<td>Industrial</td>
<td>6,870</td>
<td>1.9%</td>
</tr>
<tr>
<td>Public/Semi-public</td>
<td>23,611</td>
<td>6.4%</td>
</tr>
<tr>
<td>Agricultural</td>
<td>176,265</td>
<td>47.9%</td>
</tr>
<tr>
<td>Roads</td>
<td>14,082</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

Maintain and provide efficiencies in the current transportation system

Connect centers of employment, education, commerce, and housing with multiple modes of transportation, including non-motorized corridors

Advocate “complete streets” design standards that correlate with state initiatives like Safe Routes to Schools and Building Healthy Communities
Land Use: Residential, Commercial, Industrial, Public, Other

**Transportation and Land Cover**

Looking at both the land use and land cover provides a comprehensive picture of the area. Land use, referring **how** people are using the land, while land cover is defined by **what** is on the surface of the land, whether vegetation, urban infrastructure, water, bare soil or other. For example, a land use of residential may have the land cover of developed or if vacant, the land cover of forest.

In TwinCATS, an invaluable natural resource is the water, shown on the map as a network of rivers, streams and open water. Wetlands are found along most of these waterways, with an exceptional green infrastructure core* along the Paw Paw River. Two state parks are seen, highlighted in yellow, showing the unique sand dunes along Lake Michigan. Farmland dominates the western portion of the area reaching into Hagar Township. The highest intensity of development is within the city and village limits, in addition to areas in Benton Township. Surrounding these areas, the land is low to medium developed. The transportation network can be seen across TwinCATS classified as medium and low developed.

*Green infrastructure core is a natural, relatively undisturbed, intact area, larger than

Overall, using land efficiently conserves farmland, water resources and environmentally sensitive areas such as wetland that absorb and filter storm water, reducing localized flooding and its impacts, and provide opportunities for recreation and enhance the quality of life and economic development in our communities.
Land Cover Change 1975-2016

In TwinCATS, the largest change in land cover is the increase in development. In 2016, the combined area of low and high intensity developed is 27.3% of the land cover (25,279 acres). This is an increase of 4,139 acres since 1975.

<table>
<thead>
<tr>
<th>Land Cover Class</th>
<th>1975</th>
<th>Loss</th>
<th>Gain</th>
<th>2016</th>
<th>Net Change</th>
<th>Percent Change</th>
<th>2016 Percent Land Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Intensity Developed</td>
<td>4,099.40</td>
<td>-7.56</td>
<td>1,388.19</td>
<td>5,480.03</td>
<td>1,380.63</td>
<td>33.7%</td>
<td>5.92%</td>
</tr>
<tr>
<td>Low Intensity Developed</td>
<td>17,039.90</td>
<td>-222.84</td>
<td>2,981.65</td>
<td>19,798.70</td>
<td>2,758.81</td>
<td>16.2%</td>
<td>21.39%</td>
</tr>
<tr>
<td>Cultivated Crops</td>
<td>37,910.77</td>
<td>-3,006.11</td>
<td>253.75</td>
<td>35,158.41</td>
<td>-2,752.36</td>
<td>-7.3%</td>
<td>37.98%</td>
</tr>
<tr>
<td>Grassland</td>
<td>3,260.31</td>
<td>-507.73</td>
<td>296.45</td>
<td>3,049.03</td>
<td>-211.28</td>
<td>-6.5%</td>
<td>3.29%</td>
</tr>
<tr>
<td>Forested</td>
<td>16,439.65</td>
<td>-831.53</td>
<td>812.41</td>
<td>16,420.53</td>
<td>-19.13</td>
<td>-0.1%</td>
<td>17.74%</td>
</tr>
<tr>
<td>Scrub/Shrub</td>
<td>1,612.36</td>
<td>-688.96</td>
<td>62.27</td>
<td>1,005.87</td>
<td>-606.69</td>
<td>-37.6%</td>
<td>1.09%</td>
</tr>
<tr>
<td>Woody Wetland</td>
<td>8,257.74</td>
<td>-201.71</td>
<td>95.85</td>
<td>8,151.88</td>
<td>-105.86</td>
<td>-1.3%</td>
<td>8.81%</td>
</tr>
<tr>
<td>Emergent Wetland</td>
<td>1,201.60</td>
<td>-130.32</td>
<td>62.05</td>
<td>1,133.32</td>
<td>-68.28</td>
<td>-5.7%</td>
<td>1.22%</td>
</tr>
<tr>
<td>Barren Land</td>
<td>1,353.72</td>
<td>-538.20</td>
<td>320.47</td>
<td>1,135.99</td>
<td>-217.72</td>
<td>-16.1%</td>
<td>1.23%</td>
</tr>
<tr>
<td>Open Water</td>
<td>1,397.31</td>
<td>-217.95</td>
<td>59.62</td>
<td>1,239.18</td>
<td>-158.12</td>
<td>-11.3%</td>
<td>1.34%</td>
</tr>
</tbody>
</table>

*Land Cover Classes, for more details www.csc.noaa.gov/landcover

The largest decrease in land cover is cultivated crops with a loss of 2,752 acres; this is comparable to the size of the City of Benton Harbor at 2,832 acres.

Source: NOAA's Coastal Change Analysis Program (C-CAP) 1975 to 2016 Regional Land Cover Change Data
Land Cover Change 1975-2016: Trends in Detail

In TwinCATS, the trend over the last 40 years has been an increase in development and a loss of cultivated crop land. The main transformation in the region is shown on the map with US 31, running north to south, a large tract of land at US-94 and Pipestone Street and the US-94/Niles Ave exit. In various locations, smaller tracts of forest land cover have been transformed into developed areas. Highlights of the land cover types that were converted into developed areas are:

**Land Cover Type Converted to Developed (acres)**

- High, Medium and Low Intensity Developed

<table>
<thead>
<tr>
<th>Land Cover Type</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated Land</td>
<td>1274</td>
</tr>
<tr>
<td>Forest</td>
<td>502</td>
</tr>
<tr>
<td>Developed Open Space</td>
<td>293</td>
</tr>
<tr>
<td>Wetlands</td>
<td>109</td>
</tr>
</tbody>
</table>

Agricultural areas being converted to development would be an undesirable future trend in the area. This trend leads to an increased pressure on the transportation infrastructure, creates issues of mobility accessibility and increases impermeable surfaces. Given this past trend of increase in impermeable surfaces, the loss of any wetlands should be closely monitored. Wetlands function to lessen storm water run-off and diminish the impacts of flooding events. The total loss of wetlands was 173 acres during this time period.
Population

From the late 19th century until early 1970s, Michigan's population grew more rapidly than the nation's. The nationwide recession of the early 1980s hit Michigan harder than most other states because of its effect on the auto industry and the related smaller businesses associated with the auto industry. Since then, Michigan has grown more slowly than the rest of the nation. The population in TwinCATS experienced a similar trend from 1960 to 1980 with an 11% increase in population. As in the entire state, from 1980-1990 there was a substantial decrease in population. Since the 1990’s the population is decreasing, yet at a lower rate, where it remains today.

<table>
<thead>
<tr>
<th>Year</th>
<th>Benton Harbor City</th>
<th>Benton Charter Township</th>
<th>Bridgman City</th>
<th>Hagar Township</th>
<th>Lake Charter Township</th>
<th>Lincoln Charter Township</th>
<th>Stevensville Village</th>
<th>Royalton Township</th>
<th>St. Joseph City</th>
<th>St. Joseph Charter Township</th>
<th>Shoreham Village</th>
<th>Sodus Township</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>19,136</td>
<td>19,914</td>
<td>1,454</td>
<td>3,562</td>
<td>2,016</td>
<td>4,462</td>
<td>697</td>
<td>1,744</td>
<td>11,755</td>
<td>7,418</td>
<td>443</td>
<td>2,575</td>
</tr>
<tr>
<td>1970</td>
<td>16,481</td>
<td>19,034</td>
<td>1,621</td>
<td>4,088</td>
<td>2,146</td>
<td>11,007</td>
<td>1,107</td>
<td>2,513</td>
<td>11,042</td>
<td>10,271</td>
<td>666</td>
<td>2,504</td>
</tr>
<tr>
<td>1980</td>
<td>14,707</td>
<td>19,120</td>
<td>2,235</td>
<td>4,943</td>
<td>2,212</td>
<td>13,520</td>
<td>1,268</td>
<td>3,046</td>
<td>9,622</td>
<td>9,961</td>
<td>742</td>
<td>2,260</td>
</tr>
<tr>
<td>1990</td>
<td>12,818</td>
<td>17,163</td>
<td>2,140</td>
<td>4,113</td>
<td>2,487</td>
<td>13,604</td>
<td>1,230</td>
<td>3,135</td>
<td>9,214</td>
<td>9,613</td>
<td>737</td>
<td>2,065</td>
</tr>
<tr>
<td>2000</td>
<td>11,182</td>
<td>16,404</td>
<td>2,428</td>
<td>3,964</td>
<td>3,148</td>
<td>13,952</td>
<td>1,191</td>
<td>3,888</td>
<td>8,789</td>
<td>10,042</td>
<td>860</td>
<td>2,139</td>
</tr>
<tr>
<td>2010</td>
<td>10,038</td>
<td>14,749</td>
<td>2,291</td>
<td>3,671</td>
<td>2,972</td>
<td>14,691</td>
<td>1,142</td>
<td>4,766</td>
<td>8,365</td>
<td>10,028</td>
<td>862</td>
<td>1,932</td>
</tr>
</tbody>
</table>

Sources: US Census Bureau
Population Shift

<table>
<thead>
<tr>
<th>Geography</th>
<th>1960</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton Harbor City</td>
<td>19,136</td>
<td>10,038</td>
<td>9,098</td>
</tr>
<tr>
<td>Benton Charter Township</td>
<td>19,914</td>
<td>14,749</td>
<td>5,165</td>
</tr>
<tr>
<td>Bridgman City</td>
<td>1,454</td>
<td>2,291</td>
<td>837</td>
</tr>
<tr>
<td>Hagar Township</td>
<td>3,562</td>
<td>3,671</td>
<td>109</td>
</tr>
<tr>
<td>Lake Charter Township</td>
<td>2,016</td>
<td>2,972</td>
<td>956</td>
</tr>
<tr>
<td>Lincoln Charter Township</td>
<td>4,462</td>
<td>14,691</td>
<td>10,229</td>
</tr>
<tr>
<td>Stevensville Village</td>
<td>697</td>
<td>1,142</td>
<td>445</td>
</tr>
<tr>
<td>Royalton Township</td>
<td>1,744</td>
<td>4,766</td>
<td>3,022</td>
</tr>
<tr>
<td>St. Joseph City</td>
<td>11,755</td>
<td>8,365</td>
<td>-3,390</td>
</tr>
<tr>
<td>St. Joseph Charter Township</td>
<td>7,418</td>
<td>10,028</td>
<td>2,610</td>
</tr>
<tr>
<td>Shoreham Village</td>
<td>443</td>
<td>862</td>
<td>419</td>
</tr>
<tr>
<td>Sodus Township</td>
<td>2,575</td>
<td>1,932</td>
<td>-643</td>
</tr>
</tbody>
</table>

Sources: US Census Bureau

Comparing 1960 to 2010, the total population has not increased dramatically; however, there has been a shift in population numbers between townships, villages and cities. The largest increase in population has occurred in Lincoln Township. The greatest decrease in population has occurred in the City of Benton Harbor.
Population forecasts for the TwinCATS planning area show that the majority of jurisdictions are expected to grow. Exceptions to this population growth are the Village of Shoreham, Hagar Township, and Sodus Township.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Population Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cities</strong></td>
<td></td>
</tr>
<tr>
<td>City of Benton Harbor</td>
<td>9,998</td>
</tr>
<tr>
<td>City of Bridgman</td>
<td>2,258</td>
</tr>
<tr>
<td>City of St. Joseph</td>
<td>8,286</td>
</tr>
<tr>
<td><strong>Villages</strong></td>
<td></td>
</tr>
<tr>
<td>Village of Grand Beach</td>
<td>-</td>
</tr>
<tr>
<td>Village of Michiana</td>
<td>-</td>
</tr>
<tr>
<td>Village of Shoreham</td>
<td>853</td>
</tr>
<tr>
<td>Village of Stevensville</td>
<td>1,130</td>
</tr>
<tr>
<td><strong>Townships</strong></td>
<td></td>
</tr>
<tr>
<td>Benton Charter Township</td>
<td>14,459</td>
</tr>
<tr>
<td>Hagar Township</td>
<td>3,671</td>
</tr>
<tr>
<td>Lake Charter Township</td>
<td>2,939</td>
</tr>
<tr>
<td>Lincoln Charter Township</td>
<td>13,398</td>
</tr>
<tr>
<td>Royalton Township</td>
<td>4,759</td>
</tr>
<tr>
<td>St. Joseph Charter Township</td>
<td>9,013</td>
</tr>
<tr>
<td>Sodus Township</td>
<td>1,935</td>
</tr>
<tr>
<td><strong>TwinCATS</strong></td>
<td>72,699</td>
</tr>
</tbody>
</table>

*For townships with villages, the population reported for the township is not including the village population.

**TwinCATS total population is excluding the Villages of Grand Beach and Michiana.
The Millennials and Boomers are the two largest age cohorts alive today nationwide and within the TwinCATS planning area. Millennials between 15 and 34 years of age and will be 45 to 64 by 2045. Baby Boomers, ages of 50-69 in 2015 will be 80 years and older by 2045. The Gen X population in 2015 represents 19% of the NATS area population, in 2045 will be 64-79.
The number of households and their size is an indicator of how the population is distributed over the TwinCATS area. Overall, the number of households by jurisdiction remained relatively steady between 2010 and 2015. The majority of jurisdictions had a significant increase in the percent of one-person households.
Employment trends in retail trade, professional, science, and technical services, health care and social assistance, and manufacturing from 2001 through 2013.

In Berrien County, it is forecasted that employment in health care and social assistance will overtake manufacturing in the 2030s. Retail trade and manufacturing employment are projected to decrease over the next twenty-five years whereas employment in professional, science, and technical services and health care and social assistance are expected to increase.

For transportation planning purposes, it is helpful to anticipate large changes in the employer/employment market. For example, a strong retail market requires a somewhat different capacity in a transportation network than that of a strong manufacturing economy. All-season roads are likely of greater importance on a continuing basis to manufacturers than retailers.

Employment trends in retail trade, professional, science, and technical services, health care and social assistance, and manufacturing from 2001 through 2013.
Commuting to Work

According to the American Community Survey 85% of workers who live in the metro area commuted by personal vehicle. Of those, 78% drove alone while 7% carpoolled. Only about 2% of the workers within the TwinCats area commute using active transportation such as walking, biking or taking transit. This rate is about half of the state average rate.

<table>
<thead>
<tr>
<th>City</th>
<th>Drove Alone</th>
<th>Carpool</th>
<th>Bus</th>
<th>Bike</th>
<th>Walk</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Benton Harbor</td>
<td>72%</td>
<td>13%</td>
<td>3%</td>
<td>2%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>City of Bridgman</td>
<td>83%</td>
<td>9%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>City of St. Joseph</td>
<td>86%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Benton Charter Township</td>
<td>85%</td>
<td>8%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Hagar Township</td>
<td>87%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Lake Charter Township</td>
<td>87%</td>
<td>8%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Lincoln Charter Township</td>
<td>90%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Royalton Township</td>
<td>89%</td>
<td>4%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>St. Joseph Charter Town-</td>
<td>86%</td>
<td>6%</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>ship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodus Township</td>
<td>87%</td>
<td>9%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>TwinCats Total</td>
<td>85%</td>
<td>7%</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Berrien County</td>
<td>83%</td>
<td>8%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Michigan</td>
<td>83%</td>
<td>9%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Reliance on automobiles for work trips increase as the distance from high-density employment areas increases.

Highest rates of commuting by automobile: Lincoln Twp. 95%
Sodus Twp. 96%

2010-2015
TwinCats Average Commute Time
17 Minutes
Michigan
24 Minutes
United States
26 Minutes
Commuting Patterns of Workers within Berrien County

U.S. Census Bureau’s Longitudinal Employer-Household Dynamics Origin-Destination Employment data measures the inflow and outflow of Berrien County’s workers and employed residents. Today, 37% of commuters who reside in Berrien County work outside of the county. From 2005 to 2015, there has been a 12% increase in the number of jobs filled by residents within the county.

Inflow & Outflow of Workers in Berrien County

- **20,558** commuters ENTER Berrien County every day for work.
- **25,495** commuters LIVE and LEAVE Berrien County every day for work.
- **40,471** commuters LIVE and WORK in Berrien County.
Employment Density & Household Income

Median household income serves as an important indicator of transportation options available for the residents of the region. Lower household incomes usually correlate with lower vehicle ownership and thus a greater reliance on other modes of transportation such as public transit to reach employment opportunities.

In the TwinCATS area approximately 35% of jobs are located in areas outside of public transit service areas. Those without access to cars—including low-income workers and people with disabilities—lose out on employment opportunities. Low-income people who do have access to cars spend a large percentage of their household resources on transportation at the expense of other necessities.

Highest Rates of Poverty
Benton Harbor: 50.3%
Benton Charter Township: 33.6%
Employment Density

Many communities across the U.S. have experienced a decline in traditional downtown employment centers in favor of office parks and retail in outer suburbs. Such dispersion of employment to the suburbs can result in reduced accessibility by workers due to longer average trip distances, and lack of public transit. The movement of jobs to areas outside of the core cities has been most pronounced in industries that offer low- and middle-skill jobs. The National Research Council reported that while half of people on welfare live in the core city, 70% of jobs available to them are located outside of the core city. The city of Benton Harbor is a good example of this. In the 1970’s most of the jobs moved out of the city and into Benton Township.

53% of the businesses within the TwinCATS planning area employ five people or less.
Equity

The Social Vulnerability Index (SVI) was created for communities to identify populations at greater risks in the event of human-made or natural disasters. At the same time, the data directly relates to current conditions that make these same communities in need of transportation alternatives.

The merging of different social factors gives greater weight to the overall conditions that impact a person’s ability to travel to jobs, medical services, educational resources, grocery stores and other places that offer means of survival.

Social Vulnerability Index (SVI) uses U.S. Census data to determine the social vulnerability of every Census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The SVI ranks each tract on 14 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Maps of the four themes are shown in the next pages. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking.

For more information about the SVI, visit: http://svi.cdc.gov

CALL OUT HERE
Social Vulnerability Index

### Social Vulnerability Index (SVI)
In TwinCATS, by census tract where the top 10%, at the 90th percentile of values were assigned a flag. Data from the State of Michigan was used to determine the relative vulnerability. In the table, following the variable name, the percentage represents when a flag was applied in Berrien County which may differ slightly than the percentage calculated for the entire state. See the Overall Social Vulnerability Index (SVI) Map for the location of the census tract.

<table>
<thead>
<tr>
<th>CENSUS TRACT NUMBER</th>
<th>BELOW POVERTY (&gt;53%)</th>
<th>UNEMPLOYED (&gt;25%)</th>
<th>INCOME (&lt;$12,000)</th>
<th>NO HIGH SCHOOL DIPLOMA (&gt;24%)</th>
<th>AGE 65 OVER (&gt;22.5%)</th>
<th>AGE 17 &amp; UNDER (&gt;28%)</th>
<th>DISABILITY (&gt;22.5%)</th>
<th>SINGLE PARENT (&gt;20%)</th>
<th>MINORITY (&gt;90%)</th>
<th>LESS ENGLISH (&gt;3.2%)</th>
<th>MULTI-UNIT (&gt;24%)</th>
<th>MOBILE HOME (&gt;15%)</th>
<th>CROWDING (&gt;4%)</th>
<th>NO VEHICLE (&gt;24%)</th>
<th>GROUP QUARTERS (&gt;4.4%)</th>
<th>TOTAL FLAGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>111</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Uncertain Future

**COMMUTER TRAVEL PREFERENCES**
Younger generations are increasingly looking for more transportation options, especially for their trips to work. Frequent transit routes and bicycling facilities are in higher demand. Choosing to live closer to where you work provides opportunities to walk. As desires to walk more increase, demand for better sidewalk conditions also increase.

**CLIMATE CHANGE**
Environmental changes could challenge the resiliency of the transportation network. Roadways, bridges, and other transportation infrastructure are susceptible to environmental impacts including a higher frequency of flash flooding and unpredictability of pavement freeze-thaw cycles, which could lead to uncertainty of material lifecycles. These impacts have the potential to effect daily regional transportation operations.

**E-COMMERCE**
For many decades, consumers traveled to retail stores to purchase goods. As online retail companies grow their services, a new pattern of e-commerce is emerging. Instead of delivering a large quantity of goods by truck to stores, internet purchases create a demand for more distribution centers nationally, and the use of many smaller delivery vehicles traveling directly to the home of each customer.

**AUTONOMOUS VEHICLES**
Fully autonomous vehicles are currently rare and primarily still in prototype stages. In order to operate in the real world, they will require significant infrastructure support, like consistent roadway paint and signage, as well as sophisticated on-board communication software. Autonomous vehicles have the potential to significantly disrupt transportation networks in the future, occurring faster in some regions of the country than in others.
Economic Opportunity
Supports growth, innovation, job creation and productivity.

Environment
Protects and preserves our natural resources, including land, water and air.

System Preservation
Maintains existing facilities in good and reliable condition.

Choice
Offers multi-modal transportation options that are affordable and accessible.

Safety & Security
Designs and maintains transportation network to enhance the safety and security of all users.

Health
Designs transportation networks to invite and enhance healthy and active lifestyles.

Equity
Provides access and opportunity for all people and all neighborhoods.

Resiliency & Reliability
Improve the resiliency and reliability of the transportation system.
Economic Opportunity

Supports growth, innovation, job creation and productivity.

An efficient, reliable, and accessible transportation network is an essential component for fostering economic opportunity – one that connects suppliers with producers; businesses with workers and customers; and people with employment centers, education, and services. A true multi-modal transportation network where all modes of transportation are considered and provided, while providing a ladder of opportunity for unemployed or underemployed residents seeking employment opportunities.

Proximity

Proximity to major markets of Chicago, Detroit (90 miles to Chicago, 180 Miles to Detroit)

- 3 Class 1 & 2 short rail providers, deep freight ports in St. Joseph MI, Burns Harbor, IN and Chicago IL.
- Convergence of I-94, I-96, I-80, I-90
- 12 Interchanges off I-94
- 37% of the population can be reached in one day.
- More than 78% of the U.S population can be reached within two days by roadway.

Labor Force and Talent

Proximity greatly impacts the quality of the labor shed. The TwinCats planning area is positioned to pull labor not only from the planning area, but also Michigan City, South Bend Mishawaka, and Kalamazoo.

When compared with peer communities, the region boasts minimal congestion on roadways as shown by very low delays per auto commuter – at 50% less than the national average [2015 American Community Survey]. Maintaining minimal road congestion, and providing access to job centers of the future will be a key component of ensuring economic opportunity through-out the region for both commuters and freight alike.
Distribution and Logistics Cluster

“Michigan’s Great Southwest’s proximity to major thoroughfares and strategic positioning between Chicago and Detroit, make it a natural fit for focusing on the targeted industry of logistics and warehousing. Positioned along the North American Free Trade Agreement (NAFTA) Corridor, businesses can connect regionally, nationally and across the globe.”

Strategies to Enhance Economic Opportunity

- Focus transportation dollars to the area of greatest need.
- Employ strategies that improve multi-modal access to employment centers.
- Encourage use of intelligent transportation technologies to improve corridor efficiency.

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURE</th>
<th>DEFINITION</th>
<th>DESIRED TREND</th>
<th>BASELINE</th>
<th>DATA</th>
</tr>
</thead>
</table>


Attention to the natural and social environment should be demonstrated during transportation project development. Projects included in the LRTP are often years away from final design; therefore detailed environmental review may not be feasible at the early stages of the planning process. However, the MPO can identify potential impacts to natural and historic resources which can help ensure that transportation projects have minimal impacts on the environment.

Environmental Consultation

Federal code outlines requirements for MPOs regarding environment consultation. During project development, TwinCATS encourages its member entities to strive to avoid or minimize any detrimental effects that transportation projects may have on the environment. The MPO encourages member entities to follow the steps used to define mitigation in 40 CFR 1508.20, which are:

To support this regulation TwinCATS has completed a three step process for addressing the technical aspects of the Fast Act requirement by

- Defining and inventorying the environmentally sensitive resources including that of Threatened, Endangered, and Special Concern Species.
- Identifying and assessing possible impacts on these environmental resources by examining projects in comparison to environmental resources using a Geographical Information System (GIS). See Appendix xxx
- Addressing possible mitigation at a system-wide level with best practice methods listed in Appendix XXXx

Long Range Transportation Plans should include:

“Discussion of the types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions accepted by the metropolitan transportation plan. This discussion may focus on policies, programs, or strategies, rather than at the project level. The discussion shall be developed in consultation with Federal, State, and Tribal land management, wildlife, and regulatory agencies.”

Source: Federal Code section 23 CFR Section 450.322
Environment

Protects and preserves our natural resources, including land, water and air.

Development of naturalized areas has the potential to impact threatened and endangered species. Under Part 365 of Public Act 451 people are not allowed to take or harm any endangered or threatened fish, plants, or wildlife. Rule that apply are administered by Michigan Department of Natural Resources: Michigan: Part 365 of the Natural Resources and Environmental Protection Act, Act 451 of the Michigan Public Acts of 1994 and the U.S. Fish & Wildlife Service Endangered Species Act of 1973. Additionally, special concern species, high quality natural communities, and other unique natural features are not legally protected by state or federal endangered species legislation. However, they are considered to be rare and should be protected to prevent future listing.

The Migratory Bird Treaty Act is a Federal law that carries out the United States’ commitment to four international conventions with Canada, Japan, Mexico and Russia. Those conventions protect birds that migrate across international borders. The take of all migratory birds, including bald eagles, is governed by the Migratory Birds Treaty Act’s regulations. The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except as authorized under a valid permit.

In TwinCATS, Berrien County, these species are listed as threatened, endangered or of special concern by U.S. Fish and Wildlife Service.

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana Bat (Myotis sodalis)</td>
<td>Endangered</td>
<td>Summer habitat includes small to medium river and stream corridors with well-developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula.</td>
</tr>
<tr>
<td>Northern Long-eared Bat (Myotis septentrionalis)</td>
<td>Threatened</td>
<td>Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.</td>
</tr>
<tr>
<td>Piping Plover (Charadrius melodus)</td>
<td>Endangered</td>
<td>Beaches along shorelines of the Great Lakes</td>
</tr>
<tr>
<td>Rufa Red Knot (Calidris canutus rufa)</td>
<td>Threatened</td>
<td>Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1- SEPTEMBER 30</td>
</tr>
<tr>
<td>Eastern Massasauga (Sistrurus catenatus)</td>
<td>Threatened</td>
<td>Hibernates below frost line in small burrows, tree roots or rock crevasses - Close proximity and in a variety of wetlands</td>
</tr>
<tr>
<td>Mitcheller’s Satyr Butterfly (Neonympha mitchelli mitchelli)</td>
<td>Endangered</td>
<td>Fens; wetlands characterized by calcareous soils which are fed by carbonate-rich water from seeps and springs</td>
</tr>
<tr>
<td>Pitcher’s Thistle (Cirsium pitcheri)</td>
<td>Threatened</td>
<td>Stabilized dunes and blowout areas</td>
</tr>
<tr>
<td>Small Whorled Pogonia (Isotria medeoloides)</td>
<td>Threatened</td>
<td>Dry woodland; upland sites in mixed forests (second or third growth stage)</td>
</tr>
</tbody>
</table>
As part of the process to identify and access impacts on the environment, transportation projects were mapped. A ¼ mile buffer was then created around each project and 250 foot buffer was created around each bridge or site project. The buffers were used to identify environmental features and significant places that road projects could impact (show below). More details and maps are in Appendix XXX.

Some of the projects will be completed over multiple years.

<table>
<thead>
<tr>
<th>IDENTIFIED SENSITIVE ENVIRONMENTAL FEATURES AND SIGNIFICANT CULTURAL AND PLACES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lakes &amp; Streams</td>
</tr>
<tr>
<td>Designated Trout Lakes/ Streams</td>
</tr>
<tr>
<td>Wetlands</td>
</tr>
<tr>
<td>Floodplains</td>
</tr>
<tr>
<td>Critical Dunes</td>
</tr>
</tbody>
</table>

The analysis of possible impacts from planned transportation projects on environmentally sensitive resources should not be used to infer that simply because an impact is possible, the transportation project is not justified. It is simply designed to draw attention to the range of possible impacts and to elevate the consideration of environmental resources in all phases of project planning, design, construction, and maintenance.
Strategies to Protect or Preserve the Environment

- Avoid impacts to environmentally sensitive features, such as woodlands and wetlands, early in the planning process when planning for and designing and building new infrastructure.
- Expand context sensitive and sustainable solutions in the planning and design of transportation infrastructure.
- Continue to monitor National Ambient Air Quality Standards thresholds for fine particulate matter (PM 2.5) and improve air quality when possible.
- Integrate land use and economic development goals with transportation planning. Encourage and support land use plans and policies to enhance overall transportation efficiency, including compact and mixed use development.
- Adhere to adopted TwinCATS “Complete Streets” Policy.

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Description</th>
<th>Baseline Data</th>
<th>Target</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total emissions reductions.</td>
<td>The amount of emissions reduced by projects funded through the Congestion Mitigation and Air Quality program.</td>
<td>Data in development</td>
<td>In Dev.</td>
<td>Data in development.</td>
</tr>
<tr>
<td>Percent change in tailpipe CO2 emissions on the National Highway System</td>
<td>The percent change in tailpipe emissions on the NHS compared to the calendar year 2017 levels.</td>
<td>Data in development</td>
<td>In Dev.</td>
<td>MDOT</td>
</tr>
<tr>
<td>Percent of Single Occupancy Vehicles</td>
<td>The percentage change in single occupancy vehicles</td>
<td>85%</td>
<td>Decrease</td>
<td>US Census</td>
</tr>
</tbody>
</table>
**System Preservation**

**Maintains existing facilities in good and reliable condition.**

Across the Benton Harbor St. Joseph Urbanized Area, deteriorating pavement, deficient bridges and culverts impact trips made everyday across the area. With scarce funding and an aging system, it will be important to focus on preventative maintenance by maximizing results from each dollar spent.

Rehabilitating a road that has deteriorated is substantially more expensive than keeping that road in good condition. Within the TwinCATS planning area approximately ___ miles of road are in Good condition, while ____ miles of road are in Poor condition.

**Strategies to Ensure System Preservation**

- Effectively manage and maximize existing transportation assets by prioritizing rehabilitation and replacement of aging infrastructure.
- Focus investments on roadways with the highest traffic volumes.
- Establish achievable pavement condition targets.
- Ensure investments are adequate to improve bridge and pavement conditions, keep transit fleet in a state of good repair, and maintain bicycle and pedestrian facilities.

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURE</th>
<th>DEFINITION</th>
<th>DESIRED TREND</th>
<th>BASELINE</th>
<th>DATA</th>
<th>REPORTING FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Bridge Condition</td>
<td>Percent of NHS bridges in good condition</td>
<td>Increase</td>
<td></td>
<td>National Bridge Inspection Standard</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>Percent of NHS bridges in poor condition</td>
<td>Decrease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHS Pavement Condition (excluding Interstate)</td>
<td>Percent of pavement in good condition</td>
<td>Increase</td>
<td></td>
<td>IRI</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>Percent of pavement in poor condition</td>
<td>Decrease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Pavement Condition</td>
<td>Percent of pavement in good condition</td>
<td>Increase</td>
<td></td>
<td>IRI</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td>Percent of pavement in poor condition</td>
<td>Decrease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolling stock in a state of good repair</td>
<td>Percent of rolling stock transit vehicles over useful life</td>
<td>Decrease</td>
<td></td>
<td>MDOT/ PTMS and FTA/NTD</td>
<td>Annually</td>
</tr>
<tr>
<td>Non-Revenue Vehicles in a state of good repair</td>
<td>Percent of non-revenue vehicles past their useful life</td>
<td>Decrease</td>
<td></td>
<td>MDOT/ PTMS and FTA/NTD</td>
<td>Annually</td>
</tr>
<tr>
<td>Facilities in a state of good repair</td>
<td>Percent of facilities within an asset class rated 3 or below on the FTA TERM scale.</td>
<td>Decrease</td>
<td></td>
<td>MDOT/PTMS and NTD</td>
<td>Annually</td>
</tr>
</tbody>
</table>
System Preservation

Maintains existing facilities in good and reliable condition.

Across the Benton Harbor St. Joseph Urbanized Area, deteriorating pavement, deficient bridges and culverts impact trips made everyday across the area. With scarce funding and an aging system, it will be important to focus on preventative maintenance by maximizing results from each dollar spent.

Rehabilitating a road that has deteriorated is substantially more expensive than keeping that road in good condition. Within the TwinCATS planning area approximately ____ miles of road are in Good condition, while ____ miles of road are in Poor condition.

Strategies to Ensure System Preservation

- Effectively manage and maximize existing transportation assets by prioritizing rehabilitation and replacement of aging infrastructure.
- Focus investments on roadways with the highest traffic volumes.
- Establish achievable pavement condition targets.
- Ensure investments are adequate to improve bridge and pavement conditions, keep transit fleet in a state of good repair, and maintain bicycle and pedestrian facilities.

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURE</th>
<th>DEFINITION</th>
<th>DESIRED TREND</th>
<th>BASELINE Data</th>
<th>REPORTING FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Occupancy Vehicle</td>
<td>Decrease</td>
<td>Number Rate</td>
<td>US Census</td>
<td></td>
</tr>
</tbody>
</table>
Choice

Offers multi-modal transportation options that are affordable and accessible.
Safety & Security

Designs and maintains transportation network to enhance the safety and security of all users.

The safety of motorists, bicyclists, and pedestrians is a top priority in transportation planning. Motor vehicle collisions result in premature deaths, serious injuries, and are a cause of major economic losses and disruptions to the transportation system. Safety concerns can discourage from utilizing active transportation such as bicycling, walking and transit.

Planning for transportation safety should be a comprehensive, system-wide, multi-modal process that integrates safety into surface transportation decision making.

HIGH-RISK BEHAVIORS IN TWINCATS PLANNING AREA

Despite continuous efforts that have improved the safety of roadways, that safety is ultimately reliant upon road-user behavior. Research has shown that the vast majority of crashes are due to errors by these users. Fortunately, many of these errors are ultimately preventable and strategies to encourage the safe behavior of road users are integral to highway safety.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Crashes</th>
<th>Fatalities</th>
<th>Serious Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2,180</td>
<td>12</td>
<td>47</td>
</tr>
<tr>
<td>2007</td>
<td>2,439</td>
<td>12</td>
<td>77</td>
</tr>
<tr>
<td>2008</td>
<td>2,740</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td>2009</td>
<td>2,306</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>2010</td>
<td>2,027</td>
<td>15</td>
<td>57</td>
</tr>
<tr>
<td>2011</td>
<td>2,015</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>2012</td>
<td>1,917</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>2013</td>
<td>2,150</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>2014</td>
<td>2,253</td>
<td>7</td>
<td>36</td>
</tr>
<tr>
<td>2015</td>
<td>2,308</td>
<td>9</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>22,335</td>
<td>100</td>
<td>478</td>
</tr>
</tbody>
</table>
23% of crashes that involved a pedestrian or bicyclist resulted in a serious or fatal injury.

2007-2015 MI Crash Facts

2.6% of vehicular crashes resulted in a serious or fatal

<table>
<thead>
<tr>
<th>Year</th>
<th>TotalCrashes</th>
<th>Fatalities</th>
<th>SeriousInjuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2,180</td>
<td>12</td>
<td>47</td>
</tr>
<tr>
<td>2007</td>
<td>2,439</td>
<td>12</td>
<td>77</td>
</tr>
<tr>
<td>2008</td>
<td>2,740</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td>2009</td>
<td>2,306</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>2010</td>
<td>2,027</td>
<td>15</td>
<td>57</td>
</tr>
<tr>
<td>2011</td>
<td>2,015</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>2012</td>
<td>1,917</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>2013</td>
<td>2,150</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>2014</td>
<td>2,253</td>
<td>7</td>
<td>36</td>
</tr>
<tr>
<td>2015</td>
<td>2,308</td>
<td>9</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>22,335</td>
<td>100</td>
<td>478</td>
</tr>
</tbody>
</table>
EMPHASIS AREAS To facilitate improvements of this magnitude, a well integrated, comprehensive safety program is required that focuses upon those areas where resources can be

LANE DEPARTURE CRASHES In Michigan during 2015, lane departure crashes accounted for 17.1 percent of all crashes and percent of fatal crashes. While lane departure crashes comprise nearly half of fatal crashes, this percentage has increased more than 2 percent in 2011, as lane departure fatalities increased from 444 to 455. Primary objectives in this area are to identify cost-effective strategies that reduce unintentional lane departure, as well as alert the driver should a departure event occur. A secondary objective is to assist the driver in returning to the travel lane
The identification and analysis of high-risk intersections statewide is a safety priority. At the local level we will use various software tools, including Safety Analyst and Roadsoft, to help identify the most problematic intersections.

**Nickerson/M-139**
- 128 Crashes
- 5 Serious Injuries

**Pipestone/Mall Drive**
- 104 crashes
- 2 fatalities,
- 1 serious injury

**Napier/Union**
- 87 crashes
- 4 serious injury

There were 6,758 Intersection related crashes between 2007-2016, representing 30% of all crashes. Such crashes resulted in 23 fatalities (25% of total fatalities) and 149 incapacitating injuries (32% of total incapacitating injuries).
Strategies to Improve Safety & Security

- Produce and distribute an annual report of crash data that includes vehicle, pedestrian and bicycle total crashes, total serious injury crashes, total fatal crashes.
- Provide information on top collision trends such as distracted or impaired driving, and incidents involving bicycles and pedestrians.
- Provide recommendations for facilities based on FHWA, NACTO and AASHTO best practices and design principles that have proven to be safe and reliable.
- Assist the TwinCATS Policy Committee in evaluating safety considerations during Transportation Improvement Program (TIP) call for projects.
- Assist MPO members in identifying and applying for safety related grant funds.
- Improve safety and security by incorporating pedestrian and bicyclist facilities when highway/street and transit improvements are made.
- Partner with local and state agencies on safety education and outreach campaigns to address safety issues.
- Conducting road safety audits (MDOT)
- Assisting MPO members with safety-related applications.

Safety performance measures are key to ensuring that safety issues are considered and addressed throughout the transportation planning process. In 2016, the Federal Highway Administration (FHWA) published new Safety Performance Measures as a part of its national safety program, calling for state and regional targets to help reduce highway deaths and injuries, including for the first time, those people walking and bicycling.

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURE</th>
<th>DEFINITION</th>
<th>DESIRED TREND</th>
<th>BASELINE NUMBER</th>
<th>BASELINE RATE</th>
<th>DATA</th>
<th>REPORTING FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatalities</td>
<td>Number of motorized fatalities</td>
<td>Decrease</td>
<td>Road Soft Crash Data</td>
<td>Annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate of fatalities per 100 million vehicle miles traveled. (VMT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious Injuries</td>
<td>Number of motorized serious injury accidents</td>
<td>Decrease</td>
<td>Road Soft Crash Data</td>
<td>Annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate of serious injury collisions per 100 million VMT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrian/Bicyclists</td>
<td>Number of pedestrian/Bicycle fatalities/injures</td>
<td>Decrease</td>
<td>Road Soft Crash Data</td>
<td>Annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatalities/Injuries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycle Collisions</td>
<td>Total Collisions</td>
<td>Decrease</td>
<td>Road Soft Crash Data</td>
<td>Annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrian Collisions</td>
<td>Total Collisions</td>
<td>Decrease</td>
<td>Road Soft Crash Data</td>
<td>Annually</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## GUIDING PRINCIPLES & STRATEGIES—Safety & Security

### Annual Total Crashes – TwinCATS Planning Area

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Crashes</th>
<th>Fatalities</th>
<th>Serious Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2,180</td>
<td>12</td>
<td>47</td>
</tr>
<tr>
<td>2007</td>
<td>2,439</td>
<td>12</td>
<td>77</td>
</tr>
<tr>
<td>2008</td>
<td>2,740</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td>2009</td>
<td>2,306</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>2010</td>
<td>2,027</td>
<td>15</td>
<td>57</td>
</tr>
<tr>
<td>2011</td>
<td>2,015</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>2012</td>
<td>1,917</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>2013</td>
<td>2,150</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>2014</td>
<td>2,253</td>
<td>7</td>
<td>36</td>
</tr>
<tr>
<td>2015</td>
<td>2,308</td>
<td>9</td>
<td>37</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22,335</strong></td>
<td><strong>100</strong></td>
<td><strong>478</strong></td>
</tr>
</tbody>
</table>

### TwinCATS Crashes- Five Year Moving Average

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Crashes</th>
<th>Fatalities</th>
<th>Serious Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2305</td>
<td>10.4</td>
<td>53.8</td>
</tr>
<tr>
<td>2012</td>
<td>2201</td>
<td>8.8</td>
<td>47.4</td>
</tr>
<tr>
<td>2013</td>
<td>2083</td>
<td>9.8</td>
<td>42.8</td>
</tr>
<tr>
<td>2014</td>
<td>2072</td>
<td>10.2</td>
<td>42.8</td>
</tr>
<tr>
<td>2015</td>
<td>2129</td>
<td>9.0</td>
<td>38.8</td>
</tr>
</tbody>
</table>
Health

Designs transportation networks to invite and enhance healthy and active lifestyles.
Equity

Provides access and opportunity for all people and all neighborhoods.
Equity

Provides access and opportunity for all people and all neighborhoods.

Need to Reach Jobs Outside of Community

There are approximately 1403 people in reside in Benton Harbor who earn $1250 or less per month.

Yet...There are only approximately 512 entry level jobs paying $1250 or less located in Benton Harbor.
Citizens are dependent on the public and private utility infrastructure to provide essential life supporting services such as electric power, water, sewage disposal and treatment, storm drainage, communications, and transportation for the movement of people and goods. When one or more of these independent yet interrelated systems fail for even a short period of time, due to disaster or other cause, it can have devastating consequences.

During the planning process for the 2005 Berrien County Hazard Mitigation Plan municipalities identified and ranked the hazards to determine which hazards were of greatest concern. Of the 24 identified and ranked, winter weather and infrastructure failure were ranked in the top 5 hazards utilizing the following criteria:

- Likelihood of Occurrence
- Percent of Population Affected
- Potential for Causing Casualties
- Potentials for Negative Economic Effects

The plan also noted that communities need to continue to push for greater system reliability through mitigation efforts. Although the problem of infrastructure failure will never be completely eliminated, it can certainly be greatly diminished through proper planning, design, construction, and maintenance practices.

As part of the Long Range Transportation planning process MPO’s are required to assess assets and other strategies that could reduce the vulnerability of existing transportation infrastructure do to natural or disasters.
Asset Management is not a complete answer to addressing the threats to physical transportation assets but it can serve as an important component of the Three R’s, particularly in making assets robust and agencies’ asset-repair practices resilient in times of crisis.

**Redundancy** can be defined as duplicative or excess capacity that can be used in times of emergency. Adding redundant highway capacity generally falls outside the practice of asset management. However, sound management of the assets on detour and emergency evacuation routes increases a highway system’s redundancy.

**Robustness** can be defined as the capacity to cope with stress or uncertainty. Asset management focuses upon optimizing the conditions of assets with available revenues. Well-maintained assets generally are better able to withstand the stresses of storm events and other disasters better than weakened and poorly maintained ones.

**Resiliency** has been defined as the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events. Enhanced resilience allows better anticipation of disasters, better planning to reduce disaster losses and faster recovery after an event.

“Where recurring severe damage and system failures occur, due to natural or technological hazard events, it makes sense to explore enhancing infrastructure design, construction, and operational codes and standards.
Resiliency & Reliability

Improve the resiliency and reliability of the transportation system.

Each cell of the “honeycomb” represents some facet of resilience but is not, by itself, the whole. For example, while emergency management is an essential component of resilience, its conceptual framework is ill-suited for the kinds of actions necessary to mitigate or adapt to slow disruptors such as climate change. Some disruptions are known well in advance and can be planned for in great detail; others occur with no warning and require a great deal of resourcefulness to restore service. Resilience, much like safety, affects every major business function within a transportation agency, not just operations. Planning, design engineering, maintenance, and business management divisions all play significant roles.

Strategies to Improve Resiliency & Reliability

- Develop, promote and encourage effective working relationships among local and regional officials and other stakeholders responsible for various aspects of transportation infrastructure protection, emergency management, and system operations.

- Update inventories of assets and their condition and life cycle to assist in identifying which assets are at risk for given types of events such as winter weather, power failures and large rain events.

- Identify and update assets that are vulnerable to extreme weather events and prioritize future investments through the use of a lifeline network that defines critical facilities, corridors, systems, or routes that must remain functional during a crisis or be restored most rapidly.

- Collect and maintain inventories of assets and their condition to provide critical before-event prioritization and post – event recovery allocation resources.

- Research and provide MPO members information about new studies, forecasts or environmental risks that could affect the future condition of transportation assets.

- Encourage sound inspection and maintenance practice regimes for transportation related infrastructure that includes but is not limited to bridges, culverts, underdrains, catch basins, transit facilities and busses.
**PERFORMANCE MEASURES**

Specific performance measures *target specific areas for improvement.*

Measurable performance measures *are quantifiable and objective.*

Available performance measures *use data that can be accessed.*

Relevant performance measures *are strongly linked to the objectives they support.*

---

### Resiliency & Reliability

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Description</th>
<th>Baseline Data</th>
<th>Target</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of the Person-Miles traveled on the Interstate that are reliable.</td>
<td>The percentage of miles traveled by a person on the Interstate that are reliable.</td>
<td>Data in development.</td>
<td>In Dev.</td>
<td>Travel Demand Model - MDOT</td>
</tr>
<tr>
<td>Percentage of the Person-Miles traveled on the non-Interstate NHS that are reliable.</td>
<td>The percentage of miles traveled by a person on the non-Interstate NHS that are reliable.</td>
<td>Data in development.</td>
<td>In Dev.</td>
<td>Travel Demand Model - MDOT</td>
</tr>
<tr>
<td>Annual hours of peak hour excessive delay per capita.</td>
<td>The annual hours of travel delay experienced by each person at peak travel times.</td>
<td>Data in development.</td>
<td>In Dev.</td>
<td>Travel Demand Model - MDOT</td>
</tr>
</tbody>
</table>

### Safety & Security

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Description</th>
<th>Baseline Data</th>
<th>Target</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of serious injuries.</td>
<td>The number of serious injuries as a result of a vehicular crash. reported</td>
<td>$38.8$</td>
<td>$5,136$</td>
<td>Michigan Crash Facts &amp; Road Soft</td>
</tr>
<tr>
<td>Serious injuries per 100 million vehicle miles traveled (VMT).</td>
<td>The rate of serious injuries.</td>
<td>$4.08$</td>
<td>$5$</td>
<td>Michigan Crash Facts &amp; Road Soft</td>
</tr>
<tr>
<td>Number of fatalities.</td>
<td>The number of fatalities as a result of a vehicular crash.</td>
<td>$9$</td>
<td>$1,003$</td>
<td>Michigan Crash Facts &amp; Road Soft</td>
</tr>
<tr>
<td>Fatalities per 100 million vehicle miles traveled (VMT).</td>
<td>The rate of fatalities.</td>
<td>$0.9$</td>
<td>$1$</td>
<td>Michigan Crash Facts &amp; Road Soft</td>
</tr>
<tr>
<td>Non-motorized fatalities, serious injuries.</td>
<td>The number of pedestrians and bicyclists seriously injured or killed as a result of a vehicular crash.</td>
<td>$7$</td>
<td>$744$</td>
<td>Michigan Crash Facts &amp; Road Soft</td>
</tr>
</tbody>
</table>
**PERFORMANCE MEASURES**

Specific performance measures *target specific areas for improvement.*

Measurable performance measures *are quantifiable and objective.*

Available performance measures *use data that can be accessed.*

Relevant performance measures *are strongly linked to the objectives they support.*

### System Preservation - Road & Bridge

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Description</th>
<th>Baseline Data</th>
<th>Target</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of pavement on the Interstate System in good condition.</td>
<td>The percentage of pavement on the Interstate system considered in good condition.</td>
<td>22%</td>
<td>In Dev.</td>
<td>International Roughness Index- MDOT</td>
</tr>
<tr>
<td>Percentage of pavement on the Interstate System in poor condition.</td>
<td>The percentage of pavement on the Interstate system considered in poor condition.</td>
<td>27%</td>
<td>In Dev.</td>
<td>International Roughness Index- MDOT</td>
</tr>
<tr>
<td>Percentage of pavement on the non-Interstate National Highway System in good condition.</td>
<td>The percentage of pavement on the non-Interstate National Highway System considered in good condition.</td>
<td>39%</td>
<td>In Dev.</td>
<td>International Roughness Index- MDOT</td>
</tr>
<tr>
<td>Percentage of pavement on the non-Interstate National Highway System in poor condition.</td>
<td>The percentage of pavement on the non-Interstate National Highway System considered in bad condition.</td>
<td>33%</td>
<td>In Dev.</td>
<td>International Roughness Index- MDOT</td>
</tr>
<tr>
<td>Percentage of National Highway System (NHS) bridges in good condition.</td>
<td>The percentage of bridges on the NHS that are considered in good condition.</td>
<td>17.5%</td>
<td>In Dev.</td>
<td>National Bridge Inventory</td>
</tr>
<tr>
<td>Percentage of National Highway System (NHS) bridges in poor condition.</td>
<td>The percentage of bridges on the NHS that are considered in poor condition.</td>
<td>11.3%</td>
<td>In Dev.</td>
<td>National Bridge Inventory</td>
</tr>
</tbody>
</table>

### Environment

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Description</th>
<th>Baseline Data</th>
<th>Target</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total emissions reductions.</td>
<td>The amount of emissions reduced by projects funded through the Congestion Mitigation and Air Quality program.</td>
<td>Data in development.</td>
<td>In Dev.</td>
<td>Data in development.</td>
</tr>
<tr>
<td>Percent change in tailpipe CO2 emissions on the National Highway System</td>
<td>The percent change in tailpipe emissions on the NHS compared to the calendar year 2017 levels.</td>
<td>Data in development.</td>
<td>In Dev.</td>
<td>MDOT</td>
</tr>
</tbody>
</table>
Fiscal constraint is a required component of long-range planning. Transportation expenditures included in this plan should not exceed revenue estimates during the life of the plan. Simply put, this plan includes only those transportation improvements that can be realistically completed based on anticipated revenues.

Future Transportation Funding

Financial Planning Overview
A sound financial plan demonstrating how the unified vision for our regional transportation system can be achieved is a critical element of Principles in Motion 2045. While this long range transportation plan is not a programming document, FHWA regulations require that the plan be ‘fiscally constrained’. To accomplish this, an analysis of fiscal constraint was undertaken for the life of the Plan (2017-2045). This analysis fulfills the requirements of the current Federal ‘FAST Act’ transportation legislation outlined in 23 CFR 450.322 (10).

Financial Planning Overview
Following are brief descriptions of the primary funding sources used to forecast future funding targets. While there are many additional State and Federal funding sources available, this list includes only those that the TwinCATS urbanized area has been successful in obtaining through competitive grant processes.
Funding Sources

**Federal**

**National Highway Performance Program (NHPP):** Funding for resurfacing, restoring, and rehabilitating, routes on the Eisenhower National System of Interstate and Defense Highways.

**MDOT Surface Transportation Block Grant (STBG):** Funds improvements to any roadway or bridge on the federal-aid system, transit capital projects, bicycle and pedestrian facilities, enhancement projects, environmental restoration, and the establishment of native species.

**Regional Surface Transportation Block Grant (STBG):** Funds improvements to any roadway or bridge on the federal-aid system, transit capital projects, bicycle and pedestrian facilities, enhancement projects, environmental restoration, and the establishment of native species. Regional STBG funds are formula funds that are provided to TwinCATS and programmed by the TwinCATS Policy Committee using a competitive grant process.

**Regional Transportation Alternatives Program (TAP):** Funds enhancement activities that have a direct relationship to surface transportation facilities including: facilities for bicycles and pedestrians (including safety and educational activities), landscaping and other scenic beautification, historic preservation, and the preservation of abandoned railway corridors for bicycle and pedestrian uses. TAP funds are awarded on a Statewide competitive grant process.

**Congestion Mitigation & Air Quality Improvement (CMAQ):** Flexible funding for transportation projects and programs tasked with helping to meet the requirements of the Clean Air Act. These projects can include those that reduce congestion and improve air quality. CMAQ funds are formula funds that are provided at a countywide level.

**Federal Recreational Trails Program (FRT):** Funding for public recreational trails. The recipient must use funding for trail projects that are part of a local, regional, or statewide trails plan.

---

**How much funding has each member community received?**

Add 2011—2017 data here
Funding Allocation Process for Surface Transportation Block Grant Funds (STBG)

STBG funds are federal formula funds distributed annually by the Michigan DOT. Allocation of federal funds from STBG, (formerly STP) and Transportation Alternatives funding is a primary responsibility of TwinCATS.

TwinCATS entities and other stakeholders work cooperatively through committees and the Urbanized Area Policy Committee, which includes designated officials from each community, to make decisions regarding which transportation projects will receive funding.
Local Federal Aid Pavement Condition Scenario

Under the current level of funding, if TwinCATS spend the majority of all STBG I funds on preventive maintenance, the average PASER rating would remain virtually unchanged with an average PASER rating of 4.

In order to see a steady increase in local federal aid pavement condition TwinCATS would need approximately 3 times as much funding. With the increased budget TwinCATS could invest additional funds into rehabilitation and reconstruction projects along with preventative maintenance which would improve the quality of pavement.

With a $3 million annual budget it is estimated that TwinCATS could achieve an average PASER rating just below 7 on the local federal aid network. This translates to approximately 80 percent of roads in good condition and 20 percent of roads in poor condition.

Assumptions:
Actual annual budget increase of 2% and a 2% inflation on construction costs cancels out. Costs estimated based on Report by MDOT, Asset Management Council, and Michigan Tech.
Will there be enough funding for all of our transportation infrastructure needs?

Add anticipated funding table here with shortfalls here— (Local FA road scenario numbers)
Will there be enough funding for all of our passenger transit needs?

Add anticipated funding table here with shortfalls here—(Use State of Good Repair shortfalls here—numbers)
Within the TwinCATS planning area there are 767 miles of public roads. Road agencies in TwinCATS, which include cities, villages, and the Berrien County Road Department, are responsible for the maintenance of 624 miles of these roads. The other 143 miles are owned and maintained by MDOT, including the interstate (I-94, I-196), US-31 BL-94, and all routes with an “M” designation (M-63, M139). Three hundred ten miles of road are part of the federal aid highway system, which enables these roads to use federal surface transportation block grant funds for maintenance. This road network is the main transportation system carrying automobiles, buses, pedestrians, cyclists, and freight throughout the region and beyond.

The road network includes a variety of road types that serve various trip purposes. The local non-federal aid eligible roads are mainly designed to serve as residential streets or to provide access to individual properties. The federal aid network is the backbone for cross-jurisdictional and region wide trips. Within this category is the National Highway System (NHS) which are not just important regional roads, but they are vital to the movement of people and goods across the state and the nation.
National Functional Classification

The National Functional Classification (NFC) is the system by which the FHWA classifies roads into categories according to the function, speed, and amount of traffic the facility carries. NFC is used to determine design standards of roads and is a consideration in determining eligibility for federal aid funding. NFC classification is determined through cooperation between the road agency, MPO, MDOT, and FHWA. There are seven NFC categories, they are grouped into four major categories.

They are covered on this and the following page.

**Principal Arterials (NFC 1-3):**

**Interstate:** Also know as the Eisenhower Interstate System, they are designated with an “I” prefix (in TwinCATS, the 78 miles of I-94 and I-196—counting both directions and ramps). These roads are high speed divided highways that cover multiple states. While funded by the federal government, they are maintained by the state DOTs.

**Other Freeways & Expressways (OF&E):** All other high-speed, limited access divided highways, which is not designated as interstate (in TwinCATS, the 22 miles of north- and south-bound US-31 south of Napier Ave.) In Michigan all OF&E routes are maintained by MDOT.

**Other Principal Arterial (OPA):** These routes are typically designed for high volumes of through traffic as well as commercial traffic. Unlike freeways, OPA often have direct access to adjacent properties.

**National Functional Classification, continued:**

**Minor Arterial (NFC 4):** A major thoroughfare, typically used for shorter trip distances and carry less traffic than principal arterials.

**Collectors (NFC 5-6):**

- **Major Collector:** These routes funnel traffic from local and minor collector routes to the arterials. These may directly serve schools, business districts, and important public functions.

- **Minor Collector:** Carries more through traffic than a local road but not as heavy as a major collector.

  ◆ *Urban minor collectors* were created recently by the 2010 Highway Performance Monitoring System (HPMS) re-assessment and have federal-aid eligibility—TwinCATS: 6 mi.

  ◆ *Rural minor collectors* are not federal-aid highways but do have limited STBG federal-aid eligibility—TwinCATS: 20 mi.

**Local Roads (NFC 7):** Predominately traveled by those accessing their property, rural farm roads and residential neighborhood roads. This is the majority of public road mileage.

---

**National Highway System (NHS):**

The NHS is a category for the most important roads for the nation’s economy, defense, and mobility. The NHS includes all Principle Arterials (NFC 1-3). In addition, the NHS can include roads that are connectors to major transportation hubs (ports, airports) and roads used to reach military bases and any other road considered necessary for national defense. In TwinCATS, NHS includes NFC 1-3 and the part of Napier that serves as US-31.
Federal-Aid Eligible

All NFC categories, other than local roads and rural minor collectors are federal-aid eligible. Federal-Aid Eligible roads are able to use federal Surface Transportation Block Grant funding. Other federal funding sources may not be exclusive to the federal-aid system.

Vehicle Miles Traveled

Vehicle Miles Traveled (VMT) represents an estimate of all of the combined miles that were driven by all vehicles within the Benton Harbor-St. Joseph urbanized area. VMT is calculated based on traffic counts and travel models through the Highway Performance Monitoring System (HPMS). Traffic on local roads is based solely on estimates because HPMS currently doesn’t collect traffic counts on non-federal aid eligible roads. VMT helps us understand generally how trends in vehicle use and congestion change over time.

VMT is also used to calculate the environmental effect of the transportation system, such as deriving greenhouse gas emission estimates. VMT is very dependent on the overall economy and gas prices. When the economy is doing well it means more people are commuting to work and generally means more money to take trips or do other activities outside of the home.

### NFC

<table>
<thead>
<tr>
<th>Category</th>
<th>Miles Traveled (2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td>341,291,060</td>
</tr>
<tr>
<td>Other Freeway</td>
<td>-</td>
</tr>
<tr>
<td>Other Principle Arterial</td>
<td>137,531,270</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>134,432,055</td>
</tr>
<tr>
<td>Major Collector</td>
<td>55,872,740</td>
</tr>
<tr>
<td>Minor Collector</td>
<td>222,650</td>
</tr>
<tr>
<td>Local</td>
<td>86,764,150</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>756,113,925</strong></td>
</tr>
</tbody>
</table>
### Pavement Condition

#### 2016-2017

- **Poor**: 17%
- **Fair**: 36%
- **Good**: 47%

---

#### All Federal Aid Roads (includes MDOT roads)

<table>
<thead>
<tr>
<th>Location</th>
<th>2016-2017 Miles</th>
<th>Poor %</th>
<th>Fair %</th>
<th>Good %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton Harbor</td>
<td>17.4</td>
<td>49.7%</td>
<td>44.3%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Benton Twp</td>
<td>93.9</td>
<td>52.9%</td>
<td>36.8%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Bridgman</td>
<td>8.1</td>
<td>0.9%</td>
<td>48.9%</td>
<td>50.2%</td>
</tr>
<tr>
<td>Hagar Twp</td>
<td>31.5</td>
<td>45.9%</td>
<td>53.1%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Lake Twp</td>
<td>24.0</td>
<td>42.5%</td>
<td>27.5%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Lincoln Twp</td>
<td>35.7</td>
<td>67.4%</td>
<td>17.4%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Royalton Twp</td>
<td>18.4</td>
<td>51.7%</td>
<td>35.8%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Shoreham</td>
<td>1.8</td>
<td>66.5%</td>
<td>7.8%</td>
<td>25.7%</td>
</tr>
<tr>
<td>Sodus Twp</td>
<td>35.4</td>
<td>37.9%</td>
<td>14.1%</td>
<td>45.3%</td>
</tr>
<tr>
<td>St Joseph</td>
<td>18.3</td>
<td>47.6%</td>
<td>46.9%</td>
<td>5.4%</td>
</tr>
<tr>
<td>St Joseph Twp</td>
<td>15.4</td>
<td>50.6%</td>
<td>46.6%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Stevensville</td>
<td>7.2</td>
<td>68.3%</td>
<td>10.9%</td>
<td>20.9%</td>
</tr>
<tr>
<td><strong>TwinCATS Total</strong></td>
<td><strong>307.1</strong></td>
<td><strong>49.8%</strong></td>
<td><strong>33.9%</strong></td>
<td><strong>16.3%</strong></td>
</tr>
</tbody>
</table>

---

#### Trends in PASER Ratings

- **Fair**: 2010-2011: 30%, 2012-2013: 40%, 2014-2015: 50%, 2016-2017: 60%
- **Poor**: 2010-2011: 50%, 2012-2013: 30%, 2014-2015: 20%, 2016-2017: 10%
Pavement condition is gathered using the Pavement Surface Evaluation and Rating system (PASER) which gives every road a score from 1-10 with 10 being a new or newly reconstructed road and 1 being a complete failure. For all federal aid routes, it is gathered every year by a team comprised of SWMPC staff, a Berrien County Road Department engineer, and an MDOT staff member.

The condition for roads owned by MDOT is in relatively good condition. MDOT owns roughly 143 miles of road in TwinCATS area. Of this, 38 miles were rated in good condition, while 61 miles were rated fair. On the other hand, only 40 miles were rated poor. MDOT owned roads are overall in far better condition than the locally owned roads. This is due mainly to the fact that far more funding is allocated to the maintenance of the Interstate and other highways.
While MDOT roads are generally in fair or good condition, the locally owned roads are in far worse condition. There are 161 miles of locally controlled federal aid eligible roads in the TwinCATS area. Out of this number, 112 miles are rated poor. Only 8.5 miles are rates in good condition. About 70 miles (or a third of the locally owned federal aid miles) have a PASER of 4. What this means is that while roads are in the poor category, most have not reached a point where a complete reconstruction is the only option.

Maintaining roads in good or fair condition if far cheaper than reconstruction or resurfacing to bring roads in poor condition up to good condition. A long term strategy of routine maintenance will be required. But currently the more expansive fixes to prevent poor roads from completely failing is required. With current funding levels, improving road conditions from poor to good or fair is an extremely challenging task.
National Highway System

Due to the importance of the National Highways system to the nation’s economy and defense, there are more stringent requirements for maintaining this network. The Interstate is especially critical for national travel, thus the FHWA has placed requirements on MDOT to prioritize Interstate maintenance.

The vast majority of the NHS is owned by MDOT. Of the 141 miles of NHS, 132 are owned by MDOT while only 9 miles are owned by local road agencies: Red Arrow Highway and Grand Mere Road between Exits 22 and 23 of I-94, Napier Ave. between M-63 and I-94, and Pipestone between BL-94 and I-94.

A specific performance measure was established to track the pavement condition of the Interstate and non-Interstate NHS routes.

### Interstate Condition:
- **22% Good**
- **27% Poor**

### Non-Interstate NHS:
- **39% Good**
- **33% Poor**
MDOT owns most of the bridges in the TwinCATS area. Of this number a significant portion are on the Interstate. Every overpass on the Interstate is a bridge.

Approximately one third of the bridges in the TwinCATS area are less than 100 feet long. Most of these bridges cross stream or creeks, many of which flow through a pipe known as a culvert.

The second approximately one third of bridges in the TwinCATS area are between 100 and 250 feet long. And the final third of the bridges are over 250 feet long. These bridges tend to cross the St. Joseph River or are highway overpasses.

The longest bridges are both spans of US-31 crossing the St. Joseph River.

TwinCATS’s 122 Bridges:
- 51 Over Roads
- 9 Over Railroad
- 61 Over Water
Inspectors rate Michigan's bridges using the National Bridge Inventory (NBI) 0 to 9 rating scale where they rate each of a bridge's primary elements: deck, superstructure, substructure, and culvert. The lowest rated element is used for the overall bridge rating.

The ratings are divided into the following categories:

**7-9 Good Condition:** This indicates a completely new bridge or has only minor problems.

**5-6 Fair Condition:** All structural elements are sound but may have minor corrosion, cracking or chipping.

**0-4 Poor Condition:** Previously known as structurally deficient. There is advanced corrosion, deterioration, cracking or chipping. This does not necessarily mean the bridge is unsafe.

Within the poor category a value of 2 to 3 is serious or critical.

A value of 0-1 means the bridge is closed or is in imminent danger of failure.

As of 2017, two Bridges in the TwinCATS area have a rating of a 3: M-63 over I-196 and River Road over Pipestone Creek. No bridge was rated lower than a 3.

TwinCATS NHS Bridges:

- **17.5% Good**
- **11.3% Poor**

Based on number of structures

Source: Michigan Transportation Asset Management Council (TAMC)
KATIE BECK
2045 Vehicular Level of Service—
Existing, Committed, & Planned Roadways

Katie Beck
Road and Bridge Infrastructure Challenges

Aging Infrastructure:

Projected Funding Shortfall:

Gas Tax: (Refer to Bill Hamilton House Fiscal paper)
NON-MOTORIZED NETWORK

48 miles
Federal Aid Roads with Sidewalks

34 Miles
Federal Aid Roads with Wide Shoulders

65% Federal Aid Eligible Roads
Have No Accommodations
For Pedestrians or Cyclists.

2.5% TwinCATS Commuters
Walk or Bike
TCATA routes and any planned future routes, a network of sidewalks bike lanes or shared use paths could connect transit stops to neighborhoods and popular destinations and improve the efficiency of the fixed routes. Today the majority of the fixed route stops within the townships of Benton Charter and St. Joseph Charter require the bus to pull off the route onto private property to pick up passengers. This lack of infrastructure increases the routed length and time of the route.

The table below identifies corridors within the TwinCATS study area that exhibit strong indicators of need and opportunity for fixed route transit service. These indicators include population density, employment density, activity centers, demographic characteristics associated with transit dependency and large volume of existing riders.

<table>
<thead>
<tr>
<th>Corridor</th>
<th>From</th>
<th>To</th>
<th>Jurisdiction</th>
<th>Responsible Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mall Drive</td>
<td>M-139</td>
<td>Pipestone Ave</td>
<td>Benton Township</td>
<td>Berrien Road Commission</td>
</tr>
<tr>
<td>M 139</td>
<td>Britain Ave.</td>
<td>Nickerson Ave.</td>
<td>Benton Township</td>
<td>MDOT</td>
</tr>
<tr>
<td>Fair Ave.</td>
<td>Britain Ave.</td>
<td>Territorial Rd</td>
<td>Benton Twp. &amp; City of Benton Harbor</td>
<td>MDOT</td>
</tr>
<tr>
<td>Martin Luther King</td>
<td>Britain Ave.</td>
<td>Territorial Rd</td>
<td>Benton Twp. &amp; City of Benton Harbor</td>
<td>MDOT</td>
</tr>
</tbody>
</table>

Poor “first and last mile” connections can be a barrier to accessing fixed route transit service within the jurisdictions of Benton Charter Township, and St. Joseph Charter Township.
Part of the TwinCATS mandate, as a Metropolitan Planning Organization (MPO), is to consider the needs of all users; this includes travel by car, transit, walking, or cycling. Together walking, cycling, and wheel chairs, are referred to as non-motorized transportation.

Walking and cycling are considered a priority due to the variety of benefits it produces. These benefits include improved health, attraction of new residents who desire walkable communities, and a decrease in vehicle miles traveled. Reducing the vehicle miles traveled (VMT), through increases in walking, cycling, or transit is a key way to improve roadway lifespan, decrease congestion, and reduce air pollution.

Despite the many benefits of non-motorized transportation, few residents of the TwinCATS area use non-motorized transportation other than for recreation. This is likely because conditions for non-motorized transportation in TwinCATS are generally poor. The majority of employment, shopping, and other tasks are difficult to accomplish without a car. Yet despite sometimes challenging conditions, there are residents who must still walk or bike because they lack other means of travel. Furthermore, those who use transit must begin and end their journey on foot or bicycle.

**CHALLENGES**

Walking and biking with the TwinCATS area can be difficult, dangerous and in many places unpleasant. The following obstacles to walking and biking were identified:

- The absence of sidewalks
- The presence of sidewalks in poor condition
- The absence of market bike paths
- Unpaved or poorly maintained shoulders
- Difficult road crossings
- Barriers to bus access
Strategies to Protect or Preserve the Environment

BUILD CONNECTED NETWORKS
- Develop networks of accommodations along appropriate roadways.
- Improve integration of bicycle and pedestrian transportation with transit.
- Prioritize enhancement of pedestrian & bicycle travel in areas with high potential for short trips that can be accomplished by walking & biking.
- Research and improve links between shared use paths and on-road facilities and address key gaps in transportation trail systems.

IMPROVE SAFETY
- Improve education and training of the public regarding safe driving, walking, and biking.
- Use best practices to analyze bicycle and pedestrian crashes and identify effective countermeasures.
- Ensure maintenance to provide safe access for pedestrians and cyclists.

PLAN AND DESIGN FOR EVERYONE
- Increase professional capacity to effectively plan, design, implement and maintain infrastructure for bicycling and walking.
- Ensure design of non-motorized facilities is appropriate for the conditions by following best practices in ASSHTO, NACOT, and FHWA design guides. Ensure facilities work for all users.
- Leverage funding opportunities to improve bicycle and pedestrian networks.
- Adhere to the TwinCATS Complete Streets Policy in project selection.

PROMOTE WALKING AND BIKING IN BERRIEN COUNTY
- Promote current facilities where people can bike and walk
- Support growth in bicycle tourism in Michigan
Add Napier Information Here—High Priority Corridor -
### MDOT Fiscally Constrained Projects 2018-2025

<table>
<thead>
<tr>
<th>ID</th>
<th>Project Title</th>
<th>Project Description</th>
<th>Length</th>
<th>Federal Cost Estimate at Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Cost 2018-2025**

$\text{Total Cost 2018-2025}$

**Estimated Funding**

$80,014,204$

**Remaining**

$\text{Remaining}$
### Local Fiscally Constrained Projects 2018-2025

<table>
<thead>
<tr>
<th>ID</th>
<th>Project Title</th>
<th>Project Description</th>
<th>Length</th>
<th>Road Agency</th>
<th>Federal Cost Estimate at Construction</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Total Cost</th>
<th>Estimated Funding</th>
<th>Remaining</th>
</tr>
</thead>
</table>

| $ |
2036-2045
There are four independently operated public transit systems spread throughout the County of Berrien. Twin Cities Area Transportation Authority (TCATA) is the designated transit provider in the St. Joseph Benton Harbor urbanized area and Berrien Bus is the designated rural provider for areas in the County not served by Niles Dial a Ride and Buchanan Dial a Ride within the Niles Buchanan urbanized area.

TCATA provides same day curb-to-curb Dial-A-Ride service to the City of Benton Harbor, Benton Charter Township and the City of St. Joseph with limited service to destinations in St. Joseph Charter and Royalton Townships. TCATA also operates two fixed routes that provide hourly service six days a week in the Benton Harbor and St. Joseph areas. Communities surrounding the St. Joseph-Benton Harbor urbanized area are served by

---

2016 Berrien County Transit Agencies Provided 299,200 rides
Twin Cities Area Transportation Authority (TCATA) is the designated public transit provider for people living in the census-designated Benton Harbor/Saint Joseph urbanized area in Berrien County (approximately 63,000 people). TCATA serves approximately 33,000 residents within a fourteen square mile service area, about fifty three percent of the St. Joseph-Benton Harbor urbanized area. The remaining forty seven percent of the St. Joseph-Benton Harbor urbanized receives limited service from TCATA in portions of Royalton and St. Joseph Charter.

<table>
<thead>
<tr>
<th>AREA</th>
<th>Population within TCATA</th>
<th>Total Population in Municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton Twp</td>
<td>12,160</td>
<td>14,749</td>
</tr>
<tr>
<td>Benton Harbor, City</td>
<td>10,060</td>
<td>10,060</td>
</tr>
<tr>
<td>St Joseph, City</td>
<td>8,119</td>
<td>8,362</td>
</tr>
<tr>
<td>St Joseph, Twp</td>
<td>2,985</td>
<td>10,028</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>33,324</strong></td>
<td><strong>43,199</strong></td>
</tr>
</tbody>
</table>

**Table:** Populations within and in their respective municipalities.

**Map:** Benton Harbor - St Joseph Urbanized Area

*Limited Service* refers to only pick-ups and drop-offs that are available to the specified locations. TCATA provides pickup and drop off service at Hollywood Road Medical Facilities and Lake Michigan College from origins located the City of Benton Harbor, Benton Township and the City of St. Joseph.
Red Route

The Red route has been in service since December 2009 and since that time the route it had experienced consistent increases in ridership until 2015 where it has since reported small decreases in ridership. The route operates Monday through Friday from 6:00 am – 10:00 pm and on Saturday from 8:00 am – 10:00 pm. This hourly one way loop route originates in the City of Benton Harbor at Union, an area with higher than average poverty rates, unemployment and no access to a vehicle. Along the route there are several clusters of entry level employment opportunities and life sustaining services including Lakeland Hospital, Berrien County Court House, Michigan WORKS, and two large grocery stores. The Red route also offers an option to flex to locations along the route if the route is on schedule.

Blue Route

The Blue route operates Monday through Friday from 6:00 am – 10:00 pm and on Saturday from 8:00 am – 10:00 pm. This hour loop route originates in the City of Benton Harbor at TCATA headquarters and provides services to several housing developments, social service agencies and retail locations. The route is serviced by two vehicles that leave on the hour and half hour. The majority of stops along the route receive service every thirty minutes with the exception of Intercare, DHS, and River Terrace which receive service every fifteen minutes with inbound and outbound stops. The Blue route also offers an option to flex to locations along the route if the route is on schedule.
With an estimated 40 percent of buses and 25 percent of U.S. rail transit assets considered to be in marginal or poor condition, helping transit agencies maintain bus and rail systems in a state of good repair remains an FTA priority. TCATA has a wide variety of capital assets to maintain, including, but not limited to, busses and facilities. The agency must rehabilitate and replace their existing physical assets to keep them in a state of good repair (SGR) and provide a consistent level of service to their passengers. Absent adequate investment in existing assets, a transit agency may find its equipment becoming increasingly unreliable and difficult to maintain, and in extreme cases may suffer reductions in system reliability resulting in degraded transit service. Transit asset management provides a set of tools and approaches for helping transit agencies manage their physical assets and achieve SGR.

In 2016 FTA published the final rule that requires public transit agencies to establish targets for three asset categories and report annually on progress towards targets.

<table>
<thead>
<tr>
<th>Asset</th>
<th>Detail</th>
<th>Performance Measure</th>
<th>Baseline</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Revenue support service and maintenance vehicles</td>
<td>4 (3 staff vehicles and one tow truck)</td>
<td>Percent met or exceeded Useful Life Benchmark</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>Facilities: Maintenance Administration and passenger facilities</td>
<td>Wilbert Brown Transit Center</td>
<td>Percentage of assets with condition rating below 3.0 on FTA TERM Scale.</td>
<td>0 %</td>
<td>0%</td>
</tr>
<tr>
<td>Revenue Vehicles by Mode</td>
<td>25 passenger busses.</td>
<td>Percentage of revenue vehicles met or exceeded Useful Life Benchmark</td>
<td>40 %</td>
<td>15%</td>
</tr>
</tbody>
</table>

---

Investment needed to bring TCATA fleet up to 100% State of Good Repair

$900,000

Investment needed to bring TCATA Support Service Fleet up to 100% State of Good Repair

$282,000
**Passenger Rail—Existing Services**

While the private vehicle is the predominant mode of travel to destinations across county and state boundaries, passenger rail options are available to residents in the Twin Cities area. Amtrak provides passenger rail service via three Michigan service lines. All three lines have a western terminus in Chicago where passengers can change trains to get to any passenger rail station in the United States. The St. Joseph-Benton Harbor Amtrak Station serves the **Pere Marquette** line.

**Pere Marquette.** Amtrak’s **Pere Marquette** service provides daily service between Chicago and Grand Rapids, with stops also in Bangor and Holland. The service is limited to one trip daily leaving Grand Rapids in the morning and returning home from Chicago in the evening.

**Wolverine.** Amtrak’s **Wolverine** service is available to Benton Harbor-St. Joseph urbanized area residents who are able to travel to nearby communities with stations that serve that line, such as New Buffalo, Niles, Dowagiac, and Kalamazoo. See the route alignment illustration to the right for a full listing of all of the cities served by the **Wolverine**.

**Blue Water.** Amtrak’s **Blue Water** service has the same stops between Chicago and Battle Creek as the **Wolverine** service (see below). Beyond Battle Creek, the **Blue Water** also service East Lansing, Durand, Flint, Lapeer, and Port Huron.

**Amtrak Thruway Bus Connection.** Amtrak Thruway Bus Connections are available at several train stations in Michigan and Chicago to offer additional destinations to passengers. See the Amtrak Michigan Services Schedule for additional information.

**Commuter Rail**

The closest interurban commuter rail service for the Twin Cities area is the **South Shore Line**, an electrically powered line operated by the Northern Indiana Commuter Transportation District, between Millennium Station in downtown Chicago and the South Bend Airport. The closest station is in Michigan City, IN. Residents and visitors can use this option as part of their travel plans to points west as far as downtown Chicago, connecting to Chicago’s transit system: Chicago Transit Authority, Metra, and Pace.
Amtrak Endpoint On-Time Performance

The Amtrak Endpoint On-Time Performance report below for Train 370 (Chicago to Grand Rapids) for October 2017 (the most recent report available on amtrak.com), is a good illustration of the primary causes of delay. Large portions of the Wolverine and Blue Water services run on Amtrak and MDOT owned tracks. Most of the Pere Marquette service runs on CSX owned tracks and the remainder is owned by Norfolk Southern. Track owners get priority for their trains.

Amtrak Ridership

Over the last six years annual ridership on Michigan’s Wolverine and Blue Water services have fluctuated as the cost for gas, demand for travel and other variables have fluctuated (see table, top right). But during that same period the Pere Marquette has mostly only see drops in ridership, except 2017, but it is too early to know if this is a change in pattern or if some of the factors that increased ridership on the Wolverine also affected the Pere Marquette.

Corridor Station Activity

The table below for Pere Marquette stations shows that boarding and deboarding activity has increased the most at Benton Harbor-St. Joseph and Bangor Stations compared to other stations on that service during each of the last two years.
Midwest Regional Rail Planning Study

The Federal Railroad Administration (FRA) is studying ways to improve current Midwest passenger rail service into a high-performance, multi-state intercity passenger rail network through a planning initiative called the Midwest Regional Rail Planning Study (MRRP).

The MRRP identifies several opportunities to improve overall service throughout the Midwest. Part of those improvements include adding new service to currently unconnected communities.

In West Michigan, the MRRP contemplates changing the Pere Marquette service. Currently, the Pere Marquette runs to-from Chicago and Grand Rapids through Benton Harbor-St. Joseph, Bangor, and Holland. The proposed change would eliminate Amtrak passenger rail service in Benton Harbor-St. Joseph and Bangor in favor of a new Pere Marquette service that would run from Chicago to Kalamazoo, then Grand Rapids. The train could go from Grand Rapids to Holland. Or it could head to Lansing and onward to Ann Arbor and Detroit—this is called the Michigan Coast-to-Coast emerging service option (see map below). According to the MRRP there are currently 200,000 riders on the corridor, but with the proposed change ridership could increase to 1.5 million. Under this plan Benton Harbor-St. Joseph would get Amtrak Thruway bus service to Niles, where people may board the train. Bangor would not have a rail nor Thruway connection.

Westrain

Westrain is a coalition of stakeholders along the Pere Marquette Amtrak passenger rail line (GVMC in Grand Rapids, Macatawa Area Coordinating Council in Holland, City of Bangor, Cornerstone Chamber of Commerce, the Michigan Association of Rail Passengers, and the Southwest Michigan Planning Commission, together with the Amtrak and the Michigan Department of Transportation Office of Rail) that promote passenger rail service in West Michigan, including improved Amtrak service and marketing for special events such as for the Senior PGA Tour in Benton Harbor. This coalition also discusses the changes to the Pere Marquette proposed in the MRRP, and they contemplate ways to counter this loss of service.
Intercity Bus

Intercity bus service provides scheduled service to cities over much longer distances than local transit agencies. Greyhound and Indian Trails carriers provide direct service from the Benton Harbor Transportation Center (BHTC) to various destinations that include Battle Creek, Kalamazoo, Holland, Grand Rapids, Elkhart, and Chicago (see map below).

The BHTC, on M-139 at Nickerson Avenue, is an MDOT owned and operated facility. MDOT subsidizes intercity bus services such as Greyhound Indian Trails. Subsidized bus service in Michigan has emerged in response to carrier service reductions. MDOT’s Intercity Bus Service White Paper (2012) notes: “As carrier decisions are made, the Michigan Department of Transportation (MDOT) reviews the affected routes and determines whether to provide a subsidy for the service, based on the state’s objective to maintain community access to the national intercity bus network, and subject to the availability of federal and state resources.”

Intercity bus passengers may arrive at or depart from the BHTC using the Twin Cities Area Transportation Authority Red Route by calling to request the bus to flex. The St. Joseph-Benton Harbor Amtrak Station is also served by Red Route, with a fixed route stop at Ship St./Lakeview Blvd. The BHTC does not have pedestrian nor bicycle infrastructure that connects to it.
What is Freight?

“any good, product, or raw material carried by a commercial means of transportation – including air, highway, rail, water, and pipeline”

– Michigan Freight Plan

In the Twin CATS area, I-94, I-196, and US-31 are the most significant corridors for freight, with I-94 being the most well used. The Twin CATS area also has a railroad network, commercial port, and an airport to move freight. Pipelines go through the area, but there are not any commercial access points, so they are not covered in this section.

The MDOT 2016 Freeway Congestion & Reliability Report states that the in 2016 the user delay cost for the I-94 corridor in Berrien County was $5,658,000. This is an improvement on the 2012 to 2015 four-year average of $9,042,000. The graph below, from that report, shows how that user delay cost is broken out by month.
Freight Vehicle-Miles Traveled

E-commerce growth and other factors are expected to increase long-haul freight traffic on the National Highway System flowing to, from, and within Michigan between 2012 and 2045 by:

73%
Freight goods depend heavily on the Interstate System for delivery. Although only one-fourth of the miles traveled by all traffic is on the Interstate System, about one-half of combination-truck vehicle miles of travel are on interstate highways.

The number of National Highway System miles carrying large volumes and high percentages of trucks is projected to increase dramatically by 2045. Segments with more than 8,500 trucks per day and where at least every fourth vehicle is a truck are estimated to grow from 5,560 miles in 2012 to 13,480 in 2045, an increase of more than 140%.

TwinCATS is located adjacent to the NAFTA Corridor, which provides access to:
- 54% of the nation’s manufacturers
- 48% of all national retail sales
- 54% of the nation’s business payroll
- 65% of Canada’s Gross National Product
- 37% of the U.S. population can be reached in one day by truck

More than 78% of the U.S. population can be reached within two days by roadway
More than 100 million people live within overnight delivery capability
More than 105 million people live within a 500-mile radius and 221 million people live within 1,000 miles radius of the region’s center
Freight Rail

CSX Transportation runs freight rail service through the Twin Cities, following the Pere Marquette line between Holland and Chicago. In Holland, the CSX line splits off into a route along the Lake Michigan coast and another that follows the Pere Marquette route to Grand Rapids and beyond (see map to right). Rail offers an economical and environmentally conscientious means to move freight. The table below shows inbound and outbound rail movements in Berrien County for 2014 (source: MDOT Office of Rail – IHS Transearch database). Pass through tonnages, such as for coal, are not shown here.

<table>
<thead>
<tr>
<th>Product</th>
<th>Inbound Tons</th>
<th>Outbound Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber/Plastic Scrap</td>
<td>21,600</td>
<td></td>
</tr>
<tr>
<td>Primary Metal Products</td>
<td>8,800</td>
<td></td>
</tr>
<tr>
<td>Fiber, Paper, or Pulpboard</td>
<td>12,080</td>
<td></td>
</tr>
</tbody>
</table>
Twin Cities Harbor

The Twin Cities Harbor is a deep draft commercial harbor with over 5,300 feet of structures including piers and revetments and over 1.5 miles of maintained channel. The U.S. Army Corps of Engineers (USACE) Fact Sheet for the Twin Cities Harbor reported that 243,000 tons of material were shipped and received at the Twin Cities Harbor in 2014. This is a reduction from the five-year average between 2004 and 2008 of 563,050 tons.

- **Commercial Harbor Importance**

  The USACE Fact Sheet identifies the transportation importance of the Harbor:
  - Regionally significant receiving port on the Great Lakes
  - Commodities received include limestone, sand, gravel, armor stone, cement, slag, salt, and petroleum products
  - Project serves as an important Harbor of Refuge
  - Harbor is home to the U.S. Coast Guard Station Saint Joseph

- **Harbor Freight Stakeholders**

  - **Dock 63:** In 2015, they handled $4.7M in road salt and $1.5M in limestone.
  - **LaFarge North America:** Employees five people and supplies cement to over 30 ready-mix plants within southwestern Michigan and Indiana.
  - **Central Dock Company:** In 2017, citing difficult economic viability, the owner approached Cornerstone Alliance for assistance in selling the property, potentially for mixed-use development.

- **Twin Cities Harbor Dredging**

  The Twin Cities Harbor is usually dredged by the USACE. Until January 2017, Berrien County had been taking responsibility for locally coordinating this work. The City of Benton Harbor, City of St. Joseph, and St. Joseph Charter Township have been meeting to build a multi-jurisdictional framework to address harbor dredging and other issues.

- **Harbor Study**

  In 2015, a multi-jurisdictional group prepared *Twin Cities Harbor A Study of Potential in Benton Harbor & St. Joseph MI* to explore several issues facing the harbor. Infographics related to harbor freight are on the following pages, but the whole study is online:

**Bulk commodities that pass through the harbor:**

- $840M annually in business **revenue**
- 5,057 direct, indirect, & induced **jobs**
- $251M per year in personal **income**

*Source: USACE Fact Sheet for the Twin Cities Harbor*
**Principles in Motion — Freight Transportation**

---

**CEMENT**
- $19.8 Million
- @ $110/ton
- 2015

**LIMESTONE**
- $1.5 Million
- @ $20/ton
- 2015

**SALT**
- $4.7 Million
- @ $55/ton
- 2015

---

**2015 Freight**
- Projections: 340,000 tons
- 340 Jobs

---

**ESTIMATED**
- $2.5 Million Saved by Shipping in 2015

---

**ADDED COST THROUGH TRUCKING**
- $1.8 Million 2015 Cement
- $256,000 2015 Salt
- $450,000 2015 Limestone

---

**84% SUPPORT**
- Commercial Shipping


---

1. 2015 Projection based on records provided by Lafarge via phone
2. 2015 Projection based on records provided by Peter Berghoff, Dock 63
3. Based on records provided by Peter Berghoff, Dock 63
5. Based on 2015 tonnage and trucking cost projections in the River Action Plan

---

### U.S. Army Corps of Engineers Fiscal Year (FY) 2017, 2018, and 2019

#### St. Joseph Harbor, MI - Project Requirements and President’s Budget ($1,000)

<table>
<thead>
<tr>
<th>Work Package</th>
<th>FY17 Requirement</th>
<th>FY17 Appropriation</th>
<th>FY18 Requirement</th>
<th>FY18 President’s Budget</th>
<th>FY19 Requirement</th>
<th>FY19 President’s Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Dredging of Outer Harbor – Primary Work Package</td>
<td>750</td>
<td>750</td>
<td>765</td>
<td>765</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>Maintenance Dredging of Inner Harbor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>Maintenance Dredging – Backlog Work Package</td>
<td>225</td>
<td>0</td>
<td>225</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>975</strong></td>
<td><strong>750</strong></td>
<td><strong>990</strong></td>
<td><strong>765</strong></td>
<td><strong>1,500</strong></td>
<td><strong>1,500</strong></td>
</tr>
</tbody>
</table>
Principles in Motion >>> FREIGHT TRANSPORTATION—Strategies for Improving Freight Transportation

State Freight Priorities

The 2040 Michigan Transportation Plan goals particular to freight are tightly connected with national freight priorities, including:

- **System Improvement**: Modernize and enhance the transportation system to improve mobility and accessibility.

- **Efficient and Effective Operations**: Improve the efficiency and effectiveness of the transportation system and transportation services, and expand MDOT’s coordination and collaboration with partners.

- **Safety and Security**: Continue to improve transportation safety and ensure the security of the transportation system.

- **Stewardship**: Preserve transportation system investments, protect the environment, and utilize public resources in a responsible manner.

National Freight Priorities

The Fixing America’s Surface Transportation (FAST) Act of 2015 governs surface transportation federal spending, thus setting national priorities. The Michigan Freight Plan summarized national freight goals (*emphasis added*):

- Improve the contribution of the freight transportation system to *economic efficiency, productivity*, and *competitiveness*;

- **Reduce congestion** on the freight transportation system;

- Improve the *safety, security, and resilience* of the freight transportation system;

- **Improve the state of good repair** of the freight transportation system;

- Use advanced technology, *performance management, innovation, competition* and *accountability* in operating and maintaining the freight transportation system;

- **Reduce adverse environmental and community impacts** of the freight transportation system.

- Improve the flexibility to support *multi-state corridor planning* and the creation of multi-state organizations to increase the ability of states to address multimodal freight connectivity; and

- Improve the *short- and long-distance movement of goods* that travel across rural areas between population centers, between rural areas and population centers, and from the nation’s ports, airports, and gateways to the National Multimodal Freight Network.

Strategies for Improving Freight Transportation

**Freight Committee.** As shown in this section, freight is very important the area. A freight committee could be established to bring together freight stakeholders (air, highway, rail, water, and pipeline) to review, analyze, and make recommendations on how best to assist the Twin Cities area with any fright issues the committee identifies.

**Twin Cities Harbor.** The City of Benton Harbor, City of St. Joseph, St. Joseph Charter Township, and other stakeholders could organize a multijurisdictional body that could focus on harbor related issues, including dredging and other issues identified by those communities for the new multijurisdictional body to work on.

**Regional Prosperity Initiative – Region 8.** Support the Southwest Michigan Regional Prosperity Initiative Committee pursuing its strategies for its Goal #3, “Create, improve, and maintain services and infrastructure,” Objective 3, “advance the effective and efficient transportation of goods.”
Air Freight

The Southwest Michigan Regional Airport (SWMRA) is the largest airport in Berrien County, and the only all-weather airport in Berrien, Cass, and Van Buren Counties.

The airport has air cargo activity with UPS flights and other local charter operators delivering material for just-in-time manufacturing. The latest economic impact estimate conducted (2014) by Michigan Department of Transportation showed the airport’s contribution to the local economy to be $30 million.

The SWMRA is owned by the Cities of Benton Harbor and St. Joseph, and is governed by the Southwest Michigan Regional Airport Authority, established in 1997, which is responsible for airport operations. The airport authority is comprised of six municipalities: Cities of Benton Harbor and St. Joseph, St. Joseph Charter Township (including the Village of Shoreham), Lincoln Charter Township (including the Village of Stevensville), Royalton Township, and Benton Charter Township – all of which contribute a millage.
PASSENGER TRANSPORTATION—Passenger Rail