Saint Cloud Area Planning Organization's 2015-2019 Pavement Condition Report

Prepared by the Saint Cloud Area Planning Organization
October 2020

SAINT CLOUD | AREA PLANNING ORGANIZATION

Disclaimer and Assurances

DISCLAIMER

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Somali
Ururka Qorsheynta Deegaanka ee Cloud Cloud (APO) wuxuu si buuxda u waafaqsanahay Cinwaanka VI ee Xuquuqda Xuquuqda Rayidka ee 1964, Cinwaanka II ee Sharciga Naafada Mareykanka ee 1990, Amarka Fulinta 12898, Amarka Fulinta 13116 iyo qawaaniinta iyo qawaaniinta la xiriira. APO waa u furan tahay dhammaan dadka awooda oo dhan. Qofka u baahan dib-u-habeyn ama dejin, caawimaad gargaar ah, adeegyo turjumaad, adeegyo turjubaan, iwm, si uu uga qeyb galo kulan dadweyne, oo ay ku jiraan helitaanka ajendahaan iyo / ama ku lifaaqan qaab kale, ama luqadda fadlan la xiriir APO. 320-252- 7568 ama at admin@stcloudapo.org ugu yaraan toddobo (7) maalmood kahor kulanka.

Spanish
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Glossary

- ***CSAH*** **– The County State Aid Highway system is a network of key highways under the jurisdiction of Minnesota's counties.**
- ***DIV – A*** **Digital Inspection Vehicle is equipped with cameras to collect images displaying pavement distress and rutting measurements. A scanning laser and a 3D laser/camera system are used to produce images of the pavement surface, from which the type, severity, and amount of cracking can be determined. The vehicle is also equipped with laser height sensors that measure the longitudinal pavement profile from which pavement roughness is calculated.**
- ***Functional Classification*** **– Functional classification is the grouping of streets and highways into classes or systems according to the character of service they are intended to provide.**
- ***IRI*** **– The International Roughness Index a statistic used to estimate the amount of roughness in a measured longitudinal profile of roadway pavement.**
- ***MnDOT*** **– The Minnesota Department of Transportation oversees transportation by all modes including land, water, air rail, walking and bicycling in the state of Minnesota.**
- ***MPA*** **– A Metropolitan Planning Area is the geographic area over which an MPO exercises planning authority and which must include the Census-defined Urban Area, plus other urban and urbanizing areas as agreed to by the MPO's Board.**
- ***MPO*** **— An organization designated by agreement between the governor of a state, units of local governments of an urban area, and relevant agencies as being responsible for carrying out the terms of 23 USC Sect. 134. Any urban area of more than 50,000 residents must have an MPO. The Saint Cloud Area Planning Organization is the MPO for the Saint Cloud metropolitan area.**
- ***NHS*** **– The National Highway System is a network consisting of roadways important to the nation's economy; defense; and mobility; including Interstate Highways, Principal Arterials, Strategic Highway Network (STRAHNET) roads, major strategic highway network connectors, and highways between major intermodal facilities and the other four subsystems.**
- ***PCI*** **– The Pavement Condition Index is a numerical rating of the pavement condition based on the type and severity of distresses observed on the pavement surface.**
- ***PQI*** **– The Pavement Quality Index is a composite index, equal to the square root of the product of RQI and SR. As such, it gives an overall indication of the condition of the pavement, taking into account both the pavement smoothness and cracking.**
- ***RQI*** **– The Ride Quality Index is a smoothness index calculated from the pavement's longitudinal profile, measured by the front mounted lasers on the digital inspection vehicle.**
- ***SR*** **– The Surface Rating identifies distresses and defects visible on the pavement surface.**

Pavement Data Collection

Introduction

The Saint Cloud Area Planning Organization (APO) has made a commitment to efficiently and cost-effectively manage the operations and preservation of the roadway network, as identified in the APO's long-range planning document, the Metropolitan Transportation Plan (MTP). To assist in achieving this goal, the APO hired GoodPointe Technology to survey the pavement condition of portions of the existing roadway network within the metropolitan planning area (MPA) in 2019. Taken collectively with pavement condition data collected by the Minnesota Department of Transportation (MnDOT), this data provides a clearer picture of the pavement condition of the MPA's existing roadway network.

Why is the data needed?

Pavement data collection is good practice as it can assist agencies and jurisdictions in prioritizing costly infrastructure preservation treatments. This information can also assist in the development and implementation of a pavement preservation program. The creation of such a program can:

- Improve pavement performance.
- Lead to smoother roads and fewer construction delays due to a proactive versus reactive approach to system preservation.
- Extend the pavement service life of a roadway and reduce the overall life cycle cost due to the appropriate maintenance treatment being done at the appropriate time.
- Increase safety in terms of improved pavement texture and correction of safety related defects such as ruts, low surface friction, and poor surface drainage.

**Data courtesy of MnDOT.*

Who collects the data?

As mentioned earlier, pavement condition data collected for this report comes from two sources: MnDOT and GoodPointe Technology. MnDOT annually collects pavement conditions for Minnesota's National Highway System (NHS) including NHS roadways that fall within the APO's planning area: MN 15, MN 23, US 10, and CSAH 75. In addition, MnDOT also surveys the pavement condition for most of the county-owned roadway network approximately every two years. Stearns County's pavement condition (along with CSAH 75) was collected in 2018; Sherburne County's pavement condition was collected in 2017; and Benton County's pavement condition was collected in 2015.

Consulting firm GoodPointe Technology was contracted by the APO to survey portions of the roadway network not collected by MnDOT. GoodPointe Technology surveyed functionally classified county and municipal roads along with local roads identified as part of APO's local freight network and also surveyed the pavement and striping condition of on-road bicycle routes.

In this report, pavement condition data from MnDOT and GoodPointe Technology were combined.

**Example of poor pavement quality on Grainteview Road in Waite Park.*

Pavement Data Collection Methodology

How is Pavement Condition Calculated?

* Pavement condition is calculated using the International Roughness Index (IRI). IRI is a statistic used to estimate the amount of roughness on a roadway.

* IRI uses three types of pavement distress as measurements:

Cracking – A visible line in the surface of the pavement due to a variety of environmental conditions and vehicle usage.

Rutting - A surface depression located in the wheel path of the travel lane.

Faulting – A difference in elevation between adjacent pavement due to environmental conditions and vehicle usage.

Data and photos courtesy of MnDOT.

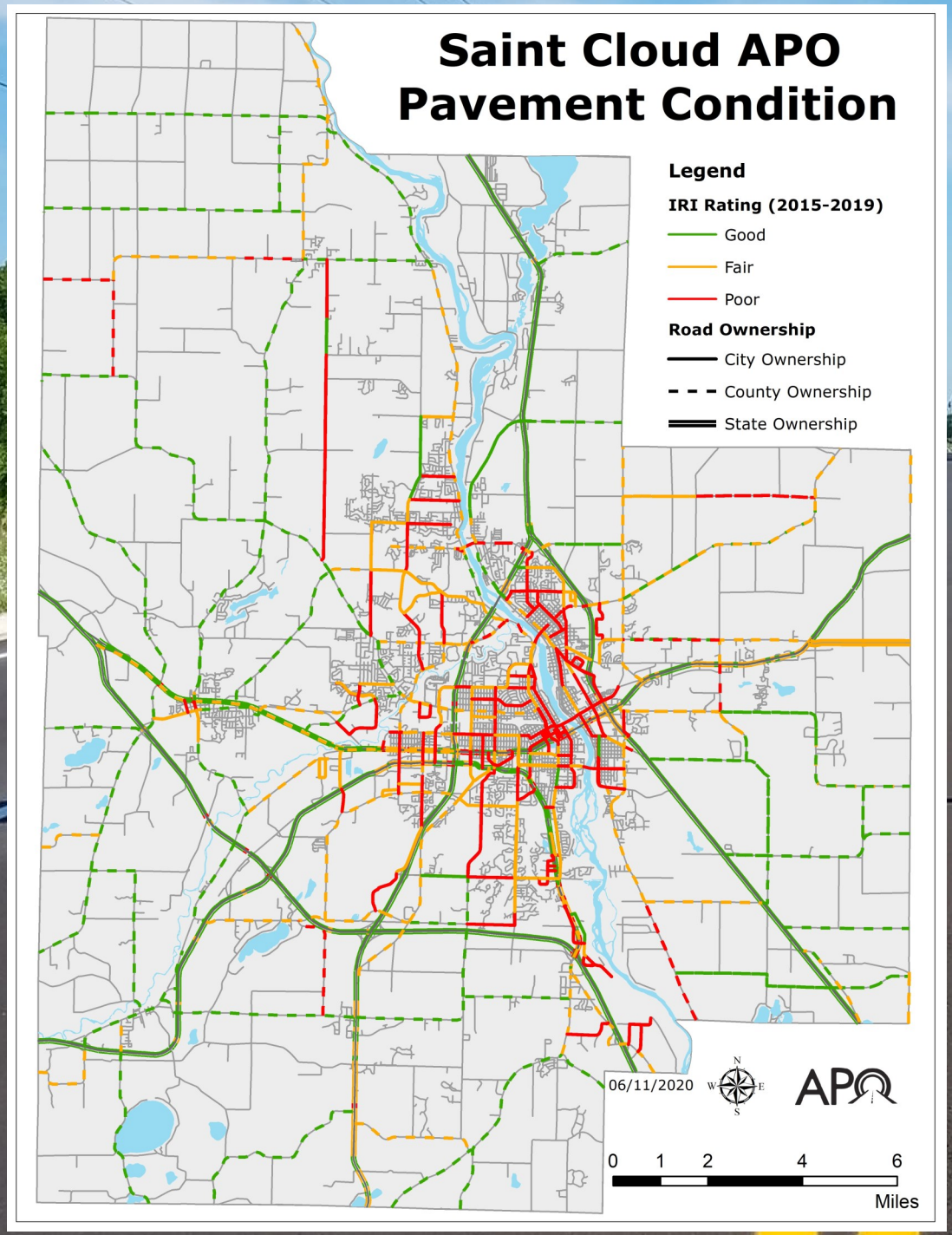
Data Collection Method

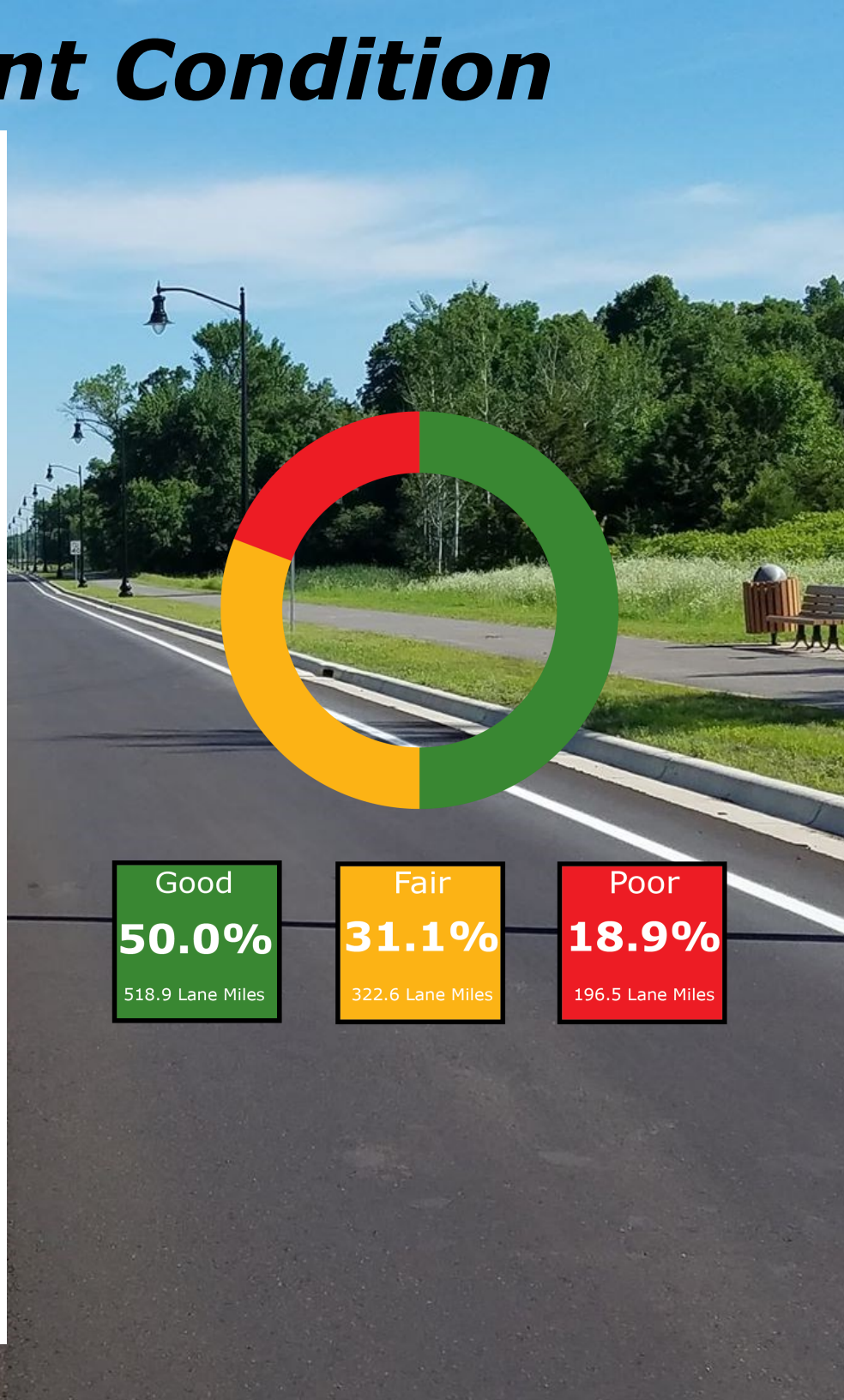
Pavement condition data is typically collected bi-directionally using a Digital Inspection Vehicle (DIV). The vehicle is equipped with two cameras to collect images for the video log. For pavement distress and rutting measurements, a scanning laser and a 3D laser/camera system are used to produce images of the pavement surface, from which the type, severity, and amount of cracking can be determined. The vehicle is also equipped with laser height sensors that measure the longitudinal pavement profile from which pavement roughness is calculated.

Example of DIV use by the Minnesota Department of Transportation (MnDOT).

Example of DIV use by GoodPointe Technology.

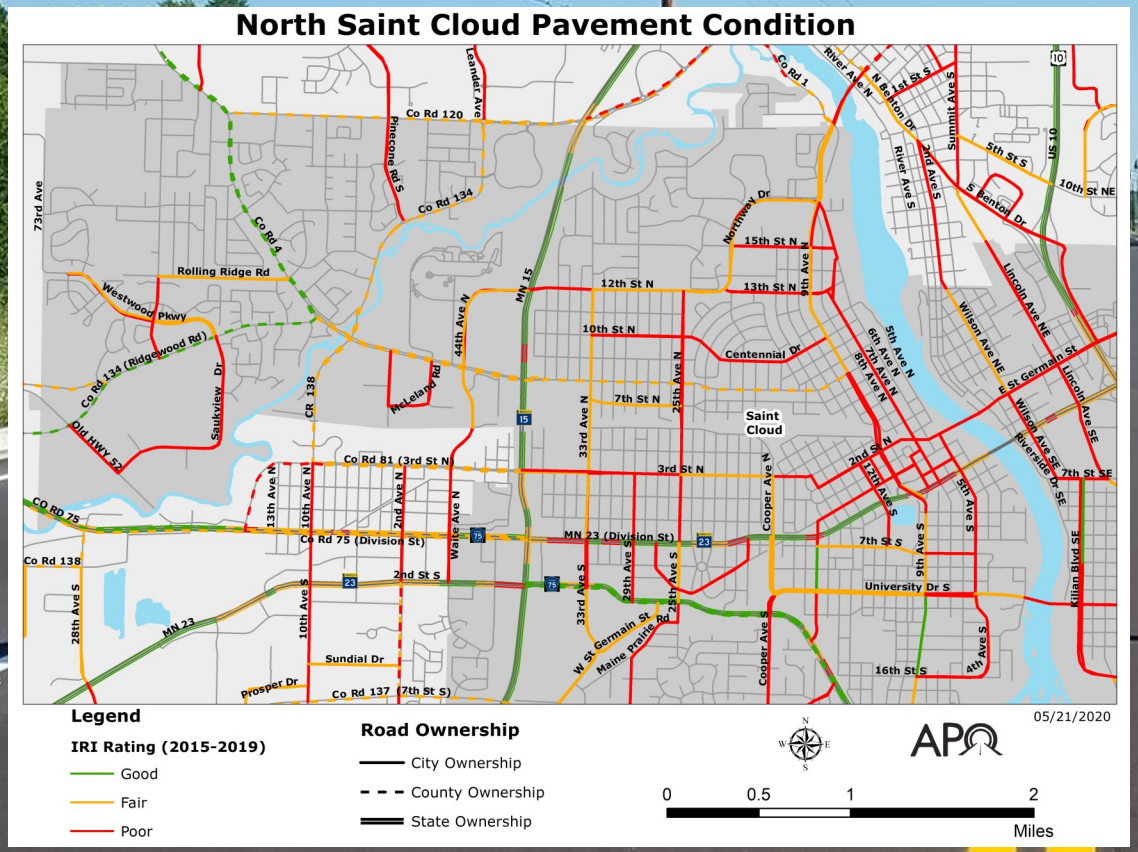
APO's Pavement Condition





*Data Source: GoodPointe Technology and MnDOT

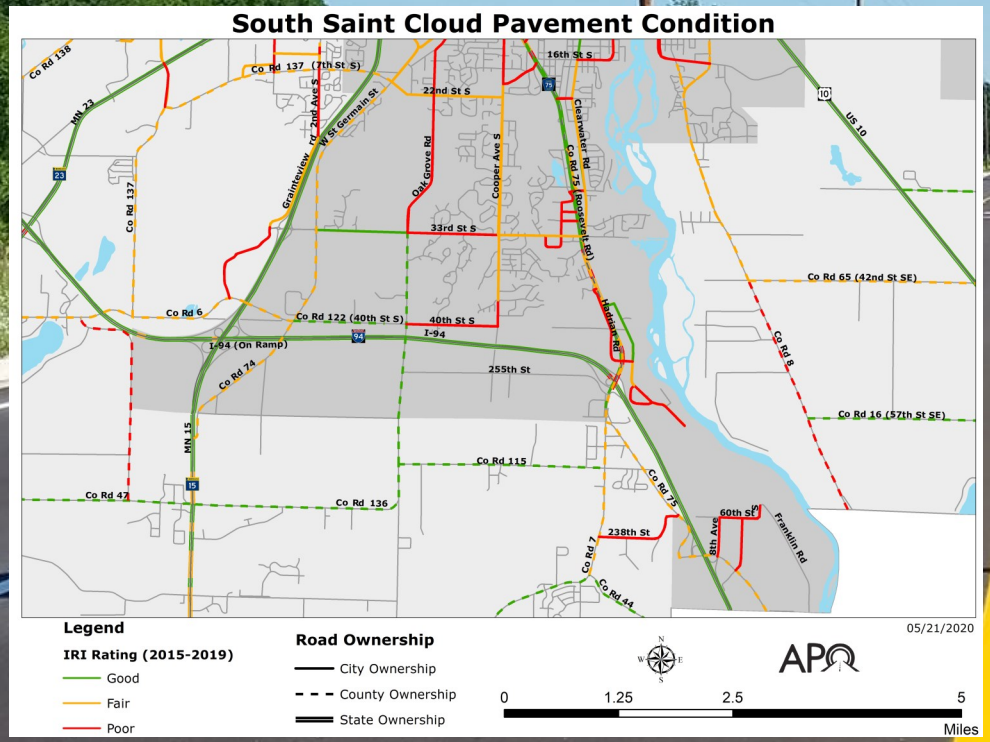
Saint Cloud's Pavement Condition



Good	Fair	Poor
2.2%	43.8%	54.0%
3.4 Lane Miles	68.3 Lane Miles	84.3 Lane Miles

*Data Source: GoodPointe Technology and MnDOT

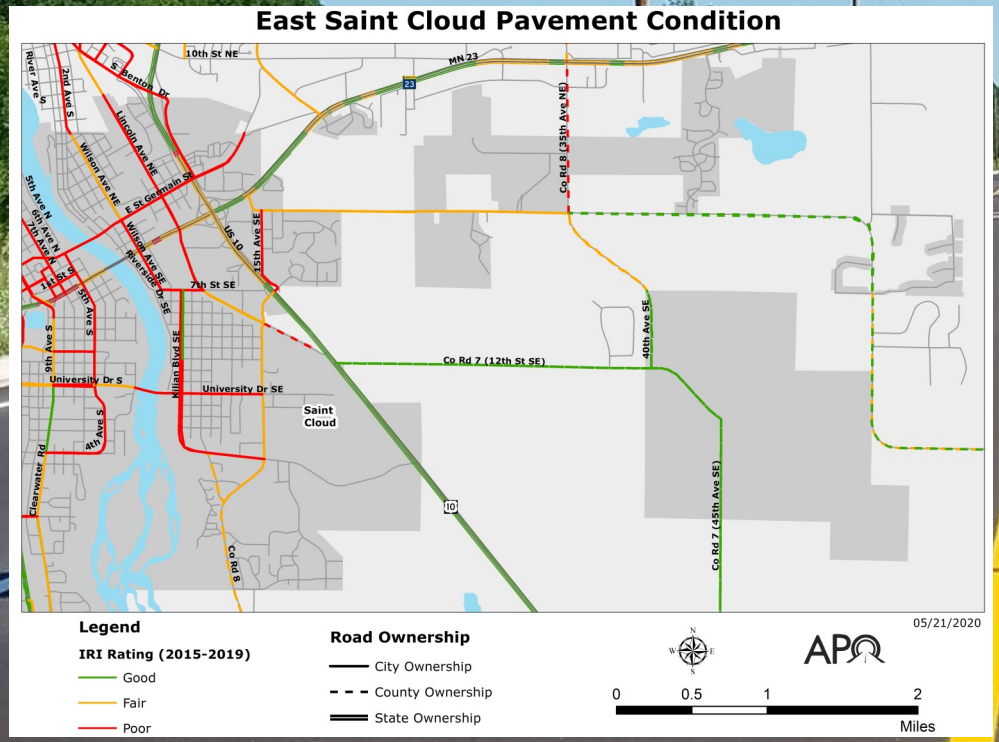
Saint Cloud's Pavement Condition



*Data Source: GoodPointe Technology and MnDOT

Good	Fair	Poor
2.2%	43.8%	54.0%
3.4 Lane Miles	68.3 Lane Miles	84.3 Lane Miles

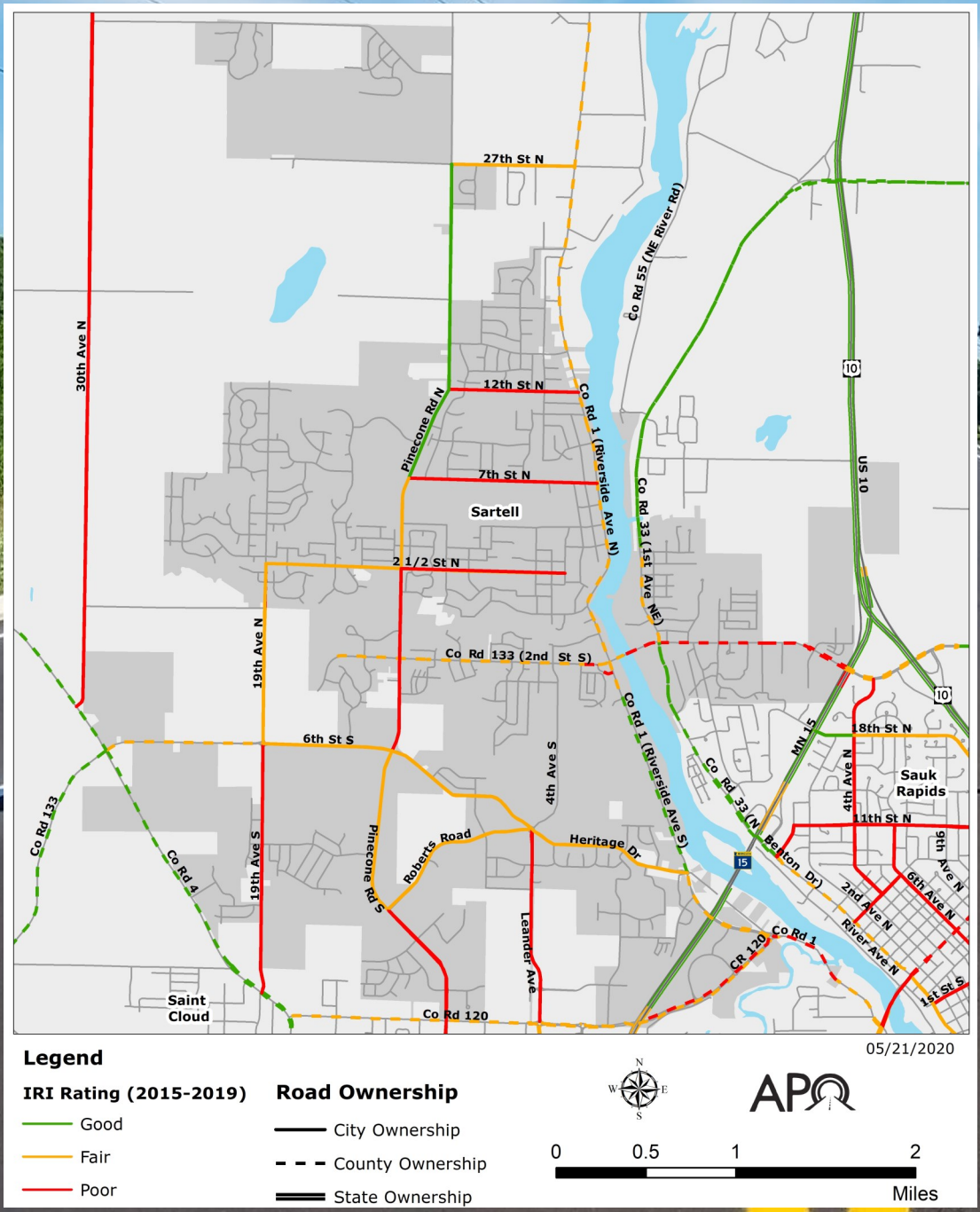
Saint Cloud's Pavement Condition



*Data Source: GoodPointe Technology and MnDOT

Good	Fair	Poor
2.2%	43.8%	54.0%
3.4 Lane Miles	68.3 Lane Miles	84.3 Lane Miles

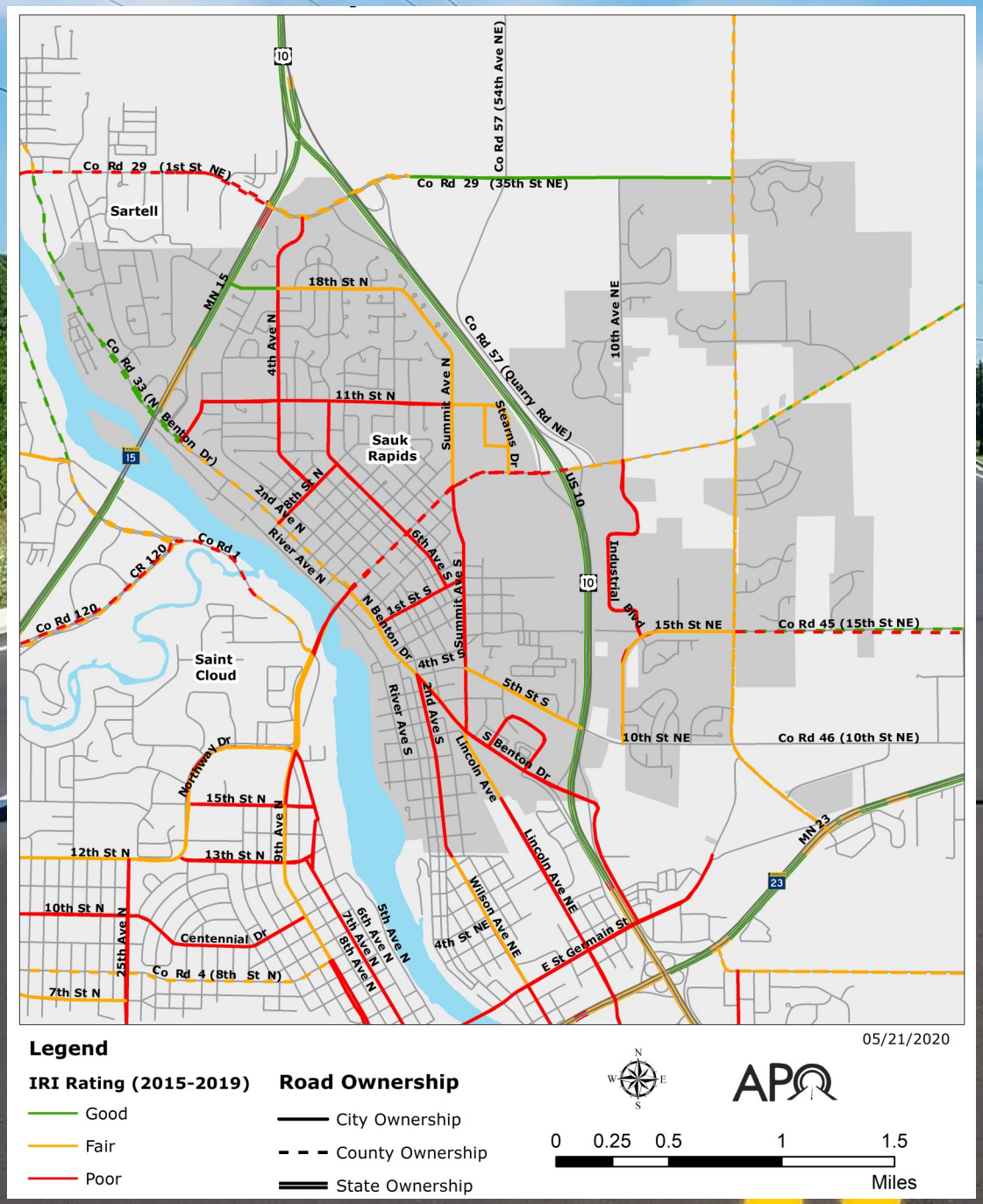
Sartell's Pavement Condition



Good	Fair	Poor
9.1%	40.4%	50.5%
3.6 Lane Miles	15.9 Lane Miles	19.9 Lane Miles

*Data Source: GoodPointe Technology and MnDOT

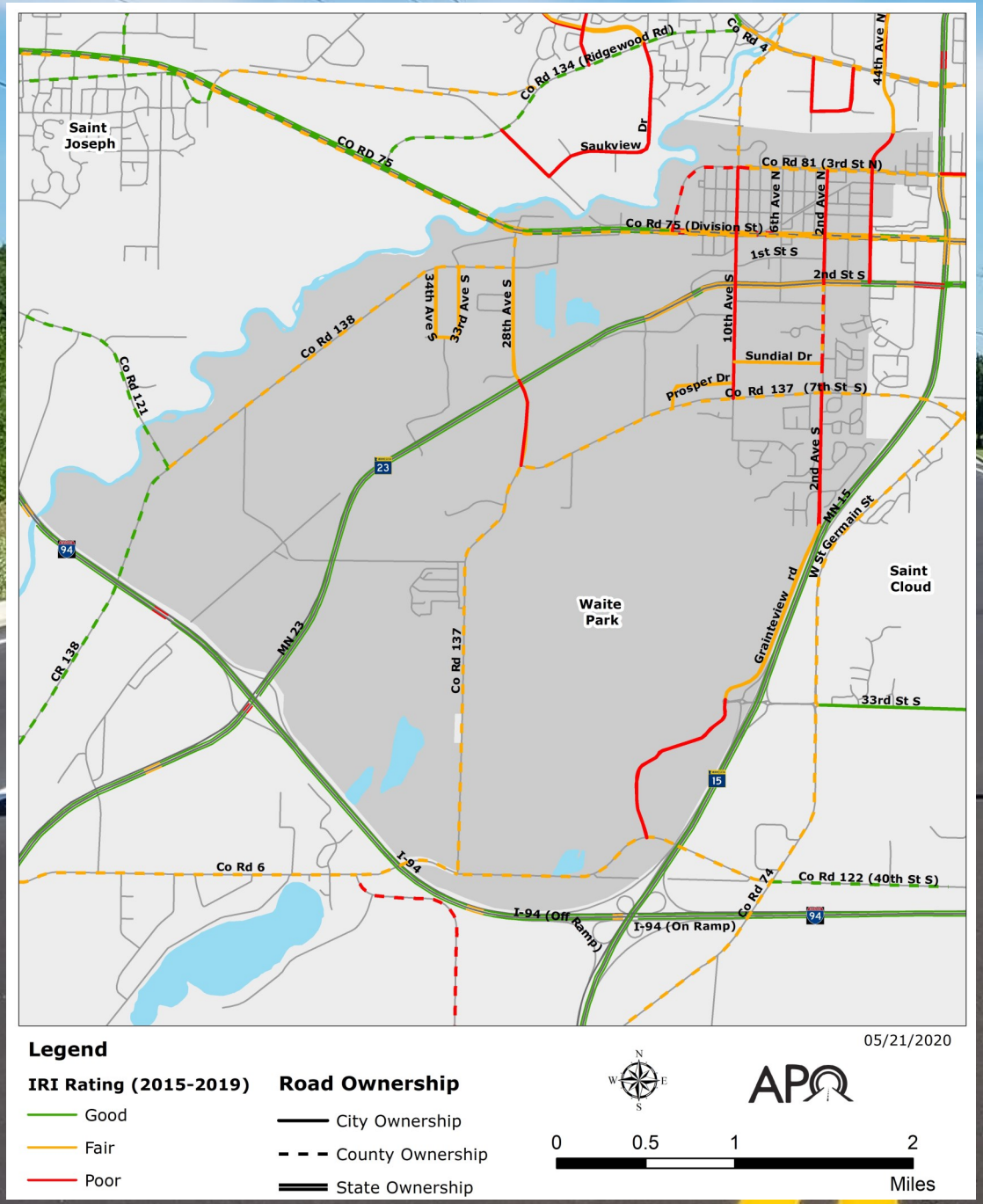
Sauk Rapids' Pavement Condition



*Data Source: GoodPointe Technology and MnDOT

Good	Fair	Poor
0.7%	34.9%	64.4%
0.2 Lane Miles	11.4 Lane Miles	21.0 Lane Miles

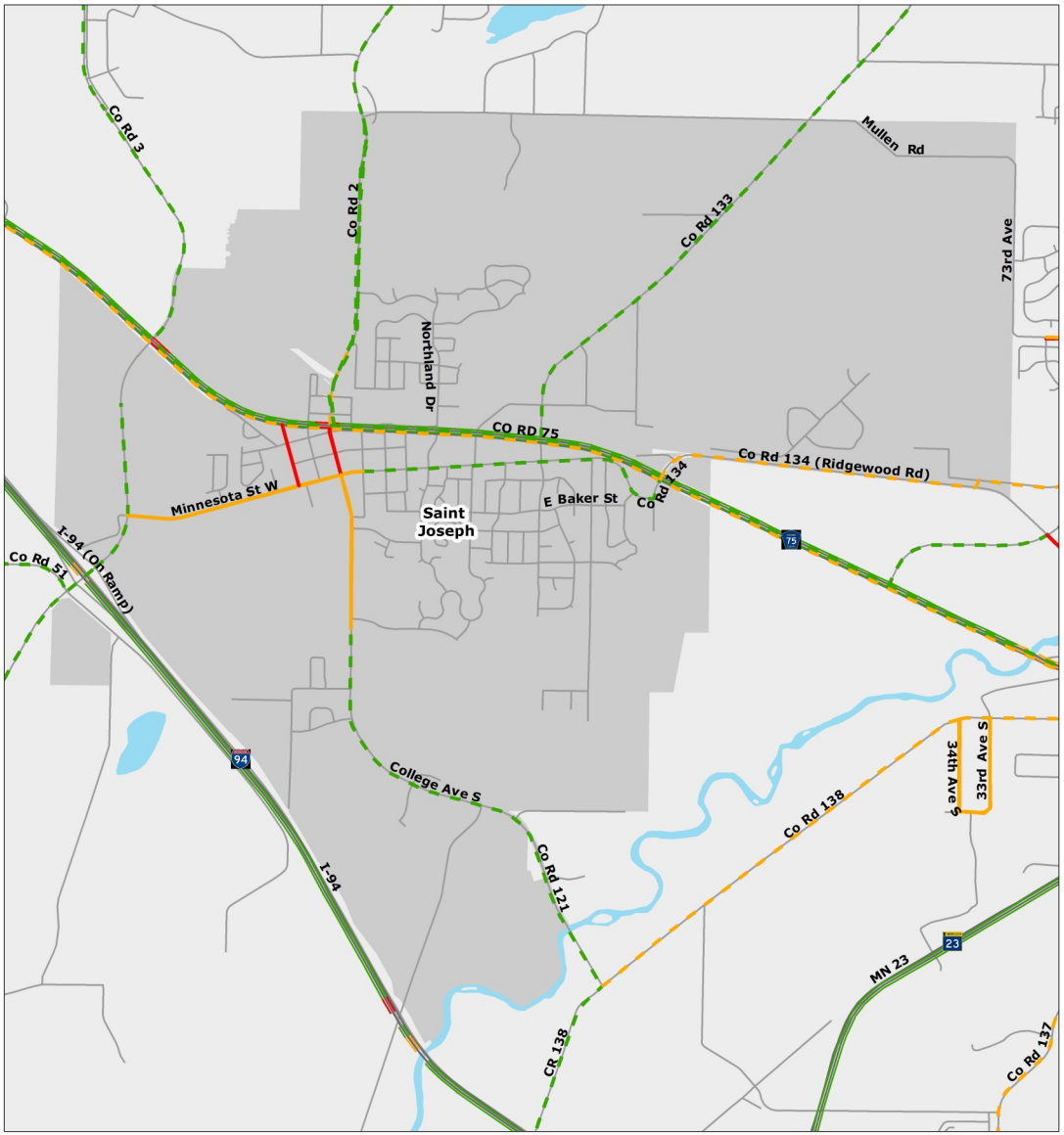
Waite Park's Pavement Condition



*Data Source: GoodPointe Technology and MnDOT

Good	Fair	Poor
0.0%	32.4%	67.6%
0 Lane Miles	8.1 Lane Miles	17.0 Lane Miles

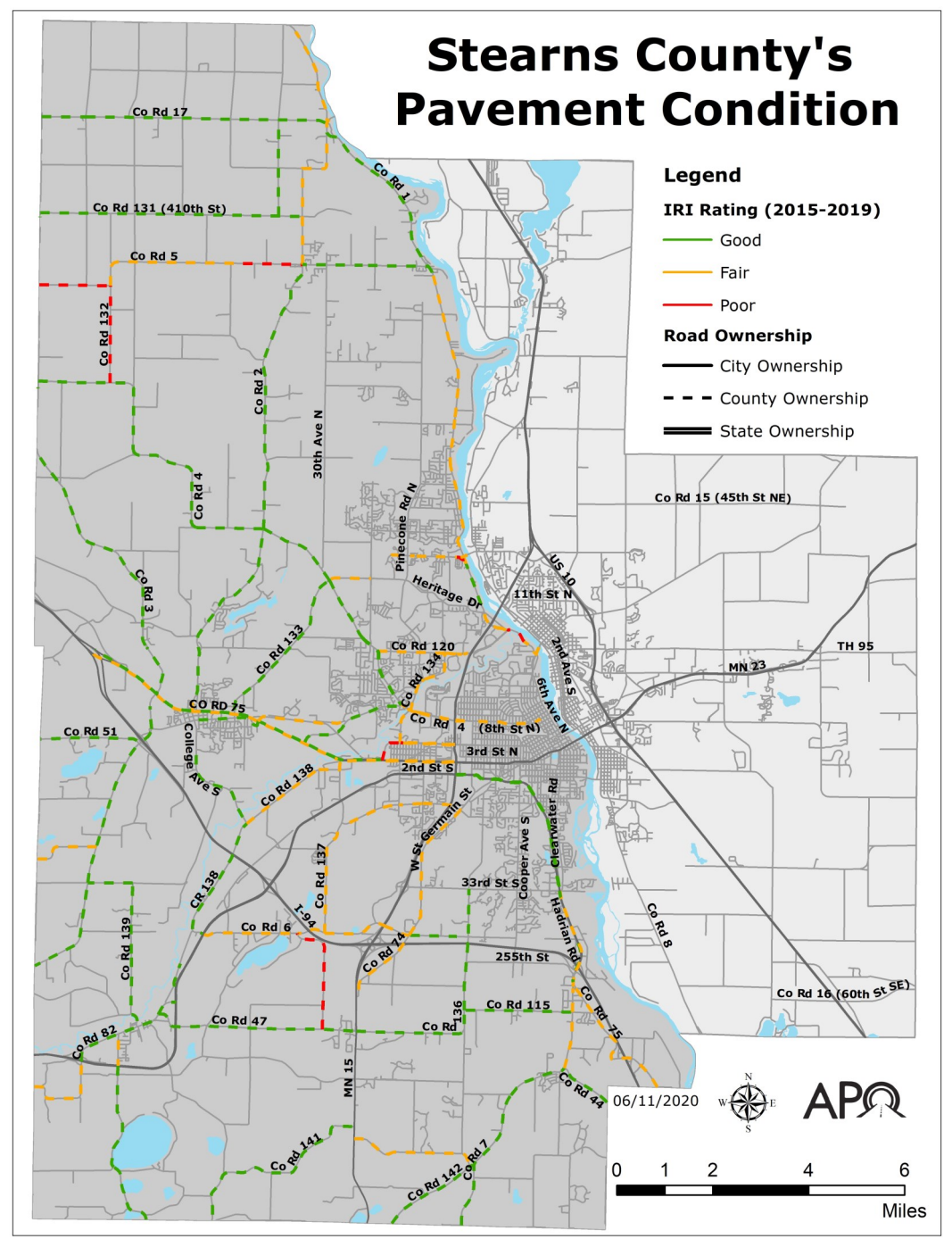
Saint Joseph's Pavement Condition

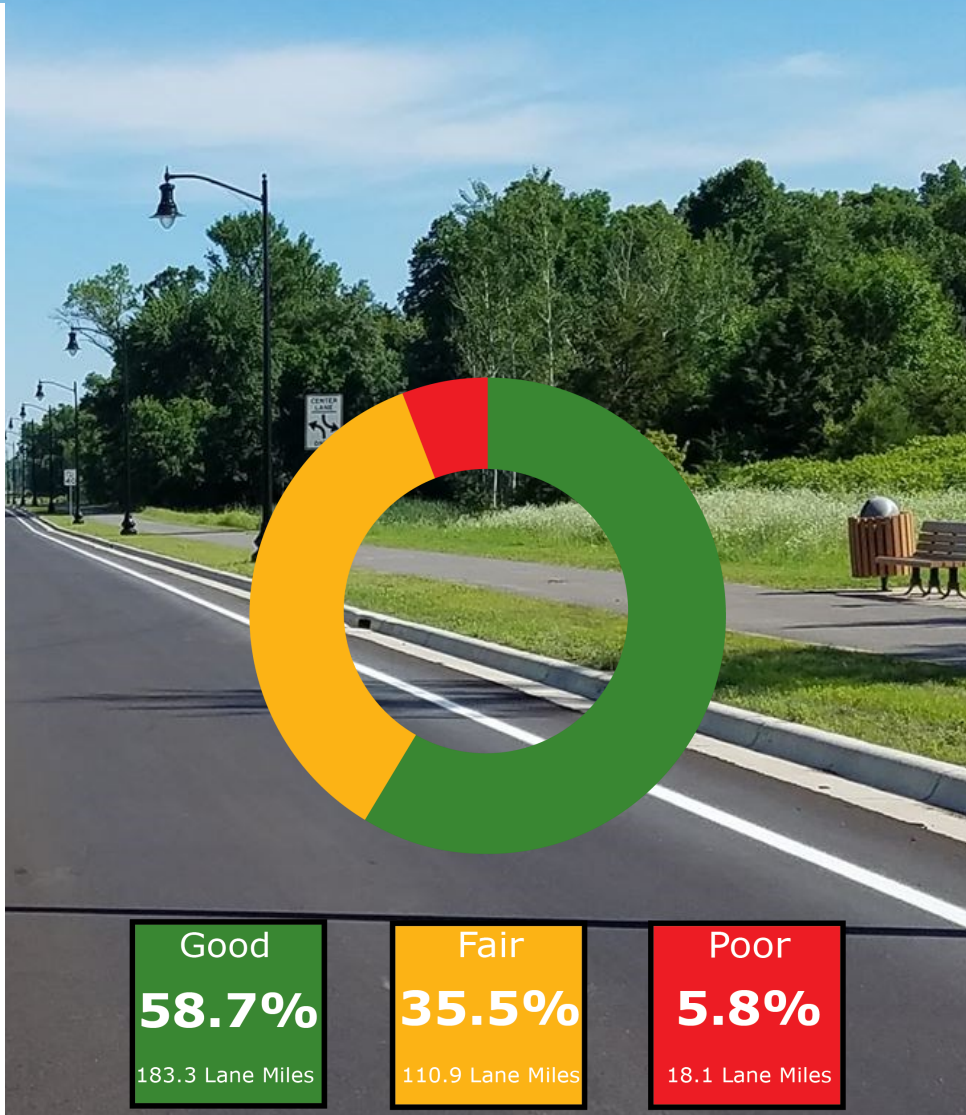


*Data Source: GoodPointe Technology and MnDOT

Good	Fair	Poor
0.0%	78.2%	21.8%
0.0 Lane Miles	3.3 Lane Miles	0.9 Lane Miles

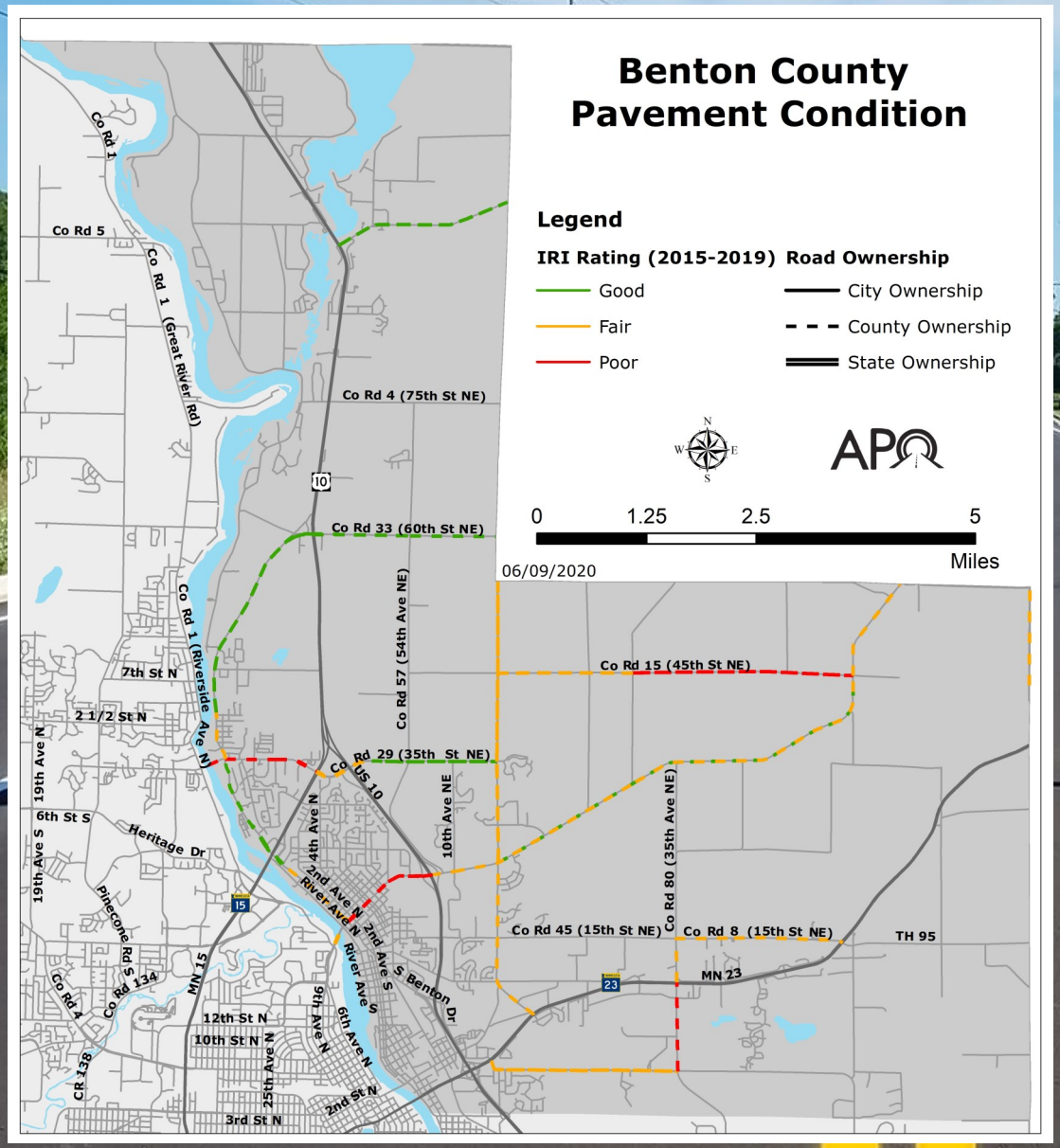
Stearns County's Pavement Condition

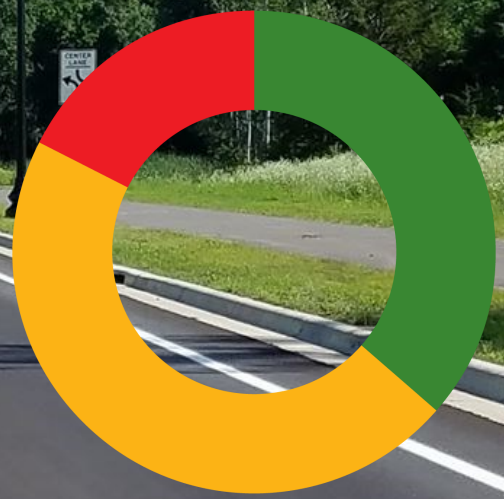




*Data Source: GoodPointe Technology and MnDOT

Benton County's Pavement Condition

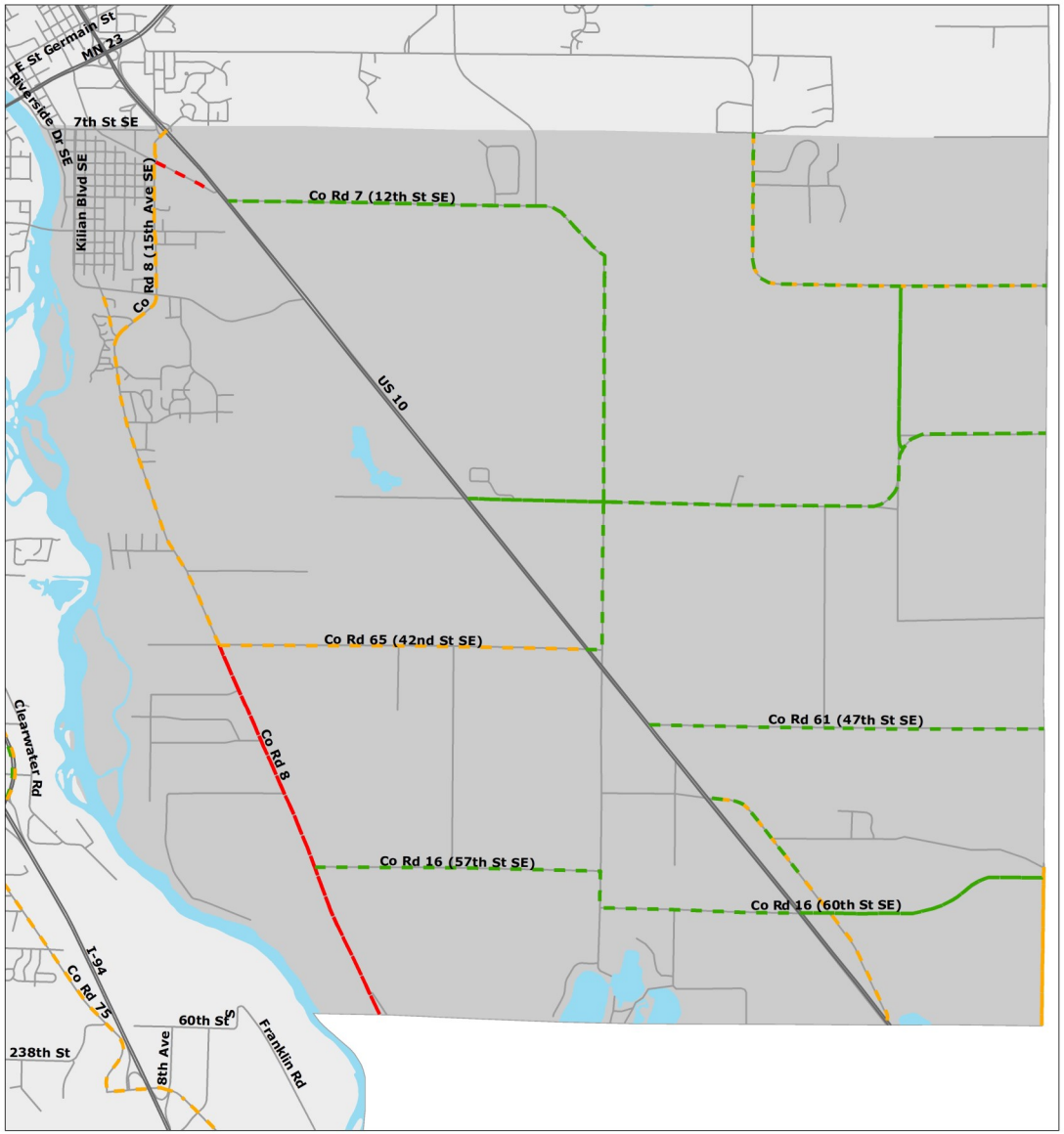




Good	Fair	Poor
36.5%	46.1%	17.5%
30.8 Lane Miles	38.9 Lane Miles	14.8 Lane Miles

*Data Source: GoodPointe Technology and MnDOT

Sherburne County's Pavement Condition



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Legend

IRI Rating (2015-2019)
- Good
- Fair
- Poor

Road Ownership
- City Ownership
- County Ownership
- State Ownership

N W E S

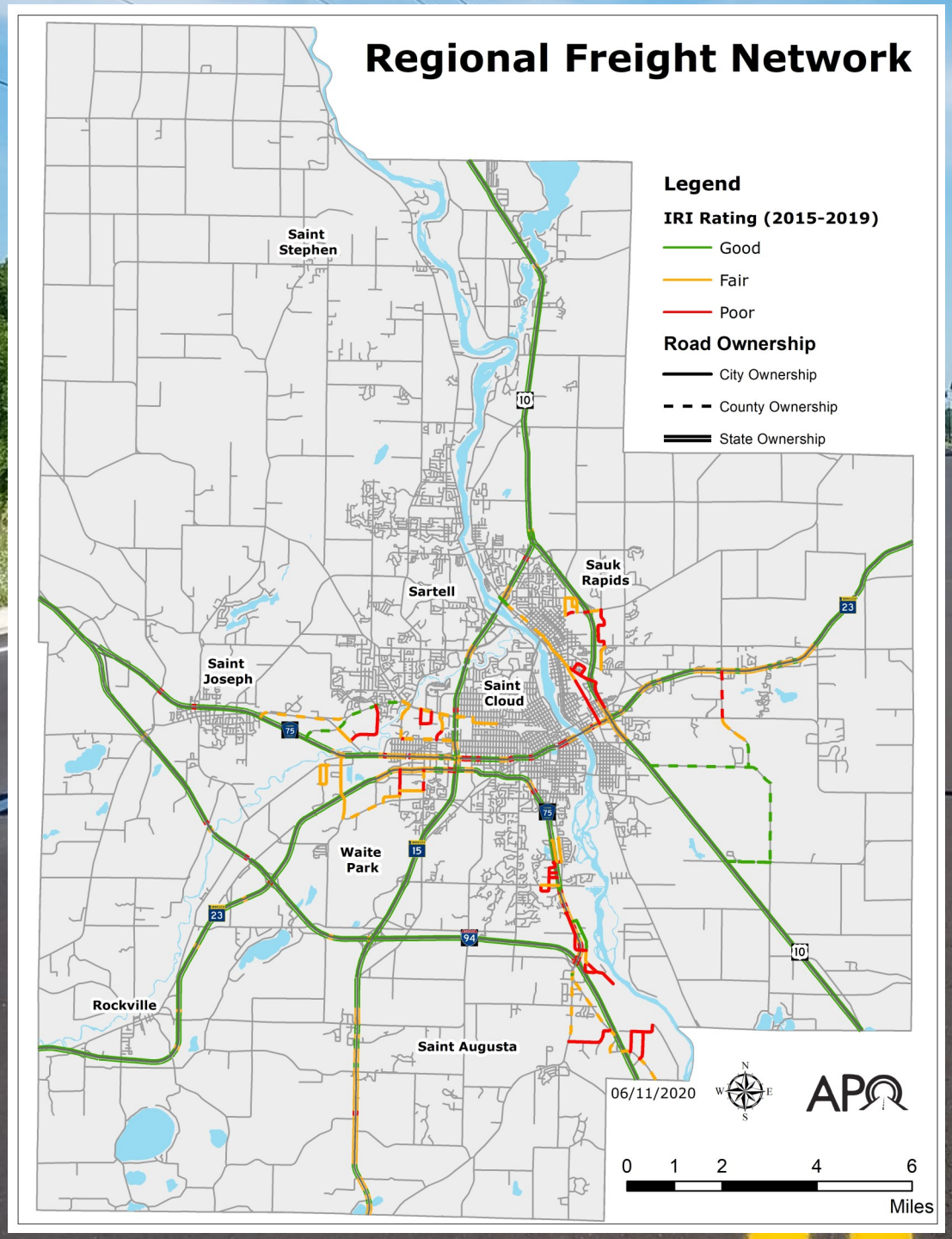
APO

0 0.75 1.5 3 Miles

*Data Source: GoodPointe Technology and MnDOT

Good	Fair	Poor
60.5%	30.6%	8.9%
42.4 Lane Miles	21.4 Lane Miles	6.2 Lane Miles

Freight Network Pavement Condition

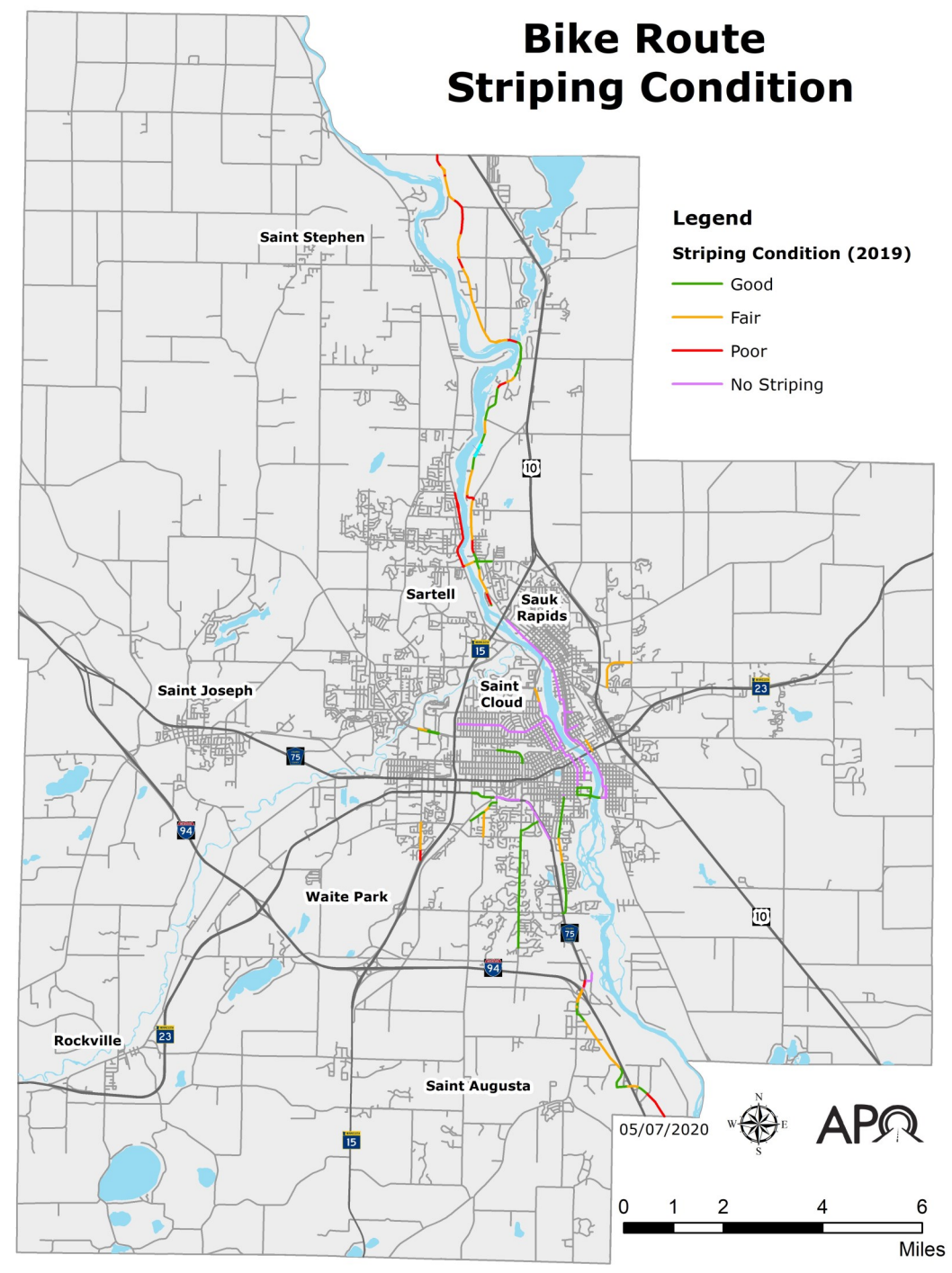


*Data Source: GoodPointe Technology

The regional freight network is a combination of Interstate 94, highways (US 10, MN 15, MN 23), various county and local roads. The designation of an official local freight network recognizes the importance of certain roadway links for the movement of freight. This designation can also provide opportunities for focused investment that will benefit the movement of freight in the area.

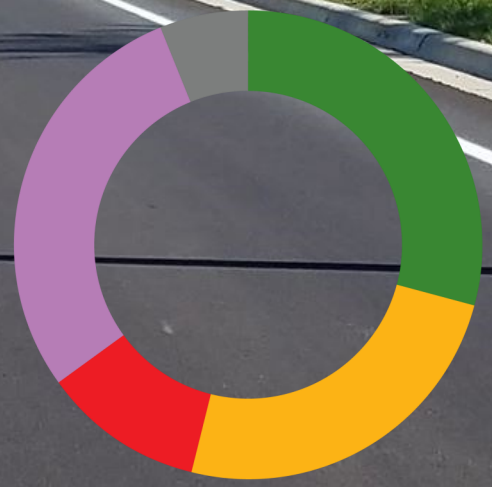
Good	Fair	Poor
36.8%	38.3%	24.9%
55.1 Lane Miles	57.4 Lane Miles	37.3 Lane Miles

Bike Route Striping Condition



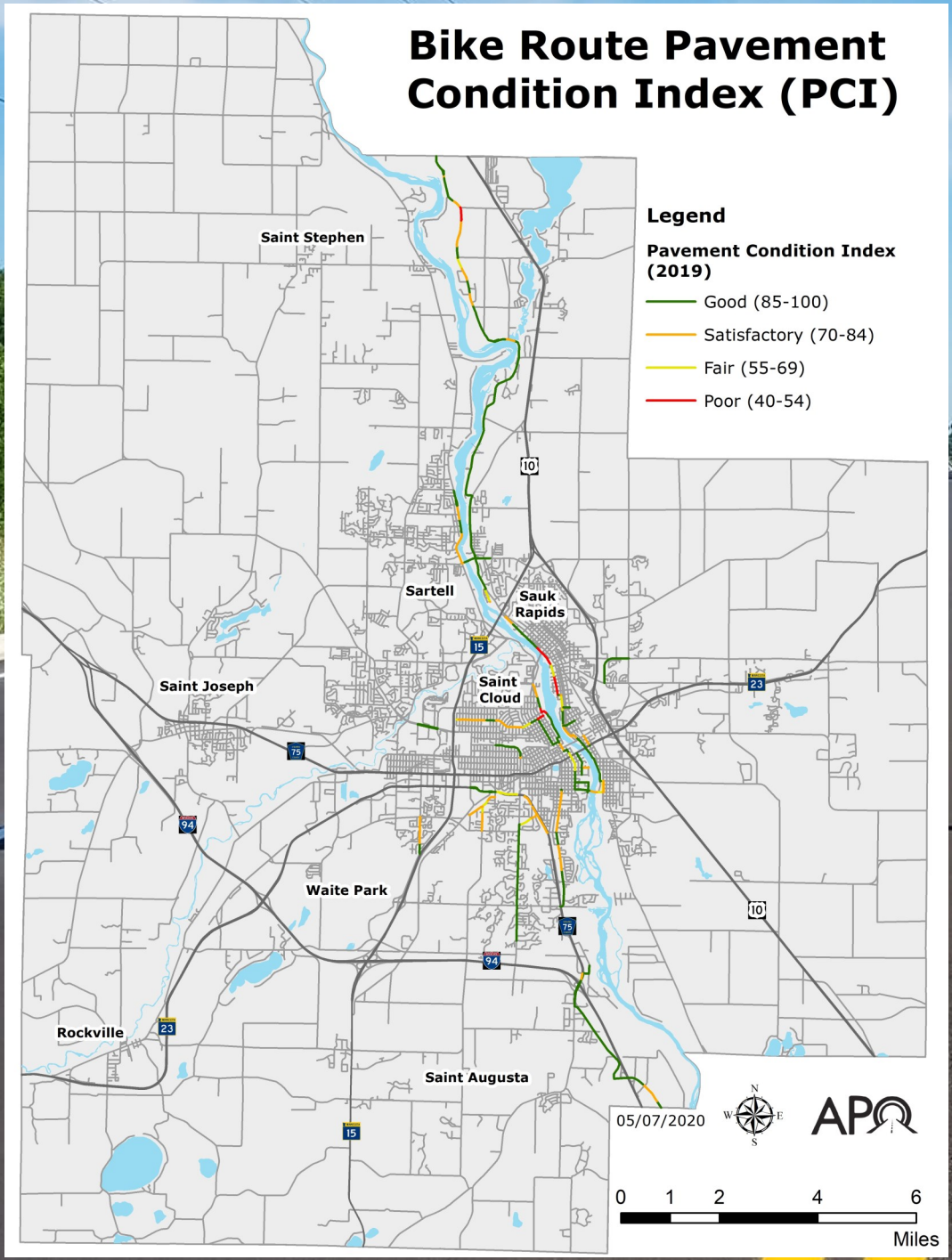
*Data Source: GoodPointe Technology

In 2019, GoodPointe Technology visually surveyed the condition of all signed bike route pavement markings in the APO planning area. These bike routes include bike lanes, paved shoulders and shared lanes. Some bike routes have no striping thus the category none or no striping was added. These routes are typically shared lanes where the person who cycles and the motorist are sharing the same lane simultaneously. The not surveyed category include facilities installed in 2019 or were not part of the study.



Good	Fair	Poor	None	Not Surveyed
29.2%	24.8%	11.1%	28.7%	6.1%
23.8 Lane Miles	20.2 Lane Miles	9.0 Lane Miles	23.4 Lane Miles	5.0 Lane Miles

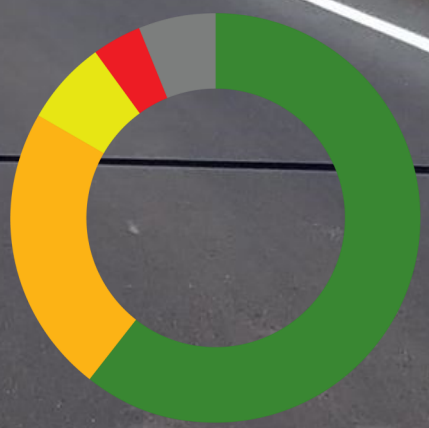
Bike Route Pavement Condition



*Data Source: GoodPointe Technology

In 2019, GoodPointe Technology collected the pavement condition index (PCI) of all signed bike routes. During a PCI survey, visible signs of deterioration within a segment are recorded and given a score. In general terms, maintenance activities such as crack sealing and patching often provide benefit when the PCI is above 60. However, as the pavement continues to deteriorate, more complex and expensive treatments will be necessary. Pavements with a PCI between 40 and 60 are good candidates for a variety of major repairs ranging from overlays to reconstruction. Once the PCI drops below 40, reconstruction is typically the only viable alternative.

*Data Source: MnDOT



Good	Satisfactory	Fair	Poor	Not Surveyed
60.7%	22.9%	6.6%	3.7%	6.1%
49.4 Lane Miles	18.6 Lane Miles	5.4 Lane Miles	3.0 Lane Miles	5.0 Lane Miles