

**THOROUGHFARE MASTER PLAN
PRESENTATION**



CITY OF NOVI

MASTER PLAN STEERING COMMITTEE

THOROUGHFARE MASTER PLAN PRESENTATION SUMMARY

October 05, 2022

INTRODUCTION

The material provided in this presentation gives an overview of three key areas. These include an evaluation of existing conditions, safety analysis, and capacity analysis of the transportation network in the City of Novi. Select maps are provided for these areas to best convey the information. The evaluations were based on data from multiple sources including but not limited to the City of Novi, the Road Commission for Oakland County (RCOC), the Michigan Department of Transportation (MDOT), and the Southeast Michigan Council of Governments (SEMCOG). Below is a summary and materials provided for each key area.

EXISTING CONDITIONS

The evaluation of the existing conditions of the transportation network presents the baseline level of analysis on which future recommendations are based. The evaluation is based on review of prior transportation related studies such as the City's 2016 Thoroughfare Master Plan, Road Committee Reports, Complete Streets Guidelines, and analysis of data such as road classification, road ownership, road conditions, national highway system, truck routes, right-of-way (ROW), speed limits, and traffic volumes. Below are select data points presented through maps and a description of each.

National Functional Class (NFC)

The road network in the City of Novi is characterized by a grid-pattern, where primary routes run both in the east-west and north-south direction. Grand River Ave presents the only major route running diagonally through the City. According to the NFC which groups public roads based on mobility and land access, the network is characterized by a combination of freeways, principal arterials, minor arterials, collectors, local, and private roads, with a total of 329 miles of roadway (*source: MI Geographic Framework v20a*).

- ≡ Freeway – I-96 is a major freeway running east-west through the City limits. The interchange of I-96, I-696, I-275, and M-5 is located partially within the east side of the City and is a major critical regional infrastructure. There are approximately 25.4 miles of freeway in the City. This length includes all ramps and interchange infrastructure.
- ≡ Principal Arterial – The most heavily traveled cross city routes within urbanized areas and which encourage mobility and commercial traffic. There are approximately 29.3 miles of principal arterials in the City. Examples include 10 Mile Rd and Haggerty Rd.
- ≡ Minor Arterial – Provide a lower level of mobility than principal arterials and are intended for shorter trip distances and less traffic. There are approximately 34.2 miles of minor arterials in the City. Examples include 9 Mile Rd and Meadowbrook Rd.
- ≡ Collectors – Major or minor roads which connect local roads to the arterials. They provide less mobility and more land access than arterials. There are approximately 12.7 miles of collectors in the City. Examples include 11 Mile Rd and Taft Rd.
- ≡ Local Roads – Provide limited mobility and are the primary access to residential neighborhoods and other local areas. There are approximately 160 miles of local roads in the City. Examples include Cranbrook Dr and Garfield Rd.

- ≡ Private Roads – Roads not included in the public road system. While the reasons for not being designated as public may vary, they generally serve a similar purpose as local roads. There are approximately 67.4 miles of private roads and infrastructure in the City. Additional ones may not be reflected in the available data. Examples include Twelve Oaks Mall Rd and Carlton Way Dr.

Road Ownership

Road ownership in the City of Novi falls under four main categories of ownership. These include the state trunkline, county roads (primary or local), city roads (major or local), and private roads. The state trunkline is under the Michigan Department of Transportation (MDOT) jurisdiction and includes I-96, M-5 and the interchange. County roads are under the Road Commission for Oakland County's (RCOC) jurisdiction and include principal arterial routes and Grand River Ave and Napier Rd. City roads are under the City of Novi jurisdiction and comprise the majority of the road network. The remaining private roads are under the control of various private entities such as neighborhood associations.

Traffic Volumes

Of the more critical variables in the evaluation of transportation networks are traffic volumes. Traffic volumes represent the demand side of a transportation network and thus are critical in evaluating congestion. They also represent the primary exposure variable in safety evaluations and are used in determining levels of funding for maintenance and roadway improvements. At the most basic level, traffic volumes are critical in determining what improvements are required in a transportation facility.

- ≡ Data Collection – Traffic volumes were collected from various sources to obtain a complete dataset for all major roadways. These included the RCOC Transportation Data Management System (TDMS), RCOC Traffic Count Database System (TCDS), MDOT TDMS, SEMCOG Traffic Volumes, and SEMCOG Traffic Demand Forecast Model. The data was compiled together and cross-verified between the different sources. Priority was given to actual counts, recent data, and the more conservative volumes.
- ≡ Growth Rates – Traffic growth rates were based on SEMCOG's 2015 and 2035 Traffic Demand Forecast Model. The model estimates current and future traffic volumes, speeds, and traffic patterns in Southeast Michigan, and is used in the development of SEMCOG's long-range transportation plan. These traffic growth rates were used to project all obtained volumes to 2022 traffic volumes (present volumes), and 2032 traffic volumes (future volumes). These data were then used as basis for the evaluation of the transportation network.

SAFETY ANALYSIS

Safety is a critical component of a transportation network. The objective of traffic safety is to prevent fatalities and injuries for all road users through appropriate engineering, enforcement, education, emergency services, and equity measures. The appropriate identification and implementation of safety measures requires a data-driven approach to best identify areas of safety improvement opportunities.

The safety evaluation was based on five years of traffic crash data obtained from the Transportation Improvement Association (TIA) Traffic Crash Analysis Tool (TCAT) for 2016-2021. Crash data from 2020 were not included in the analysis due to COVID-19 disruptions in traffic patterns. Similarly, animal related crashes were not considered to minimize the element of randomness associated with these types of crashes. Lastly crashes were analyzed separately for segments and intersections to account for the differences between segment and intersection related crashes. Several methods were used to evaluate safety conditions along the City of Novi transportation network. These were based on crash frequencies

occurring on a specific segment or intersection over a specified time period. A high magnitude of crashes may indicate a safety concern.

CAPACITY ANALYSIS

A capacity analysis was performed to assess the transportation network's capacity performance. The analysis was based on the Volume-to-Capacity (V/C) ratio. The V/C ratio is a measure of the level of congestion on a given roadway and can determine which parts of the network operate at acceptable levels and which have capacity constraints. The V/C ratio is a function of demand and capacity. Demand is represented by traffic volumes. Whereas capacity represents the maximum traffic flow that can be accommodated in a transportation facility during a given time under various road conditions. Capacity is typically expressed in passenger cars per hour per lane (pc/h/ln) and is a function of various factors such as the number of lanes and free flow speed (FFS). The V/C ratio ranges on a scale of 0 to 1 or greater and can generally be defined as follows:

- ≡ 0 → no demand
- ≡ 0.8 to 1 → demand reaching capacity
- ≡ 1 → demand equals capacity
- ≡ Greater than 1 → demand exceeds capacity

The SEMCOG 2015 and 2035 Traffic Demand Forecast Models for PM peak were used to determine existing and future capacity for all public non-local roads. The 2015 model was used to evaluate existing (2022) capacity conditions, and the 2035 model was used to evaluate future (2032) capacity conditions. Both models were reviewed and modified to include the most up to date traffic volumes and road lane configurations. Traffic volumes were collected from various sources such as RCOC TDMS, RCOC TCDS, MDOT TDMS, and SEMCOG volumes. Priority was given to actual traffic counts, recent data, and conservative volumes. In both cases growth rates were applied to project all volumes to 2022 (existing) or 2032 (future) traffic volumes.

Existing road lane configurations were also reviewed through aerial imagery and revised to accurately reflect current road capacities. These modifications were applied to both the existing (2022) and future (2032) models. The 2032 model included an additional round of review for road capacity. It included changes to the road configuration based on ongoing and proposed projects which are either funded or likely to be funded and are currently not fully captured in the 2035 SEMCOG model. These projects were identified based on coordination with City staff and review of sources such as the City's 2021-2027 Capital Improvement Projects (CIP), Road Committee Reports, the 2016 Thoroughfare Master Plan, 2023-2026 SEMCOG's Transportation Improvement Program (TIP), and RCOC projects. The following eligible projects were identified in the City and incorporated in the 2032 model as part of this review:

- ≡ I-96 Flex Route
- ≡ 10 Mile Rd, Meadowbrook Rd to Haggerty Rd – Install TWLTL
- ≡ 12 Mile Rd, Beck Rd to Cabaret Dr – Widen to 4-lane boulevard
- ≡ Beck Rd, 11 Mile Rd to Providence Dr – Widen to 5-lane road

Following the development of the 2032 capacity models, areas with V/C ratios where demand is reaching or exceeding capacity were evaluated further to determine potential corridor-wide capacity improvements. The evaluation considered factors such as land use, functional classification, safety, and potential available ROW in the identification of improvements.

Table 1 below presents corridor related capacity improvements identified as part of this evaluation.

Table 1: Potential Corridor Related Capacity Improvements

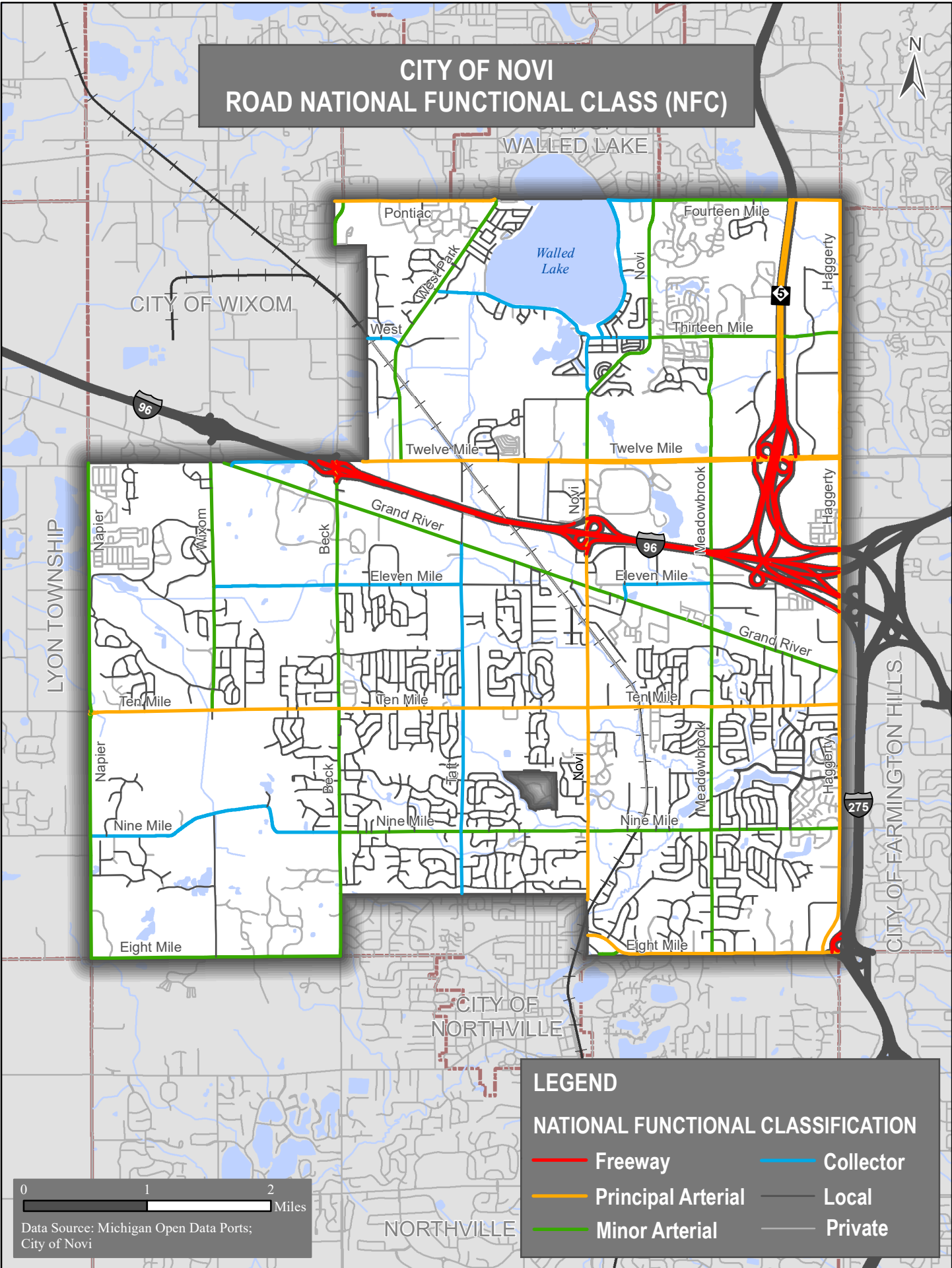
ROAD NAME	FROM	TO	POTENTIAL IMPROVEMENT	2032 V/C RATIO	
				BEFORE	AFTER
9 Mile Rd	Meadowbrook Rd	Haggerty Rd	Install TWLTL	0.74	0.67
10 Mile Rd	Wixom Rd	Beck Rd	Install TWLTL	0.64	0.58
10 Mile Rd	Novi Rd	Meadowbrook Rd	Install TWLTL	0.66	0.60
Meadowbrook Rd	8 Mile Rd	10 Mile Rd	Install TWLTL	0.66	0.60
West Park Dr	West Rd	South Lake Dr	Install TWLTL	0.68	0.61
West Park Dr	Bristol Cir	Gateway Dr	Install TWLTL	0.73	0.67
Pontiac Trl	Beck Rd	Park Dr	Install TWLTL	0.85	0.77
Haggerty Rd	8 Mile Rd	10 Mile Rd	Install TWLTL where missing	0.60	0.58
Haggerty Rd	12 Mile Rd	13 Mile Rd	Install TWLTL where missing	0.76	0.69
Haggerty Rd	Regency Dr	JR Blvd	Widen to 4-lane road	1.16	0.58
Grand River Ave	Novi Rd	Haggerty Rd	Widen to 5-lane road	0.79	0.49
Beck Rd	8 Mile Rd	11 Mile Rd	Widen to 5-lane road	1.10	0.52
Beck Rd*	City Limit	Pontiac Trl	Widen to 5-lane road	1.79	0.94

*Widening should extend south to 12 Mile Rd

V/C ratios above are for the entire segment. Parts of the segment may exhibit lower or greater V/C ratios

TWLTL = Two-Way Left Turn Lane

CITY OF NOVI ROAD NATIONAL FUNCTIONAL CLASS (NFC)



LEGEND

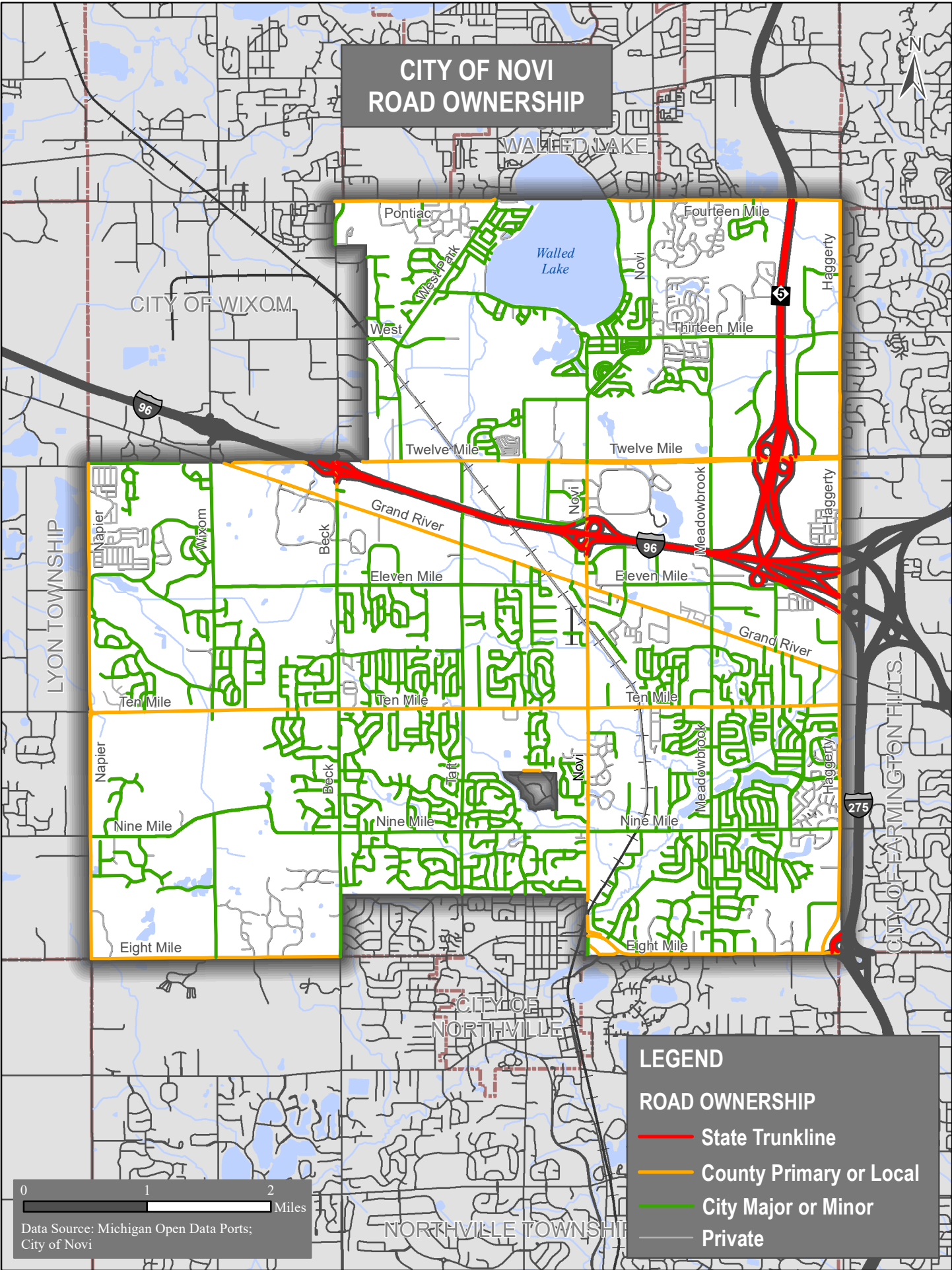
NATIONAL FUNCTIONAL CLASSIFICATION

— Freeway	— Collector
— Principal Arterial	— Local
— Minor Arterial	— Private

0 1 2 Miles

Data Source: Michigan Open Data Ports;
City of Novi

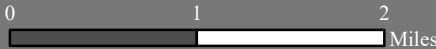
CITY OF NOVI ROAD OWNERSHIP



LEGEND

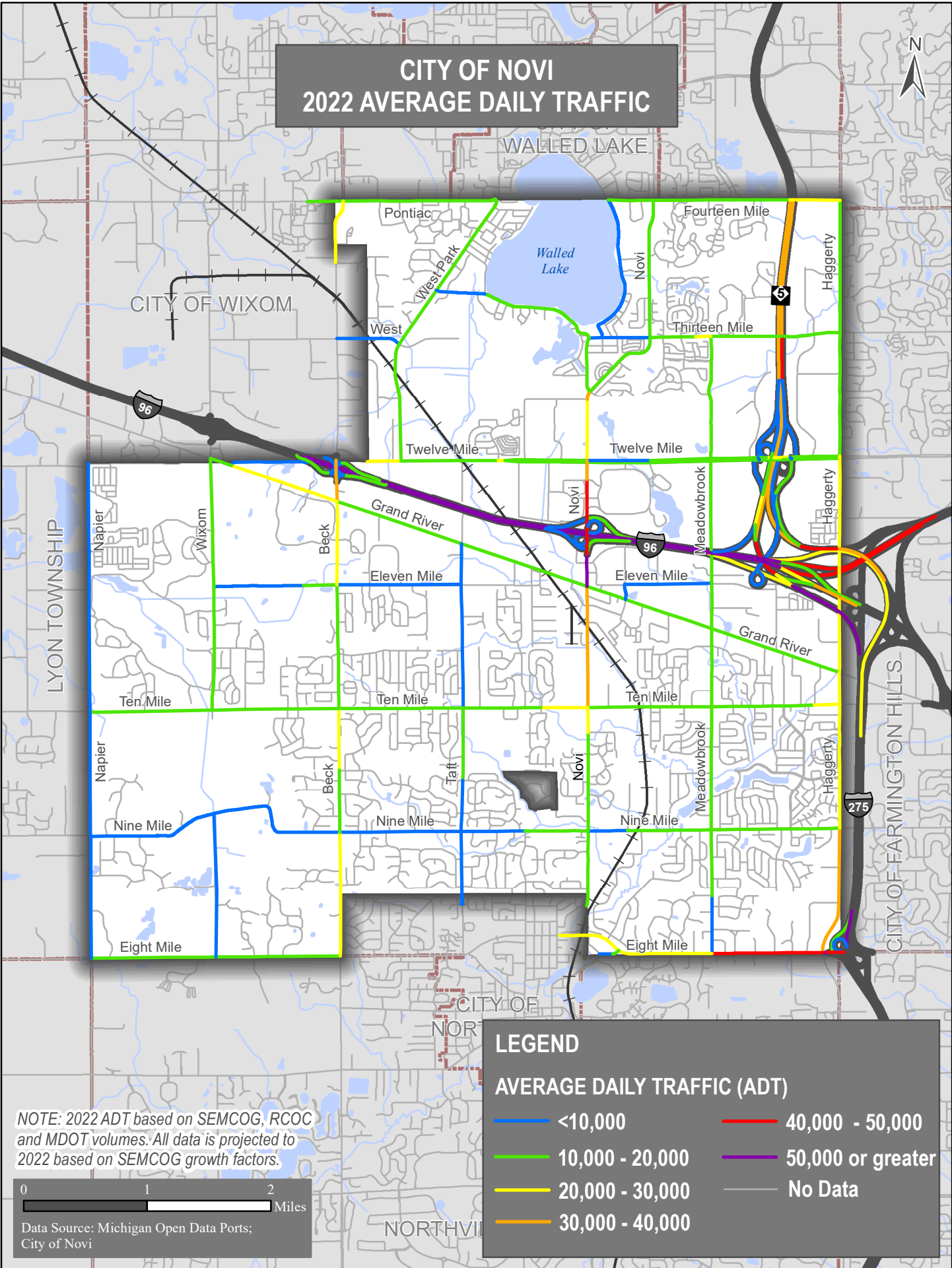
ROAD OWNERSHIP

- State Trunkline
- County Primary or Local
- City Major or Minor
- Private



Data Source: Michigan Open Data Ports;
City of Novi

CITY OF NOVI 2022 AVERAGE DAILY TRAFFIC

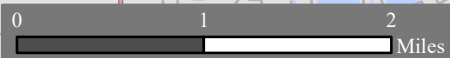


LEGEND

AVERAGE DAILY TRAFFIC (ADT)

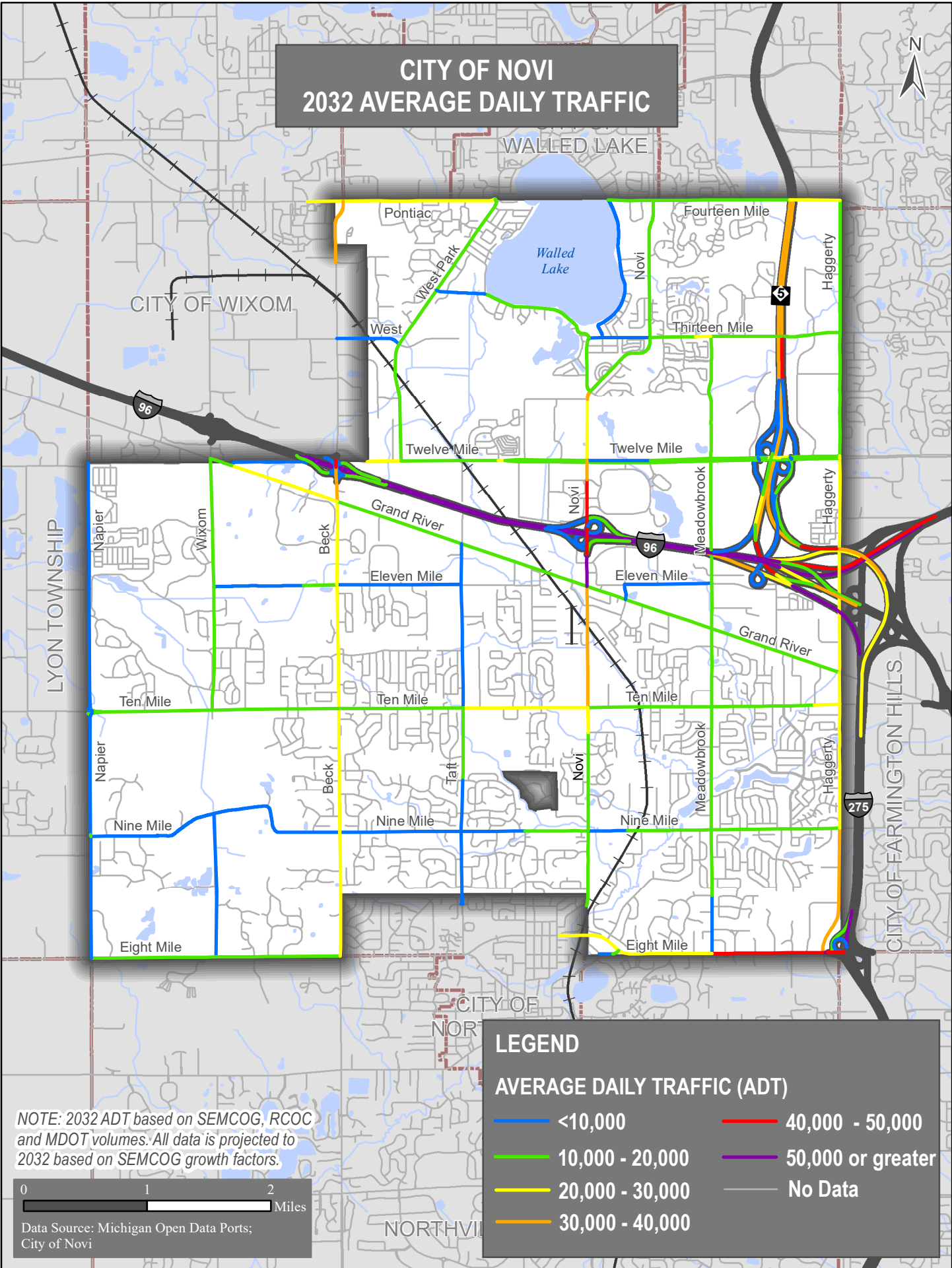
- | | |
|---|---|
| — <10,000 | — 40,000 - 50,000 |
| — 10,000 - 20,000 | — 50,000 or greater |
| — 20,000 - 30,000 | — No Data |
| — 30,000 - 40,000 | |

NOTE: 2022 ADT based on SEMCOG, RCOC and MDOT volumes. All data is projected to 2022 based on SEMCOG growth factors.



Data Source: Michigan Open Data Ports;
City of Novi

CITY OF NOVI 2032 AVERAGE DAILY TRAFFIC



LEGEND

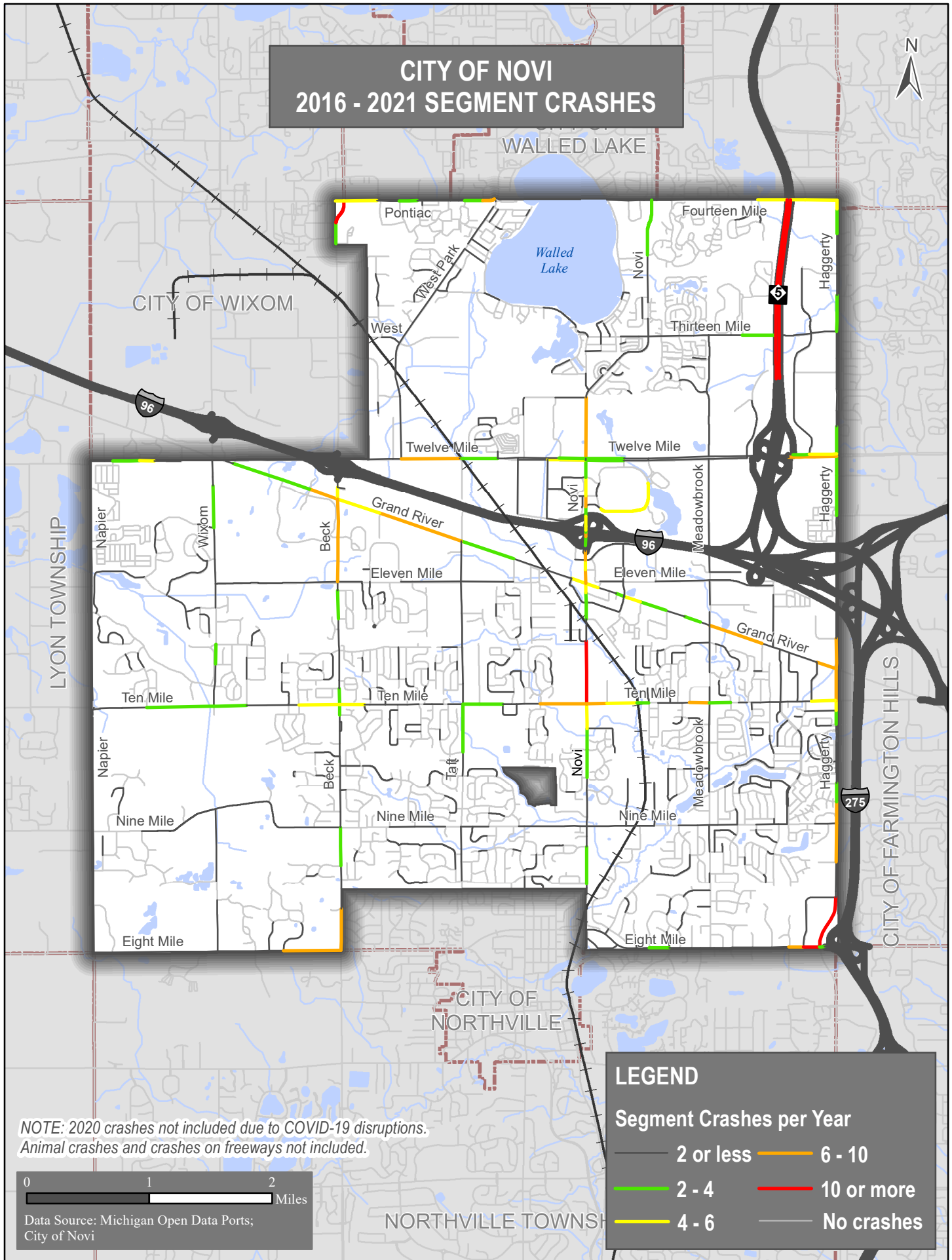
AVERAGE DAILY TRAFFIC (ADT)

- | | |
|---|---|
| — <10,000 | — 40,000 - 50,000 |
| — 10,000 - 20,000 | — 50,000 or greater |
| — 20,000 - 30,000 | — No Data |
| — 30,000 - 40,000 | |

NOTE: 2032 ADT based on SEMCOG, RCOC and MDOT volumes. All data is projected to 2032 based on SEMCOG growth factors.

0 1 2 Miles
Data Source: Michigan Open Data Ports; City of Novi

CITY OF NOVI 2016 - 2021 SEGMENT CRASHES

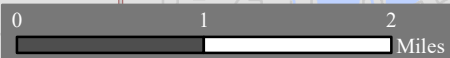


LEGEND

Segment Crashes per Year

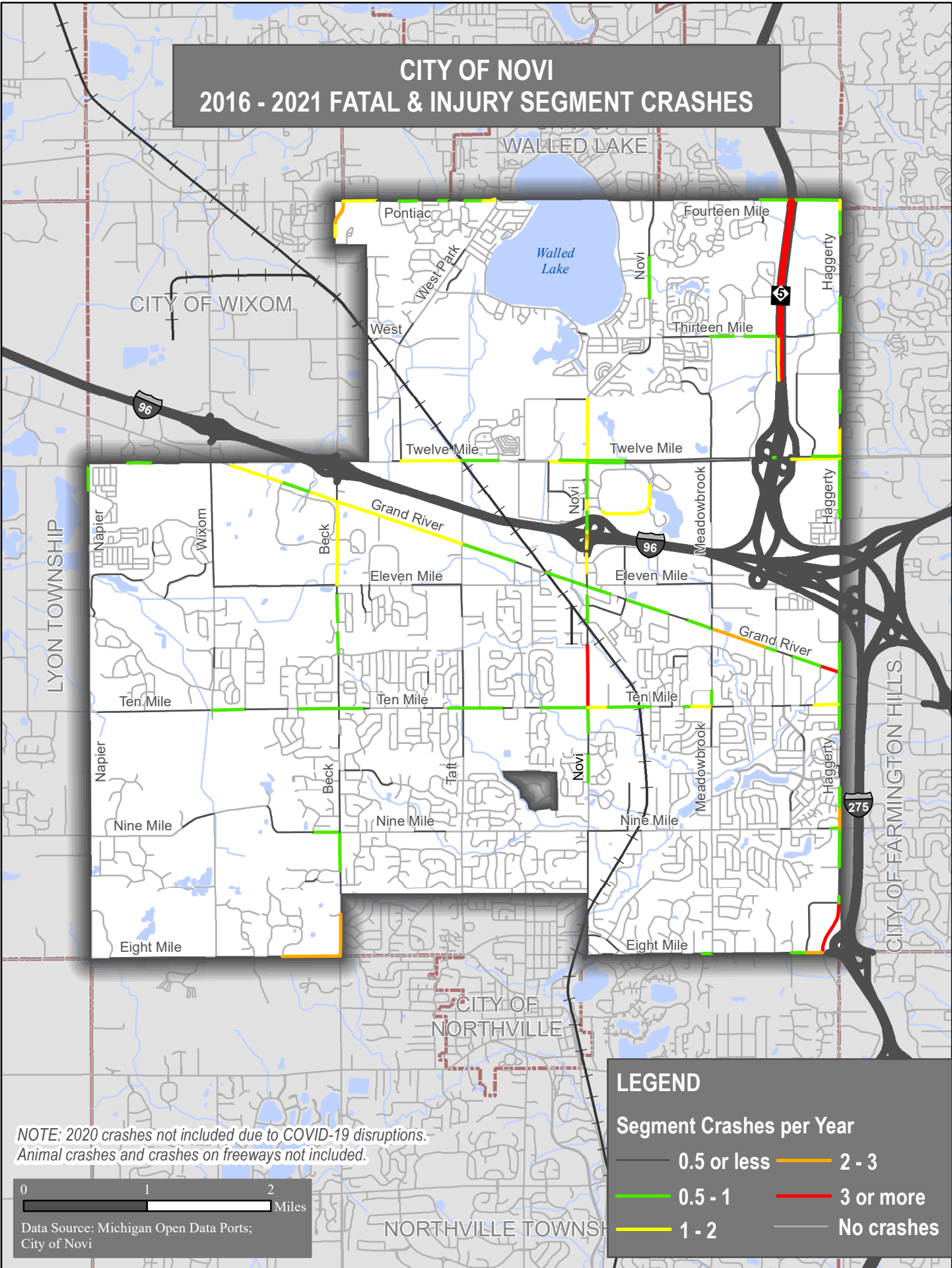
- 2 or less
- 2 - 4
- 4 - 6
- 6 - 10
- 10 or more
- No crashes

NOTE: 2020 crashes not included due to COVID-19 disruptions.
Animal crashes and crashes on freeways not included.



Data Source: Michigan Open Data Ports;
City of Novi

CITY OF NOVI 2016 - 2021 FATAL & INJURY SEGMENT CRASHES

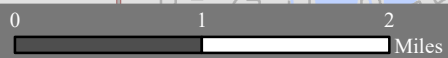


LEGEND

Segment Crashes per Year

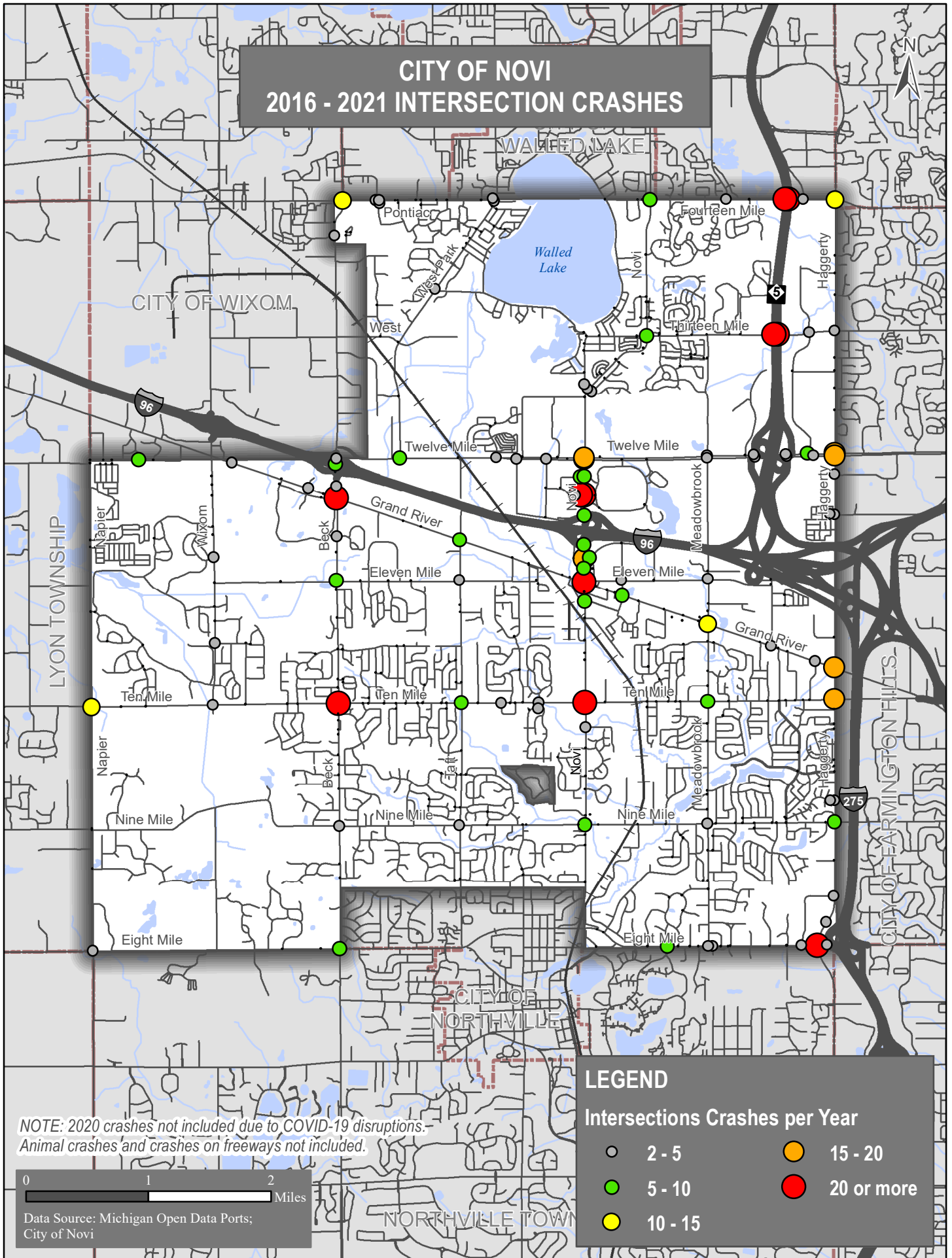
— 0.5 or less	— 2 - 3
— 0.5 - 1	— 3 or more
— 1 - 2	— No crashes

NOTE: 2020 crashes not included due to COVID-19 disruptions.
Animal crashes and crashes on freeways not included.



Data Source: Michigan Open Data Ports;
City of Novi

CITY OF NOVI 2016 - 2021 INTERSECTION CRASHES

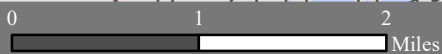


LEGEND

Intersections Crashes per Year

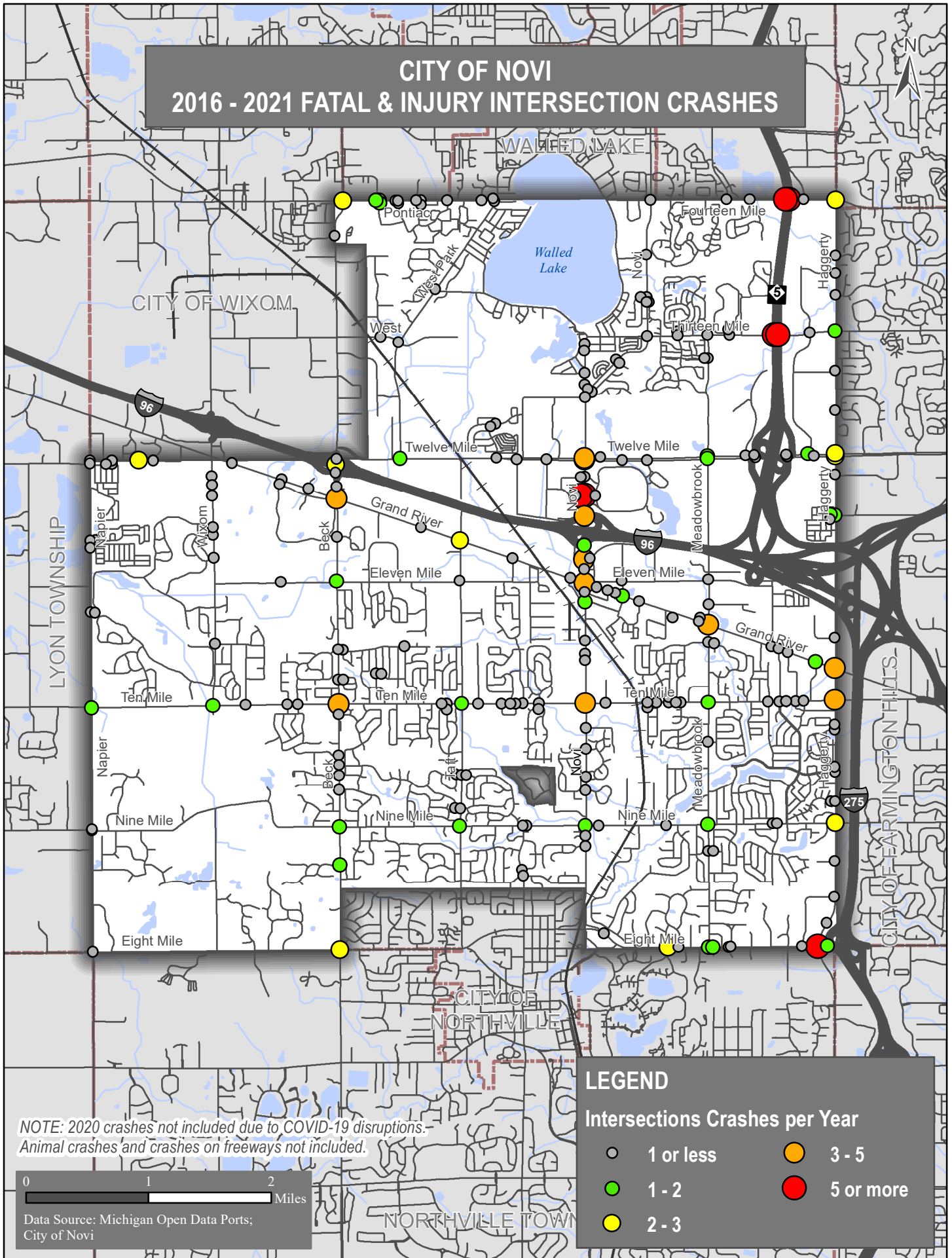
- 2 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 or more

NOTE: 2020 crashes not included due to COVID-19 disruptions.
Animal crashes and crashes on freeways not included.



Data Source: Michigan Open Data Ports;
City of Novi

CITY OF NOVI 2016 - 2021 FATAL & INJURY INTERSECTION CRASHES



NOTE: 2020 crashes not included due to COVID-19 disruptions.
Animal crashes and crashes on freeways not included.

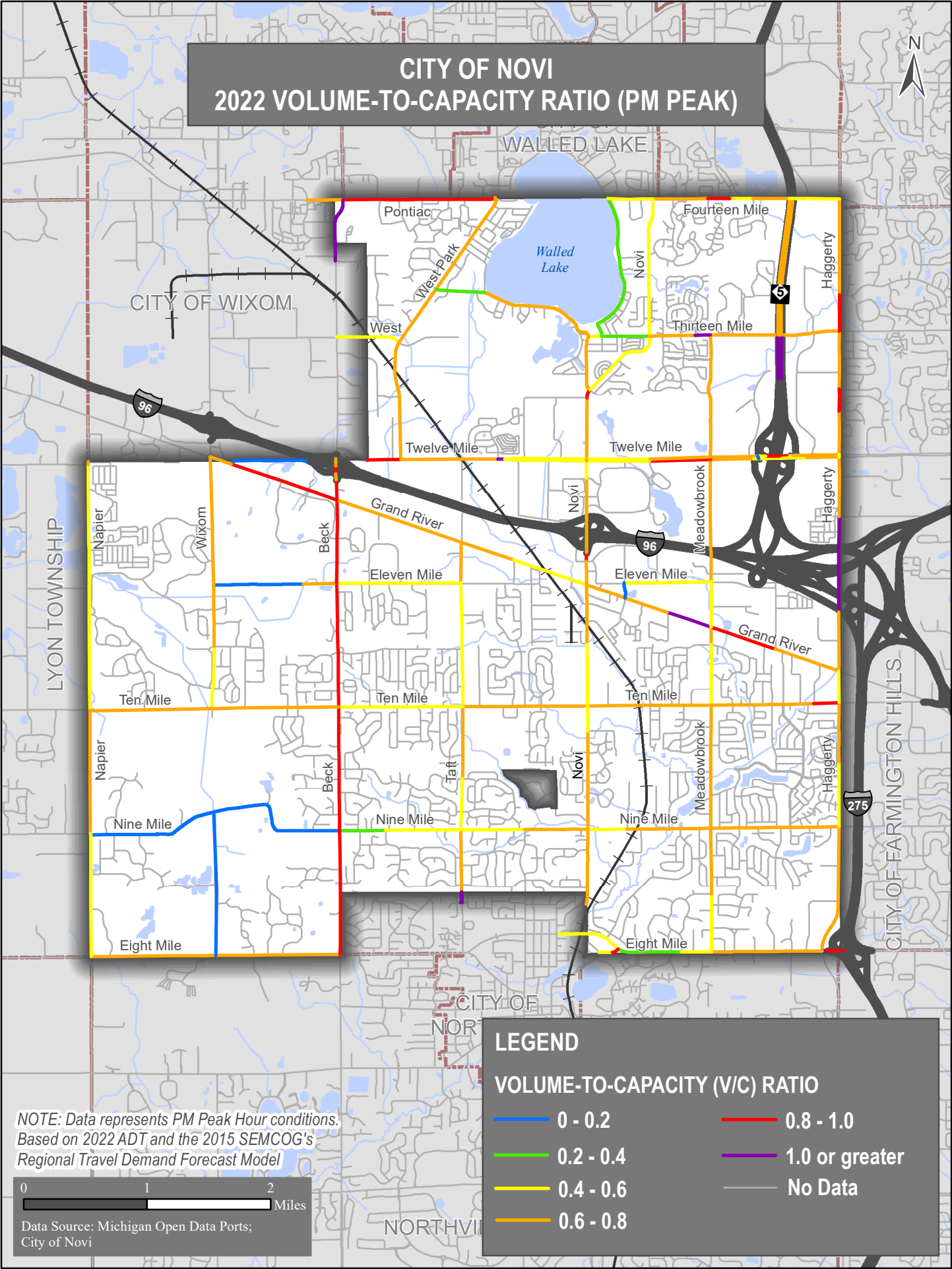
0 1 2 Miles
Data Source: Michigan Open Data Ports;
City of Novi

LEGEND

Intersections Crashes per Year

- 1 or less
- 1 - 2
- 2 - 3
- 3 - 5
- 5 or more

CITY OF NOVI 2022 VOLUME-TO-CAPACITY RATIO (PM PEAK)

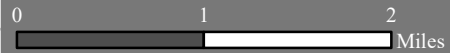


LEGEND

VOLUME-TO-CAPACITY (V/C) RATIO

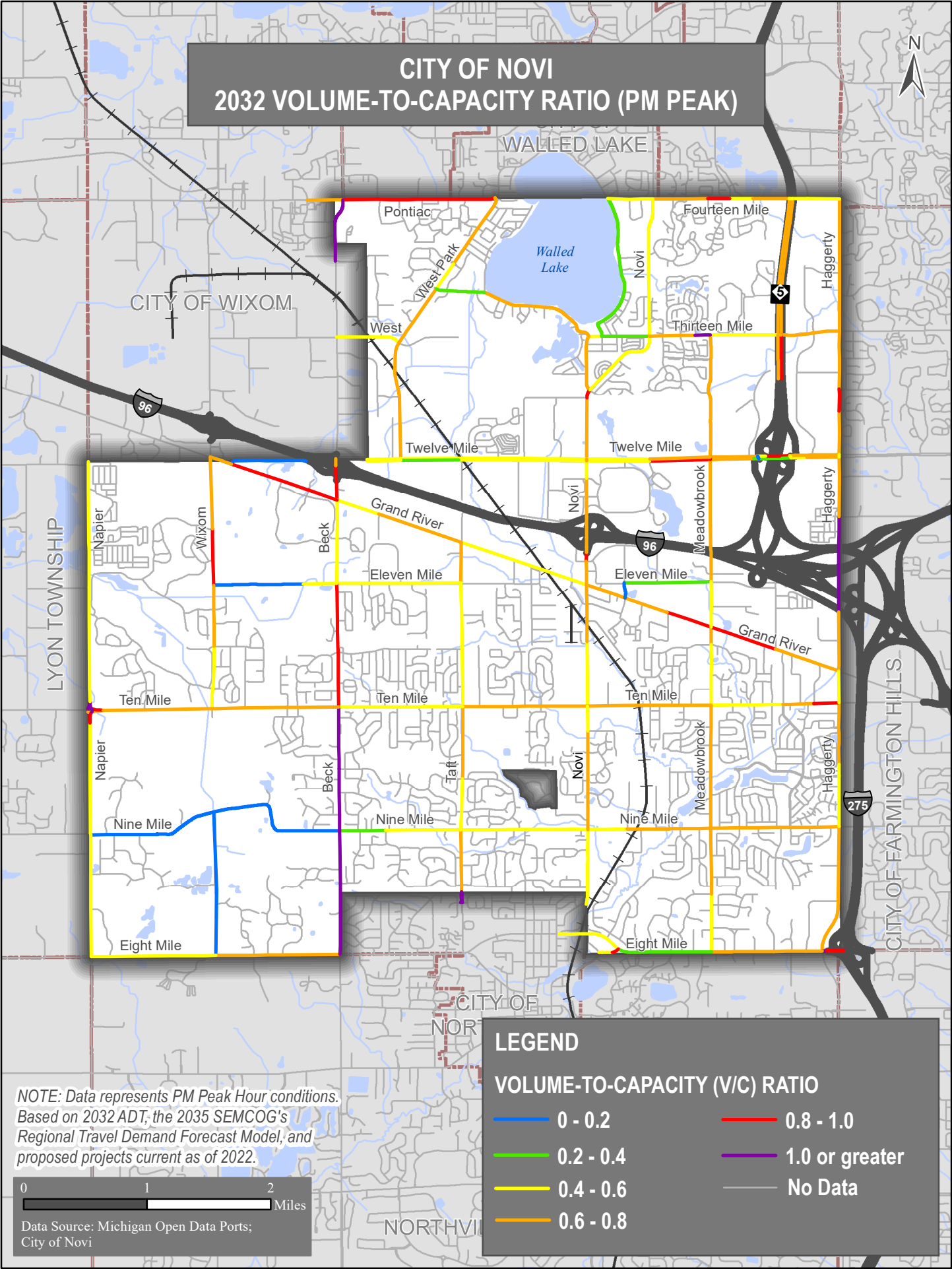
— 0 - 0.2	— 0.8 - 1.0
— 0.2 - 0.4	— 1.0 or greater
— 0.4 - 0.6	— No Data
— 0.6 - 0.8	

NOTE: Data represents PM Peak Hour conditions. Based on 2022 ADT and the 2015 SEMCOG's Regional Travel Demand Forecast Model



Data Source: Michigan Open Data Ports; City of Novi

CITY OF NOVI 2032 VOLUME-TO-CAPACITY RATIO (PM PEAK)



NOTE: Data represents PM Peak Hour conditions. Based on 2032 ADT, the 2035 SEMCOG's Regional Travel Demand Forecast Model, and proposed projects current as of 2022.

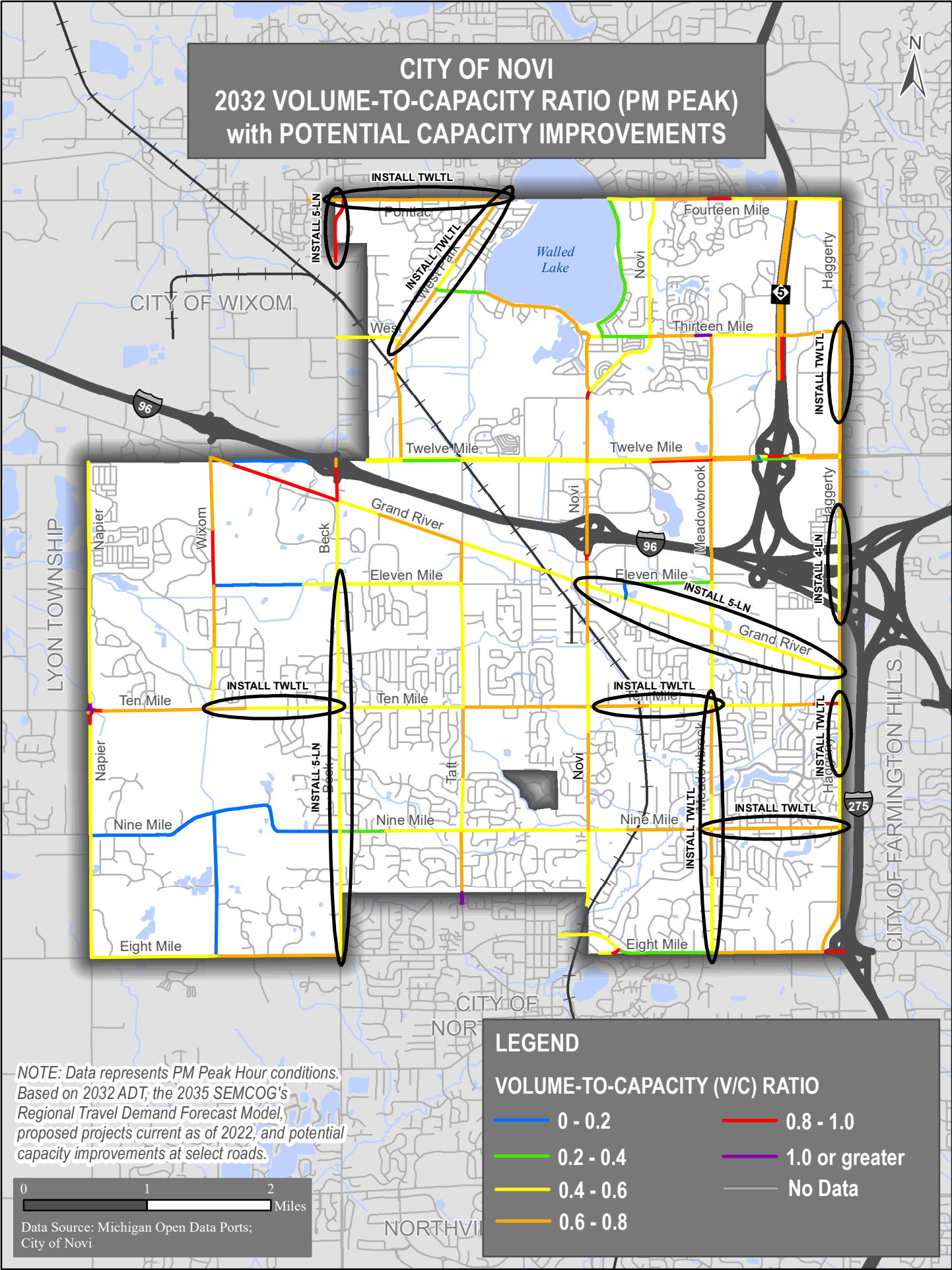
0 1 2 Miles
Data Source: Michigan Open Data Ports; City of Novi

LEGEND

VOLUME-TO-CAPACITY (V/C) RATIO

0 - 0.2	0.8 - 1.0
0.2 - 0.4	1.0 or greater
0.4 - 0.6	No Data
0.6 - 0.8	

CITY OF NOVI 2032 VOLUME-TO-CAPACITY RATIO (PM PEAK) with POTENTIAL CAPACITY IMPROVEMENTS



NOTE: Data represents PM Peak Hour conditions. Based on 2032 ADT, the 2035 SEMCOG's Regional Travel Demand Forecast Model, proposed projects current as of 2022, and potential capacity improvements at select roads.

0 1 2 Miles
Data Source: Michigan Open Data Ports; City of Novi

LEGEND

VOLUME-TO-CAPACITY (V/C) RATIO

— 0 - 0.2	— 0.8 - 1.0
— 0.2 - 0.4	— 1.0 or greater
— 0.4 - 0.6	— No Data
— 0.6 - 0.8	

**COPY OF
2016 FUTURE LAND USE MAP—
THOROUGHFARE PLAN**

