

# COMPLETE STREETS ANALYSIS

FOR THE GRAND RAPIDS  
METROPOLITAN AREA

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GRAND VALLEY  
METROPOLITAN COUNCIL

**GVMC**



**2023**

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## 1. Complete Streets Infrastructure Analysis

GVMC has conducted an initial overview of the road network to determine what percentage of the arterials in the GVMC planning area can be considered a complete street. While the FHWA defines a complete street as a street that is safe, and feels safe, for all users. MDOT defines complete street as roadways planned, designed, and constructed to provide appropriate access to all users in a manner that promotes safe and efficient movement of people and goods whether by car, truck, transit, assistive device, foot, or bicycle.

Working with local jurisdictions, GVMC collected and updated all nonmotorized facilities in the planning area consolidating these into a new shapefile. This shapefile, in addition to fixed-route transit shapefile for The Rapid, was then used to determine where various user type facilities overlap.

### 1.1 Complete Streets Rating Criteria

To rank an arterial, staff first looked at how many facility types overlap on each road segment and scored them based on the system shown in the table below:

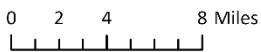
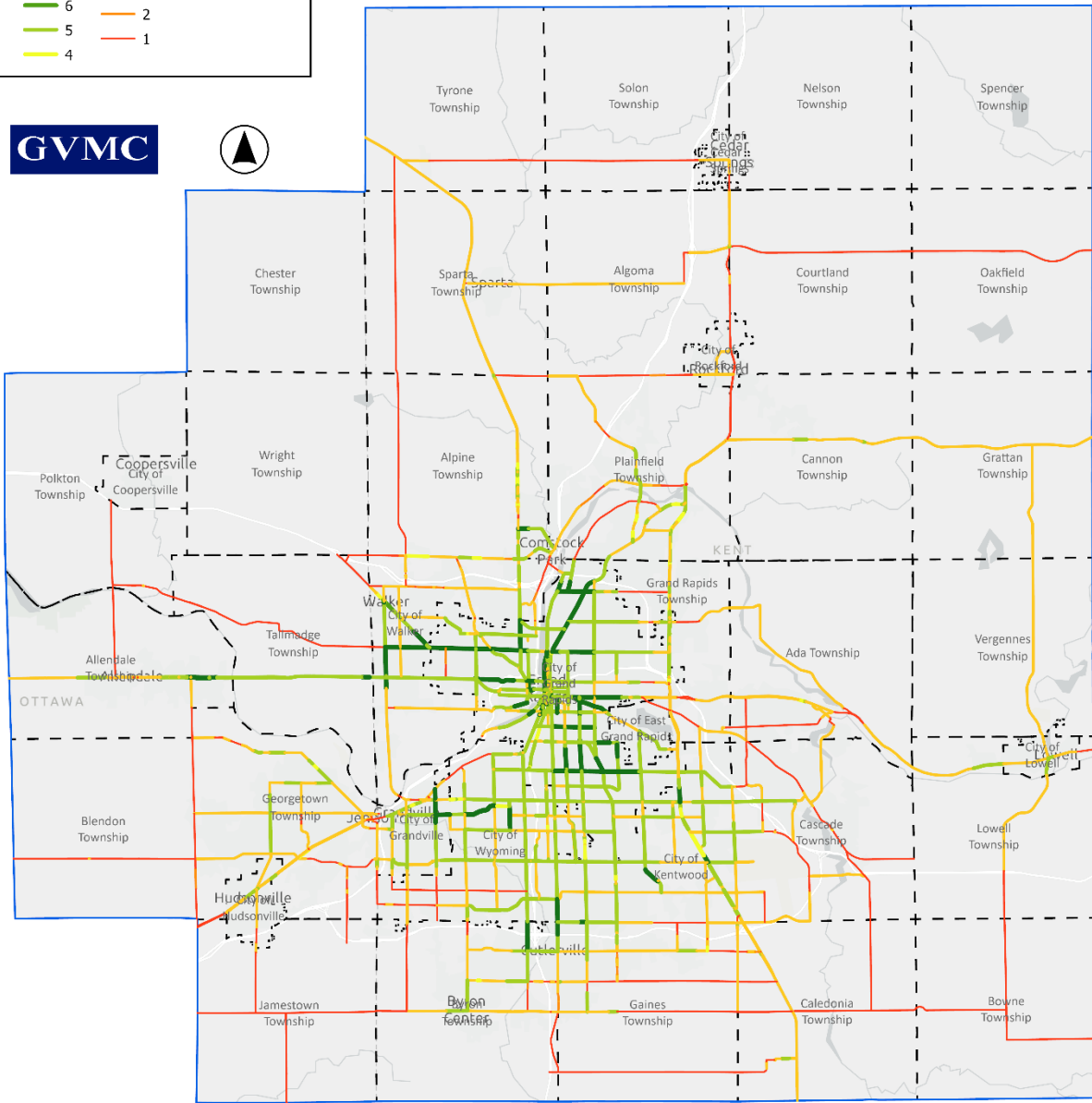
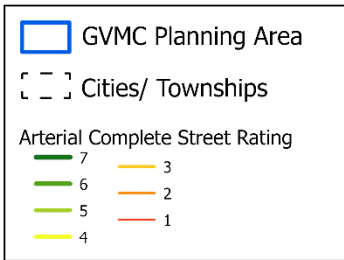
Complete Streets - Arterial Status			
	<u>Infrastructure</u>		
Score	Sidewalk	On Street Bike Lane	Transit Route
<b>7</b>	Yes	Yes	Yes
<b>6</b>	Partial	Yes	Yes
	Yes	Partial	Yes
<b>5</b>	Yes	Yes	No
	Yes	No	Yes
	No	Yes	Yes
<b>4</b>	Partial	No	Yes
	Yes	Partial	No
	Partial	Yes	No
<b>3</b>	No	Yes	No
	Yes	No	No
	No	No	Yes
<b>2</b>	Partial	No	No
	No	Partial	No
<b>1</b>	No	No	No

*\* There are currently no segments where there are only two partially completed modes.*

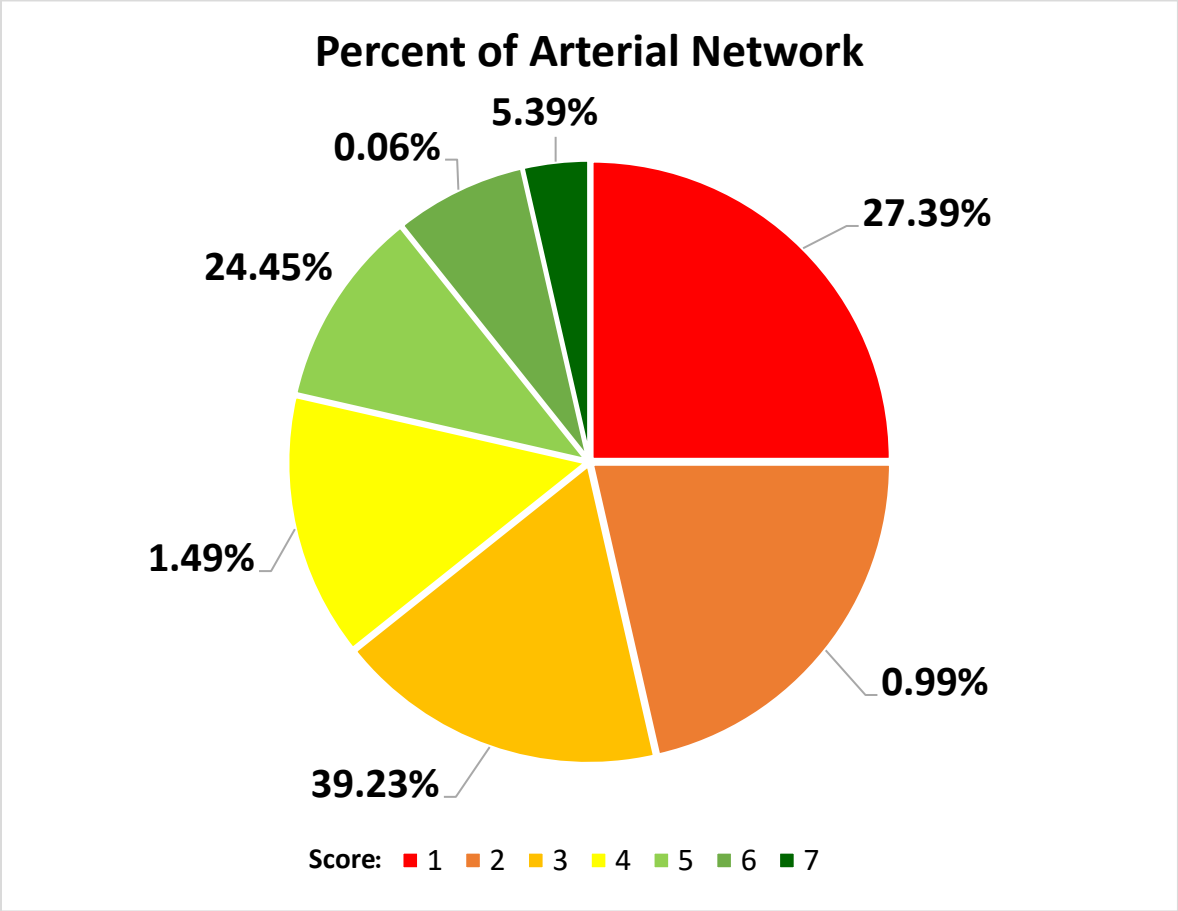
This initial ranking rated arterial segments based on availability of all modal facilities without taking the surrounding land use into consideration. Though a 7 is the highest score a segment can score using this ranking system, it might not indicate an “ideal” complete street configuration based on a context sensitive understanding of users and surroundings of the segment. The percentage of arterials for each of the previously described rankings can be seen in the chart below.

### 1.2 Arterial Infrastructure Existing Conditions

Score	Mileage	Percent of Total Mileage	Description
7	40.67	5.39%	Segments are purposed with infrastructure for pedestrians (sidewalk), cyclist (on street bike facility), and a transit system.
6	0.43	0.06%	Segments are purposed for at least two other modes of transportation with part of the segment purposed with either a sidewalk or on a street
5	191.90	24.45%	Segments are purposed for at least two other modes of transportation.
4	11.26	1.49%	Segments are purposed for at least one other mode of transportation and partially purposed for one other mode.
3	295.84	39.23%	Segments are purposed for one other mode of transportation.
2	7.43	0.99%	Segments are only partially purposed for one other mode of transportation.
1	206.57	27.39%	Segments are purposed for no other mode of transportation.



Map 1: GVMC Arterial Complete Street Ranking



The GVMC arterial network segments that have infrastructure to support at least two types of roadway users comprise 31.33% of the network. These are primarily located on arterials that are within areas that have higher population concentrations and development. While there are some gaps in the infrastructure, the current complete streets network generally supports the appropriate context sensitive design for the roadway.

## 2. Safety

In 2021, 57% of all bicycle fatalities occurred on arterials in the state of Michigan, while 65% of bicycle fatalities occurred on arterials at the national level. For pedestrian fatalities, 72% occurred on arterials in the state of Michigan, while 60% of all pedestrian fatalities occurred on arterials at the national level.

To understand the baseline of all crashes occurring in the arterials, staff looked at crash data from 2001 – 2021 within the GVMC network, specifically targeting crashes that involved pedestrians and crashes that involved bicyclists. Bike and pedestrian crashes are a small fraction of the total amount of motor vehicle crashes on the arterials; therefore, a 10-year base was used to gather a larger sample size to understand the place of nonmotorized crashes on arterials. Arterial pedestrian crashes make up 48% of pedestrian crashes on the entire regional roadway network during this timeframe, and arterial bike crashes make up 23% of bicycle crashes on the entire network.

### 2.1 Prioritizing Complete Street Needs by Segment

The first step in understanding bicycle and pedestrian crash data was understanding the quantity and level of severity of the crashes. Staff used the *Safer Streets Priority Finder*<sup>1</sup> tool, which uses road network and crash data for a specific study area and outputs a depiction of severity-weighted pedestrian/bicycle/other crashes (including fatal (K), serious injury (A), and non-incapacitating injury (B) crashes). The *Safer Streets Priority Finder* is a free open-source resource that allows practitioners to analyze and understand the risk to vulnerable road users (bicyclists and pedestrians) on their local roadways.

*The analysis takes the crashes and road data within the study area and allocates the crashes to roads, measured on ½-mile sliding window segments stepped in 1/10-mile increments along the network. The sliding windows score weights the most severe crashes more heavily than lower severity crashes. The sliding windows score is calculated by multiplying the number of Fatal (K) and Incapacitating Injury (A) crashes by 3 and multiplying the number of Non-Incapacitating Injury (B) crashes by 1. Once the weights are established and applied to the crashes, the total number of crashes are aggregated along a corridor while incorporating the crash severity weighting. Possible Injury (C) and Property Damage Only (O) Crashes are not reflected. If you used FARS data alone, only fatal crashes will have been used and visualized.*

For this analysis, local crash data extracted from Roadsoft was filtered for the GVMC planning area.

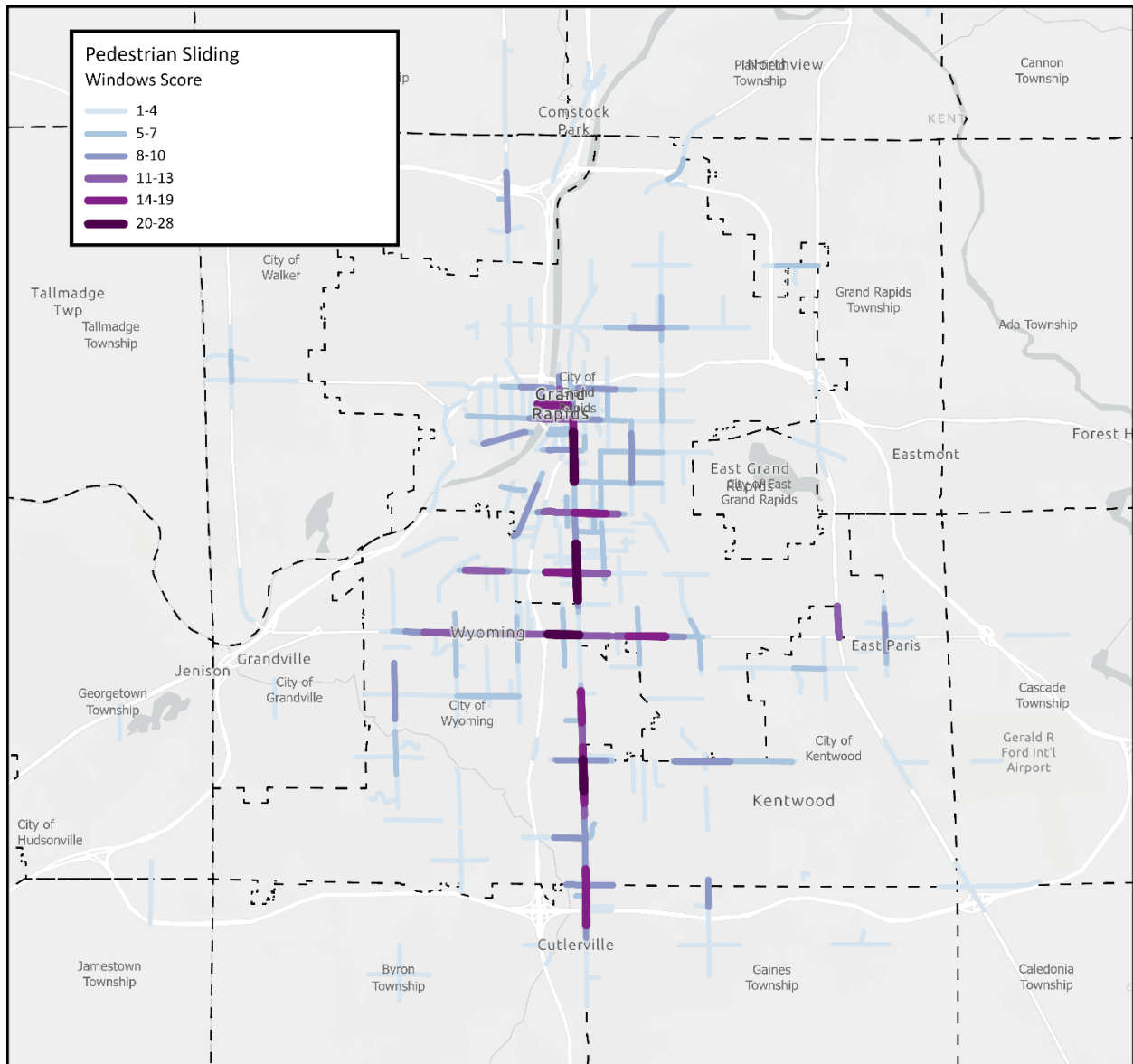
The maps below show the results of this analysis, with the darkest segments indicating the highest risk for pedestrians and cyclists.

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<sup>1</sup> <https://www.saferstreetspriorityfinder.com/>



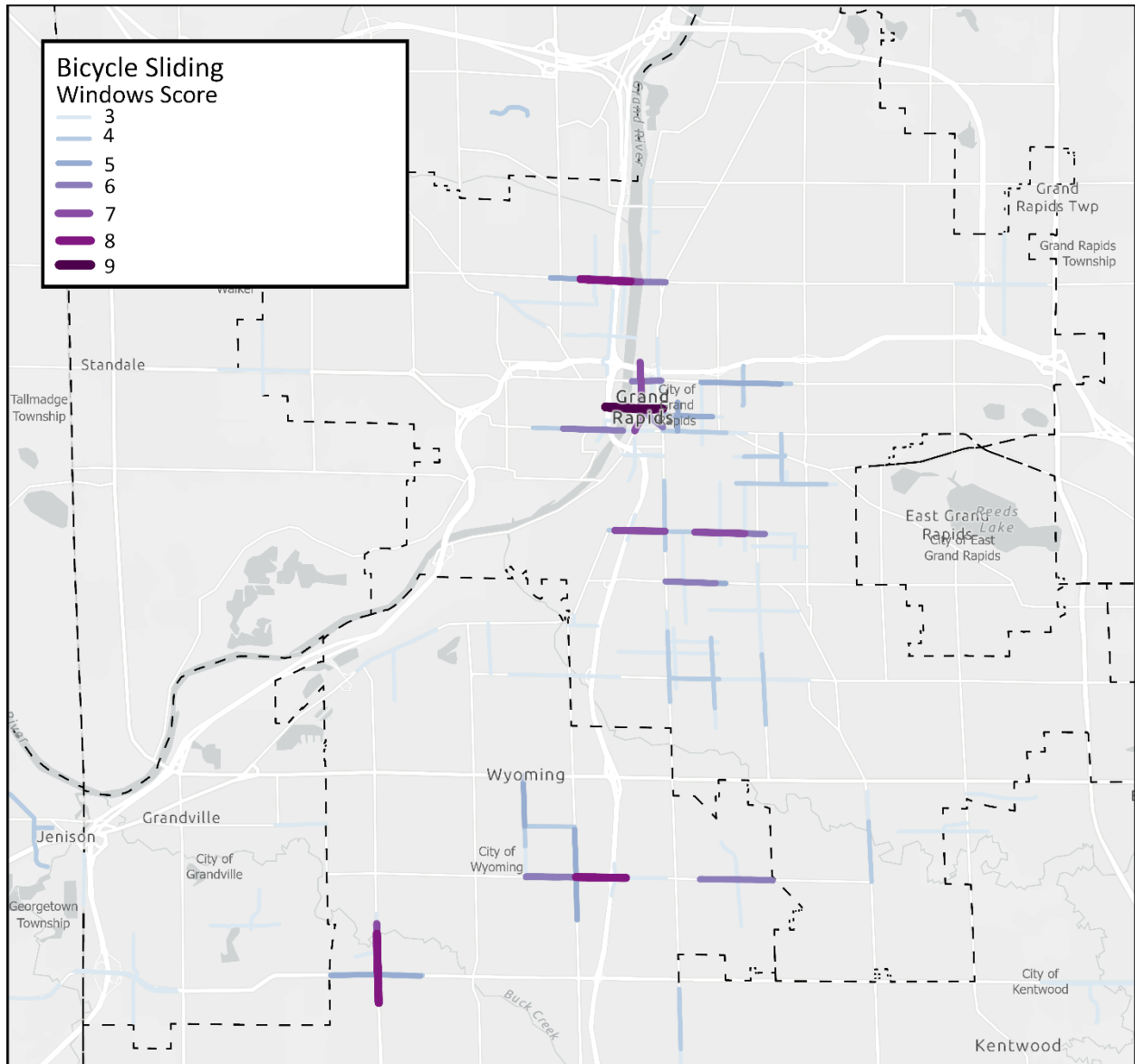




Map 3: GVMC Pedestrian Sliding Windows Score Enhanced

The most dangerous road segments for pedestrians can be found along 28<sup>th</sup> Street (M-11) between Byron Center Ave. and Kalamazoo Ave., and along Division Ave. between Fulton Street and 68<sup>th</sup> Street. Two other high scoring segments are East Beltline Rd. (M-37) – this segment divides the Woodland Mall from the Shops at Centerpoint, and Pearl Street from Mt. Vernon Ave to Ionia Ave.





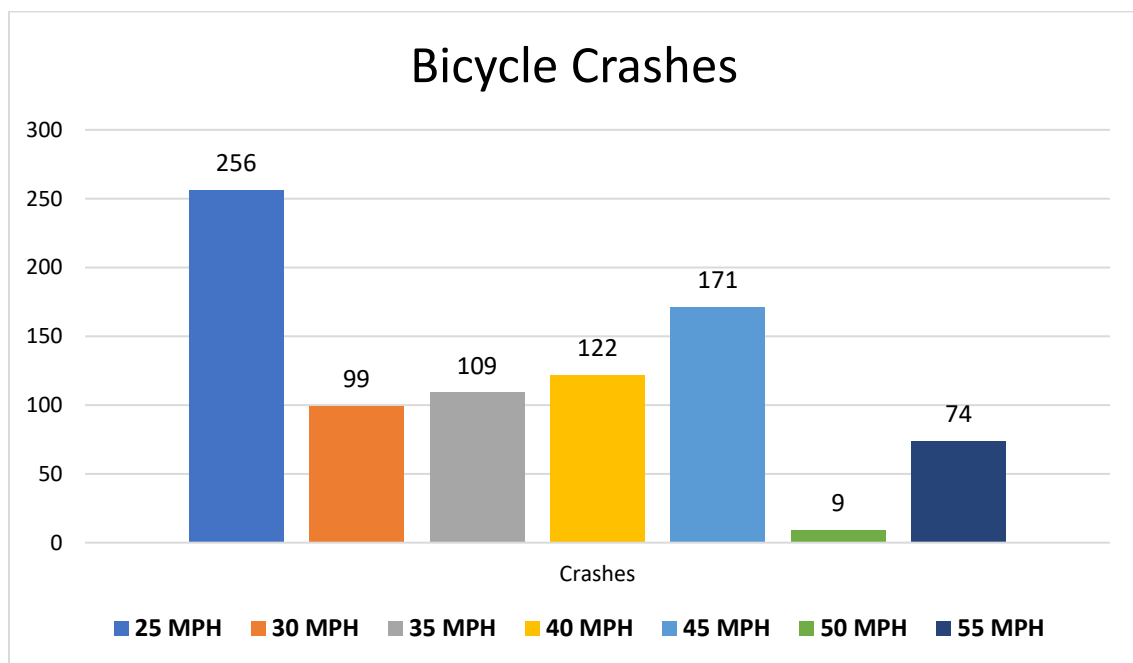
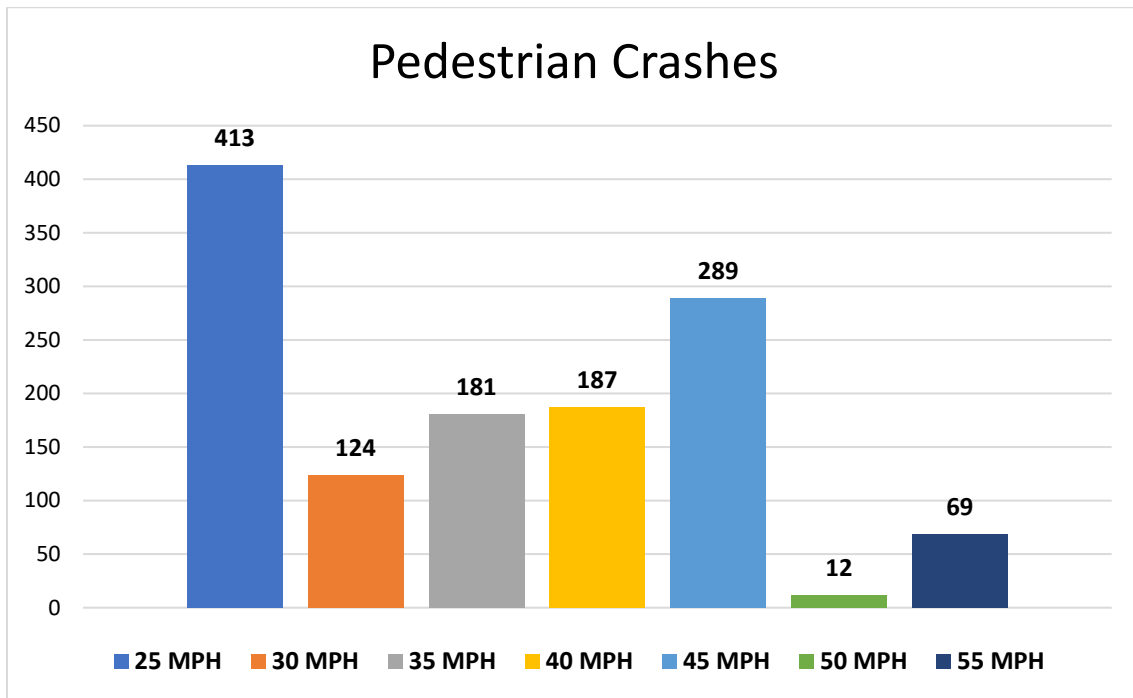
Map 5: GVMC Bicycling Sliding Windows Score Enhanced

The top high scoring segments (8 and 9s) are located throughout the central portion of the region:

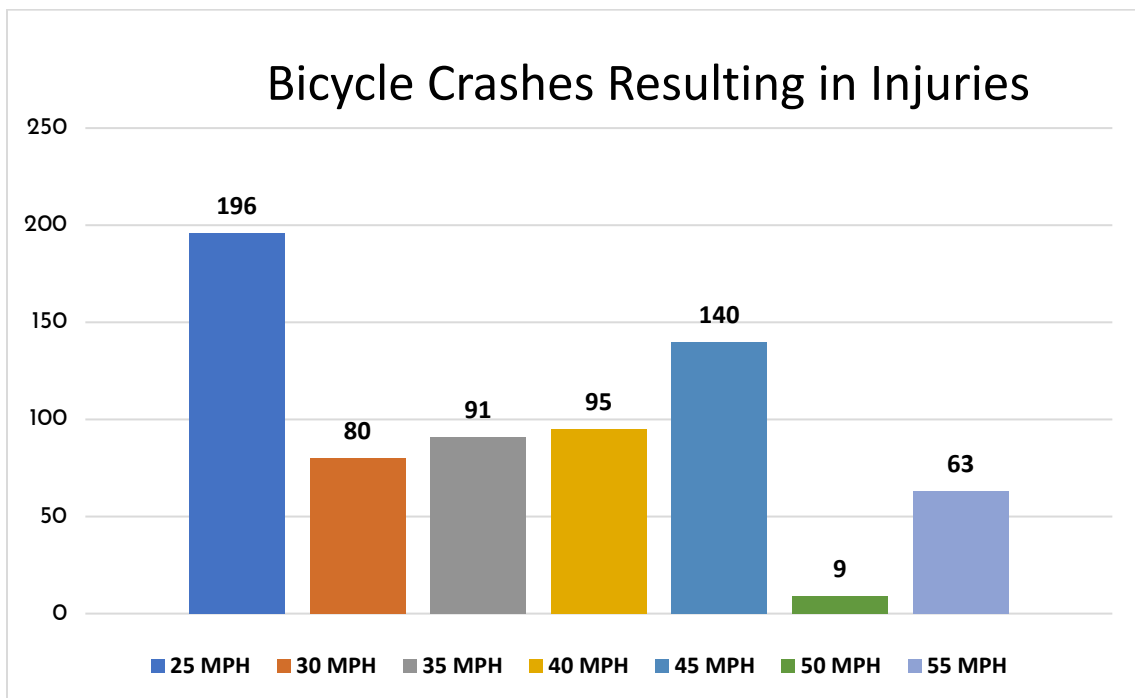
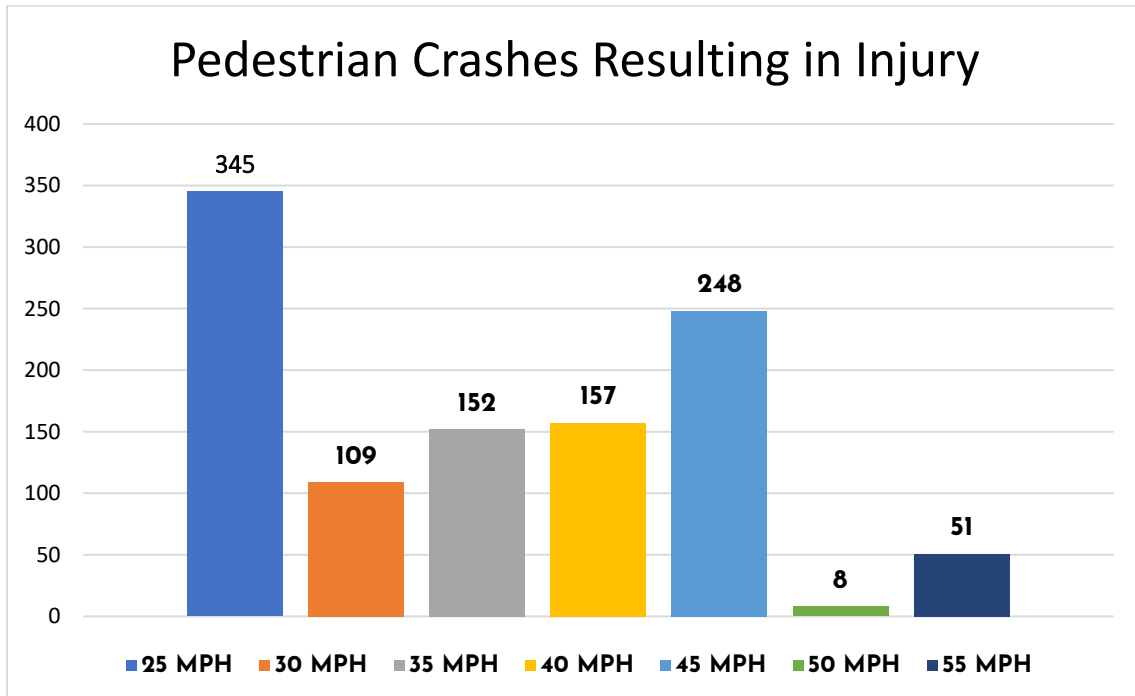
1. Pearl Street from Mt Vernon Ave NW to Division Ave N.
2. Leonard St NW from Muskegon Ave to the Leonard St Bridge
3. 36<sup>th</sup> St SW from Clyde Park Ave to Clay Ave
4. Byron Center Ave from Buck Creek to Ancient Dr.

## 2.2 Speeds and Non-Motorized Crashes

According to the FHWA, “A driver traveling at 30 miles per hour who hits a pedestrian has a 45 percent chance of killing or seriously injuring them. At 20 miles per hour, that percent drops to 5 percent.” With that in mind, staff broke down nonmotorized crashes from 2001-2021 based on roadway speed limit – shown in the charts below.

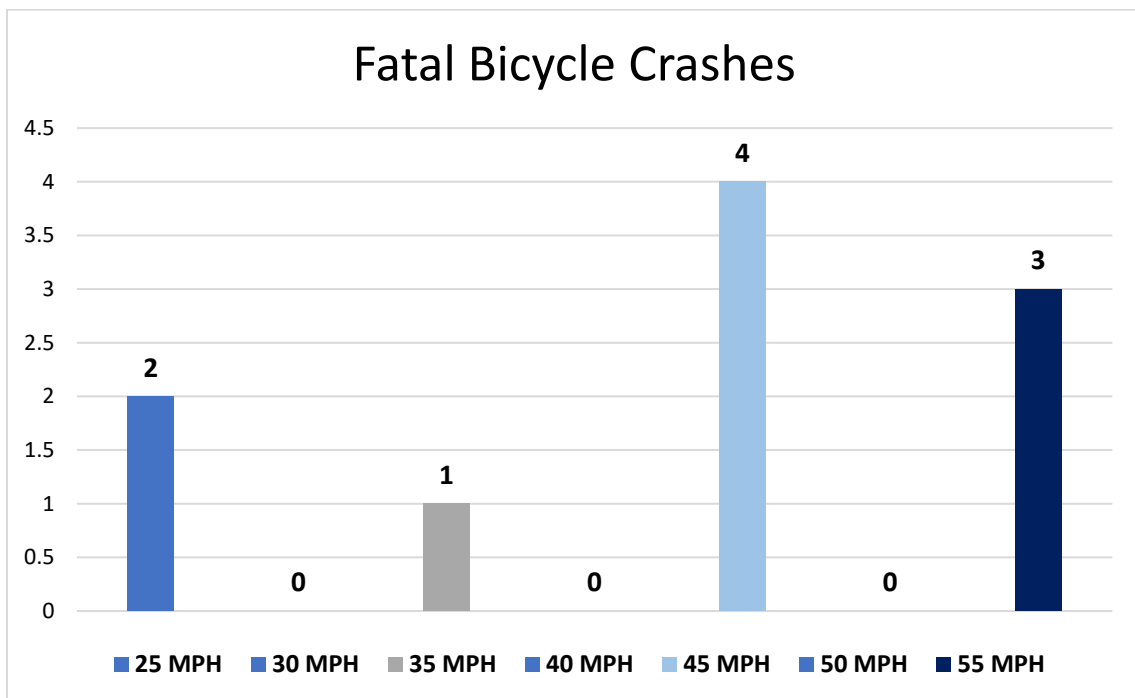
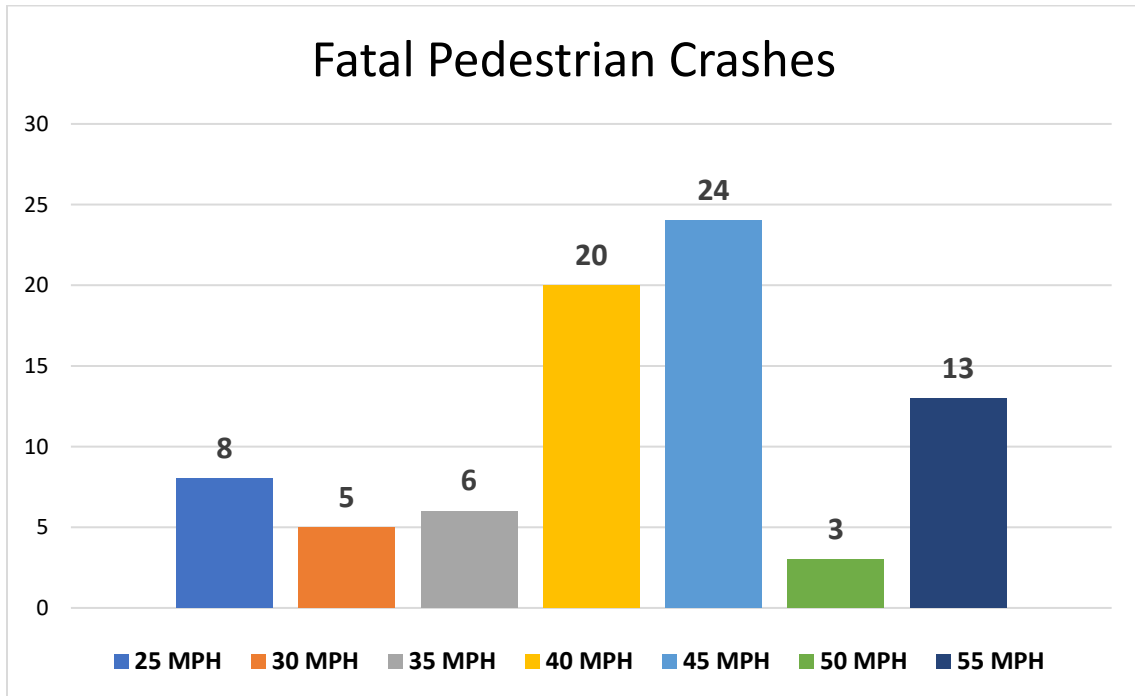


**Injury Crashes:**



67.76% of pedestrian crashes resulting in injury occurred where the posted speed limit was 30 MPH or higher, and 67.55% of bicycle crashes resulting in injury occurred where the posted speed limit was 30 MPH or higher.

**Fatal Crashes:**



80% of fatal bicycle crashes occurred where the posted speed limit was 30 MPH or higher, and 76% of the fatal pedestrian crashes occurred where the posted speed limit was 30 MPH or higher.

### 3. Environmental Justice and Vulnerable Populations

Transportation access is a key component of the vision, goals, and objectives of the GVMC Metropolitan Transportation Plan (MTP) and is also a federal priority. Thus, analyzing the complete streets network in Environmental Justice areas compared to the entire GVMC planning area is important in understanding equity in the complete streets space. ***(GVMC currently defines EJ areas as any block groups where the % of minority race, ethnic group, low-income, persons with disabilities, or elderly populations is greater than the % of one of those groups for the MPO area.)*** These areas are defined individually for each designated population, but the total areas combined were used for this analysis.

The demographics that comprise the environmental justice areas include populations that are more likely to rely upon certain aspects of a complete streets network infrastructure other than that of a car. Zero-vehicle households, aging populations, and persons with disabilities are all groups that may include a higher percentage of non-car users and could warrant a prioritization for addressing complete streets gaps. Therefore, in addition to looking at EJ areas, staff compared complete streets scores in areas with higher concentrations of these populations against the entire MPO area as well.

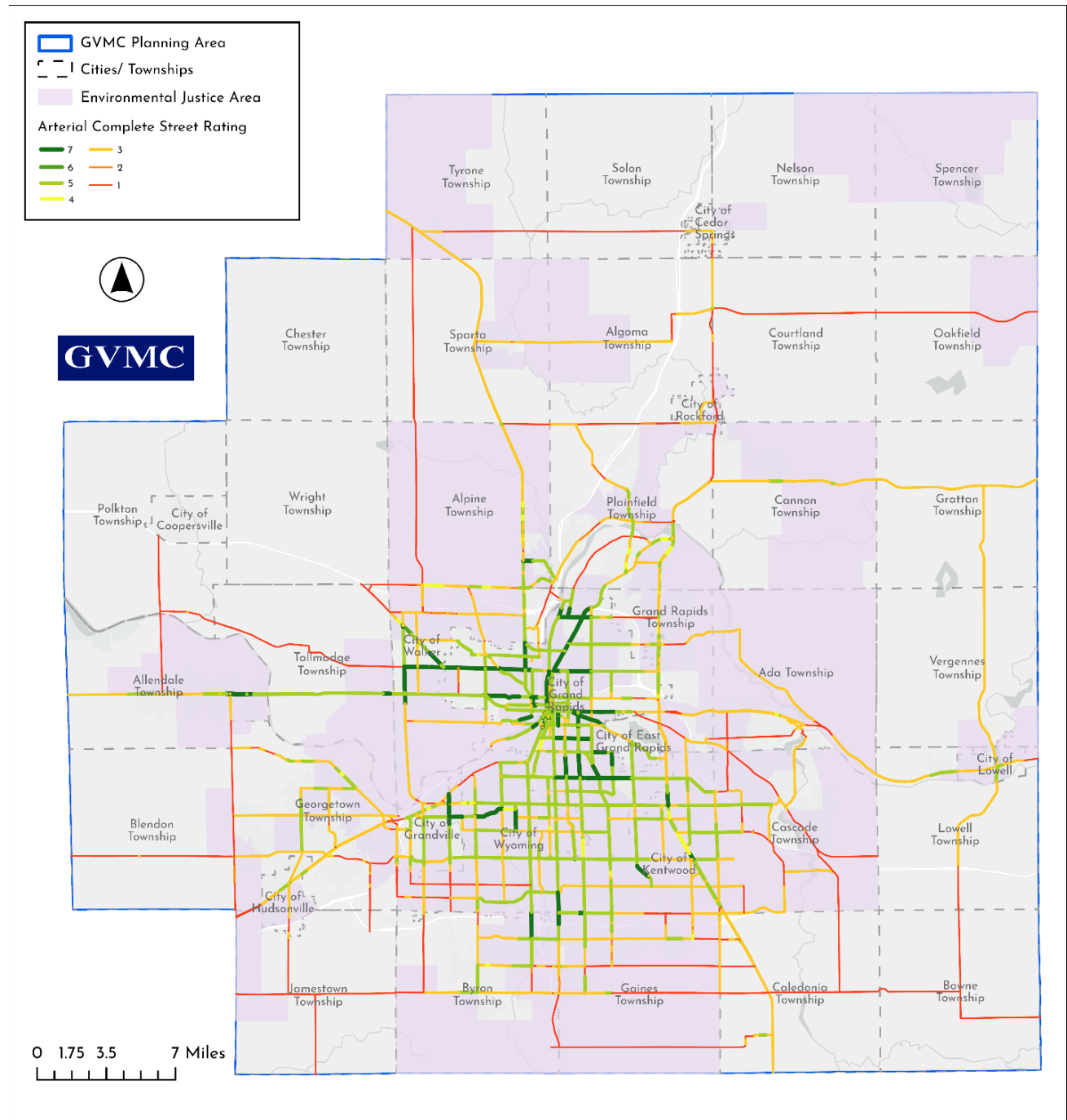
Additional information on Environmental Justice can be found at [gvmc.org/environmental-justice](https://gvmc.org/environmental-justice).










### 3.1 Complete Streets in Environmental Justice Areas

The map below shows the entire arterial network within the GVMC planning area overlaid upon the EJ areas.

The table that follows shows the percentage of arterial mileage for each complete streets score within EJ areas compared to the total MPO area arterial complete streets score.



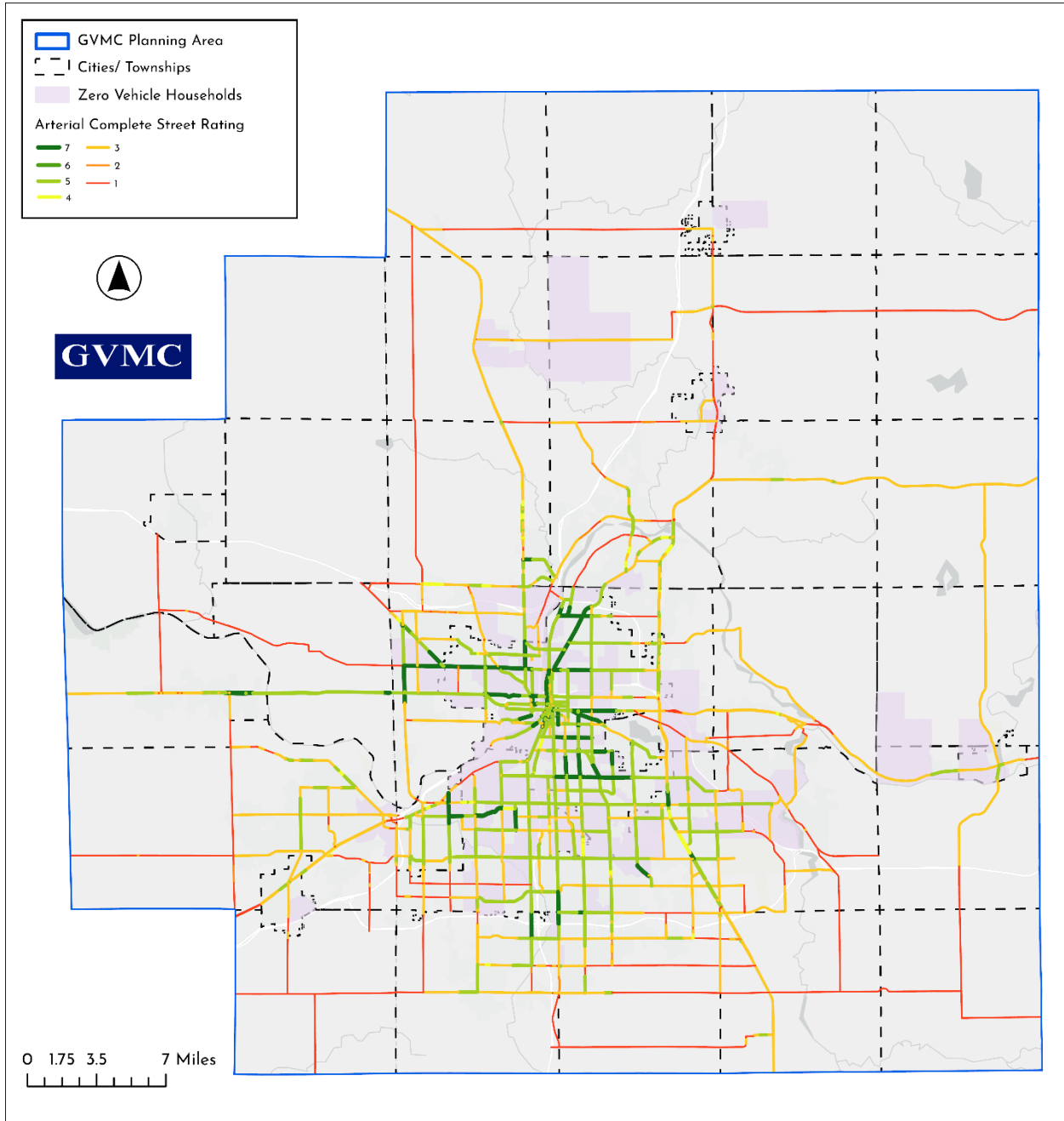
Map 6: GVMC Environmental Justice Areas

Score	Mileage	Percent of Total Mileage	% Compared to GVMC Area Arterials
<b>7</b>	37.44	7.04%	
<b>6</b>	0.43	0.08%	
<b>5</b>	172.10	32.34%	
<b>4</b>	9.49	1.78%	
<b>3</b>	202.40	38.04%	
<b>2</b>	5.49	1.03%	
<b>1</b>	104.76	19.69%	








This information indicates that the arterials that are in EJ areas support a higher composition of complete facilities for all roadway users as compared to all arterials in the GVMC planning area.

### 3.2 Zero-Vehicle Households

The percentage of zero-vehicle households in the GVMC region is 6.37%. Shown in the map below, 30.5% of block groups in the GVMC area have larger than that regional average of zero vehicle households. The complete streets scores for these block groups compared to the region are shown in the table that follows.



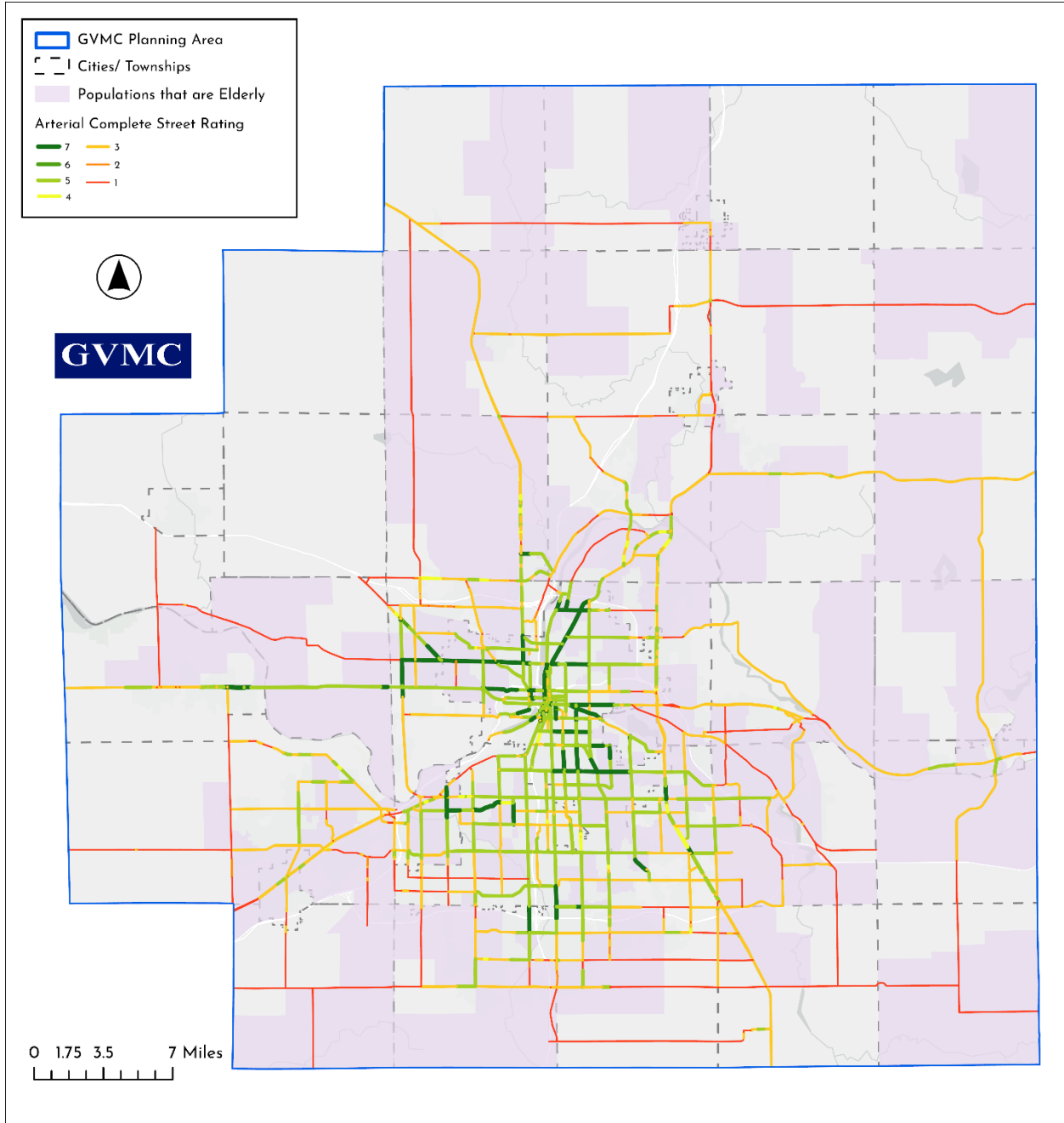
Map 7: GVMC Zero-Vehicle Households

Score	Mileage	Percent of Total Mileage	% Compared to GVMC Area Arterials
7	34.31	11.16%	
6	0.00	0.00%	
5	145.57	47.33%	
4	3.37	1.10%	
3	98.42	32.00%	
2	2.10	0.68%	
1	23.77	7.73%	

Arterials located in areas that have higher concentrations of zero vehicle households than the regional average support a higher composition of road segments categorized at a score of 7 and 5. Arterials in this category that were rated with a score of 1 are less than half of the overall GVMC arterial network with a score of 1.

### 3.3 Aging Populations

The Aging Population is defined as those that are 65 years or older. The aging population consists of 99,724 people representing 13.1% of the regional population. Shown in the map below, 37.4% of block groups in the GVMC area have larger than that regional average of populations of elderly people.



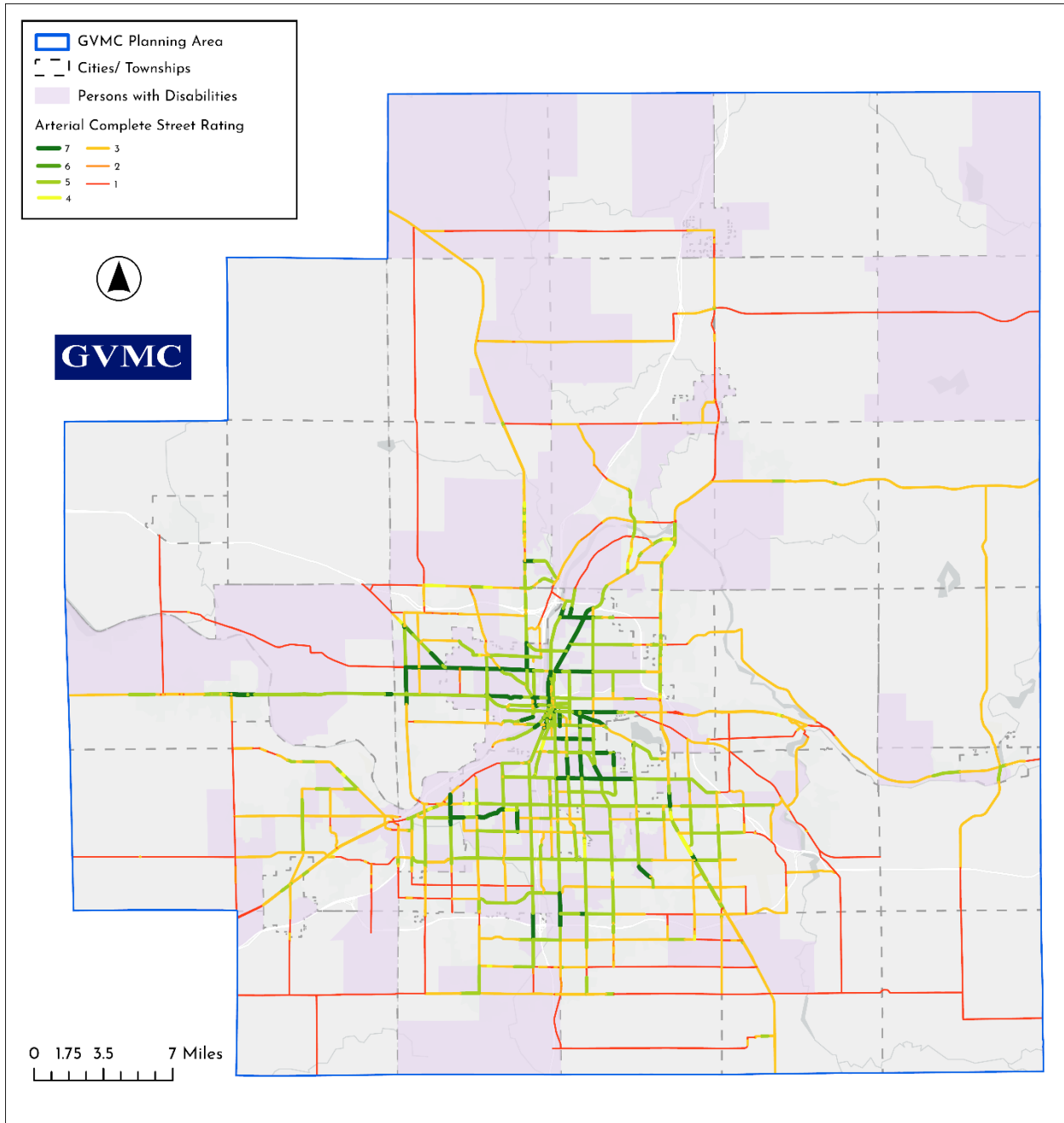
Map 8: GVMC Aging Populations

Score	Mileage	Percent of Total Mileage	% Compared to GVMC Area Arterial
7	26.05	4.07%	↓
6	0.04	0.01%	↑
5	153.21	23.95%	↓
4	11.40	1.78%	↑
3	268.87	42.04%	↓
2	7.01	1.10%	↓
1	173.01	27.05%	↑








The percentage of arterials that are purposed for at least two other modes of transportation beyond vehicle traffic is greater in higher concentrations of people that area elderly than the overall GVMC area.

### 3.4 Persons with Disabilities

Persons with disabilities are defined as those who report having difficulty with one or more of four basic areas of functioning – hearing, vision, cognition, and ambulation. There are 63,485 households reporting inclusion of persons with disabilities, making up 22.8% of all households in the GVMC planning area. Shown in the map below, 40.1% of block groups in the GVMC area have larger than that regional average of persons with disabilities.



Map 9: GVMC Persons with Disabilities

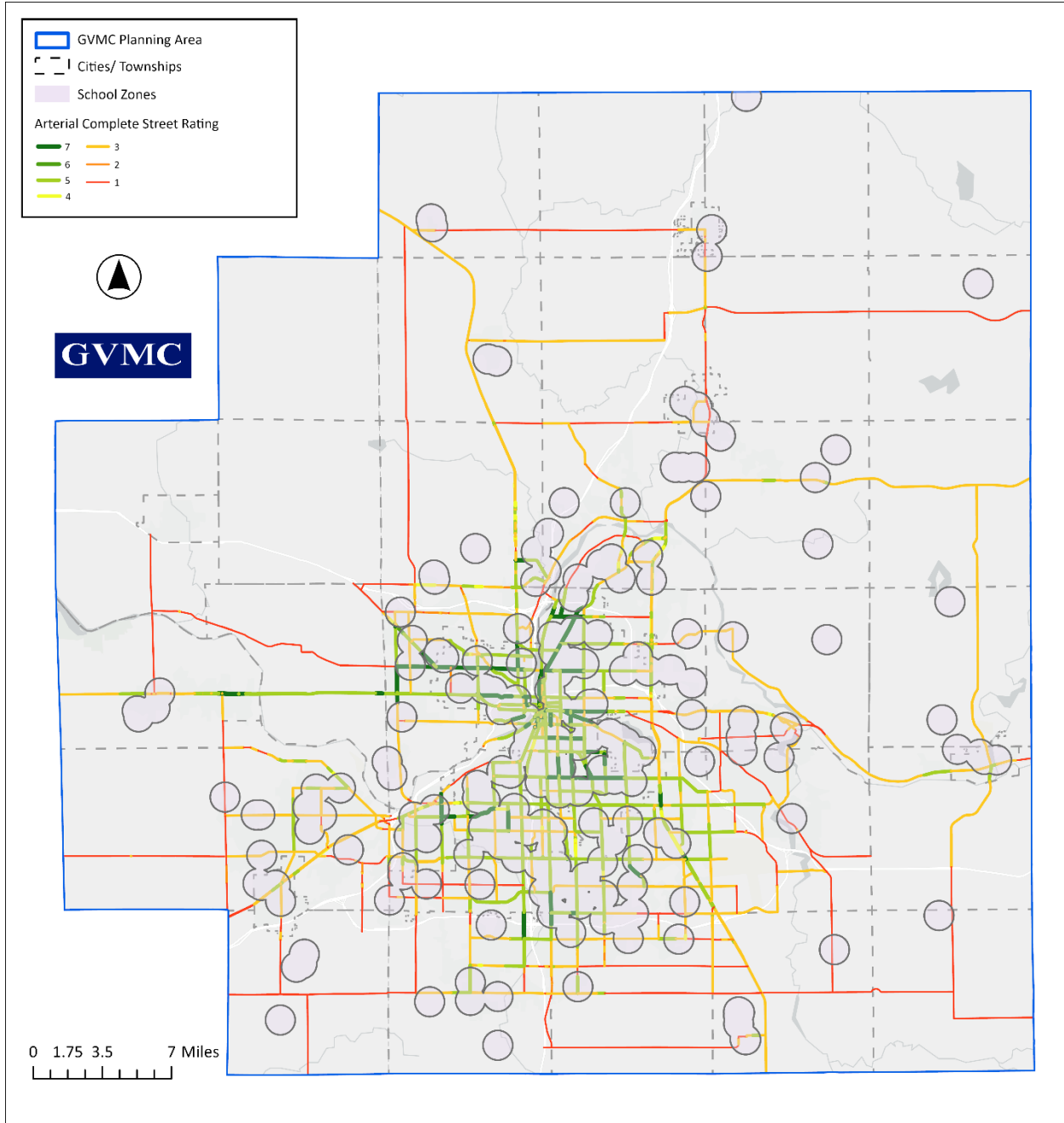
Score	Mileage	Percent of Total Mileage	% Compared to GVMC Arterial
7	38.22	7.37%	
6	0.00	0.00%	
5	175.35	33.83%	
4	7.67	1.48%	
3	182.32	35.17%	
2	6.57	1.27%	
1	108.21	20.88%	

Arterials within block groups of higher than regionally average amount of persons with disabilities had the largest percent increase on segments that scored a 5. Overall, these block groups saw increases in higher scoring segments and decreases in lower scoring segments with minimal percent change in segments scored at 2 and 6.










### 3.5 School Zones

For this analysis, school zones were identified by selecting all segments within a .75-mile buffer of all schools. There are 222 elementary and secondary schools in the planning area covering 264 square miles with a .75-mile radius.



Map 10: GVMC School Zones

Score	Mileage	Percent of Total Mileage	% Compared to GVMC Area Arterials
7	41.51	11.26%	
6	0.25	0.07%	
5	153.38	41.61%	
4	8.29	2.25%	
3	130.70	35.46%	
2	0.66	0.18%	
1	33.78	9.16%	

Arterial segments that were located within school zones increased in segments scoring 4 through 7 and decreased in segments scoring 1 through 3. This chart shows arterials in school zones are better purposed for children to safely get to and from school via alternative modes of transportation other than the automobile.

## 4. Land Use Context

The land use context of where both gaps in infrastructure as well as safety issues occur are important to note while developing solutions to address these issues. Complete Streets are developed to create a safe environment for every user. Therefore, a Context Sensitive Design/Solution is key for the most effective complete streets solution. FHWA defines Context Sensitive Solution and Design (CSS/D) as “a collaborative, interdisciplinary decision-making process and design approach that involves all stakeholders to develop a transportation facility that fits its physical setting.”

### 4.1 CSS Core Principles in the decision-making process include:

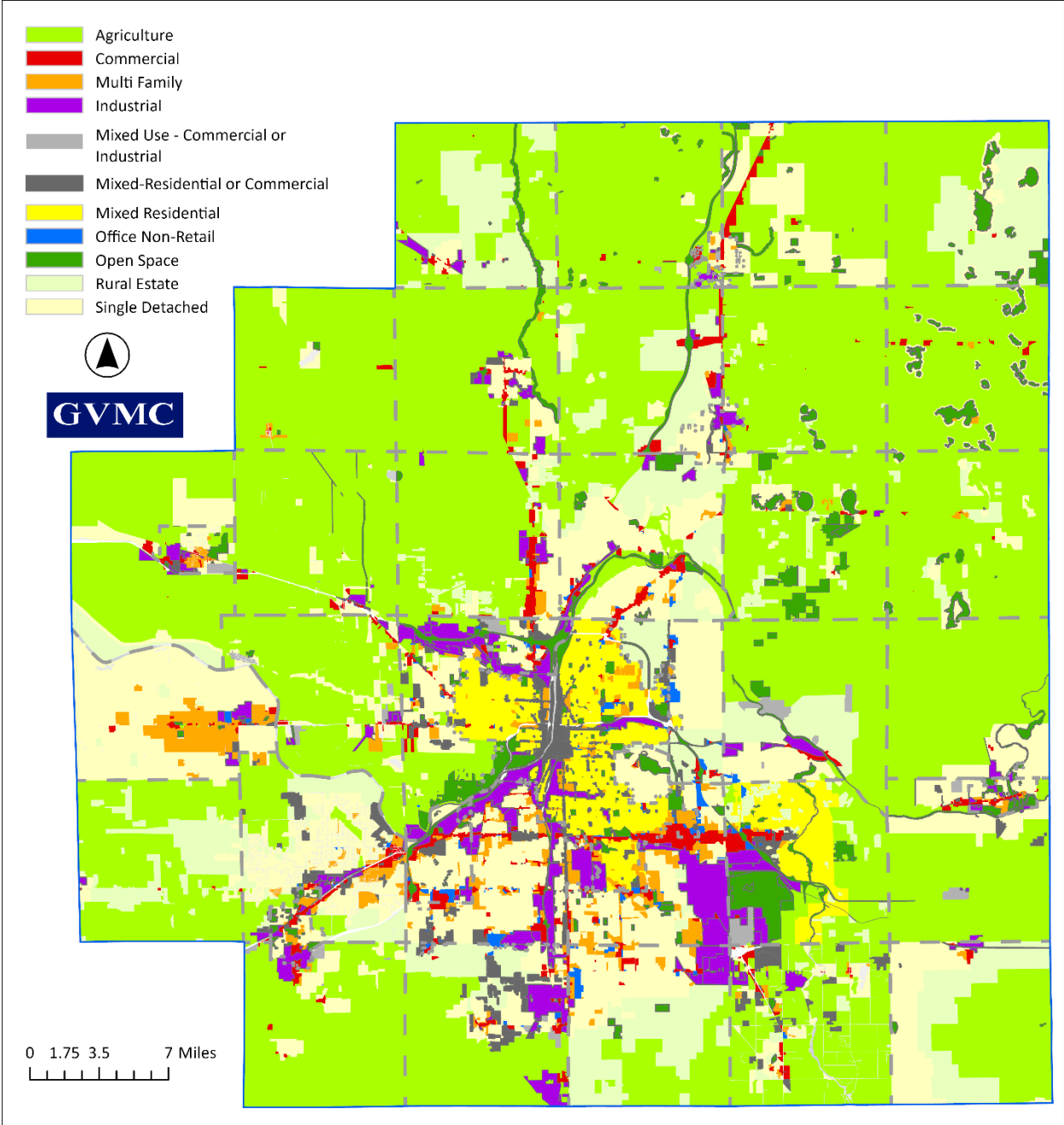
1. Strive towards a shared stakeholder vision to provide a basis for decisions.
2. Demonstrate a comprehensive understanding of contexts.
3. Foster continuing communication and collaboration to achieve consensus.
4. Exercise flexibility and creativity to shape effective transportation solutions, while preserving and enhancing community and natural environments.

### 4.2 CSD Core Principles in the design approach include:

1. Safe for all users.
2. The design process involves a shared stakeholder vision as a basis for decisions and solving problems that may arise.
3. Design outcomes meet or exceed the expectations of both designers and stakeholders, thereby adding lasting value to the community, the environment, and the transportation system.
4. Demonstrate effective and efficient use of resources.

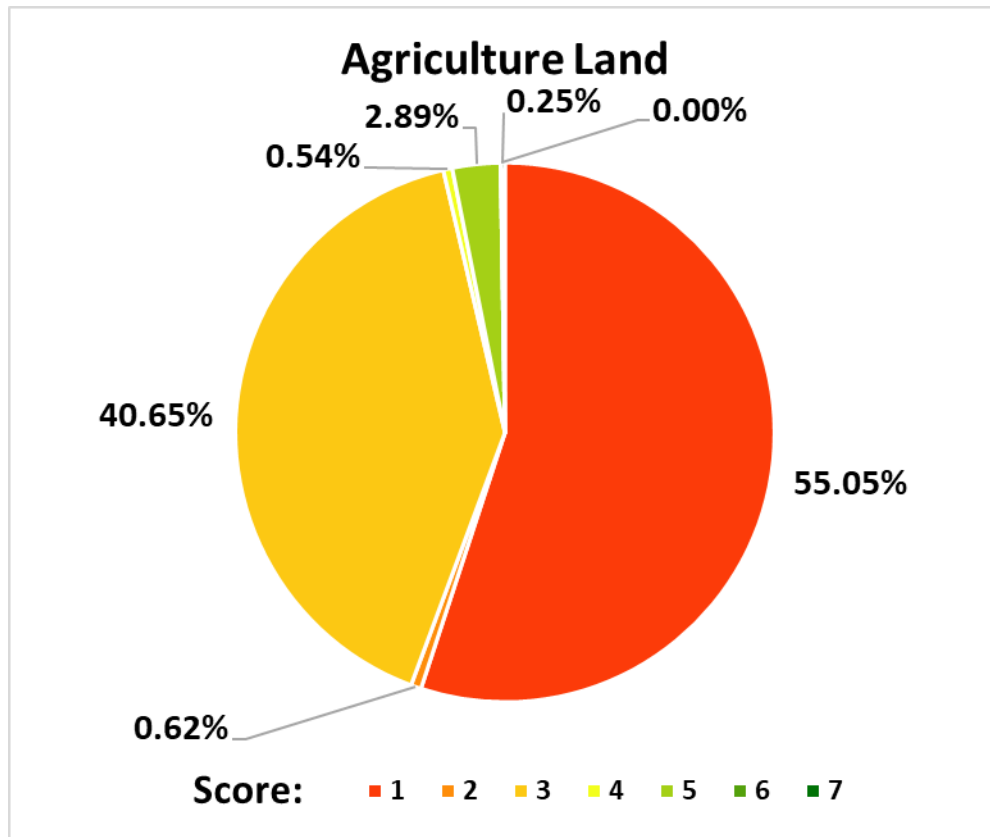
### 4.3 Land Use and Arterial Scores

The surrounding land use type can provide an indication to what context sensitive level or design would be most appropriate to build out the complete streets network. The land use types are small-scale approximations of regional zoning trends sourced from REGIS *Single Source Online Map*. Below is a map showing the single source land use types (Agriculture, Commercial, Multi Family, Industrial, Mixed Use-Commercial or Industrial, Mixed- Residential or Commercial, Mixed Residential, Office Non-Retail, Open Space, Rural Estate, Single Detached) through out the GVMC planning area.

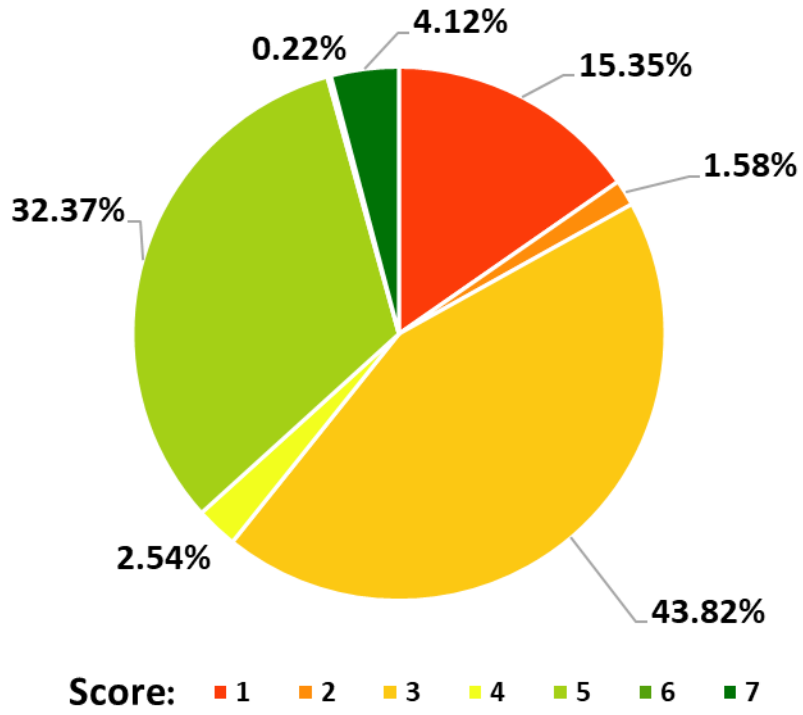


Map 11: GVMC Land Use

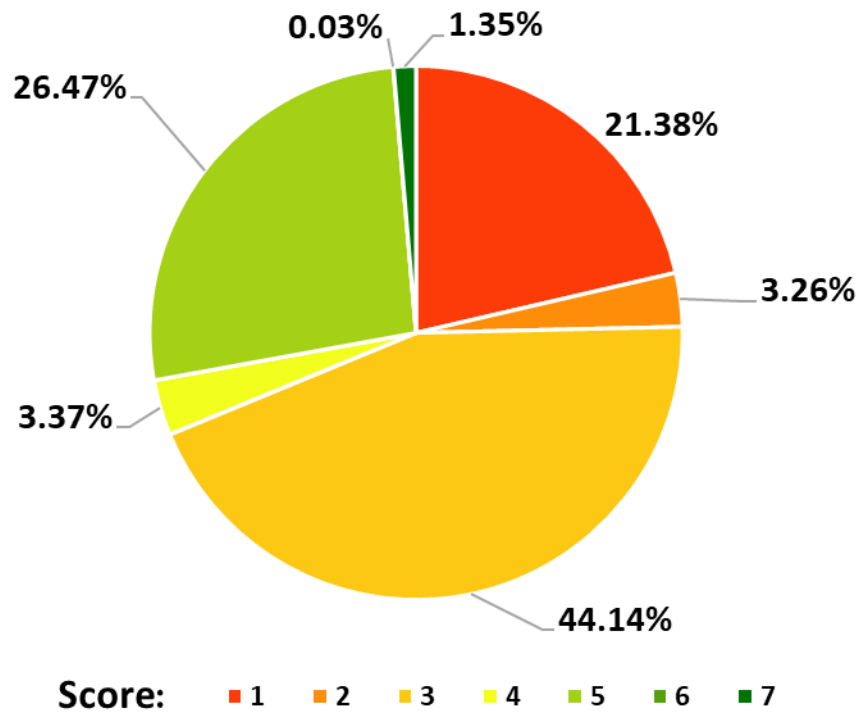
The proceeding charts provide the percentage of arterial scores that make up the network in each land use type. Mixed Residential and Mixed Residential Commercial are the two land use types that have more than 10% of their arterial mileage rated at “7”. There were five different land use types that had over 30% of their arterial mileage rated at a “6”. Rural Estate and Agricultural land uses have the highest percentage of arterial mileage rated at a “1”; however, this may be appropriate given the context.



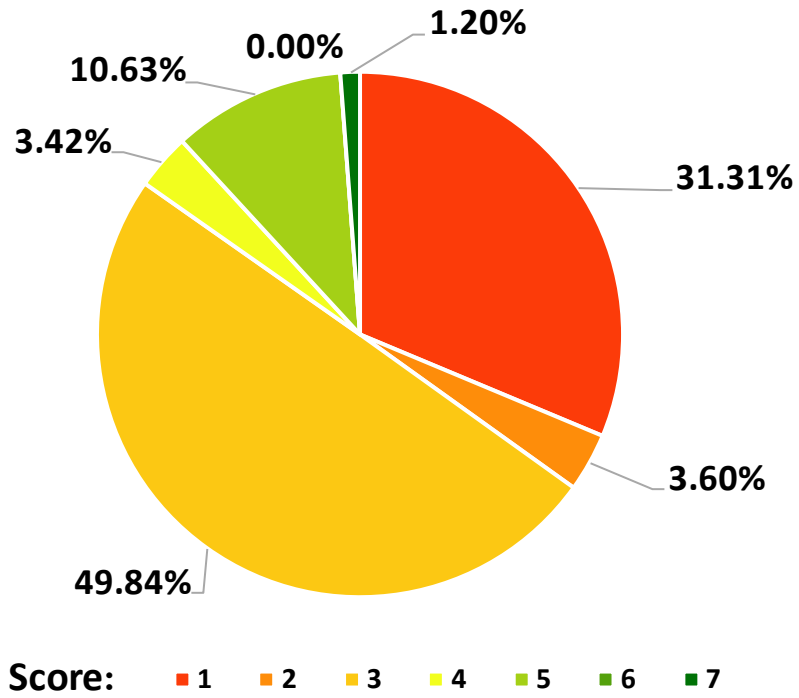
### Commercial



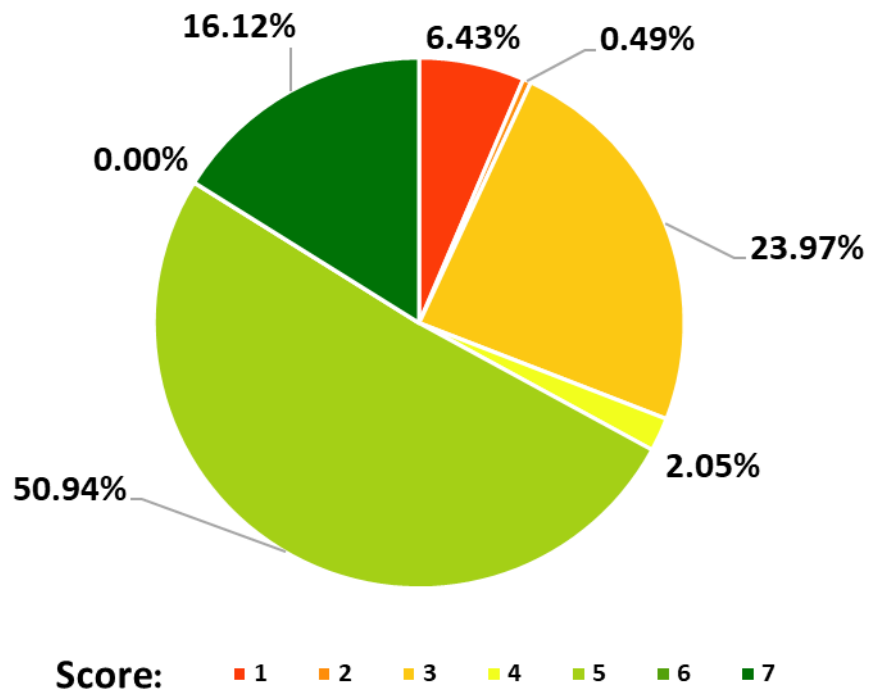
### Industrial Arterial



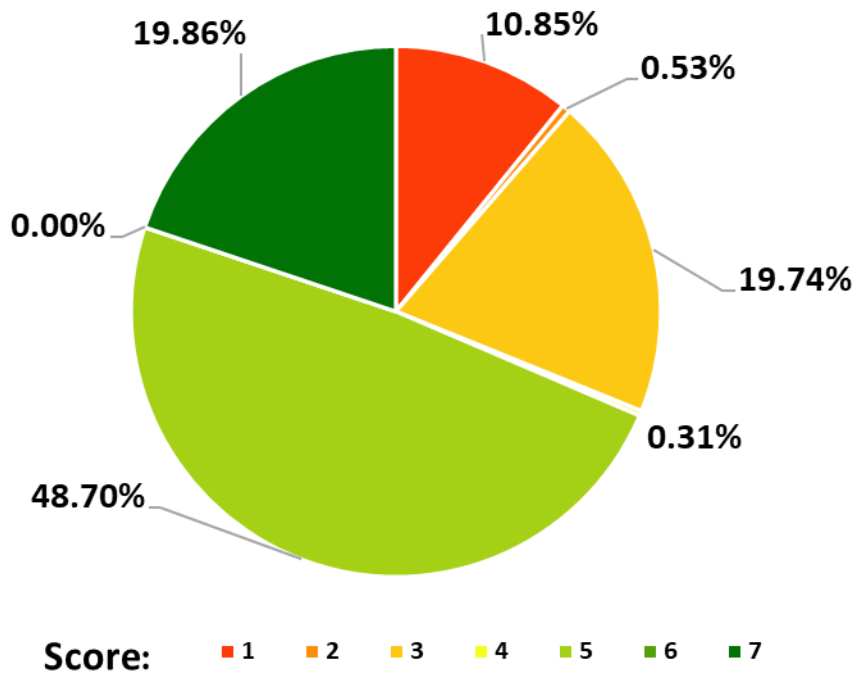
### Mixed Commercial- Industrial



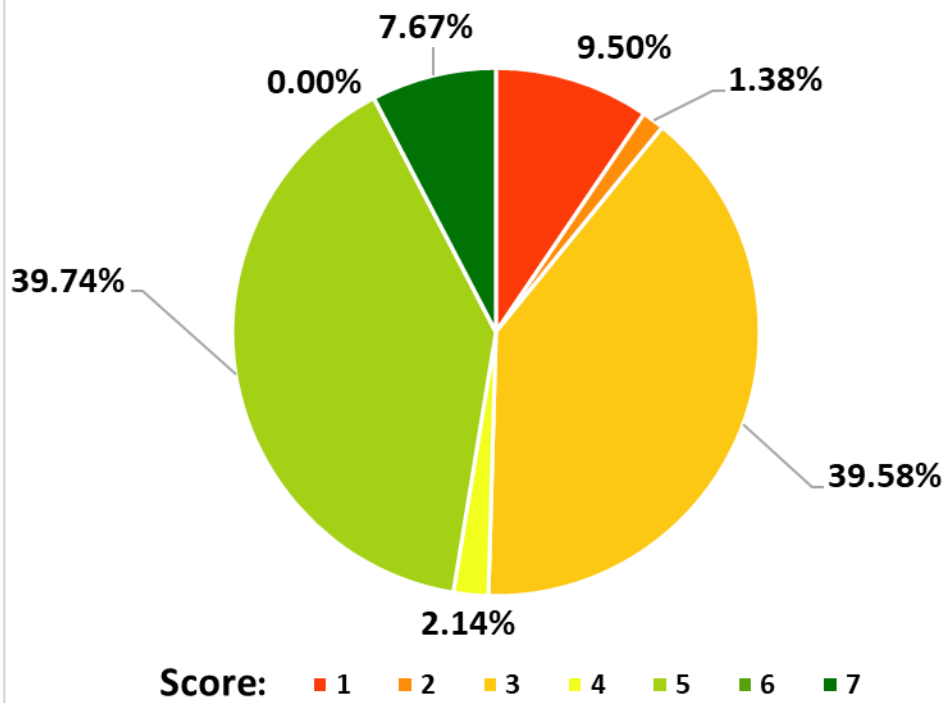
### Mixed Residential-Commercial



### Mixed Residential

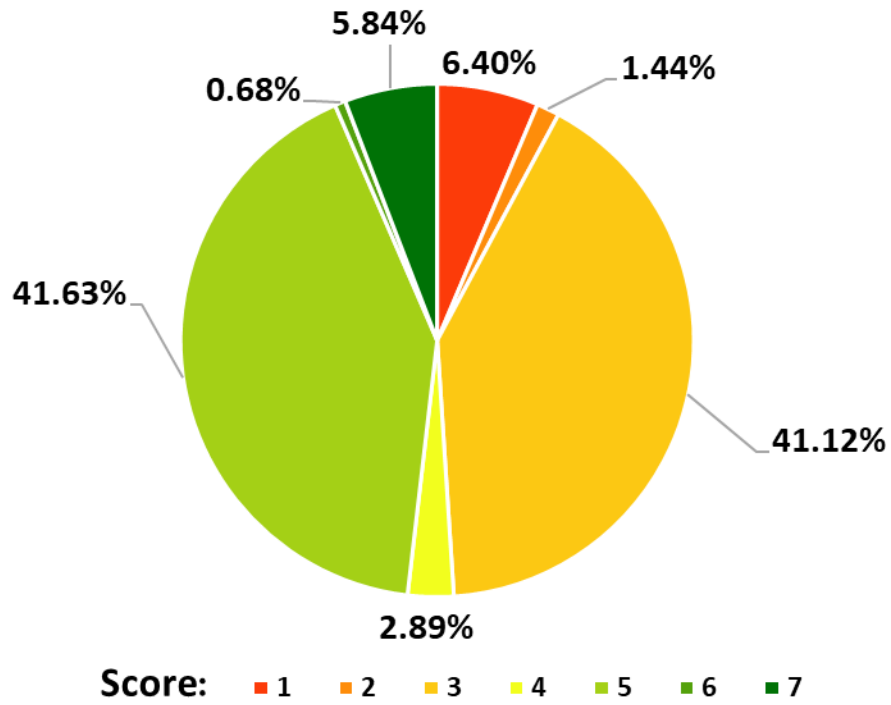


### Multi Family

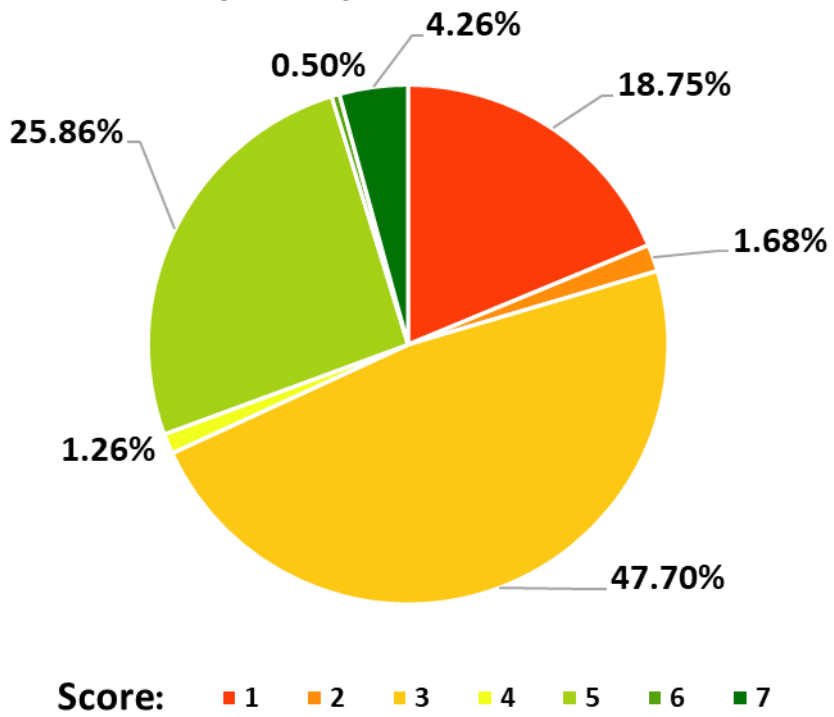




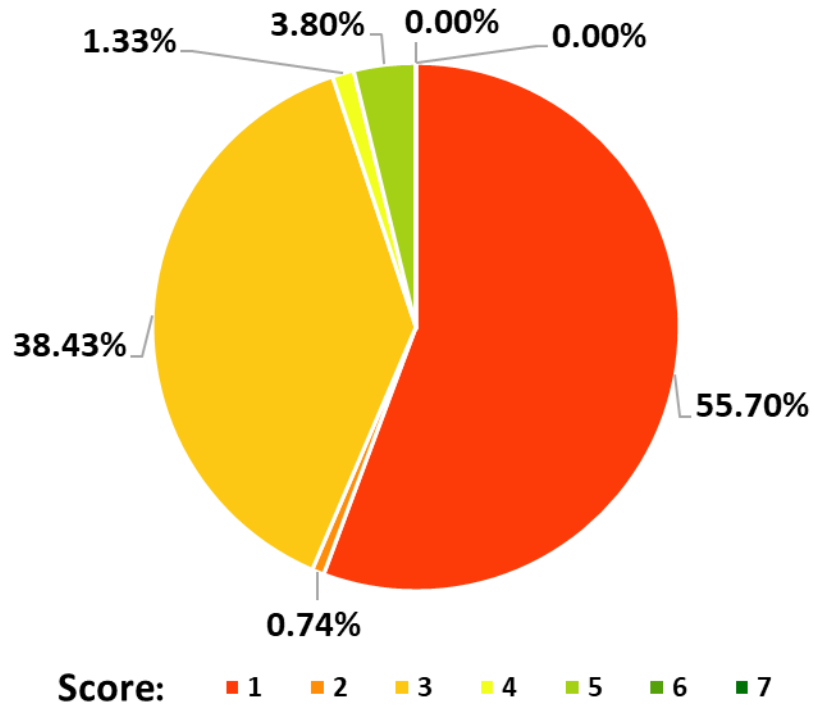
### Office Non-Retail



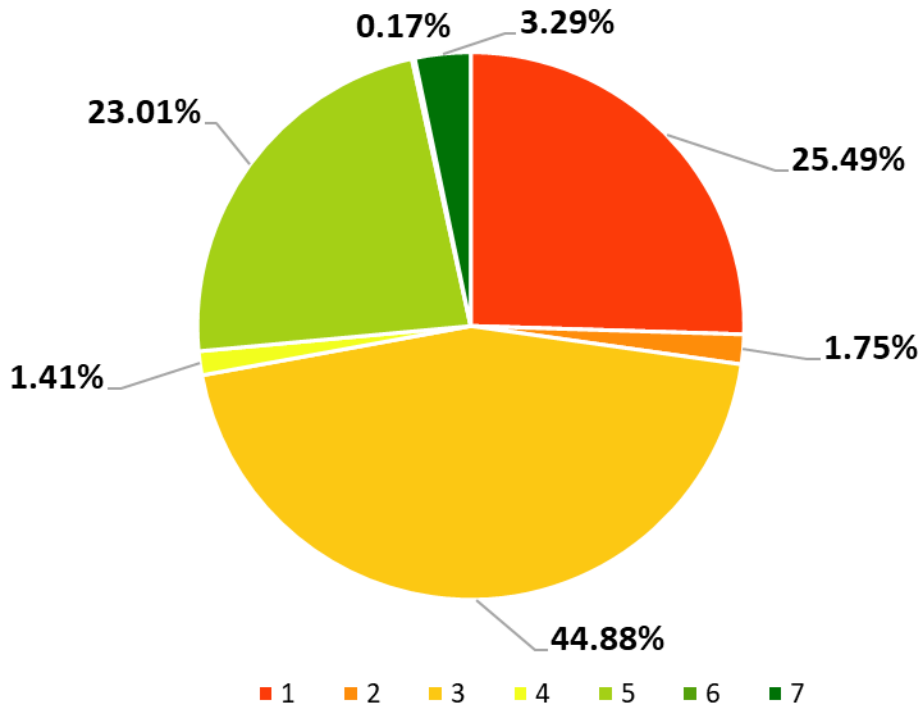
### Open Space Arterials



### Rural Estate



### Single Detached

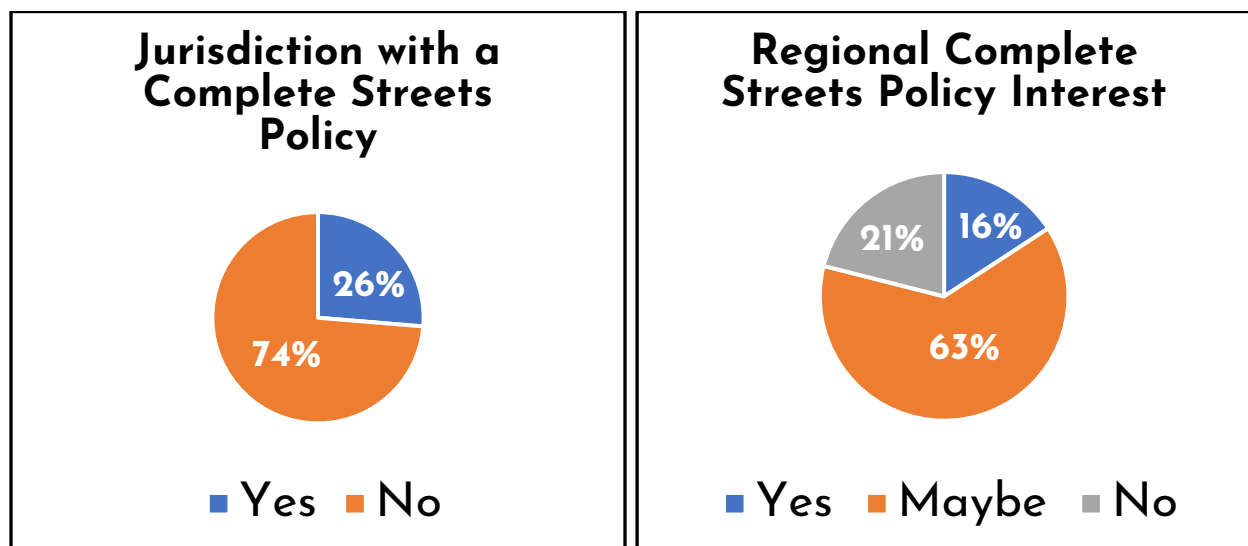


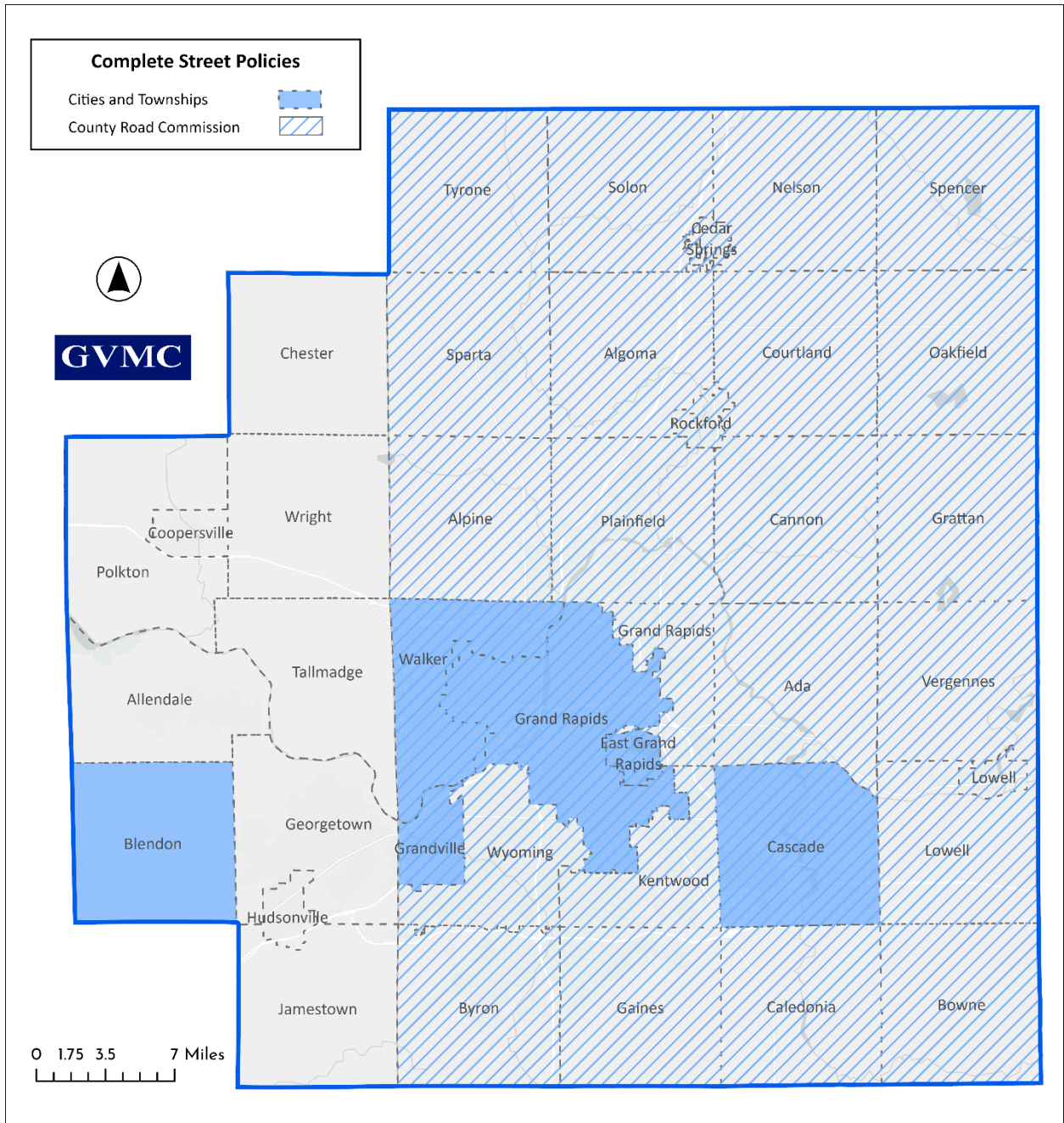
## 5. Complete Streets in a Regional Context

Jurisdictions throughout the GVMC planning area have a range of complete streets policies or unofficial practices that aim to satisfy all modes of transportation. The region consists of both urban and rural networks and diverse land use patterns that support dense urban populations, suburban development, rural farmland, and industrial development that requires freight centric networks. GVMC has previously supported complete streets along with the MACC (Macatawa Area Coordinating Council) and WMRPC (West Michigan Regional Planning Commission) in the *West Michigan Traffic Safety Plan*. The plan includes a policy that supports incorporating elements of complete streets and green streets to holistically manage the transportation system for all users and reduce conflicts between vehicles, transit, rail, and non-motorized modes of travel.

### 5.1 Complete Streets Survey

The Technical and Policy Committee members were asked to participate in a survey to understand the current complete streets policy context in the GVMC planning area. This survey (Appendix A.) included five questions to understand what jurisdictions have Complete Streets policies or if they are interested in developing a policy. Nineteen jurisdictions responded to the survey, and the results are as follows:





Map 12: Jurisdictions with Complete Street Policies

## 5.2 Regional Complete Streets Policy Concerns

Most responses to the survey indicated that jurisdictions “maybe” are interested in developing a complete streets policy. During potential development of a regional policy, GVMC will work with local partners and take into consideration the nuances of the transportation systems at the jurisdictional level. These considerations should have context sensitive goals depending on the jurisdictional transportation needs.

Feedback from the survey conveyed there is a consensus that all survey participants would like to improve road safety for all users.

## 5.3 Potential Future Steps

As of 2023, there are 98 regions that have adopted a Complete Streets policy throughout the United States. These may take the form of a policy, resolution, plan, design manual/ design guidelines, or executive orders. These policies range from regionally adopted resolutions in support of state level Complete Streets policies to an adopted policy that requires all federally funded projects to accommodate all users or apply for an exception to the policy. Whatever level of requirement these regional policies agree upon, underlying goals are important to define why a jurisdiction is in support of a Complete Streets policy. These goals are then used to develop metrics to be able to measure progress. Projects resulting from the complete streets policy can be used to improve safety, health, equity, environmental, and economic conditions within the region. Examples of placing metrics on goals to improve these conditions can be measured in quantifiable results such as: reduced number of nonmotorized crashes, reduced number of vehicles on the road, and number of lights installed within a project incorporating complete streets.

Michigan Complete Streets legislation was signed at the state level on August 1, 2010. The state’s adopted policy defines complete streets as providing “appropriate access to all legal users in a manner that promotes safe and efficient movement of people and goods whether by car, truck, transit, assistive device, foot or bicycle.” As previously stated, several municipalities within the GVMC planning area already have a complete streets policy or support the principle of complete streets. GVMC could consider adopting a policy that fits the unique needs of all the jurisdictions in the planning area. A regional Complete Streets policy could bridge the gap in creating consistency in transportation connections for all users across jurisdictional boundaries. With such a diverse landscape and transportation network GVMC could develop a Complete Streets Policy that addresses the regionally agreed upon goals while being sensitive of future projects context.

GVMC can also be leveraged as a resource for local members looking for technical assistance in developing a local complete streets policy. Other MPOs and non-profits have provided technical assistance to local jurisdictions through:

- Complete Streets presentations to elected officials and staff
- Assistance to cities interested in adopting a Complete Street policy or plan
- Collaboration on an action plan for a city to adopt Complete Streets Guidelines
- Pre and post evaluations on Complete Streets projects
- Walking Audits
- Development of design manuals

- Facilitation of open house complete street design workshops.

Additionally, further support and analysis including traffic counts, nonmotorized counts, crash data, pavement condition, demographics, and land use attributes can be provided to jurisdictions looking to improve complete streets in their networks.

# APPENDIX

## Appendix A.

### Regional Complete Streets Survey

1. Does your jurisdiction have a current Complete Streets policy?
  - a. Yes - What does it entail?
  - b. No – has your jurisdiction considered or plans to implement a Complete Streets policy?
2. Would you say most of your road network is suited for multiple modes of transportation? (i.e., pedestrian, bicycle, transit)
3. Would you like more information on complete streets?
4. Would you be interested in developing a regionwide complete streets policy?

**FHWA Complete Streets defined** – *A Complete Street is a safe, and feels safe, for all users. FHWA is supporting transportation agencies to plan, develop and operate equitable streets and networks that prioritize safety, comfort, and connectivity to destinations for all people who use the street network.*

**MDOT Complete Streets defined** – *Complete Streets provides appropriate access to all legal users in a manner that promotes safe and efficient movement of people and good whether by car, truck, transit, assistive device, foot, or bicycle.*