# Non-motorized Technical Memo

For The Twin Cities Area Transportation Study





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### Introduction

This report summarizes the conditions for nom-motorized transportation in the TwinCATS area. 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.

Benefits of Non-Motorized Transportation

- Reduces air pollution
- Encourages physical fitness
- Helps prevent obesity related chronic diseases
- Contributes to lower crime rates
- Allows those who can't or choose not to drive to have greater independence and reducing isolation
- Improves the viability of transit
- Helps connect people, neighborhoods and communities with each other and the outdoors
- Attracts new residents and tourists
- Improves the well being of households who live without cars

This report will describe the demand for non-motorized transportation, summarize the inventory of existing non-motorized infrastructure, and then identify potential areas for improvement. The areas to improve will focus on improving the quality of walking known as walkability. In addition, the report includes an identification of obstacles to walking and biking and an analysis of non-motorized safety. The used in this report is a based on the TwinCATS *Walk and Roll Plan*, published in 2011, as well as current conditions. Finally, the report will explain what progress has been made on improving conditions has been made over the past several years.

### **Demand for Non-Motorized Transportation**

While the majority of residents in the TwinCATS area rely on an automobile, there is still a sizable population who do not drive. This group is made up of those under the age of sixteen, the mobility impaired, seniors, people who cannot afford a car, and a growing number of people who chose not to drive. Currently the vast majority of residents in TwinCATS commute by automobile, with 85 percent driving alone and an additional 7 percent carpooling (Table 1). These commuting mode rates are similar to both the county and state. One major difference is that walking, biking, and transit usage rates in the TwinCATS area is about half the state average. In the TwinCATS area only about 2 percent of workers, commute by means other than an automobile. The commuters who walk, bike or use

transit are concentrated in a few areas. A few census blocks have more than a third of all the commuters who walk, bike or use transit (Map 1). For those who do not use an automobile to get to work the second most common method of travel is walking (Figure 1).

	Drove Alone	Carpool	Bus	Bike	Walk	Other*	Work from Home
City of Benton Harbor	72%	13%	3%	2%	7%	1%	3%
City of Bridgman	83%	9%	0%	0%	0%	4%	4%
City of St. Joseph	86%	7%	0%	0%	3%	0%	4%
Benton Charter Township	85%	8%	1%	0%	0%	3%	3%
Hagar Township	87%	7%	0%	0%	1%	1%	4%
Lake Charter Township	87%	8%	0%	0%	0%	0%	5%
Lincoln Charter Township	90%	5%	0%	0%	0%	1%	4%
Royalton Township	89%	4%	1%	0%	0%	1%	5%
St. Joseph Charter Township	86%	6%	0%	1%	1%	1%	5%
Sodus Township	87%	9%	0%	0%	1%	0%	3%
TwinCATS Total	85%	7%	1%	0%	1%	1%	4%
Berrien County	83%	8%	2%	0%	0%	0%	3%
Michigan	83%	9%	1%	1%	2%	1%	4%

Table 1. Commute Mode by Community.

\*"Other" includes motorcycle, taxi, and unspecified other means

Source: American Community Survey 5 year estimates 2011-2015. Village households are included in the surrounding Township



Figure 1. Commuters by Means of Transportation

Commute mode only tells a part of the story. While most people use a car to get to work, there are many households, which do not have access to an automobile. Within the TwinCATS area car ownership is common with 89.5 percent of households having at least one vehicle. This is still less than the county and state averages. A few TwinCATS communities though, have high levels of carless households. Benton Harbor especially stands out where 31 percent of the households do not have an automobile (Table 2, Map 2).

For households with no vehicle, reliable transportation is a major hurdle. Because car ownership is expensive, providing lower income individuals with a better ability to live without a car would relieve a major financial burden. The lack of a car particularly effects low-income populations. A lack of safe and reliable transportation can be a major hurdle in securing employment. National data shows that the lower a person's income, the more likely they are to walk or bike to work (Figure 2). This indicates that it is especially necessary to ensure good walkability around entry-level jobs. Yet, many entry-level employment centers in the region are located close to high-speed, high-traffic roadways, including Napier Avenue, and areas near I-94 exits 29 and 23. The provision of sidewalks in these areas is intermittent or completely absent in many situations. Many of the jobs in these areas also require that employees reach and depart from work during the evening hours, when transit is unavailable, and when walking and bicycling in the traffic lanes is even more unsafe than during daylight hours.

The commute mode only shows the method used to get to work. Therefore, the travel modes of those who do not work, such as, retired people, students or the unemployed is not well known. Even for those who are able to carpool to work, lack of a car can still make travel for other tasks difficult.



Map 1. Commuters who Walk, Bike or Use Transit



Map 2. Percent of Households with no Vehicle

#### Table 2. Households With no Vehicle.

City/Township	Occupied Housing Units	Households with No Vehicle	Percent
City of Benton Harbor	3,902	1,216	31.2%
City of Bridgman	872	73	8.4%
City of St. Joseph	4,013	282	7.0%
Benton Charter Township	5,606	945	16.9%
Hagar Township	1,535	33	2.1%
Lake Charter Township	1,218	83	6.8%
Lincoln Charter Township	6,006	261	4.3%
Royalton Township	1,548	62	4.0%
St. Joseph Charter Township	4,094	103	2.5%
Sodus Township	833	43	5.2%
TwinCATS Total	29,627	3,101	10.5%
Berrien County	61,167	5,322	8.7%
Michigan	3,841,148	308,369	8.0%

\*village households are included in the surrounding Township

Source: American Community Survey 5 year estimates 2011-2015

While currently, the number of people who walk for reasons other than for recreation is low, if certain trends continue the number of people who walk for daily needs will continue to increase. The population of seniors in TwinCATS has been increasing. As the population ages there will be a greater percentage of the population who are unable or unwilling to drive alone. Providing seniors with pedestrian facilities especially with connections to transit can greatly preserve their independence. As people retire and look to downsize they are increasingly looking for places where they can live when they are no longer able to drive.

The populations who are choosing areas with better non-motorized transportation is also rising. Younger people especially are prioritizing neighborhoods where they are able to walk or bike to restaurants, bars, retail, and work<sup>1</sup>. In order for Southwest Michigan to attract and retain residents, better non-motorized transportation options will be vital. For those who cannot afford or do not want to own a car, walkable communities and adequate transit are more than just an added benefit but an absolute necessity. While the TwinCATS area needs many changes to appeal to those who do not own a car, the area could attract people who own a car but want to replace some of their driving trips with walking or transit trips. Even for people who own a car, being able to drive to a single spot and access multiple destinations on foot is a benefit.

# Walking and Bicycling to Work by Household Income: 2008–2012

(Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Walk www.census.gov/acs/www/) Bicycle Less than \$10,000 \$10,000 to \$14,999 \$15,000 to \$24,999 \$25,000 to \$34,999 \$35,000 to \$49,999 \$50,000 to \$74,999 \$75,000 to \$99,999 \$100,000 to \$149,999 \$150,000 to \$199,999 \$200,000 or more 0 2 4 6 8 10 Percent

Source: U.S. Census Bureau, American Community Survey, 2008–2012.

# Figure 2. Walking and Biking to Work by Household Income

### **Existing Non-Motorized Infrastructure**

The first step toward improving pedestrian and cycling conditions is to identify the existing infrastructure that serves non-motorized users. This allows us to identify what resources are needed to maintain the current system and to locate where the system needs to be expanded. To help accomplish this, pedestrian and bike infrastructure can be divided into three categories: visual separation physical separation, and mixed traffic.

Visually separated facilities are those where pedestrians and bikes use a portion of the roadway that is separated by markings on the pavement. There are two types of these in the TwinCATS area: paved shoulders and bike lanes. To count as a non-motorized option a paved shoulder must be at least 4 feet wide. Shoulders are required on certain roadways by the American Association of State Highway and Transportation Officials (AASHTO) design guidelines based on roadway speed and traffic. They are usually designed for automobile safety, not specifically as non-motorized infrastructure. Lanes striped specifically for bicycles are typically narrower than 4 feet. This allows safe travel for cyclists, but is not an optimal solution for pedestrians or those in a wheel chair.

Physically separated facilities are those where the pedestrian or cyclist has a path that is separate from the roadway. The most common type is a sidewalk. Separated facilities also include trails or non-motorized paths. A sidewalk is typically at least 5 feet wide while a non-motorized path must be at least 10 feet wide. The width of a non-motorized path allows for both cyclists and pedestrians to pass each other easily. They may also be referred to as multi-use paths. For the purposes of this inventory, any path along the side of a federal aid eligible road is categorized as a sidewalk. Trails, which are essentially non-motorized paths independent of a roadway, were not inventoried. This is because the inventory only covers infrastructure along the federal aid eligible roads in the TwinCATS Area.

Mixed traffic is where pedestrians or bicycles share the same space as automobiles. This typically means the absence of any infrastructure that accommodates non-motorized users. However, mixed traffic can be improved with signage, such as bike arrows ("sharrows") which indicate to drivers to be aware of other users. On very low volume and low speed roads, such as some residential streets, mixed traffic may be appropriate. Furthermore, there are

**65%** of federal aid eligible roads in TwinCATS have no accommodations for

many cases where sidewalks for pedestrians exist but biking within the street is still a safe option. However, no federal aid roads in the TwinCATS area have such low speeds or low traffic that they are safe for pedestrians without any form of non-motorized infrastructure.

Excluding highways, the TwinCATS area contains 211 miles of federal aid roads. Along these roads, there are 46.5 miles of sidewalk and 35.1 miles with wide shoulders or bike lanes (Table 3). 64.5 percent of federal aid eligible roads in TwinCATS area lack any accommodation for pedestrians or cyclists. Only 22 percent of the network has sidewalks, of which nearly all are within cities or villages. The Berrien County Road Commission maintains only about 6 miles of sidewalk on federal aid eligible roads; of this of this, 4.2 of those miles are in Lincoln Township (Map 3).

Roads can contain both physically separated and visually separated facilities. In cases of high traffic and high speeds, it may be necessary to have both a sidewalk for pedestrians and a bike lane or wide shoulder for cyclists. To best understand the existing non-motorized infrastructure. An inventory of where both wide shoulders and sidewalks coexist is useful. The inventory of no-motorized infrastructure also should identify how many miles of road only have a wide shoulder or only have a sidewalk to accommodate both pedestrians and cyclists (Table 4).

The cities of St. Joseph, Benton Harbor, and Bridgman have sidewalks on nearly all roads. About 38 percent of the roads in the Village of Stevensville have sidewalks. The only federal aid eligible road that the Village of Shoreham maintains, Brown School Road, has a recently built sidewalk. On the other hand, the townships have very few sidewalks. Lincoln Township has sidewalks on about 20 percent of its federal aid eligible roads. No other township has sidewalks on more that 3 percent of their roads. In nearly all cases, sidewalks abruptly end at city or village limits.

While Townships generally lack sidewalks, there are some roads with paved shoulders. Roads that only have a paved shoulder for pedestrians and cyclists make up 12 percent of all federal aid eligible roads in the TwinCATS area. It should be noted that in many cases these are required as a shoulder for automobiles and not specifically built for pedestrians. Given the speeds and traffic volumes, these shoulders may not be a pleasant or safe way for pedestrians to travel.

#### Table 3. Miles of Non-motorized Infrastructure by Jurisdiction

Community	Total Miles of Federal Aid Roads*	Miles of Sidewalk on Both Sides	Miles of Sidewalk on One Side Only	Total Miles of Sidewalk	Percent of Sidewalk Coverage	Miles of Wide Shoulders	Percent Wide Shoulders
City of Benton Harbor	17.9	14.1	2.8	16.9	95%	4.6	26%
City of Bridgman	3.8	3.7	0.0	3.8	100%	0.0	0%
City of St. Joseph	20.2	16.9	0.9	17.8	88%	2.4	12%
Village of Shoreham	1.7	0.0	0.3	0.3	17%	0.3	17%
Village of Stevensville	4.6	0.8	1.0	1.8	38%	0.0	0%
Benton Charter Township	61.9	0.7	1.5	2.1	3%	7.0	11%
Hagar Township	16.2	0.1	0.0	0.1	0%	7.4	46%
Lake Charter Township	14.0	0.0	0.0	0.0	0%	0.5	4%
Lincoln Charter Township	25.2	3.9	1.2	5.1	20%	5.5	22%
Royalton Township	17.4	0.0	0.0	0.0	0%	1.1	6%
St. Joseph Charter Township	9.9	0.0	0.2	0.2	2%	3.6	36%
Sodus Township	18.3	0.0	0.0	0.0	0%	2.3	13%
Total	211.1	40.2	7.9	48.1	23%	34.7	16%

\*This includes both locally controlled and MDOT controlled federal aid roads. It excludes the Interstate (I-94 & I-196) and other freeways (US-31).

#### Table 4. Miles of Sidewalk and Wide Shoulder in the TwinCATS Area

Community	Total Miles of Federal Aid Roads*	Sidewalks Only (miles)	Percent of Miles with Sidewalks Only	Wide Shoulder Only (Miles)	Percent of Miles with Wide Shoulders Only	Both Sidewalks and Wide Shoulders (Miles)	Percent of Roads with Both Sidewalks and Wide Shoulders	Percent of Roads with either Sidewalks or Wide Shoulders
City of Benton Harbor	17.9	12.5	70%	0.2	1%	4.4	25%	96%
City of Bridgman	3.8	3.7	99%	0.0	0%	0.0	1%	100%
City of St. Joseph	20.2	16.8	83%	1.3	7%	1.0	5%	95%
Village of Shoreham	1.7	0.0	0%	0.0	0%	0.3	17%	17%
Village of Stevensville	4.6	1.8	38%	0.0	0%	0.0	0%	38%
Benton Charter Township	61.9	1.9	3%	6.7	11%	0.2	0%	14%
Hagar Township	16.2	0.1	0%	7.4	46%	0.0	0%	46%
Lake Charter Township	14.0	0.0	0%	0.5	4%	0.0	0%	4%
Lincoln Charter Township	25.2	2.0	8%	2.4	9%	3.2	13%	30%
Royalton Township	17.4	0.0	0%	1.0	6%	0.0	0%	6%
St. Joseph Charter Township	9.9	0.2	2%	3.6	36%	0.0	0%	38%
Sodus Township	18.3	0.0	0%	2.3	13%	0.0	0%	13%
Total	211.1	38.9	18%	25.5	12%	9.2	4%	35%



Map 3. Sidewalks and Wide Shoulders in TwinCATS Area

### **Areas of Need**

Providing non-motorized infrastructure to all areas where it is lacking is a challenging task. A methodology for prioritization of non-motorized infrastructure is needed to make best use of limited resources. Context sensitivity is central to the task of designing transportation facilities, therefore this Plan makes no mandates for specific design elements needed on any particular road segment. The goal in providing non-motorized infrastructure is to improve the conditions for pedestrians, which is known as walkability, and the condition for cyclists, which is known as bikeability. In addition to the design of the road, there are other factors, which are just as crucial to walkability. The factors that have been found to most influence walkability are density, diversity of land use, design of the road, and distance to transit<sup>2</sup>. These are sometimes referred to as the 4Ds of walkability, and have been adopted in the EPA's national walkability index.

Good design for walkability and bikeability requires more than just the existence of sidewalks or shoulders. While the above summary of existing infrastructure is useful, it does not factor in condition. In some places sidewalks are in such poor condition, they are being overgrown with grass to the point where they are almost unidentifiable (Figure 3). Therefore, before the system is expanded with new sidewalks the primary need may be to repair existing sidewalks. While roads in poor condition make travel worse for automobiles, a sidewalk in bad condition can often be very dangerous for pedestrians. This is especially true for those in wheel chairs where large cracks and bumps may lead to injury. Cyclists also are more impacted by poor roads than an automobile would be. If a wide shoulder deteriorates or there are, obstacles in the way such as storm drains, cyclists might need to leave the shoulder and enter traffic lanes. This is especially dangerous since drivers will be less likely to expect a cyclist in the roadway. Maintenance is such an important issue that Empire Avenue was listed as a top road segment in need of improvement, despite having sidewalks. Good street design for walkability includes making sure the sidewalk is free from obstacles (Figure 4), has a buffer from the street, trees for shade (in some cases), has benches, and has adequate lighting. In addition being able to safely cross streets is important. The TwinCATS Area has many places that lack a marked crosswalk even where there are sidewalks present.



Figure 3 Sidewalk along Paw Paw Avenue



Figure 4 Empire Avenue near Benton Harbor High School.

An area is only considered walkable if there are destinations that can be reached on foot. People have a limited distance they are able or willing to walk. While it is different for each person, an average of a 5-minute walk or ¼ mile is used for assessing design. A higher density of nearby uses means pedestrians and cyclists can access more places in the same timeframe. Diversity of use is also critical since it means a person can accomplish more types of tasks. This means the most value for nonmotorized infrastructure investment comes in places where people work, shop, recreate, and live within walking distance. In the TwinCATS area, the two largest employment clusters are downtown St. Joseph and downtown Benton Harbor (Map 4). Yet the highest density of retail employment is in Benton Township, in the area around M-139, Napier, and Pipestone Road. Over half of all retail employment in the TwinCATS area is located in Benton Township. Yet despite the number of destinations in the retail cluster that are close to each other, walking in this area is still difficult due to a lack of non-motorized infrastructure. The second largest cluster of retail is in Lincoln Township along Red Arrow Highway. This area has a small inventory of sidewalks but there is a lack of pedestrian infrastructure linking the north and south side of I-94. The need for improved walkability in retail areas is especially critical because people who hold lower paying retail jobs are typically the most financially burdened by car ownership and the most likely to travel using non-motorized means.

Another component, which aids walkability, is access to transit. Distance to transit is a major factor in improving walkability because it greatly extends the range a person can get to without an automobile. Transit users are dependent on non-motorized infrastructure because they have to get to and from the stop on foot or bike. The more origin or destinations that can be reached on foot from a bus stop the more useful the system becomes. If riders cannot walk to or from transit stops, the system will not attract high ridership regardless of quality of service. Within the Twin Cities Area Transportation Authority service area, bus riders can use a bike since all buses have bike racks attached.

TCATA has two fixed routes, with twenty-six unique stops. Of these, seventeen are within either the City of Benton Harbor or the City of St. Joseph. All of the stops within both cities have adjacent sidewalks. On the other hand, the relationship between the fixed route stops and sidewalk locations shows that the stops in townships lack non-motorized infrastructure (Map 5). The TCATA Red route has two stops in Lincoln Township along Red Arrow Highway. One stop is just north of I-94 and one stop is just south, stopping at Meijer. The stop north of I-94 has limited sidewalks along Red Arrow, which go north only. The Meijer stop has sidewalks going east along Marquette Woods Road. There is limited amount of sidewalk going south along Red Arrow Highway, which stops a short distance past Meijer's property. The Red route also has a stop at an apartment complex on Union Street in Benton Township, which has no sidewalk or wide shoulder. The TCATA Blue route has eight stops in Benton Township around the Napier, Pipestone, M-139, and Mall Drive retail cluster. This area is devoid of any pedestrian or bicycle facilities. There is also a stop along Empire Avenue in Benton Township, which lacks non-motorized infrastructure. This stop is at a medical facility, Intercare, which many transit riders rely on for healthcare. The lack of pedestrian and bicycle connections around stops forces the buses to pull into private property for passenger boarding. This lack of infrastructure increases the route length and time it takes to ride the route. Furthermore, riders are only able to safely reach a few destinations from each stop. Providing better pedestrian infrastructure would greatly increase the amount of destinations riders could reach as well as making the route itself more efficient.



Map 4. Areas of High Employment



Map 5. Pedestrian Accessibility Around Bus Stops

A limit to this analysis of walkability in this Report is that it primarily focuses on federal aid eligible roads. Typically, federal aid eligible roads have higher speeds and capacity for automobiles. This means that drivers tend to utilize these roads instead of slower and narrower local streets. Yet for pedestrians and cyclists, there is little reason why they would choose a federal aid road over a local one. In fact, because local streets typically have lower speeds and traffic volumes cyclists and pedestrians might prefer these to federal aid roads. While there, may be no pedestrian, or bicycle infrastructure to reach destinations along the federal aid roads, pedestrians and cyclists might be using nearby local roads as an alternative.

## Obstacles

In addition to the analysis of areas where improving may be warranted, local design obstacles to walking and biking have been identified. This was done through a process of public input, the observations of local transportation officials, and SWMPC staff through the process that generated the TwinCATS *Walk and Roll Plan*. The plan looks at particular ways that the area transportation network presents obstacles to effect transportation via walking and biking. While examples are shown in the TwinCATS area, a complete inventory of all obstacles has not been undertaken. The examples chosen are used for education on what the obstacles are; they do not indicate that these locations are a higher priority for improvement.

Seven types of obstacles were identified in the Walk and Roll Plan:

- 1. The absence of sidewalks
- 2. The presence of sidewalks in poor condition
- 3. The absence of market bike paths
- 4. Unpaved or poorly maintained shoulders
- 5. Difficult road crossings
- 6. Barriers to bus access

The following pages are deceptions of each obstacle. Included with the desertion are specific examples from the TwinCATS area.

#### Obstacle 1: Absence of Sidewalks

Area Example:

Napier Avenue, from the St. Joseph River in St. Joseph Township east to Pipestone Rd. in Benton Township

Evidence of Need:

- Identification in public surveys
- The presence of "goat paths," where grass has been worn down by frequent walking and/or biking
- Frequent observations of people walking in the grass, bicyclists riding and riding a wheelchair in the roadway
- Presence of many pedestrian origins and destinations along roadway (For Napier Ave., these origins and destinations include
  - A large apartment complex and many single family houses
  - o A middle school
  - Several grocery stores and markets
  - Several medical offices and other service centers
  - A number of churches several bus stops near corner of Napier Ave. and M-139.



Pedestrian using "goat path" on south side of Napier Ave., between Colfax Ave. and Broadway Ave.



Goat path along north (right) side of Napier Ave., between Ogden Ave. and Union. (Photo Bing Maps)

#### Obstacle 2: Sidewalks in Poor Condition

Area Example:

Main Street, from the Ship Street to Broad Street in St. Joseph

Evidence of Need:

- Identification in public surveys
- Lack of curb cuts, making navigation extremely difficult for many users
- Sidewalks following the angle sharply slanted driveway ramps
- The presence of obstacles within sidewalk, restricting mobility and significantly reducing the effect width of the sidewalk in many places
- Instances of cracked and uneven surfaces
- No buffer between sidewalk and traffic



Absent curb cuts and lack of street buffers on east side of Main St, between Port St. and Ship Street in St. Joseph



Obstacles in sidewalk and rough grading on easside of Main St., between Ship St. and Pleasant St. in St. Joseph

#### Obstacle 3: Absence of Marked Bike Paths

Local Example:

Pipestone Road, between Nickerson Road and River Drive in Sodus Township

Evidence of Need:

- Shoulders with ample width for bike use but without paving
- Other problems pertaining to shoulder conditions not seen on this section of Pipestone Rd. include
  - Paved shoulders with excessive debris (rocks, tree limbs, trash, etc.)
  - Paved shoulders with advanced deterioration
  - Concrete seems and longitudinal grids that can catch bike tires and pose a severe risk to riders



Street view of Pipestone Rd, between M-139 and Napier Ave., showing four travel lanes with no space for a shoulder or full bike lanes. (Photo from Google Maps)



Arial view of Pipestone Rd, between M-139 and Napier Ave. (photo from Bing Maps)

Obstacle 4: Unpaved or Poorly Maintained Shoulders

Local Example:

Pipestone Road, between Nickerson Road and River Drive in Sodus Township

Evidence of Need:

- Shoulders with ample width for bike use but without paving
- Other problems pertaining to shoulder conditions not seen on this section of Pipestone Rd. include

Paved shoulders with excessive debris (rocks, tree limbs, trash, etc.)

- Paved shoulders with advanced deterioration
- Concrete seems and longitudinal grids that can catch bike tires and pose a severe risk to riders



Wide, unpaved shoulder on North side of Pipestone Rd., between Nickerson Rd. and River Rd.



Aerial view of wide, unpaved shoulders on both sides of Pipestone Rd., between Nickerson Rd. and River Rd. (photo from Bing Maps)

#### Obstacle 5: Difficult Road Crossings

#### Local Example:

The intersection of Napier Avenue and Colfax Avenue, on the border of St. Joseph Township and Benton Township

Evidence of Need:

- Pedestrians have a long distances to cross with no islands or other medians
- Public input reporting difficulty crossing and short signal times crossing Napier
- Pedestrian traffic generators, with several stores and a middle school directly adjacent to the intersection
- Other possible signs of problematic crossings
  - A history of serious crashes at or near the intersection
  - Intersections that are excessively complicated and difficult to navigate for bicyclists and pedestrians
  - Excessively wide turning radii, allowing for faster car speeds through the intersection and increasing the distances that pedestrians need to cross
  - Observations of pedestrians struggling with intersections or crossing mid-block in difficult circumstances



Pedestrian crosses Napier Ave. on the east side of Colfax Ave.



Aerial view of the intersection of Napier Ave. (left-right and Colfax Ave. (up-down), showing a crossing width of five lanes on each side of intersection, with a school building shown to the lower right.

#### Obstacle 6: Barriers to Bus Access

#### Local Example:

Mall Drive, between Harbor Pointe Apartments and retail complexes in Benton Township

Evidence of Need:

- Observed absence of sidewalks, street crossings, shoulders, and other walking and biking facilities connecting to bus stops
- Bus records of heavy reliance on demand response (i.e. door-to-door) bus service near fixed route stops (resulting in great inefficiencies in transit provision)
- Presence of many potential destinations for and sources of bus riders in a neighborhood without connection to sidewalks or other non-motorized facilities
- Frequent observation of people walking and using wheelchairs within the roadway and on grassy adjacent strips.



Image of Mall Drive between a set of large apartment complexes and retail centers containing several bus stops; road showing five traffic lanes without sidewalks, bike lanes/shoulders, or intersection crossings; grass showing signs of heavy pedestrian use



Aerial view of Mall Dr. stretching east from the senior Harbor Point apartments, with several pedestrian "goat paths" and an absence of any walking and biking facilities.

# Safety

The primary goal of improved pedestrian and bicycle infrastructure is to provide safe travel for all modes. One of the federal performance measures the TwinCATS MPO is required to have is the reduction of the number of serious crashes involving pedestrians and cyclists. Between 2006 and 2015 out of 22,335 total crashes, 321 were non-motorized crashes; 186 of which involved pedestrians and 135 of which involved bicyclists (Table 5).

Year	Total Crashes	Pedestrian	Bicyclist	Total Non- Motorized Crashes
2006	2,180	26	12	38
2007	2,439	15	11	26
2008	2,740	18	18	36
2009	2,306	12	15	27
2010	2,027	17	12	29
2011	2,015	21	18	39
2012	1,917	17	14	31
2013	2,150	18	11	29
2014	2,253	17	11	28
2015	2,308	15	13	28
Total	22,335	176	135	311

Table 5. Annual Pedestrian & Bicycle Crashes

Over the 10-year period, 10 pedestrians and 3 bicyclists were killed. Over the same period, 35 pedestrians and 15 bicyclists received serious injuries (Table 6). On average, 5 percent of non-motorized crashes result in a fatality and 17 percent in a serious injury, this is compared to a fatality rate for automobile accidents of about 0.5 percent and a serious injury rate of about 2 percent. This indicates how vulnerable pedestrians and bicyclists are to injury when struck by an automobile. Furthermore, out of a 100 total traffic related fatalities in 10 years, 13 were pedestrians or bicyclists. This means that while total number of non-motorized crashes may seem low, the number and likelihood of fatalities in non-motorized crashes is significant.

The locations of pedestrian and bicycle crashes was aggregated into a density map based on the number of crashes within 100 meters (328 ft.) of each other (Map 6). Clearly, certain areas are far more dangerous than others are. Identifying the roads with the highest number of no-motorized crashes is one way to prioritize improvements. To create a list of top the top ten roads with the most non-motorized crashes overall, roads were divided into segments based on city or township (Table 7). Standing out as particularly dangerous is Napier Avenue within Benton Charter Township with the highest total number of non-motorized crashes, as well as the only road segment with more than two fatalities. The roads that had at least one fatality over the 10 years period were all within townships and in locations lacking non-motorized infrastructure.

	Pedestr	Bicyc	list	
Year	Fatalities	Serious Injuries	Fatalities	Serious Injuries
2006	1	6	0	0
2007	0	1	1	2
2008	1	5	0	3
2009	1	3	0	1
2010	2	7	0	0
2011	1	1	0	4
2012	0	5	0	1
2013	2	3	1	0
2014	1	2	0	2
2015	1	2	1	2
Total	10	35	3	15

#### Table 6. Pedestrian and Bicyclist Fatalities



Map 6. Non-motorized crashes 2006-2015

			Pedestrian		Bike		
Road	City	Crashes	Fatalities	Serious Injuries	Crashes	Fatalities	Serious Injuries
Napier Ave,	Benton Twp	9	2	2	4	0	1
Empire Ave.	Benton Harbor	8	0	1	3	0	0
Main St/ BL-94	St Joseph	7	0	1	4	0	0
Broadway	Benton Harbor	3	0	2	4	0	1
Pipestone St.	Benton Harbor	5	0	1	2	0	0
Crystal Ave.	Benton Twp	4	0	3	3	0	0
Martin Luther King/M-139	Benton Twp	5	1	2	2	0	0
Britain Ave.	Benton Harbor	2	0	0	4	0	0
Fair St.	Benton Harbor	3	0	1	2	0	0
Ogden	Benton Harbor	2	0	0	3	0	0
M-139	Benton Twp	1	0	1	4	0	0
Pipestone Rd.	Benton Twp	4	1	0	1	0	0
Territorial	Benton Twp	4	1	1	1	0	0
Union	Benton Twp	4	0	1	1	0	0
Lake	Bridgman	3	0	0	2	0	0
Cleveland	Lincoln Twp	3	0	1	2	0	1
Niles/M-63	St Joseph	4	0	0	1	0	1

#### Table 7. Roads with the Most Non-Motorized Crashes, Fatalities, and Serious Injuries

The breakdown of non-motorized incidents by township shows that a few jurisdictions account for a majority of crashes (Table 8). One indication of the effect of non-motorized infrastructure on safety is the comparison between the City of Benton Harbor and Benton Charter Township. Both Benton Harbor and Benton Charter Township have a much higher number of crashes than the TwinCATS average. Likely, this is because more people are walking in these areas as evidenced by data that shows both communities have a lower share of commuters who drive alone and higher rates of households with no vehicle. Yet while the number of total non-motorized crashes are similar, Benton Charter Township has far more fatalities and serious injuries. One factor, which plays a role, is that Benton Charter Township has very few sidewalks or wide shoulders, often leaving no place for pedestrians to walk other than in high traffic and high speed roads. On the other hand, the City of Benton Harbor had no fatalities. Typically, pedestrians and cyclists will avoid walking on roads that seem dangerous to them. A road that has a high number of non-motorized accidents indicates that despite the safety concerns, the pedestrians typically have option than to walk. It is especially critical to ensure that all people have adequate accommodations and that no one is forced to risk their life to reach needed destinations.

	Bike					
	Crashes	Fatalities	Serious	Crashes	Fatalities	Serious
			Injuries			Injuries
Benton Harbor	51	0	11	40	0	3
Benton Twp	63	7	18	33	1	4
Bridgman	5	0	0	6	0	0
Hagar Twp	2	0	0	4	1	0
Lake Twp	4	0	0	6	0	0
Lincoln Twp	8	1	2	13	0	3
Royalton Twp	2	0	0	1	0	0
Shoreham	0	0	0	1	0	0
Sodus Twp	2	1	0	0	0	0
St Joseph	26	0	1	18	0	3
St Joseph Twp	9	1	1	10	0	1
Stevensville	4	0	1	3	0	1

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	Clashes,	i ataiities,	and Senious I	iijuiies	2000-201

### Progress

Over the past several years, the TwinCATS area has made some progress in providing better nonmotorized transportation. TwinCATS has a subcommittee whose mission is to promote non-motorized improvements. This committee is called the Walk and Roll Committee In 2011, TwinCATS with assistance from the Walk and Roll Committee, published a non-motorized plan called the *Walk and Roll Plan*. This Plan, which was amended into the 2009-2035 Long Range Transportation Plan, was designed to help TwinCATS member jurisdictions target future transportation investments towards those areas that currently lack, or have insufficient, infrastructure to cater to all transportation modes. The plan identifies locations throughout the TwinCATS area where pedestrians, bicyclists, and transit users face particular challenges, and offers possible measures that member jurisdictions could take to improve these facilities in future projects. In particular, the Plan identifies the following obstacles present at some locations in the study area, to safe, efficient, and comfortable movement of pedestrians, bicyclists, and transit users:

- Absence of sidewalks
- Sidewalks in poor condition
- Absence of marked bike paths
- Unpaved or poorly maintained shoulders
- Difficult road crossing
- Excessive door-to-door service for transit due to lack of pedestrian connections on roadways, leading to increased wait times for some customers.

Following this, in 2012 the TwinCATS Policy Committee enacted a Complete Streets Policy, to guide the MPO in its selection of projects and development of plans. Complete Streets refers to streets, which accommodate all users. The Policy states that all projects funded through TwinCATS must; "plan for the safe accommodation of the needs of all users including pedestrians, bicyclists, transit users, motorists, people with disabilities, older adults, school students and young children, freight haulers, and emergency responders" This Policy has been used for the project selection in the 2014-2017 and 2017-2020 Transportation Improvement Programs (TIP). Written into the Policy was room for the MPO Policy committee to grant exemptions and therefore a number of projects were selected that did not provide complete streets. Any major (re)construction on these segments that does not include improved walking and biking facilities ought to have a strong rationale for this decision.

One notable exemption granted was for Napier Avenue due to the cost and difficulty of providing nonmotorized infrastructure. Because of the importance of this corridor for regional travel, its potential for improved transit, and its current use by pedestrians and cyclists, approval was given to study potential improvement along this corridor. The TwinCATS MPO has received a grant to conduct a study along the Napier corridor to explore potential improvements, along with the physical barriers and costs associated with removing them.

Using the *Walk and Roll Plan* as a guide, the 2040 LRP identified a 'top ten' list denoting segments of roadway that the Walk and Roll committee believed should be priorities for future non-motorized projects (Table 9). These segments were identified based on survey responses and rankings by local officials.

Of these segments, only Marquette woods Road from Roosevelt Road to Cleveland Avenue had any improvements since the 2040 Plan was approved. This segment had both sidewalks and wide shoulders added in 2015. This aligns with a non-motorized path along Roosevelt Road. The Roosevelt non-motorized path and sidewalks along Marquette Woods Road connect houses with schools and shopping. The final phase of the path is scheduled for funding in 2019.

Road	From	То	City/Township				
Marquette Woods Rd	Cleveland Ave	Washington Ave	Lincoln Township				
Marquette Woods Rd	Roosevelt Rd	Cleveland	Lincoln Township				
Marquette Woods Rd	St Joseph Ave	Roosevelt Rd	Lincoln Township				
Empire Ave	Colfax Ave	Pipestone St	City of Benton Harbor				
Pipestone Rd	M-139	Napier Ave	Benton Township				
Empire Ave	Pipestone St	M-139	City of Benton Harbor				
Lakeshore Dr	Cleveland Ave	Hilltop Rd	City of St. Joseph				
St Joseph Ave	Lincoln Twp border	John Beers Rd	Village of Stevensville				
Red Arrow Hwy	Lincoln Twp border	Lincoln Twp border	Village of Stevensville				

Table 9. Top Prioritized Road Segments From the TwinCATS 2040 Long Range Plan

It is important to note that the prioritization of roads in the Plan does not necessary fit the roads with the most pedestrians or the most safety concerns. The *Walk and Roll Plan* identified limitations to this methodology, namely that; "survey respondents tended to be clustered in a few portions of the TwinCATS region (a slight majority of respondents claimed residence in either the City of St. Joseph or Lincoln Township), and were largely recreational bicyclists and pedestrians (recreation was by far the most common purpose reported for walking and biking trips)."

While most of the identified segments in the 2040 LRP may not have seen many improvements, there have been other roads, which used federal funds to add non-motorized infrastructure (Table 10). Since 2014, when the 2014-2017 Transportation Improvement Program went into effect, 1.35 miles of sidewalks and 1.85 miles of wide shoulders were constructed. Of the roads which had improvements, 0.75 miles included both sidewalks and wide shoulders, while 0.6 miles of the sidewalks were built on a road without a wide shoulder and 1.1 miles of wide shoulders were constructed without an accompanying sidewalk. In total 2.45 miles of roads which previously had no accommodation for pedestrians or cyclists had improvements made to them (Figure 5).

Road	Improvement Type	Miles	Date
Roosevelt	Trail	0.32	2014
Colfax	Bike Lanes	0.75	2014
Marquette Woods	Sidewalks and Shoulders	0.5	2015
Brown School Rd	Sidewalk and shoulder	0.25	2014
Brown School Rd	Shoulder only	0.5	2014
Shawnee Rd	Shoulder	0.6	2016
Hilltop	Sidewalk	0.6	2017

Table 10. Improvements on Roads Using Federal Funding



Figure 5. Miles of Sidewalk, and Wide Shoulders Constructed since 2014

# Conclusion

Currently walking and biking in the TwinCATS area is not common other than for recreation. The vast majority of commuters drive alone and most households have at least one vehicle. Yet this is not uniform throughout the area. There are locations where a large percentage of households do not own a vehicle at all. Furthermore, there are a number of trends that indicate that non-motorized transportation will become even more important in the near future. The population is aging and as they age people are less likely to be able or desire to drive alone. In addition, younger residents are looking to move to communities where they have more transportation options.

Currently the cities of Benton Harbor, St. Joseph, and Bridgman have sidewalks on nearly all roads. The townships are mostly lacking in non-motorized infrastructure. Yet this is only part of the story since even where sidewalks exist, some in poor condition. Moreover, other factors that improve pedestrian and cycling conditions such besides sidewalks and shoulders deserve consideration. While wide shoulder are present on some roads, they may not be adequate as a non-motorized accommodation given the speed and traffic volumes present.

Currently some of areas of highest shopping and employment density have no non-motorized infrastructure. This means that even walking between destinations, which are near to each other can be difficult and dangerous. This is especially crucial for bus riders. While the bus stops within the cities of St. Joseph and Benton Harbor have sidewalks, most stops in the townships are lacking sidewalks. This deficiency impacts the distance people can walk from stops. The lack of non-motorized infrastructure also forces the bus to sometimes have stops on private property. The result is they often have to pull off the road thus adding complexity and time to the routes. Finally, the areas without sidewalks or wide shoulders are more dangerous. All pedestrian and cyclist fatalities between 2006 and 2015 occurred in areas lacking non-motorized infrastructure.

Despite the challenges, there has been progress. In 2011, TwinCATS published the *Walk and Roll Plan* to identify priorities for improvements. Following that, the Complete Streets Policy was enacted. Since the 2040 Long Range Plan, 2.45 miles of roads received non-motorized infrastructure. In addition, one of the highest priority roads, Napier Avenue, is undergoing a corridor study to explore options and feasibility for adding non-motorized infrastructure.

<sup>&</sup>lt;sup>1</sup> National Association of Realtors. Millennials Favor Walkable Communities. N.p., 28 July 2015. Web. <a href="https://nacto.org/wp-content/uploads/2016/02/1\_Natl-Assoc-of-Realtors-2015-Community-Preference-Survey.pdf">https://nacto.org/wp-content/uploads/2016/02/1\_Natl-Assoc-of-Realtors-2015-Community-Preference-Survey.pdf</a>>.

<sup>&</sup>lt;sup>2</sup> Ewing, R., & Cervero, R. (2010). Travel and the built environment: a meta-analysis. *Journal of the American planning association*, *76*(3), 265-294.