City of Zeeland

Zeeland Non-Motorized Plan

October 22, 2019

Moore+Bruggink
Consulting Engineers

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1.0 ACKNOWLEDGMENTS

1.1 City of Zeeland Staff

Timothy Klunder, City Manager
Timothy Maday, Community Development Director
Scott Nienhuis, Public Works Operations Superintendent
Kevin Plockmeyer, Assistant City Manager/Finance Director

1.2 Moore & Bruggink Consulting Engineers

Alan Pennington, P.E., Project Manager
Piotr Lewak, P.E., Project Engineer
Brett Heist, GIS Analyst

2.0 EXECUTIVE SUMMARY

2.1 Introduction

Zeeland is a premier and vibrant place in which to live, work, and raise a family. The community deeply cherishes its Dutch roots and promote its heritage and progressive values by inviting others to "Feel the Zeel," which is the City's adopted marketing slogan. The City's area of only three square miles constitutes its unique character and a perfect environment for a truly pedestrian and bicycle-friendly community in which a non-motorized mode of transportation can enhance residents' quality of life.

This Non-Motorized Plan is intended to offer guidance to develop infrastructure to meet the goal of promoting non-motorized transportation.

2.2 Project Scope and Methodology

The Project Team consisted of City leaders and its consultant – Moore & Bruggink Consulting Engineers. The City Council and City's Planning Commission took an active role by providing input at the projects' milestones. Public comments were heard at the Public Hearing, and more comments were invited through the City's web site. The findings of the public survey conducted as a part of the Master Plan public input process in 2011 were considered with this plan.

Project scope included the following tasks:

- Inventory of existing pedestrian and bicycle facilities.
- Assessment of existing conditions for both pedestrian and bicycle infrastructure.

Existing pedestrian facilities were compared to the ideal state benchmark, and bicycle infrastructure was tested by the Level of Traffic Stress criteria as proposed by Peter G. Furth, et al. in the Mineta Transportation Institute Report 11-9 – "Low Stress Bicycling and Network Connectivity." (5)

- Proposed pedestrian facilities were mapped and prioritized after conducting a safety audit and applying priority criteria relative to pedestrian activities.
- Proposed bicycle facilities were established to accommodate a majority of the biking population (**Interested but Concerned** group) following a safety audit studying connectivity to regional system, major destinations, and future land use.
- Six options for crossing of BL I-196 were studied and later narrowed down to three favorites. Each alternative was then superimposed over the proposed bicycle network to verify if additional improvements were justified to ensure connectivity.

2.3 Project Outcomes

The proposed Zeeland Non-Motorized Plan is meant to guide the City in developing a safe and logically connected non-motorized network that will complement an efficient multimodal transportation network. Few of the proposed pedestrian and bike facilities are on the borderline streets and some recommended improvements happen to be outside of the City of Zeeland jurisdiction. A consensus among neighboring governments within the Macatawa Area Coordinating Council will be necessary to include those improvements in the MACC Non-Motorized Plan.

Sidewalk Priorities of Most Importance Include:

- W. Washington Avenue from west city limits to Franklin Street
- W. Roosevelt Avenue from N. Colonial Street to State Street. This pedestrian facility can be combined with a bicycle facility as a side path on the north side of the street in Holland Charter Township.
- E. Washington Avenue from Maple Street to N. Carlton Street. This pedestrian facility can be combined with a bike facility as a side path on the south side of the street.
- S. State Street from BL I-196 in front of Burger King – east side
- W. Lawrence Avenue east of Lee Street
- Valley Avenue west of Taft Street
- W. Royal Park Drive from 100th Street east to Mast Heating and Cooling driveway and W Royal Park Drive from Parkside Drive to 300 feet west of 96th Avenue. This pedestrian facility can be combined with a bike facility as a side path on the north side of the street.
- Riley Street from Logan Lane to 84th Street. This pedestrian facility can be combined with a bike facility as a side path on the north side of the street in Holland Charter Township.

Proposed Bicycle Facilities

Proposed bicycle facilities may include a combination of different types of bikeways: shared use paths, side paths, on-street bike lanes, bicycle routes, bicycle boulevards, marked shared lanes (sharrows), and cycle tracks. Definitions of the different bike facilities are illustrated on pages 9-11. All recommended bikeways will be adequate for the **Interested but Concerned** group and will be the LTS 2 category.

Recommended Bikeways Include:

1. Side paths on following street segments:

    - Roosevelt Avenue between N. Franklin Street to N. Centennial. A portion of this facility will be in the Zeeland Charter Township.
    - Riley Street between Logan Lane and 84th Avenue. This facility on the north side of the street will be in the Zeeland Township.
    - E. Main Avenue between N. Fairview Street and east City limits
    - South side of E. Washington Avenue between N. Maple Street and N. Carlton Street. This bikeway can be combined with a pedestrian facility as a side path on the south side of the street.
    - N. Centennial Street from E. Washington Avenue north.
    - N. Franklin Street between W. Washington Avenue and W. McKinley Avenue.
    - North side of BL I-196 from 104th Avenue to Byron Road.
    - South side of BL I-196 from west City limits to 100th Street and from 96th Avenue to 92nd Avenue.

2. On-street bike lanes:

    - W. Main Avenue from W. Washington Avenue to State Street and E. Main Avenue from Centennial Street to Fairview Street.
    - Central Avenue from Lee Street to Fairview Street.
    - S. Taft Street from Huizenga Avenue to W. Main Avenue.
    - 101st Street from BL I-196 to Huizenga Avenue.

- S. Fairview Street from BL I-196 to E. Central Avenue.
- S. Lee Street from W. Lawrence Avenue to W. Main Avenue.

3. Bicycle boulevards:

   - N. Jefferson Street from W. Main Avenue to E. Roosevelt Avenue.

4. Bike routes:

   - E. Rich Avenue from Peck Street to east of Division Street if Option 3 (Bridge at Peck St.) is chosen for BL I-196 crossing.
   - Jefferson Street from Central Avenue to W. Roosevelt Avenue.

5. Sharrows:

   - N. Franklin Street from W. Main Avenue to W. Washington Avenue.
   - N. Centennial Street from E. Main Avenue to E. Washington Avenue.

6. Cycle tracks:

   - Alternative connection for BL I-196 crossing on S. Maple Street from BL I-196 to W. Main Street.

7. Separated grade crossings of I-196 BL Options:

   - Option I – Non-motorized bridge at the intersection of Fairview Road.
   - Option II – Non-motorized bridge at the intersection of Maple Street.
   - Option III – Non-motorized bridge at the end of Peck Street.
   - Option IV – Tunnel at the intersection of State Street.
   - Option V – Non-motorized bridge at the end of the Huizenga Avenue cul-de-sac.
   - Option VI – Non-motorized bridge at the intersection of 101st Street.

   The Project Team felt that a further study on the final crossing location and its connections to the network should be conducted to address environmental impacts, cost, and constructability.

8. Other bike promotion initiatives:

   - Way-finding signs;
   - Bicycle parking downtown;
   - Adoption of bicycle-friendly ordinances;
   - Encouragement through special biking events; and
   - Promotion of bicycle safety through safety programs and enforcement.

3.0 BACKGROUND AND NEED FOR PROJECT

3.1 Previous Planning and Policy-Setting Efforts

Zeeland is recognized as a community in which to live, work, and raise a family. The 2011 City of Zeeland Master Plan (1) emphasizes the role of an efficient and safe non-motorized infrastructure, to achieve a well-balanced multimodal system necessary to maintain a healthy and vibrant community. It notes the need to connect the existing pathways on the north side of the city and on the south side (serving Huizenga Park) with downtown and with the regional non-motorized system. The present discontinuity in the network prevents the existing pathways from being fully utilized and does not fully promote walking and biking between neighborhoods and other destinations. The residents' survey that was a part of Master Plan public input indicated that 81% of respondents felt that hiking, walking, and trails are somewhat, if not very, important. Overall, a majority of participants felt that the City could benefit from expanded non-motorized options. Non-motorized conditions most often rated fair or poor and included sidewalk interconnectedness (21%), sidewalk quality and condition (19.6%), and ease of bicycle travel (17.2%). (1)

The Master Plan Final Recommendations Include:

- Maximize the safety and efficiency of the existing Zeeland street system for motorists and non-motorists;
- Minimize traffic conflicts between various user types of transportation facilities, yet recognize the special transportation needs of each user; and
- Promote non-motorized transportation for Zeeland residents.

On March 4, 2013, the City of Zeeland adopted a Complete Streets Policy that mandates that all capital transportation projects be equally accessible to all legal users in a manner that promotes safe and efficient movement of people and goods, whether by automobile, truck, assistive device, foot, or bicycle.

The most important goals of this new approach to transportation include:

- Developing of a Non-Motorized Transportation Plan that will guide the implementation of sidewalks, curb ramps, trails, pathways, signage, bike lanes, and other components in order to maximize the opportunity to establish walkable and bikeable roadways within the limits of the City of Zeeland. This Plan will be reviewed every five years in conjunction with the review of the City's Master Plan. (2)
- The City of Zeeland's Master Plan, Non-Motorized Plan, Capital Improvement Plan, Downtown Vision Plan, Strategic Action Plan, and recommendations shall be referenced and considered during the planning and design (prior to construction, reconstruction, and rehabilitation) of capital improvement projects within the limits of the City of Zeeland. (2)

4.0 PROJECT DEFINITION AND METHODOLOGY

4.1 General

The Project was divided into two parts: **Pedestrian Facilities** (Sidewalks) and **Bicycle Facilities**. There is overlap with Shared Use Paths and Side Paths that are commonly used by both pedestrians and bikers, as well as other users. For the purpose of this study, sidewalks narrower than 8 feet were disregarded as bicycle facilities. It should be noted that according to the City of Zeeland traffic ordinances, it is legal for bikers to ride on sidewalks (except for a few streets downtown); however, the majority of US and international studies have found bikers and pedestrians do not mix safely on narrow sidewalks. This is oftentimes due to a high "free speed" of bicycles on sidewalks when pedestrian volumes are low. Dedicated bike facilities mitigate this conflict by special geometric design and traffic control devices.

In order to analyze the existing Pedestrian and Bicycle facilities, a database of street networks was developed to collect data on the following street features:

- Street width (including gutter pan);
- Number of lanes;
- Speed limit and prevailing speed;
- On-street parking and frequency of parking maneuvers;
- Mass transit routes and stops;
- Truck routes;
- Traffic volumes (ADT);
- Street grades; and
- Street ROW width.

In addition, Moore & Bruggink staff studied the City of Zeeland traffic ordinances and Ottawa County existing regional non-motorized network and reviewed the Macatawa Area Coordinating Council Non-Motorized Plan and the Ottawa County Non-Motorized Master Plan.

The non-motorized crossing alternatives of BL I-196 were reviewed from the perspective of both pedestrians and bikers. This analysis was included in the Part for Bicycle Facilities.

4.2 Methodology for Pedestrian Facilities Plan

Figure 1 illustrates the work flow algorithm for the Pedestrian Facilities Plan.

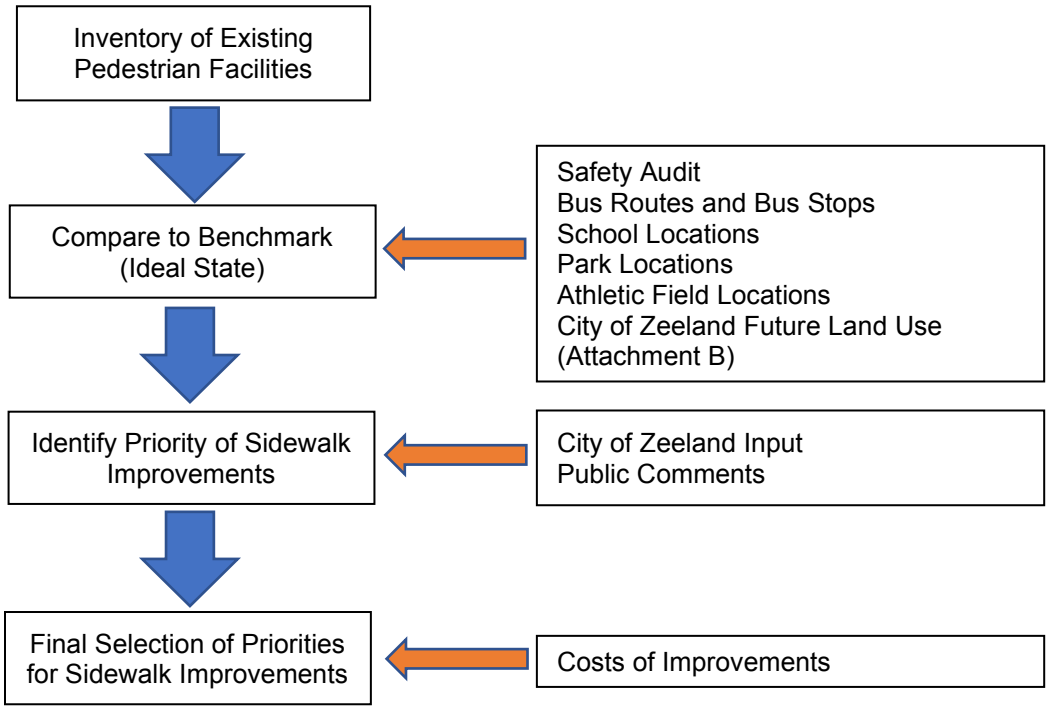

Figure 1 – Pedestrian Facilities Planning Methodology

After the survey of existing sidewalks was completed, additional information relative to pedestrian activities was collected:

- Connectivity to bus stops within 1/2 mile;
- School, parks, and athletic field locations;
- Information on planned future high density and mixed-use land use; and
- Pedestrian crashes for the period 2008-2017 (10 years).

Moore & Bruggink's project managers met several times with City staff to establish project goals and to obtain input relative to proposed sidewalk improvements. On March 11, 2019, a Public Hearing was held at the joint Zeeland's City Council and Planning Commission meeting. The City published the draft of the Non-Motorized Plan on the City's website for public comment.

Attachment A contains public comments received.

4.3 Methodology for Bicycle Plan

Figure 2 shows a work flow algorithm for Bicycle Facilities Plan.

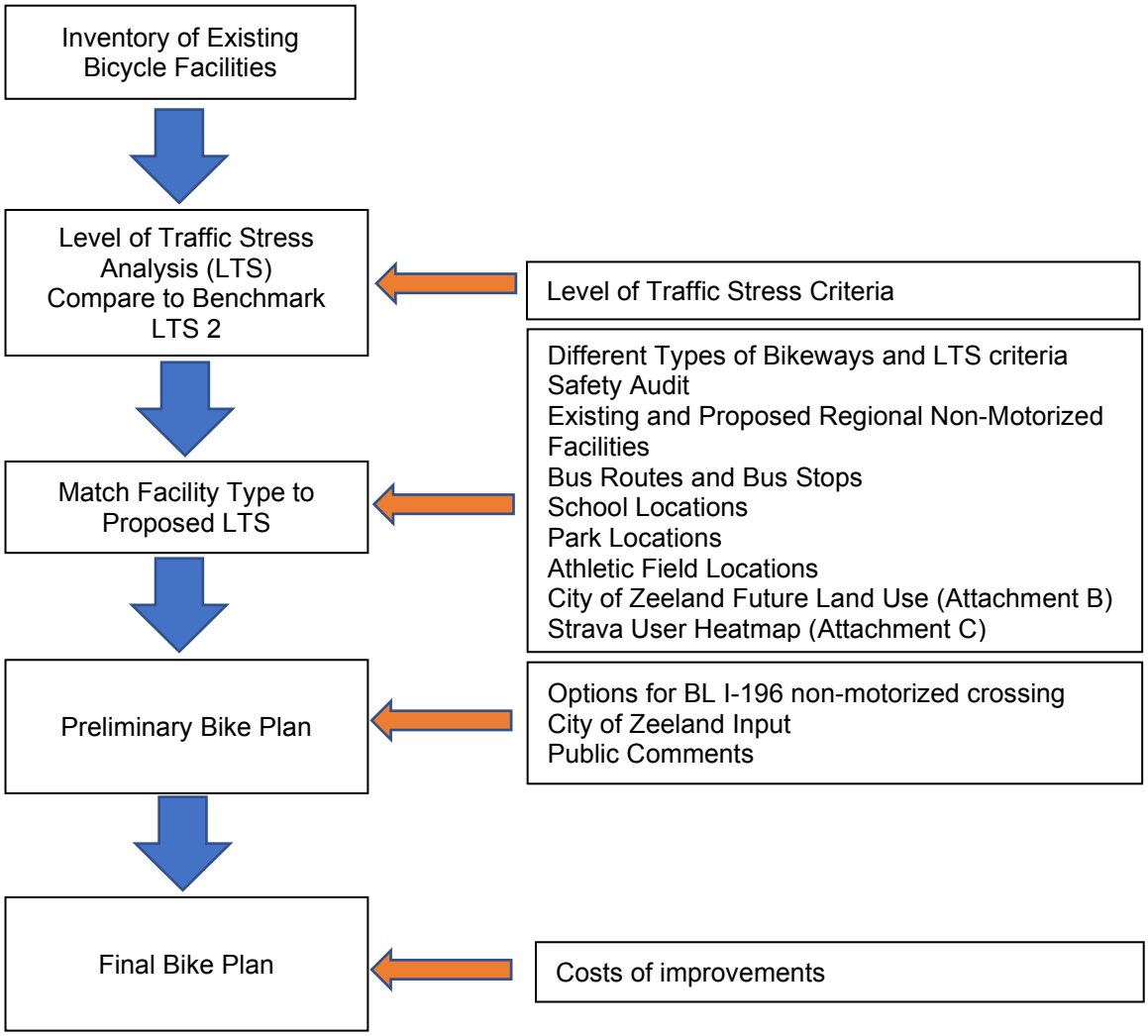

Figure 2 – Bicycle Facilities Planning Methodology

4.3.1 Definitions of Different Bike Facilities

The examples of different bike facilities illustrated in Figure 3 through Figure 9 are defined by the AASHTO's (American Association of State Highway and Transportation Officials) Guide for the Development of Bicycle Facilities, and cycle tracks (separated bike lanes – Figure 10) are defined by the NACTO's (National Association of City Transportation Officials) Urban Bikeway Design Guide.

Shared Lanes – On-road bikeways on roadways where bicycles may be operated unless prohibited by statute or regulation. Usually bicycles and motor vehicles share the same travel lane.

Figure 3 – Source: AASHTO

Marked Shared Lane – A shared lane marked with Shared Lane Markings or "sharrows." The marking is intended to assist bicyclists with lateral positioning in a shared travel lane.

Figure 4 – Source: City of Grand Rapids

Paved Shoulders – A shoulder is the portion of the roadway contiguous with the travelled way that accommodates stopped vehicles, emergency use, and support of the roadway pavement.

Figure 5 – Source: AASHTO

Bike Lanes – A portion of the roadway designated for preferential or exclusive use by bicyclists by pavement markings and signs. Bike lanes are typically located on the right side of the roadway but can be located along the left side of one-way streets.

Figure 6 – Source: City of Grand Rapids

Bicycle Boulevards – A local street or series of contiguous street segments that have been modified to function as a through way for cyclists, while discouraging through motor vehicle traffic.

Figure 7 – Source: NACTO

Shared-Use Paths – an off-road facility physically separated from motorized traffic by an open space or barrier. Shared-use paths can be used by pedestrians (including skaters, wheelchairs, and joggers). A Shared-Use Path parallel to the road and within the road ROW is referred to as a Side Path.

Figure 8 – Source: GVMC Staff

Bicycle Routes

Preferred bikeway on low volume streets defined by signs only and often supplemented with the way-finding signs.

Figure 9 – Source: AASHTO

Cycle Tracks (separated bike lanes) – A cycle track is physically separated from motor vehicle traffic travel lanes and parking lanes, and distinct from sidewalks. Unlike a shared-use path, cycle tracks are intended for the exclusive use of bicyclists. Cycle tracks can be one-way or two-way and can be at street level, sidewalk level, or an intermediate level between the street and sidewalk.

Figure 10 – Source: P. Lewak

4.3.2 Definition of Low Stress Bicycling Methodology

For bike network analysis, Moore & Bruggink Consulting Engineers employed the Level of Traffic Stress methodology proposed by Peter G. Furth, et al., in the Mineta Transportation Institute Report 11-9 – "Low Stress Bicycling and Network Connectivity." The authors of the study developed the Level of Traffic Stress criteria that can be used to evaluate and guide bicycle network planning. It allows to classify the different bicycle facilities and corresponding Level of Traffic Stress experienced by different groups of bikers from the user's perspective. Different types of users will have different tolerances of stress related to the conditions of the roadway. Roger Geller, Portland's bicycle coordinator (2) surveyed residents' attitudes toward biking and toward bike infrastructure and divided the population into four different classes as illustrated in Figure 11.

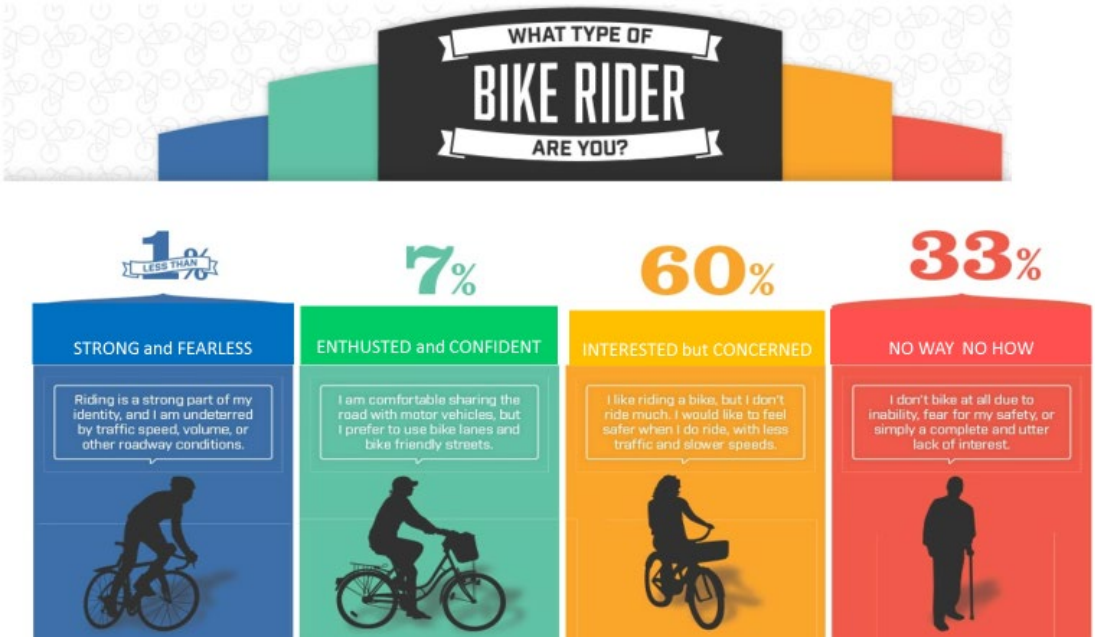

Figure 11 – Bike Rider Categories, by Roger Geller, 2006

- **Strong and Fearless** make up a very small proportion of cyclists, fewer than 1 percent. This group will cycle through inclement weather, poor road conditions, and high traffic volume and will tolerate the highest level of traffic stress. They are usually seen mixed with busy traffic and riding at high speeds. Low stress bicycle planning does not apply to them; they prefer to operate in the traffic lanes and do not want special bikeways. (4)
- **Enthused and Confident** are more common, comprising approximately 7 percent of riders. They are comfortable sharing the road with automobiles, but prefer their own facilities. This group would appreciate special accommodations like traditional bike lanes, buffered bike lanes, boulevards, and cycle tracks. This group is not afraid to mix with traffic to reach their destinations. (4)
- **Interested but Concerned** make up the largest category, approximately 60 percent. These bikers enjoy riding, but are deterred by fear of vehicular traffic. "They are generally not afraid of other cyclists, or pedestrians, or injuring themselves in a bicycle only crash. When they say they are 'afraid' it is a fear of people driving automobiles." (4)

This group prefers well-defined, preferably separated bike facilities like cycle tracks, shared-use paths, side paths, or wider bike lanes on moderate volume roads.

- **No Way, No How** – This group is not interested in bicycling at all for any purpose. They will not be persuaded to get on a bike, regardless of how favorable conditions might be. (4)

Low Stress Bicycle Planning attempts to match type of facility with the level of traffic stress that can be tolerated by the design biker group. This approach has been very successful in the Netherlands to develop design standards for planning and engineering for bicycle infrastructure. The standards are designed for Level of Traffic Stress 2 acceptable by a majority of users from the **Interested but Concerned** category. Table 1 illustrates a match-up between the biker type categories and facility LTS categories. Table 2 shows the Level of Traffic Stress Criteria from the Peter G. Furth's "Low Stress Bicycling and Network Connectivity" research that have been used for evaluating the existing Zeeland bike infrastructure and future bikeway system.

Table 1 – Biker Type and Corresponding Stress Tolerance by Facility Type

Strong and Fearless	LTS 4 and above
Enthused and Confident	LTS 3
Interested but Concerned	LTS 2 – suitable for a majority of adults and 5th grade children, LTS 1 – suitable for younger children
No Way, No How	N/A

Table 2 – Level of Traffic Stress Criteria for Road Segments

Level of Traffic Stress Criteria for Road Segments, version 2.0, June, 2017

Mixed traffic criteria

Number of lanes	Effective ADT*	Prevailing Speed ≤ 20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50+mph
Unlaned 2-way street (no centerline)	0-750	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	751-1500	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4
	1501-3000	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4
	3000+	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
1 thru lane per direction (1-way, 1-lane street or 2-way street with centerline)	0-750	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	751-1500	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4
	1501-3000	LTS 2	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	3000+	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
2 thru lanes per direction	0-8000	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4
	8001+	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
3+ thru lanes per direction	any ADT	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

* Effective ADT = ADT for two-way roads; Effective ADT = 1.5*ADT for one-way roads

Bike lanes and shoulders not adjacent to a parking lane

Number of lanes	Bike lane width	Prevailing Speed ≤ 25 mph	30 mph	35 mph	40 mph	45 mph	50+ mph
1 thru lane per direction, or unlaned	6+ ft	LTS 1	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	4 or 5 ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
2 thru lanes per direction	6+ ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3
	4 or 5 ft	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4
3+ lanes per direction	any width	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4

Notes 1. If bike lane / shoulder is frequently blocked, use mixed traffic criteria.
2. Qualifying bike lane / shoulder should extend at least 4 ft from a curb and at least 3.5 ft from a pavement edge or discontinuous gutter pan seam
3.Bike lane width includes any marked buffer next to the bike lane.

Bike lanes alongside a parking lane

Number of lanes	Bike lane reach = Bike + Pkg lane width	Prevailing Speed ≤ 25 mph	30 mph	35 mph
1 lane per direction	15+ ft	LTS 1	LTS 2	LTS 3
	12-14 ft	LTS 2	LTS 2	LTS 3
2 lanes per direction (2-way)	15+ ft	LTS 2	LTS 3	LTS 3
2-3 lanes per direction (1-way)		LTS 2	LTS 3	LTS 3
other multilane		LTS 3	LTS 3	LTS 3

Notes 1. If bike lane is frequently blocked, use mixed traffic criteria.
2. Qualifying bike lane must have reach (bike lane width + parking lane width) ≥ 12 ft
3.Bike lane width includes any marked buffer next to the bike lane.

The following examples of different bike facilities illustrate favorable road conditions categorized by the different Levels of Traffic Stress:

Bicycle Level of Traffic Stress LTS 1:

Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. (5)

Figure 12 – Source: NACTO

Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. (5)

Figure 13 – Source: GVMC Staff

Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross. (5)

Figure 14 – Source: P. Lewak

Bicycle Level of Traffic Stress LTS 2:

Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults. (5)

Figure 15 – Source: NACTO

Bicycle Level of Traffic Stress LTS 3:

More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians. (5)

Figure 16 – Source: P. Lewak

Bicycle Level of Traffic Stress LTS 4:

A level of stress beyond LTS 3 (5)

Moderate to high speeds, high traffic volumes.

From 2 to greater than 5 lanes.

Intersections may be judged unsafe or difficult to cross.

Figure 17 – Source: NACTO

High speed – multilane roadways with narrow or no bike lanes.

High stress – suitable for experienced or skilled cyclists.

Figure 18 – Source: NACTO

5.0 PEDESTRIAN FACILITIES

5.1 Existing Pedestrian Facilities

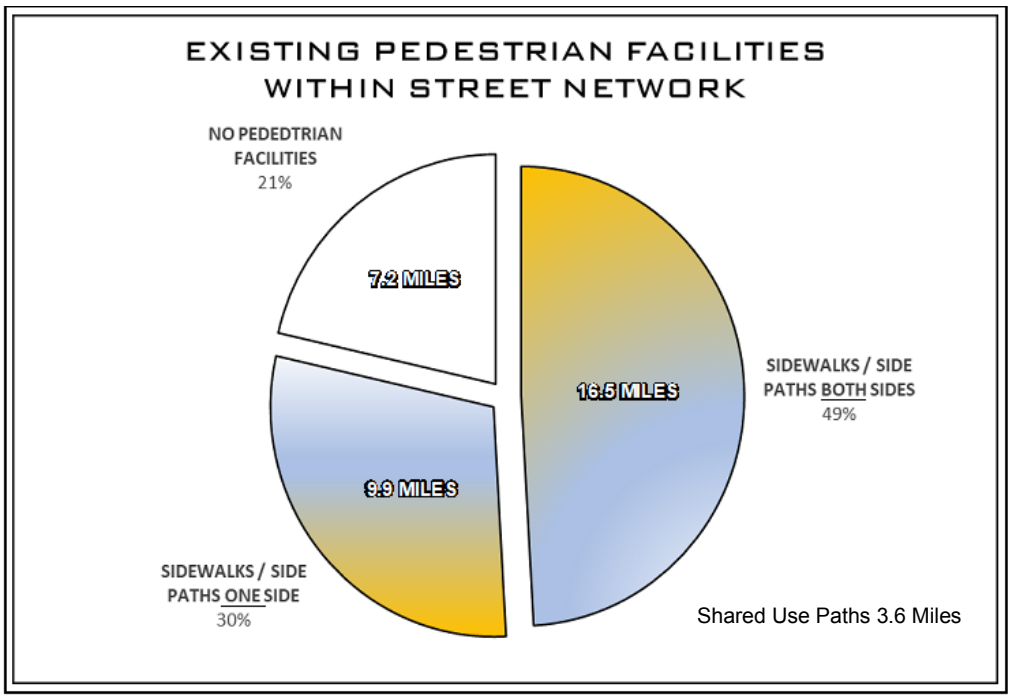

Figure 19 – Existing Pedestrian Facilities Outside of Street Network

Out of 33.6 miles of Zeeland's street network, 16.5 miles (49%) of streets have sidewalks on both sides, 9.9 miles (30%) have sidewalks on one side, and 7.2 miles (21%) have no sidewalks.

There are also 3.6 miles of shared-used paths outside of the street ROW.

Total linear length of Zeeland's pedestrian facilities is 46.5 miles.

Exhibit I shows a map of the existing pedestrian facilities.

5.1.1 Benchmarking and Pedestrian Activity Factors

Each city street segment was compared to the Ideal State Benchmark defined as: ADA (Americans with Disability Act) compliant sidewalks on both sides of the street.

There are 7.2 miles of deficient streets with no sidewalk on both sides, and 9.9 miles of deficient streets with sidewalk on one side, for a total of 17.1 miles (50.9%).

Crash analysis for the 10-year period – for years 2008-2017 – indicated 20 crashes, 19 of which are injury-type crashes.

Table 3 – History of Pedestrian Crashes, Years 2008-2017

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of Crashes	2	0	4	4	1	2	1	3	2	1

A majority of crashes happened on busy downtown streets with sidewalks on both sides:

- 5 crashes on Main Avenue
- 6 crashes on State Street

Only one crash happened on the street without sidewalk on either side – Riley Street at 84th Avenue.

Crash data does not indicate a conclusive crash pattern that would be critical in selecting particular street segments for improvements. A further study may need to be performed at the intersections of Church Street and Main Avenue (3 crashes) and Washington Avenue and State Street (2 crashes) to see if any pedestrian safety improvements are warranted.

Exhibit II shows a map of existing pedestrian facilities with bus stops and pedestrian crash locations.

Other factors used for selecting priorities for sidewalk improvements included:

- Proximity to Bus Route 11 and Bus Route 8 bus stops. Links lacking sidewalks within 1/4- to 1/2-mile radius would be rated higher. It is on the premise that the accommodation of safe walking to mass transit is essential for an efficient multimodal transportation.
- School, park, athletic field locations. Links lacking sidewalks within 1/2 mile to school (on one side or both sides) and other desirable destinations would get higher priority rating.
- City of Zeeland future land use. Links adjacent to higher densities and mixed use would receive higher priority rank. Links in residential zones R3, R2, and R1 would rank higher.
- No sidewalk on street with speed limit higher than 25 MPH. Links with higher speeds will receive higher priority due to safety concerns.
- Link is only gap in adjacent system. Links that would complete connectivity in existing system would get higher ranking.

Exhibit III shows the table with priority ranking and Exhibit IV contains a map of proposed sidewalks and their priority level: high, medium, and low.

Street segments that have the highest compounded priority include:

- W. Washington Avenue from west city limits to Franklin Street (no sidewalks within the area of business district and bus stops);
- W. Roosevelt Avenue from N. Colonial Street to State Street (no sidewalk on the north side on high speed street in proximity of the school complex; this segment is within the Holland Charter Township);
- E. Washington Avenue from Maple Street to N. Carlton Street (only missing link on higher speed street);
- S. State Street from BL I-196 in front of Burger King – east side (only missing link on a busy corridor and at a major pedestrian destination);

- W. Lawrence Avenue east of Lee Street (no sidewalks next to school);
- Valley Avenue west of Taft Street (no sidewalks next to school);
- W. Royal Park Drive from 100th Street east to Mast Heating and Cooling driveway and W Royal Park Drive from Parkside Drive to 300 feet west of 96th Avenue. This pedestrian facility can be combined with bike facility as a side path on the north side of the street.
- Riley Street from Logan Lane to 84th Street (only one link without sidewalk or shoulder on a high-speed road with proximity to a bus stop. This segment is within the Zeeland Charter Township).

6.0 BICYCLE FACILITIES

6.1 Existing Bicycle Facilities

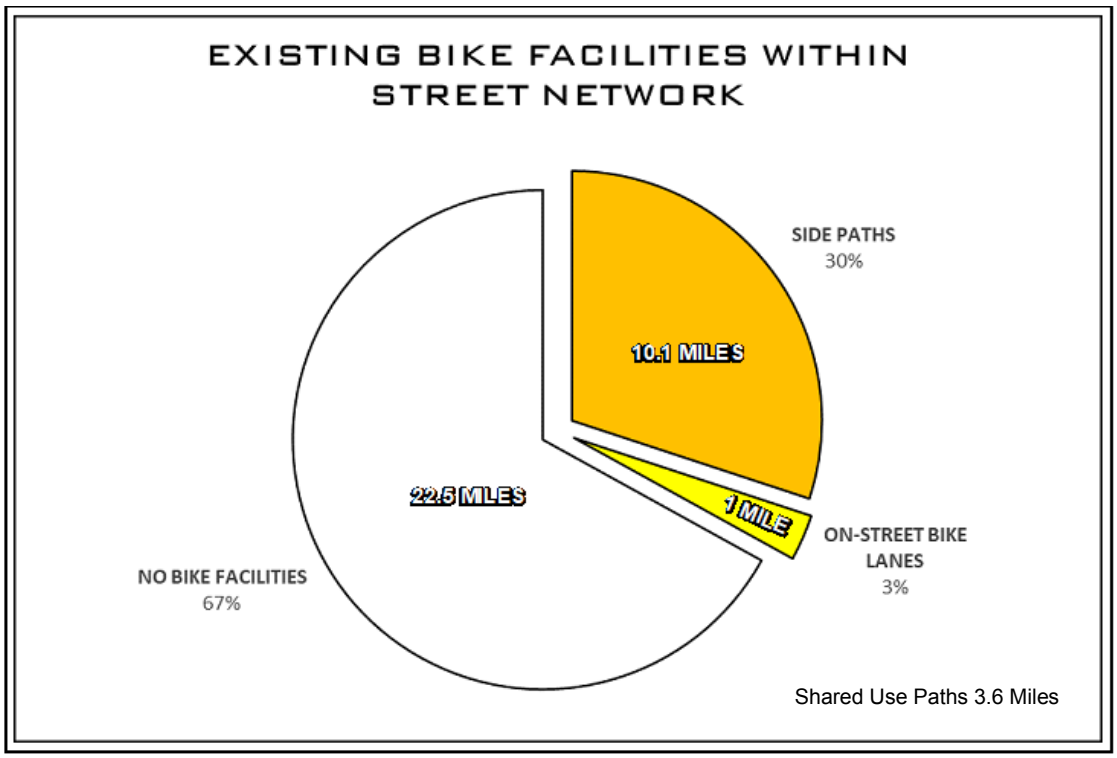

Figure 20 – Existing Bike Facilities Outside of Street Network

The existing Zeeland bikeway network consists of 3.6 miles of shared-use paths, 10.1 miles of side paths (within street ROWs and parallel to the street) and 1 mile of on-street traditional bike lanes on E. Washington Avenue between N. Fairview Road and 84th Avenue. The total length of the bikeway network is 14.7 miles.

Exhibit V shows a map of existing bike facilities.

The majority of existing bicycle infrastructure is located in the north industrial part of the city and in the south-west residential part, in close proximity of the Huizenga Park.

The existing bicycle facilities are predominantly multiuse shared use paths/side paths serving mainly a recreational purpose. The authors of the 2011 City of Zeeland Master Plan adequately captured the existing condition: “the Northside Pathway has been a successful addition to Zeeland and provides walking and cycling opportunities. However, the pathway and the widened side paths on the north side of the city that connect to it are not well connected to downtown, the parks or the neighborhoods. This prevents the existing pathways from being fully utilized and does not fully promote walking and biking between neighborhoods and other destinations.”

The biggest barrier for non-motorized public is BL I-196 bisecting City of Zeeland into separate north and south parts without friendly crossings.

Zeeland's existing bike system is connected to the regional system via Riley Street on the north side and via Perry Street and 96th Avenue on the south side.

Presently, there is no north-south continuation of the regional non-motorized system through the City of Zeeland. The existing east-west regional non-motorized routes bypass Zeeland without convenient connection to Zeeland's network.

Due to limited ROW in the urbanized core of the city, an extensive expansion of the existing shared-use paths and side paths in the downtown area is not feasible. As discussed in Section 3.1, side paths due to the operational and safety concerns are not recommended in downtown areas. In order to develop an efficient non-motorized connectivity between neighborhoods and destinations, new alternatives for network expansion should include on-street bike facilities.

6.2 Existing Street Network and Bicycle Level of Traffic Stress

Moore & Bruggink used Level of Traffic Stress methodology to access the existing street system and to develop an on-street bike system. Each street segment was tested with the LTS criteria (Figure 21).

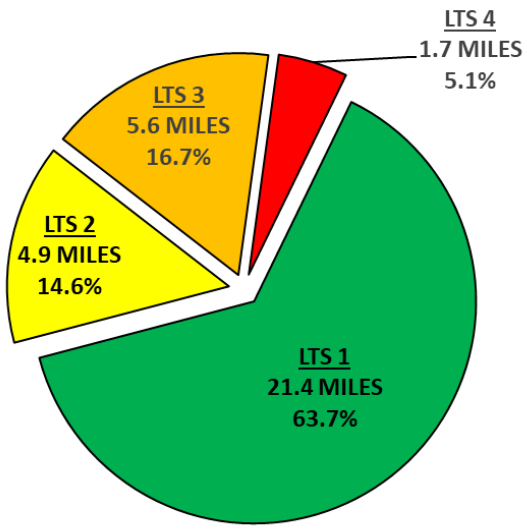

Figure 21 – Level of Traffic Stress within Street Network

A majority of Zeeland's street network – 21.4 miles (63.7%) – were rated LTS 1. Those are low volume, low speed residential streets, and streets with existing side paths.

4.9 miles of street segments were rated LTS 2. Those are neighborhood collector streets and minor low-speed streets.

The LTS 3 category in the quantity of 5.6 miles are major higher volume streets with speeds higher than 25 MPH.

Finally, 1.7 miles of Zeeland's streets were rated LTS 4. Those are major, high volume multilane streets. Also, each two-lane direction of MDOT's BL I-196 has been rated LTS 4 or higher due to the high volume, high percentage of trucks, and high speeds.

Exhibit VI presents a map of the existing Zeeland street network rated with LTS criteria.

6.3 Bicycle Level of Traffic Stress and Crash History

Exhibit VII shows the locations of bicycle-related crashes during a ten-year period, from 2008 till 2017, and Table 4 presents the distribution of crashes.

Table 4 – History of Bicycle Crashes, Years 2008-2017

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of Crashes	3	1	0	2	1	5	3	0	1	0

There is a correlation between the high LTS streets and high accident occurrences. 14 out of the total of 15 crashes happened on the street segments rated LTS 3 or higher. The majority of crashes occurred on two of Zeeland's busiest streets: State Street – 9 crashes, and Main Avenue – 4 crashes.

In 2011, there was one fatal bicycle crash at the State Street and BL I-196 crossing.

Research indicates that well-defined bicycle infrastructure can prevent some of the bicycle/car crashes. This is accomplished by assigning a dedicated space to bicycle travel, separating both modes, and increasing motorists' awareness of bikers sharing the common roadway.

Bicycle crashes are a factor in choosing particular types of bike facilities.

6.4 Recommended Bicycle Facilities

Recommended bikeway facilities were established to accommodate the **Enthused and Confident** group and provide LTS 2 facilities as much as feasible.

The routes over the City street network were configured to accomplish the following goals:

- connect higher density residential zones with major destinations (e.g., schools, parks, athletic fields, municipal offices, shopping centers);
- provide connectivity to regional non-motorized system (trails);
- provide bike facilities in downtown Zeeland;
- ensure connectivity to major recreational areas; and
- promote multimodal transportation opportunities to switch from biking to mass transit and rail.

Several major streets were excluded from the bike network due to their function as a major truck route, availability of ROW, high volume of traffic, and high speed.

Those links include:

- W. Washington Avenue from W. Main Avenue (newly constructed roundabout) to N. Maple Street.
- State Street from BL I-196 to E. Roosevelt Avenue.

Main Avenue between State Street and Centennial Street should be studied in detail to balance competing interests between on-street parking in downtown commerial zones and

bike facilities. One solution to introduce the bikers' presence is to install sharrows and change existing traditional angle parking to "reverse" (or back-in) parking. This would allow motorists to safely observe oncoming bikers.

Proposed on-street bike facilities would include the following types of bike facilities:

- Shared use paths/side paths;
- Traditional bike lanes;
- Bicycle routes;
- Marked shared lanes;
- Cycle tracks; and
- Bicycle boulevards.

A cycle track (separated bike lanes) could be considered on Maple Street when connecting on-street bikeways with the non-motorized crossing of BL I-196.

Exhibit VIII shows a map of proposed bicycle facilities system.

6.5 Alternatives for BL I-196 Non-Motorized Crossing

City of Zeeland leadership has specified that two of the biggest priorities for improving non-motorized system is providing a friendly crossing of BL I-196 and a convenient non-motorized access to Huizenga Park.

The presently marked crossing of BL I-196 at S. Fairview Road could be categorized as LTS 4 or higher in accordance with the Traffic Stress Criteria for Crossings (5). This is due to the existing highway geometry (horizontal curvature), sight distance, and the crossing distance. Only daring ones would risk crossing at this location.

The other two signalized crossings at State Street and 104th Avenue are not suitable for less experienced bikers and young children. Moore & Bruggink, during their onsite visits, observed bikers not being familiar with push buttons. Parents supervising young children have been very hesitant about when to cross because the signal timing provides only few seconds of time to cross 1/2 of the roadway to the median. Ultimately, oftentimes the crossing had to to be completed in two stages – halfway to the median, and halfway to the other side on the second signal cycle. State Street and BL I-196 is a site of the only fatal accident in Zeeland during the period from 2008 -2017.

Moore & Bruggink looked at six alternatives for the BL I-196 non-motorized crossing as illustrated in Figure 19. All options involve a grade-separated crossing:

- Option I – Non-motorized bridge at the intersection of Fairview Road.
- Option II – Non-motorized bridge at the intersection of Maple Street.
- Option III – Non-motorized bridge at the end of Peck Street.
- Option IV – Tunnel at the intersection of State Street.
- Option V – Non-motorized bridge at the end of the Huizenga Avenue cul-de-sac.
- Option VI – Non-motorized bridge at the intersection of 101st Street.

Each of the options was reviewed with respect to the connectivity to the street network and regional system, the impact on vehicular traffic, accessibility to Huizenga Park, cost, utility conflicts, drainage, and impact of construction on BL I-196.

Table 5 presents a summary of pros and cons of each alternative.

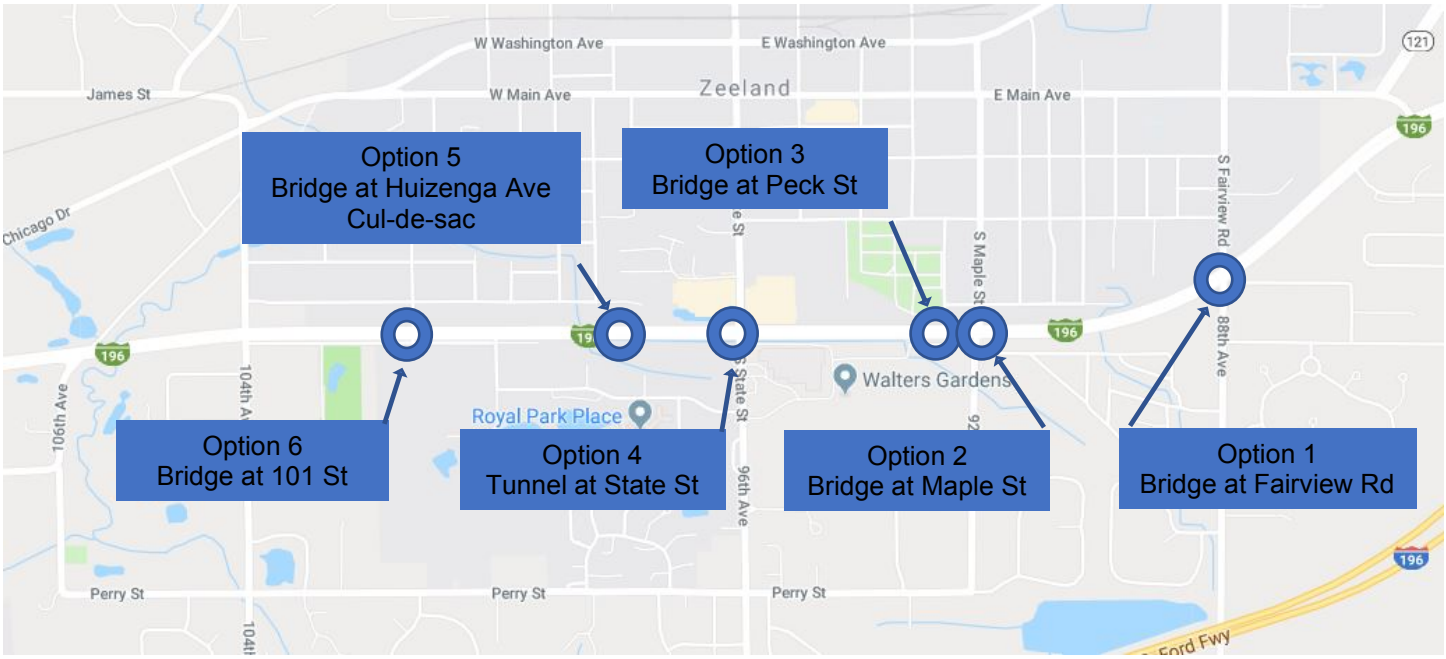

Figure 22 – Alternatives for BL I-196 Non-Motorized Crossing

Further analysis of the options, a review of the City staff comments, and public input comments resulted in narrowing of the choices to three alternatives:

- Option III – Non-motorized bridge at the end of Peck St
- Option V – Non-motorized bridge at the end of Huizenga Ave cul-de-sac
- Option VI – Non-motorized bridge at intersection of 101 St.

City of Zeeland leaders felt that in order to make a final selection, a further study should be conducted in respect to the environmental impacts, cost, and constructability.

It should be noted that each alternative will need its own suplemental connectors to the on-street network to ensure that the proposed crossing becomes a fully utilized facility by both pedestrians and bicyclists. Figure 23 shows an example of connecting the proposed non-motorized bridge for Option III.

Upon the final selection of BL I-196 crossing location, another planning effort might be undertaken to study a feasibility of way-finding signs guiding the public to the crossing and other major destination.

Figure 23 – Additional Connections for Option III – Non-Motorized Bridge at Peck Street

Table 5 – BL I-196 Crossing Alternatives

OPTION	Connectivity to Street Network	Connectivity to Regional System	Impact on vehicular traffic on street network	Accessibility to Huizenga Park	Utility Conflicts	Cost	Drainage	Impact of construction on I-196 Business Route	Notes
I. Non-Motorized Bridge at Fairview Intersection	Connects to north side via Fairview bike lanes. No direct connection to Zeeland's south side. Needs additional improvements outside of city limits. Location east of center of gravity serves NE quadrant, which is predominantly industrial and commercial. Not connecting downtown	Connects to north via Fairview bike lanes and side paths, and to south via 88th Avenue wide shoulder and side path. This location provides the shortest connection to Upper Macatawa River trails	Lane closures, turning restrictions for southbound Fairview. In extreme case needs Fairview Road closure at BL I-196	Does not serve the Park (1.5 miles away)	Conflict with numerous overhead electrical wires	$4-5M	No impact	Intermediate lane closures for pier construction and bridge deck installation	This option is favored by mountain bikers due to shortest distance to Upper Macatawa Trails. It is the least desirable option in terms of system connectivity and efficiency
II. Non-Motorized Bridge at Maple Street	Direct connection to north side via Maple Street Cycle Track and to south side via 92nd Avenue side path. Location somewhat east of center of gravity but serves residential areas better than Option I	Connects to north via on-street bikeway system, and to south via 92nd Avenue side path and proposed side paths paralleling BL I-196	Lane closures, turning restrictions for southbound Maple Street. In extreme case, needs Maple Street closure at BL I-196	Does not directly serve the Park (1 mile away). Connection will require modifications of crossings at State Street and the proposed south side side path paralleling BR-196	Some conflicts with overhead wires	$4-5M	No impact	Intermediate lane closures for pier construction and bridge deck installation	This option does not seem to provide connectivity and accessibility and has adverse effects on street network

OPTION	Connectivity to Street Network	Connectivity to Regional System	Impact on vehicular traffic on street network	Accessibility to Huizenga Park	Utility Conflicts	Cost	Drainage	Impact of construction on I-196 Business Route	Notes
III. Non-Motorized Bridge at Peck Street	Direct connection to north side via bike route on Peck Street and cycle track on Maple St and to south via 92nd Ave. side path. Location somewhat east of center of gravity but serves residential areas better than Option I or Option II	Connects to north via on-street bikeway system, and to south via 92nd Avenue side path and proposed side paths paralleling BL I-196	Neutral	Does not directly serve the Park (1 mile away) Connection will require modifications of crossings at State Street and proposed south side side path paralleling BR- 196	No conflicts with overhead wires	$3-4M	No impact	Intermediate lane closures for pier construction and bridge deck installation	This option provides a somewhat balanced trade-off between system connectivity, cost, and accessibility to Huizenga Park Cost of bridge smaller due to favorable grade
IV. Tunnel at State Street Intersection	Direct connection to north side via proposed cycle track on State Street and via 96th Avenue side path. Location in center of gravity of the non-motorized system.	Direct connection to north side via proposed cycle track on State Street and via 96th Avenue side path. Location in center of gravity of the non-motorized system.	Proposed cycle track on State Street will require lane diet on State Street	Direct – Connects to Park via convenient existing and proposed side paths	Extensive conflicts with overhead wires and underground utilities	$4-5M	Major impact involving nearby retention basin	Major impact involving BL I-196 closure for tunnel construction	This is a very expensive option with adverse effects on street network (State Street) Costly due to possible cofferdam construction and utility relocations.
V. Non-Motorized Bridge at Huizenga Ave cul-de-sac	Connection to north side via proposed bike lanes on Huizenga Avenue and Taft Street. Location somewhat to left of center of gravity of the non-motorized system.	Direct connection to north via on-street bike lanes and to south via side paths on Royal Park Drive and 96th Avenue	No major impacts	Most Direct. Connects to Park via convenient existing and proposed side paths and bike lanes	No conflicts with overhead wires.	$3-4M	Some minor issues involving nearby retention basin	Intermediate lane closures for pier construction and bridge deck installation	This option provides best access to Huizenga Park – good system and regional network connection
VI. Non-Motorized Bridge at 101st Street	Connection to north side via proposed bike lanes on 101st Street and Lee Street. Location to left of center of gravity of the non-motorized system.	Connects to north via on-street bike lanes and to south via side paths on Gordon Avenue, Royal Park Drive, and 96th Avenue	Lane closures, turning restrictions for southbound 101st Street In extreme case needs 101st Street closure at BL I-196	Connects to Park via convenient existing and proposed side paths and bike lanes	Conflict with numerous overhead electrical wires	$3-4M	No impact	Intermediate lane closures for pier construction and bridge deck installation	This option provides acceptable system and regional connection, but at the cost of possible vehicular traffic restrictions

6.6 Public Comments

On March 11, 2019, a Public Hearing was held at the joint Zeeland's City Commission and Planning Commission meeting. Following this meeting, the City published the draft of the Non-Motorized Plan on the City's website and received numerous comments. Attachment A contains public comments received.

<u>Public comments relative to bike infrastructure included</u>:

- Consider a tunnel or bridge crossing of Business I-196 at Fairview to provide access to the Upper Macatawa Recreation Area single mountain bike trail.
- Why bike lanes? "Most of the streets are not even wide enough for two-way traffic and parking on both sides."
- Provide regional connectivity in the area east of Zeeland in extension of Byron Road.

- Partner with Holland Township to improve regional connectivity in the area west of Zeeland in extension of Perry Street to west and Chicago Drive to west.
- Consider on-street bike lanes on Main Avenue through downtown.
- “Make the city as a whole a more friendly and safer place by connecting bikeways from East to West and South to North.”
- When designing bikeways “keeping Main Avenue as the focus will do better job of promoting our retail and restaurants, and bring more people to downtown.”
- Consider installation of both crossings at 101st Street and Peck Street.
- Consider advisory bike lanes on Centennial.
- Consider greenway boulevard on Jefferson Street.
- Consider way-finding signs.
- Consider a separated facility on State Street.
- Concerns about school kids crossing BL I-196 at Maple Street.
- Enhance the crossing at Fairview/88th Avenue.
- Consider crossing on BL I-196 at Peck Street.
- Consider removal of parking and installing on-street bike lanes on Elm Street north of Main Avenue.
- Continue bike lanes on Main Avenue between State Street and Elm Street.
- Consider high-quality bike parking at the edges of downtown.
- Consider adopting an ordinance prohibiting stopping, standing, or parking in bike lanes.
- Consider connections to Macatawa River Greenway.

Each of the comments was reviewed with City staff, and, after careful consideration, the plan was amended to include them.

7.0 CONCLUSION

7.1 General

This Proposed Zeeland Non-Motorized Plan is meant to aid the decision-making process in expanding the non-motorized system to complement City's overall transportation network.

It is meant as a guide rather than a cast-in-stone policy.

The Zeeland Non-Motorized Plan draws long-range goals and its objectives will be implemented over several years in concert with the available financial resources.

Development of the non-motorized system networks, especially bicycle infrastructure, takes a community's dedication and sometimes sacrifices in terms of lost on-street parking, dieted roads, and requires substantial financial expenditures.

One method of implementing the improvements is an "opportunistic way" of merging non-motorized projects with street reconstructions, pavement rehabilitation, and private site development. This approach helps to leverage the costs and provides a quick start, rather than waiting for one big opportunity. One drawback of this approach is a disseminated network at first, and risk of public criticism about lack of connectivity. A well-conducted public awareness campaign and careful project scheduling may help with this process.

A "low hanging fruit" approach has been also employed by many communities to get the bike networks started. It involves tackling the easiest segments first by modifying pavement markings, dieting road segments with excess of traffic capacity, or removing on-street parking on one side of the street. This opportunity exists on Main Avenue, where, if a consensus could be reached with residents regarding removal of parking, new bike lanes could be installed in short order and at a minimum cost.

7.2 Other Biking Promotion Initiatives

This Plan focuses on physical bikeway infrastructure only; however, other non-motorized system initiatives could be undertaken to further promote biking in Zeeland. Some of those were brought up by residents with their comments: way-finding signs, bike parking facilities on the edge of the downtown, adoption of bike friendly ordinances, biking safety promotion programs, encouragement by special events, and safety enforcement.

END NOTES

1. City of Zeeland, LSL Planning, Inc. *City of Zeeland Master Plan 2011*

2. City of Zeeland, 03/04/2013 *Resolution to Adopt a Complete Streets Policy*

3. City of Zeeland, April 2018 *City of Zeeland 2018 Strategic Action Plan as Adopted by Zeeland City Council on April 16,2018*

4. Roger Geller, 2009 *Four Types of Cyclists*

5. Mineta Transportation Institute, MTI Report 11-9, May 2012, Peter G. Furth, et al., *Low-Stress Bicycling and Network Connectivity*

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American Association of State Highway and Transportation Officials (AASHTO), *Guide for Development of Bicycle Facilities, 2012 Fourth Edition.* Washington D.C. AASHTO, 2012

Ottawa County, Corradino Group Prein & Newhof. *Ottawa County Non-Motorized*, Ottawa County, April 2002

MDOT Grand Region, Living Lab, The Greenway Collaborative, Williams & Works. *Regional Non-Motorized Plan.* MDOT, September 2017

Macatawa Area Coordinated Council. *Regional Non-Motorized Plan.* MACC, April 2014

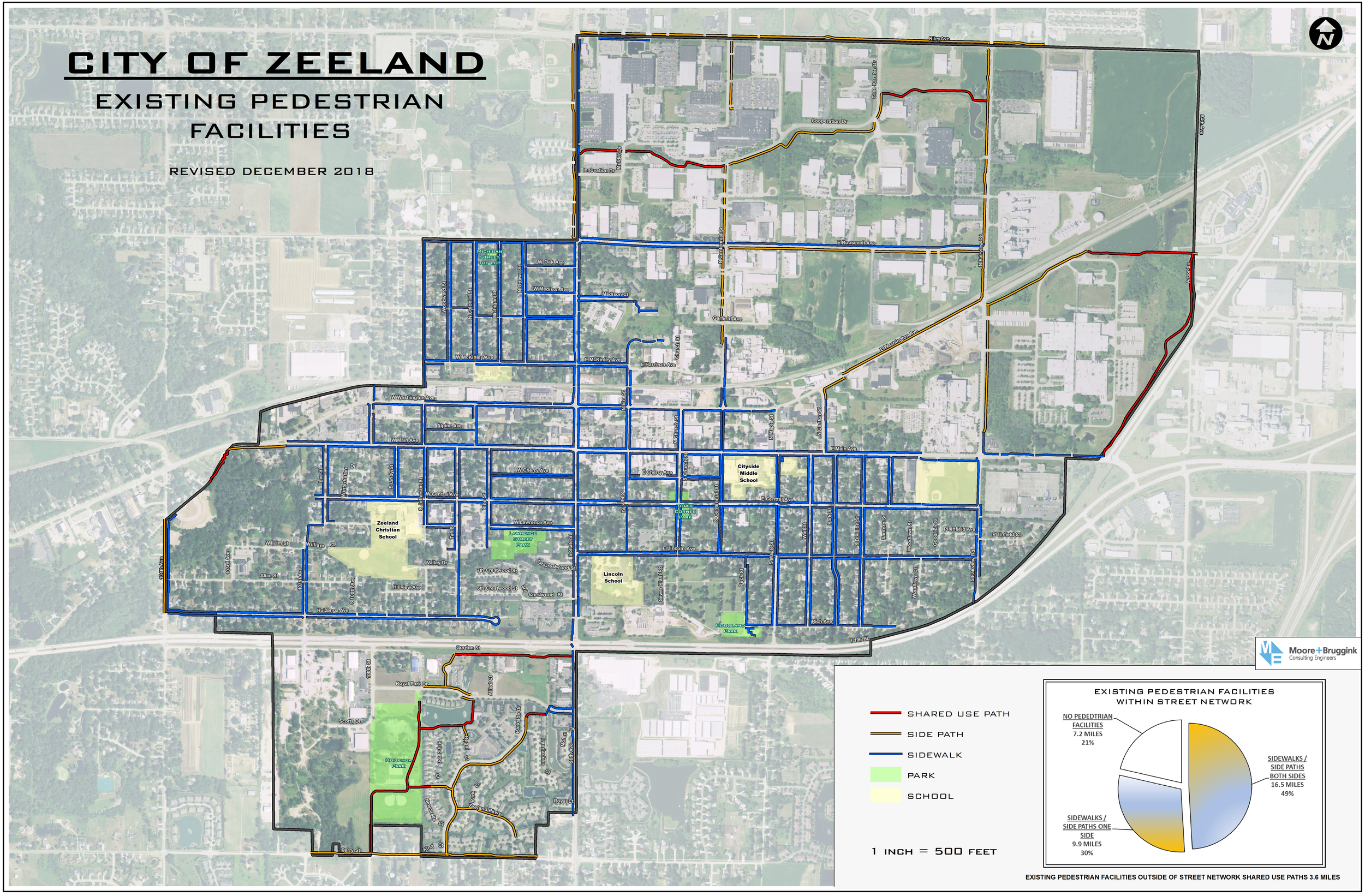
Mineta Transportation Institute, MTI Report 11-9, May 2012, Peter G. Furth, et al., *Low-Stress Bicycling and Network Connectivity*

EXHIBIT I

CITY OF ZEELAND

EXISTING PEDESTRIAN FACILITIES

REVISED DECEMBER 2018



SHARED USE PATH

SIDE PATH

SIDEWALK

PARK

SCHOOL

1 INCH = 500 FEET

Moore+Bruggink
Consulting Engineers

EXISTING PEDESTRIAN FACILITIES WITHIN STREET NETWORK

EXISTING PEDESTRIAN FACILITIES OUTSIDE OF STREET NETWORK SHARED USE PATHS 3.6 MILES

EXHIBIT II

CITY OF ZEELAND

EXISTING PEDESTRIAN FACILITIES

ZEELAND
FEEL THE ZEEL

Riley St
Northfield Dr
Southfield Dr
104th Ave
Felch St
Fairfield Dr
Meadow Dr
Greystone Dr
Marble Ct
James St
Chicago Dr
Burton Dr
Paw Paw Dr
N Jefferson St
N Woodward St
N Colonial St
N Michigan St
N Ottawa St
W Oak Ave
Madison Ct
W Garfield Ave
E Roosevelt Ave
E Garfield Ave
E Washington Ave
W McKinley Ave
W Main Ave
N Elm St
E Main Ave
E Cherry Ave
N Carlton St
S Park St
S Sanford St
S Lee St
S Lindy St
S Jefferson St
S Taft St
S Pine St
W Cherry Ave
W Central Ave
W Lawrence Ave
S State St
S Elm St
S Church St
E Central Ave
E Plainfield Ct
E Lincoln Ave
S Peck St
S Maple St
S Wall St
S Division St
E Rich Ave
S Frost St
W Alice Ave
W Huizenga Ave
S Stooth St
W Royal Park Dr
S Zeeland Pkwy
Perry St
Melvin St
Mary Ann St
Beechnut Ln
105th Ave
106th Ave
Garden View Dr
92nd Ave
84th Ave
Bennigan Ln
Gordon St
Sunburst Dr
Suntree Dr
Maple Ln
N Maple Ct
E Maple Ct
S Maple Ct
Logistic Dr
Empire Dr
121
196

Sidewalk Coverage

- Both
- One Side
- None
- Share Use Paths (Trails)

- Pedestrian Accidents 2008 to 2017 (20 Total)
- Route 11 Stop
- Route 8 Stop

Moore+Bruggink
Consulting Engineers

EXHIBIT III

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	SCORE
EAST WEST STREETS																					
70		W Roosevelt Ave	25	s	Non-Truck Route	2	25	24	50	Yes	East	3	0	333.4	1	1	1	1			4
71		W Roosevelt Ave	25	s	Non-Truck Route	2	25	24	50	Yes	East	3	0	328.3	1	1	1	1			4
68		W Roosevelt Ave	25	s	Non-Truck Route	2	25	29	50	Yes	West	3	0	316.3	1	1	1	1			4
377		W Roosevelt Ave	25	s	Non-Truck Route	2	25	35	0	No	Both	3	0	313.3	1	1	1	1			4
378		W Roosevelt Ave	25	s	All Season Route	2	30	35	66	No	Both	3	0	676.8	1	1	1	1			4
														1968.1							
63		W Garfield Ave	25	n	Non-Truck Route	2	25	24	50	Yes	East	1	0	331.3	1	1	1				3
62		W Garfield Ave	25	n	Non-Truck Route	2	25	24	50	Yes	East	1	0	324.6	1	1	1				3
177		W Garfield Ave	25	n	Non-Truck Route	2	25	26	50	Yes	West	1	0	312.8	1	1	1				3
179		W Garfield Ave	25	n	Non-Truck Route	2	25	24	50	Yes	West	1	0	327.4	1	1	1				3
														1296.2							
61		E Garfield Ave	25		All Season Route	2	35	35	50	No	Both	1	2391	371.9		1					1
336		E Garfield Ave	25		All Season Route	2	35	35	50	No	Both	1	2391	599.7		1					1
184		W McKinley Ave	25	n	Non-Truck Route	2	25	24	50	Yes	Both	1	0	330.1			1			1	2
366		W Washington Ave	35		Non-Truck Route	2	30	39	66	No	Both	3	0	324.8	1	1		1	1	1	5
206		W Washington Ave	35		All Season Route	2	25	36	66	Yes	East	3	0	1215.8	1	1		1	1	1	5
														1540.6							
240		W Washington Ave	30	s	All Season Route	2	25	36	66	Yes	East	3	0	667.1	1	1	1		1	1	5
44		E Washington Ave	30	s	All Season Route	2	25	34	50	Yes	Both	3	0	672.4	1	1			1		3
43		E Washington Ave	30	s	All Season Route	2	35	20	33	No	Both	3	0	537.0	1	1	1		1		4
161		E Washington Ave	30	s	All Season Route	2	35	20	33	No	Both	3	0	687.3	1	1			1		3
														1896.8							
35		E Washington Ave	30		All Season Route	2	25	35	50	Yes	West	3	0	871.6	1	1		1	1	1	5
36		E Washington Ave	45	n	All Season Route	2	30	33	100	No	Both	1	3524	2139.7		1			1		2

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
307		E Washington Ave	45	s	All Season Route	2	45	32	66	No	Both	3	3524	3057.6		1			1		**2**
218		Riley St	45	n	All Season Route	2	50	25	66	No	Both	1	11214	5315.0	1	1			1		**3**
22		Riley St	50		All Season Route	2	50	25	66	No	Both	4	0	1950.4		1	1		1	1	**4**
211		Innovation Dr	25		All Season Route	2	45	33	66	No	Both	1	0	566.7	1	1					**2**
212		Mulder Dr	25	s	All Season Route	2	25	32	66	No	Both	1	0	754.2	1	1					**2**
221		Cooperation Dr	25	s	Non-Truck Route	2	25	33	66	No	Both	1	0	2037.7		1					**1**
56		E Harrison Ave	25		Non-Truck Route	2	25	29	50	No	Both	1	0	676.3	1	1				1	**3**
4		E Harrison Ave	25		Non-Truck Route	2	25	29	50	No	Both	1	2391	538.0	1	1				1	**3**
196		W Oak Ave	25	n	All Season Route	2	30	35	66	No	Both	1	0	675.2	1	1	1				**3**
199		W Madison Ave	25	n	All Season Route	2	30	35	66	No	Both	1	0	672.3	1	1	1				**3**
237		W Alpine Ave	25	n	Non-Truck Route	2	25	30	50	No	Both	1	0	656.6	1	1	1				**3**
345		E Main Ave	35	s	Non-Truck Route	2	25	28	50	Yes	Both	3	0	1144.6	1	1			1	1	**4**
339		E Main Ave	45	n	All Season Route	4	45	44	66	No	Both	4	0	1129.6		1			1	1	**3**
342		Byron Rd	45	n	All Season Route	4	0	0	0			4	0	308.3		1			1	1	**3**
371		Byron Rd	45	n	All Season Route	4	0	0	0			4	0	187.5		1			1	1	**3**
138		E Cherry Ct	25		Non-Truck Route	2	25	19	33	Yes	Both	1	0	459.3	1	1	1			1	**4**

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
193		E Cherry Ave	25	s	Non-Truck Route	2	25	19	33	Yes	Both	1	0	654.1	1	1	1				**3**
163		W Lawrence Ave	25	s	Non-Truck Route	2	25	33	66	Yes	Both	2	0	211.8	1	1	1				**3**
31		W Lawrence Ave	25		Non-Truck Route	2	25	33	66	Yes	Both	1	0	565.4	1	1	1	1		1	**5**
147		W Lawrence Ave	0		Non-Truck Route	2	25	29	60	Yes	Both	1	0	95.4	1	1	1	1		1	**5**
340		E Plainfield Ave	25		Non-Truck Route	2	25	21	50	Yes	Both	1	0	486.7		1	1			1	**3**
338		E Plainfield Ct	25		Non-Truck Route	2	25	26	66	Yes	Both	1	0	813.8		1	1			1	**3**
203		W William St	25		Non-Truck Route	2	25	20	66			1	0	179.9	1	1	1			1	**4**
164		W William St	26		Non-Truck Route	2	25	20	66	Yes	Both	1	0	727.2	1	1	1			1	**4**
167		William Ct	15		Non-Truck Route	2	25	29	66	Yes	Both	1	0	235.5	1	1	1			1	**4**
27		W Alice Ave	25		Non-Truck Route	2	25	26	66	No	Both	1	0	853.7	1	1	1				**3**
28		W Alice Ave	25		Non-Truck Route	2	25	29	66	Yes	Both	1	0	920.8	1	1	1				**3**
26		W Alice Ave	25		Non-Truck Route	2	25	29	66	Yes	Both	1	0	668.1	1	1	1				**3**
29		W Valley Dr	25		Non-Truck Route	2	25	26	66	Yes	Both	1	0	105.5	1	1	1	1		1	**5**
105		W Valley Dr	25		Non-Truck Route	2	25	26	66	Yes	Both	1	0	382.7	1	1	1	1		1	**5**
186		Hillview Dr	25		Non-Truck Route	2	25	26	60	Yes	Both	1	0	506.6	1	1	1			1	**4**
148	private driv	3rd Crestwood St	0		Non-Truck Route	2	40	35	60	No	Both	1	0	72.2	1	1	1				**3**
149	private driv	2nd Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	392.5	1	1	1				**3**
150	private driv	8th Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	209.6	1	1	1				**3**
151	private driv	8th Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	74.6	1	1	1				**3**
152	private driv	4th Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	63.3	1	1	1				**3**
153	private driv	3rd Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	380.1	1	1	1				**3**

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
308	private driv	3rd Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	30.2	1	1	1				**3**
309	private driv	5th Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	299.8	1	1	1				**3**
310	private driv	6th Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	599.1	1	1	1				**3**
311	private driv	3rd Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	268.0	1	1	1				**3**
312	private driv	3rd Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	107.9	1	1	1				**3**
313	private driv	7th Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	570.2	1	1	1				**3**
314	private driv	3rd Crestwood St	0		Non-Truck Route	2	25	0	0			1	0	220.9	1	1	1				**3**
120	private driv	1st Crestwood St	0		Non-Truck Route	2	40	35	60	No	Both	1	0	510.8	1	1	1				**3**
92		E Rich Ave	25	n	Non-Truck Route	2	25	24	40	Yes	East	1	0	376.7			1				**1**
93		E Rich Ave	25	n	Non-Truck Route	2	25	29	33	Yes	Both	1	0	428.6			1				**1**
17		E Rich Ave	25	n	Non-Truck Route	2	25	29	33	Yes	Both	1	0	360.1			1				**1**
48		E Rich Ave	25	n	Non-Truck Route	2	25	29	33	Yes	Both	1	0	309.5			1				**1**
67		E Rich Ave	25	n	Non-Truck Route	2	25	29	33	Yes	Both	1	0	427.6			1				**1**
171		W Gordon Ave	55		Non-Truck Route	2	55	0	0			2	0	301.5		1	1		1		**3**
121		W Gordon Ave	55		Non-Truck Route	2	25	45	66	Yes	Both	2	0	887.9		1			1		**2**
173		W Gordon Ave	55		Non-Truck Route	2	25	45	66	Yes	Both	2	0	480.4		1			1		**2**
284		W Royal Park Dr	40		Non-Truck Route	2	25	45	66	Yes	Both	3	0	578.3		1	1	1	1	1	**5**
248		W Royal Park Dr	40		Non-Truck Route	2	40	36	66	Yes	Both	3	0	629.7		1	1	1	1	1	**5**
252		W Royal Park Dr	40		Non-Truck Route	2	40	36	66	Yes	Both	3	0	361.3		1	1	1	1	1	**5**
251		W Royal Park Dr	40		Non-Truck Route	2	30	32	66	Yes	Both	3	0	372.1		1	1	1	1	1	**5**
286		Scott Dr	25		Non-Truck Route	2	25	45	66	Yes	Both	1	0	571.5		1	1	1			**3**
202	private driv	W Royal Ct	25		Non-Truck Route	2	25	0	0			1	0	303.3		1	1			1	**3**
278	private driv	King Ct	25		Non-Truck Route	2	30	33	66			1	0	272.6			1			1	**2**
275		Majestic Ct	0		Non-Truck Route	2	30	33	66			1	0	182.8							**0**

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
243	Border Stre	Perry St	55	n	Non-Truck Route	2	55	0	0			1	0	755.8			1		1		**0**
281	Border Stre	Perry St	45	n	Non-Truck Route	2	55	0	0			1	0	722.8			1		1		**0**
280	Border Stre	Perry St	45	n	Non-Truck Route	2	45	33	66			1	0	212.9			1		1		**0**
242	Border Stre	Perry St	45	n	Non-Truck Route	2	45	33	66			1	0	67.5			1		1		**0**
245	Border Stre	Perry St	45	n	Non-Truck Route	2	45	0	0			1	0	691.1			1		1		**0**
244	Border Stre	Perry St	45	n	Non-Truck Route	2	45	0	0			1	0	124.0			1		1		**0**
227	Border Stre	Perry St	45	n	Non-Truck Route	2	45	0	0			1	0	158.7			1		1		**0**
226	Border Stre	Perry St	45	n	Non-Truck Route	2	45	0	0			1	0	176.1			1		1		**0**
262		S Zeeland Pkwy	25	n	Non-Truck Route	2	30	33	66			1	0	283.5			1				**1**
261		S Zeeland Pkwy	25	n	Non-Truck Route	2	0	0	0			1	0	659.5			1				**1**
NORTH SOUTH STREETS																					
204		S 103rd St	25		Non-Truck Route	2	25	26	66			1	0	421.2	1	1	1				**3**
30	cul-de-sac	Riverbend Ct	25		Non-Truck Route	2	25	20	66	Yes	Both	1	0	212.1	1	1		1		1	**0**
318		S 101st St	25		Non-Truck Route	2	25	31	66	Yes	Both	2	1112	226.0	1		1			1	**3**
162		S 101st St	25	e	Non-Truck Route	2	25	29	66	Yes	Both	2	0	332.4	1	1	1			1	**4**
129		N Franklin Ave	40	e	All Season Route	2	25	36	66	Yes	East	4	0	238.4		1	1		1	1	**4**
285		S 100th St	25		Non-Truck Route	2	25	45	66	Yes	Both	1	0	403.2		1	1	1			**3**
283		S 100th St	25		Non-Truck Route	2	25	45	66	Yes	Both	2	0	478.8		1	1	1			**3**
174		S 100th St	25		Non-Truck Route	2	25	31	66	Yes	Both	1	0	429.1	1		1			1	**3**
188		S Westenbroek St	25		Non-Truck Route	2	25	31	66	Yes	Both	1	0	315.1	1		1	1		1	**4**
187		S Westenbroek St	25		Non-Truck Route	2	25	26	60	Yes	Both	1	0	119.8	1		1	1		1	**4**

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
127		S Jefferson St	25		Non-Truck Route	2	25	31	66	Yes	Both	1	0	313.3	1	1	1				**3**
128		S Jefferson St	25		Non-Truck Route	2	25	26	66	Yes	Both	1	0	316.2	1	1	1				**3**
145		S Jefferson St	25		Non-Truck Route	2	25	29	60	Yes	Both	1	0	223.5	1	1	1	1			**4**
372		N Jefferson St	25		Non-Truck Route	2	25	29	60	No	Both	1	0	223.3	1	1	1			1	**4**
241		N Jefferson St	25	e	Non-Truck Route	2	25	21	50	Yes	Both	1	0	306.0		1	1				**2**
155	Border stre	N Jefferson St	25	e	Non-Truck Route	2	25	24	50	Yes	North	1	0	682.1	1	1	1				**0**
69	Border stre	N Jefferson St	25	e	Non-Truck Route	2	25	24	50	Yes	North	1	0	889.5	1	1	1	1			**0**
274		Newcastle	0		Non-Truck Route	2	30	33	66			1	0	624.3			1			1	**2**
269	private driv	Princeton Ct	0		Non-Truck Route	2	0	0	0			1	0	517.7		1	1			1	**3**
103		S Taft St	25	e	Non-Truck Route	2	25	34	60	No	Both	2	0	634.2	1	1	1			1	**4**
104		S Taft St	25	e	Non-Truck Route	2	25	34	60	No	Both	2	0	205.9	1	1	1			1	**4**
277	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	45	33	66			1	0	84.3		1	1		1		**1**
279	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	33	66			1	0	192.1		1	1		1		**1**
276	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	33	66			1	0	195.2		1	1		1		**1**
273	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	33	66			1	0	149.1		1	1		1		**1**
268	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	33	66			1	0	328.6		1	1		1		**1**
263	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	33	66			1	0	327.7		1	1		1		**1**
264	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	32	66			1	0	313.2		1	1		1		**1**
259	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	32	66			1	0	648.9		1	1		1		**1**
250	sidewalk on	Parkside Dr	30	e	Non-Truck Route	2	30	32	66	Yes	Both	1	0	406.1		1	1		1		**1**
235		N Colonial St	25	e	Non-Truck Route	2	30	39	66	Yes	Both	1	0	199.8	1	1	1			1	**4**
234		N Colonial St	25	e	All Season Route	2	30	33	50	No	Both	1	0	345.9	1	1	1			1	**4**

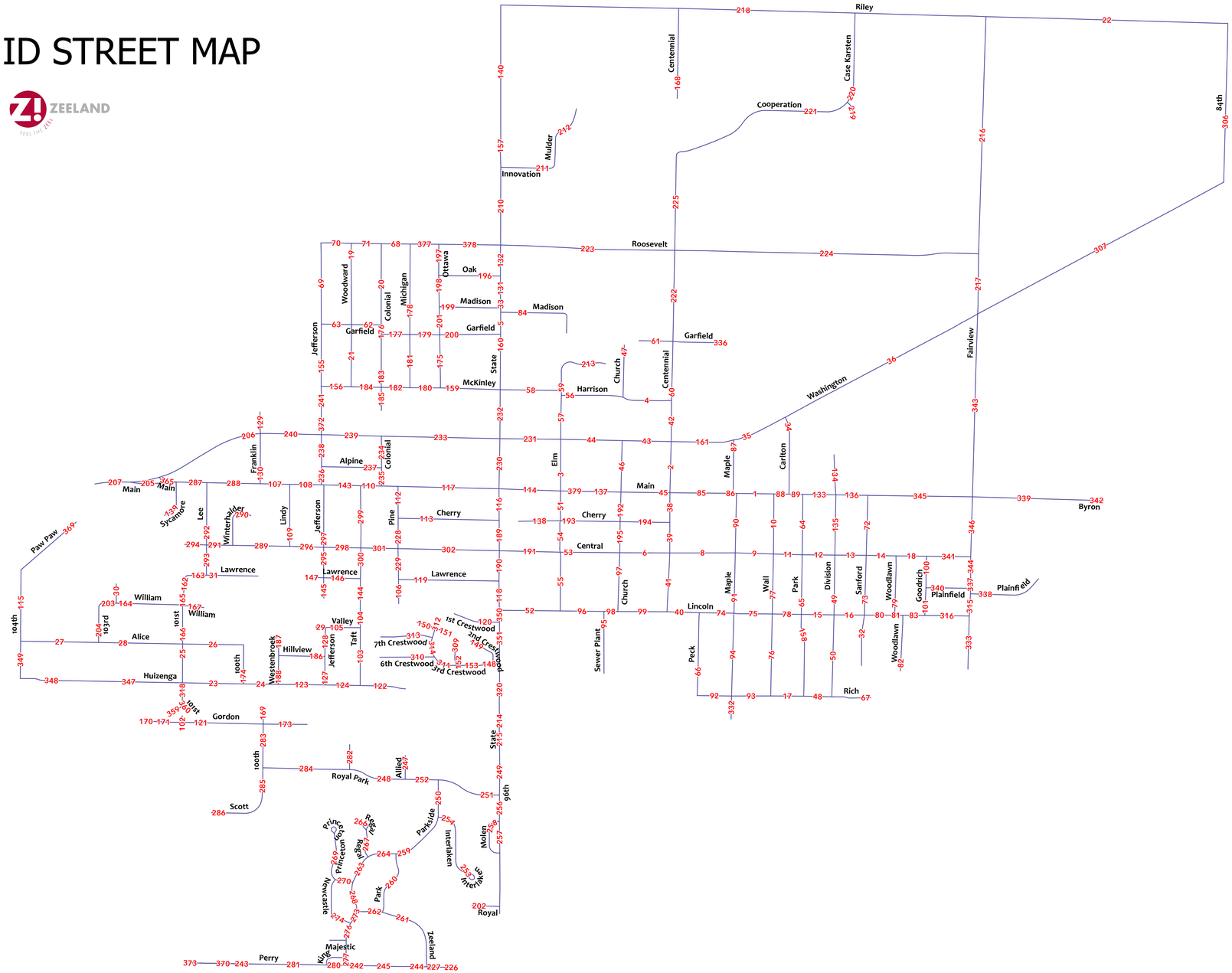
Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
185		N Colonial St	0		Non-Truck Route	2	25	29	50	Yes	South	1	0	254.7	1	1	1			1	**4**
282	Culde sac	Centerstone Ct	0	w	Non-Truck Route	2	40	36	66	Yes	Both	1	0	274.3		1	1	1			**0**
260	private driv	Park Ln	0		Non-Truck Route	2	30	32	66			1	0	702.6		1	1			1	**3**
247		Allied Ct	25		Non-Truck Route	2	40	36	66	Yes	Both	1	0	260.6		1	1				**2**
267	private driv	Regal Ct	0		Non-Truck Route	2	30	33	66			1	0	300.8		1	1				**2**
265	private driv	Regal Ct	0		Non-Truck Route	2	25	0	0			1	0	109.0		1	1				**2**
266	private driv	Regal Ct	0		Non-Truck Route	2	25	0	0			1	0	111.9		1	1				**2**
254	private driv	Interlaken Ct	25		Non-Truck Route	2	30	32	66			1	0	814.5		1	1			1	**3**
258		Molen Dr	0		All Season Route	2	45	42	0	No	Both	1	0	499.4		1	1			1	**3**
106		S Pine St	25	w	Non-Truck Route	2	25	40	60	Yes	West	1	0	263.1	1	1	1			1	**4**
320		S State St	40	w	Non-Truck Route	2	40	35	60	No	Both	4	0	571.5	1	1	1		1	1	**5**
55		S Elm St	25	w	Non-Truck Route	2	25	27	33	No	Both	1	0	644.2	1	1	1	1			**4**
54		S Elm St	25	w	Non-Truck Route	2	25	19	33	Yes	Both	1	0	346.1							**0**
47		N Church St	25		Non-Truck Route	2	25	29	50	No	Both	1	0	571.9	1	1				1	**3**
60		N Centennial St	35	e	Non-Truck Route	2	25	29	50	No	Both	3	2391	358.8	1	1			1		**3**
222		N Centennial St	35	w	All Season Route	2	35	35	50	No	Both	1	2391	996.9	1	1			1		**3**
225		N Centennial St	35	w	All Season Route	2	25	33	66	No	Both	1	2709	1056.9		1			1	1	**3**

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
168		N Centennial St	35	e	All Season Route	2	35	33	66	No	Both	1	11214	986.8		1			1	1	**3**
66	one side sid	S Peck St	25	e	Non-Truck Route	2	25	26	33	Yes	North	1	0	908.5	1	1	1				**1**
332		S Maple St	25		Non-Truck Route	2	25	29	33	Yes	Both	2	0	253.6		1	1			1	**3**
87		N Maple St	25		All Season Route	2	30	33	100	No	Both	1	0	584.7	1	1		1		1	**4**
34		N Carlton St	25	w	All Season Route	2	25	35	50	Yes	West	1	0	850.9	1	1	1			1	**4**
220		Case Karsten Dr	25		All Season Route	2	45	25	66	No	Both	1	11214	995.0		1				1	**2**
73		S Sanford St	25		Non-Truck Route	2	25	31	66	Yes	North	1	0	654.8	1	1	1			1	**4**
32		S Sanford St	25		Non-Truck Route	2	25	28	33	Yes	North	1	0	555.2	1	1	1			1	**4**
82		S Woodlawn Ct	25		Non-Truck Route	2	25	26	50	Yes	North	1	0	609.4	1	1	1			1	**4**
79		S Woodlawn St	25		Non-Truck Route	2	25	31	50	Yes	North	1	0	649.6	1	1	1			1	**4**
101		S Goodrich St	25		Non-Truck Route	2	25	26	50	Yes	North	1	0	302.0	1	1	1			1	**4**
100		S Goodrich St	25		Non-Truck Route	2	25	31	66	Yes	North	1	0	347.0	1	1	1			1	**4**
333		S Fairview St	25	w	Non-Truck Route	2	25	26	66	Yes	Both	2	0	372.8		1	1			1	**3**
346		S Fairview St	25	w	All Season Route	4	25	31	66	Yes	North	2	0	656.7		1		1		1	**3**
343	one side sid	N Fairview St	45	e	All Season Route	2	45	32	66	No	Both	1	3524	1781.6					1	1	**1**
217	one side sid	N Fairview St	45	w	All Season Route	2	45	32	66	No	Both	1	2709	659.6					1	1	**1**
216	one side sid	N Fairview St	45	w	Non-Truck Route	2	50	25	66	No	Both	1	11214	2598.8					1	1	**1**

Unique_ID	NOTES	Full Street Name	Speed Limit	Sidewalk present on side of street	TruckRoute	Number of Lanes	Speed Limit	Width	ROW_Width	On Street Parking	Side of Street (OSP)	Bike Level of Stress	ADT_2015	Street Length	Within 1/2 mile to School	Within 1/2 mile to mass transit	Residential Zoning	Major Destinaltion	Speed Limit >25mph	Link is only gap in system	**SCORE**
213		N Elm St	25	w	Non-Truck Route	2	25	32	66	Yes	Both	1	0	762.1		1	1			1	**3**
306		84th Ave	55		Non-Truck Route	2	50	25	66	No	Both	2	0	1622.2							**0**
367		84th Ave	55		All Season Route	2	55	0	0			2	3524	451.6							**0**

CITY OF ZEELAND

UNIQUE ID STREET MAP



1 INCH EQUALS 600 FEET

EXHIBIT IV

CITY OF ZEELAND

PROPOSED PEDESTRIAN FACILITIES

Riley St
Northfield Dr
Southfield Dr
104th Ave
Felch St
Fairfield Dr
Meadow Dr
Marble Ct
Greystone Dr
James St
Chicago Dr
Burton Dr
Paw Paw Dr
N Jefferson St
N Woodward St
N Colonial St
N Michigan St
N Ottawa St
W Oak Ave
Madison Ct
W Garfield Ave
E Roosevelt Ave
E Garfield Ave
E Washington Ave
W McKinley Ave
W Main Ave
E Main Ave
N Elm St
N Carlton St
W Cherry Ave
E Cherry Ave
W Central Ave
E Central Ave
S Lee St
S Lindy St
S Jefferson St
S Taft St
S Pine St
S State St
S Elm St
S Church St
S Park St
S Sanford St
W Lawrence Ave
E Lincoln Ave
E Plainfield Ct
S Stout St
W Alice Ave
W Huizenga Ave
S Beech St
S Maple St
S Well St
S Division St
E Rich Ave
S Booth St
W Royal Park Dr
S Zeeland Pkwy
Perry St
Melvin St
Mary Ann St
Beechnut Ln
105th Ave
106th Ave
92nd Ave
Garden View Dr
3rd Ave
121
Logistic Dr
Empire Dr
196
Westpark Way
N Maple Ct
E Maple Ct
S Maple Ct
Maple Ln
84th Ave
Bennigan Ln
Gordon St

Sidewalk Coverage
- Both
- One Side
- None

Implementation Priority Levels
- High
- Medium
- Low

Share Use Paths (Trails)

Pedestrian Accidents 2008 to 2017 (20 Total)
Route 8 Stop
Route 11 Stop

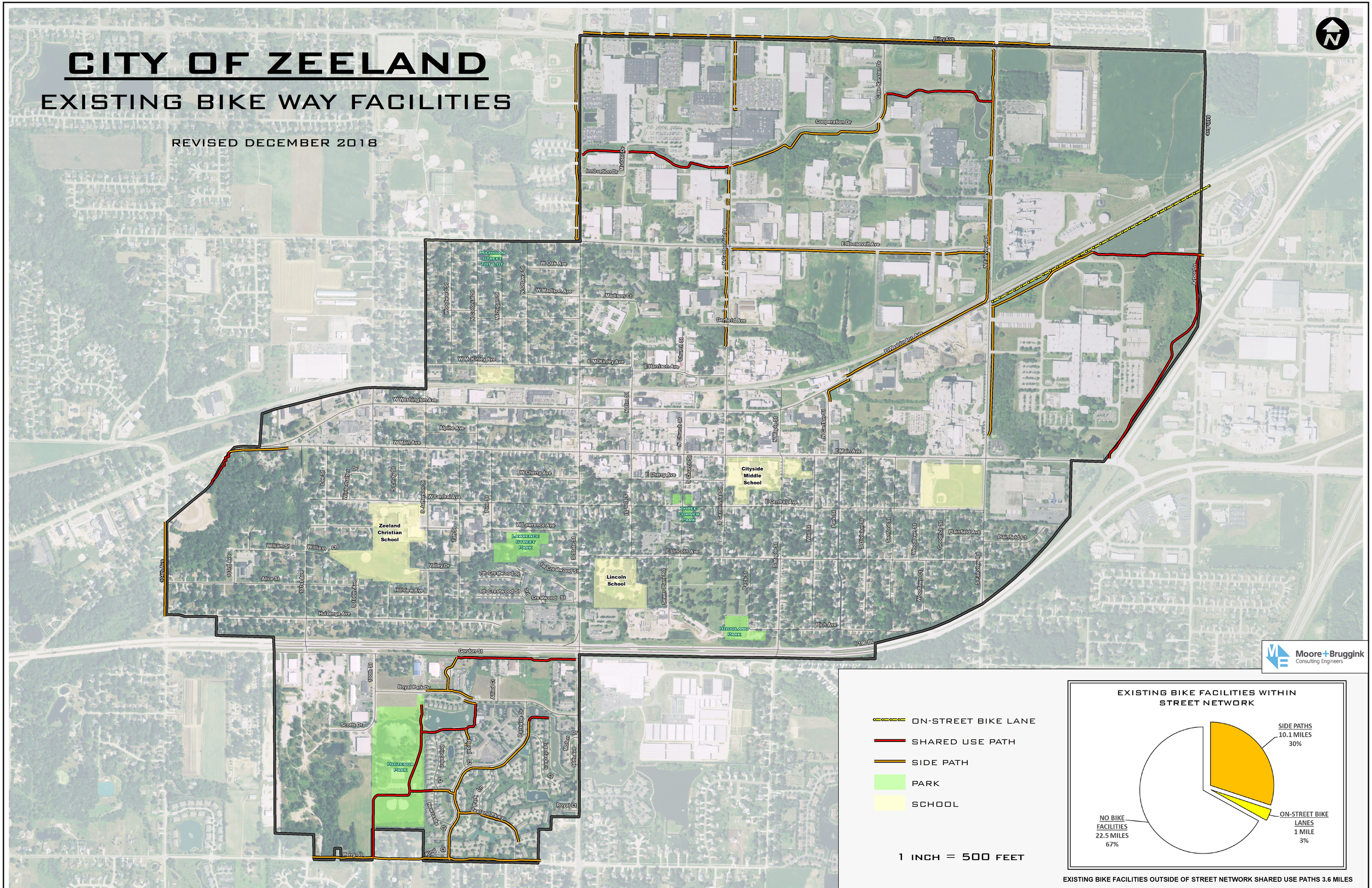
Moore+Bruggink
Consulting Engineers

EXHIBIT V

CITY OF ZEELAND

EXISTING BIKE WAY FACILITIES

REVISED DECEMBER 2018



ON-STREET BIKE LANE

SHARED USE PATH

SIDE PATH

PARK

SCHOOL

1 INCH = 500 FEET

EXISTING BIKE FACILITIES WITHIN STREET NETWORK

EXISTING BIKE FACILITIES OUTSIDE OF STREET NETWORK SHARED USE PATHS 3.6 MILES

EXHIBIT VI

EXISTING ZEELAND NON-MOTORIZED FACILITIES

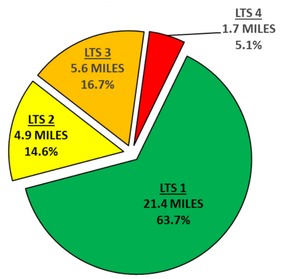
LEVEL OF STRESS

- 1 LTS
- 2 LTS
- 3 LTS
- 4 LTS

NON-MOTORIZED SYSTEM REGIONAL CONNECTIVITY

- Macatawa River Greenway
- Existing Share Use Path
- Existing Paved Shoulder
- Regional Connector

LEVEL OF TRAFFIC STRESS WITHIN STREET NETWORK



Moore+Bruggink
Consulting Engineers

CITY OF ZEELAND
EXISTING NON-MOTORIZED FACILITIES

ZEELAND

FEEL THE ZEEL

EXHIBIT VII


EXISTING ZEELAND NON-MOTORIZED FACILITIES
LEVEL OF STRESS
1 LTS
2 LTS
3 LTS
4 LTS
Bicycle Accidents 2008 to 2017 (Bicycle Facilities)
NON-MOTORIZED SYSTEM REGIONAL CONNECTIVITY
Macatawa River Greenway
Existing Share Use Path
Existing Paved Shoulder
Regional Connector
LEVEL OF TRAFFIC STRESS WITHIN STREET NETWORK
LTS 1
21.4 MILES
63.7%
LTS 2
4.9 MILES
14.6%
LTS 3
5.6 MILES
16.7%
LTS 4
1.7 MILES
5.1%
Moore+Bruggink
Consulting Engineers
N
Zeeland Township
Holland Township
City of Holland
City of Zeeland
Riley St
E Roosevelt Ave
E Washington Ave
E Garfield Ave
Madison Ct
W Oak Ave
W Madison Ave
W Garfield Ave
W McKinley Ave
Early Childhood Center
W Main Ave
E Main Ave
W Cherry Ave
E Cherry Ave
W Central Ave
E Central Ave
W Lawrence Ave
Lawrence Street Park
E Lincoln Ave
W Valley Dr
W Alice Ave
Hillview Dr
W Huizenga Ave
E Rich Ave
E Plainfield Ct
W Royal Park Dr
S Zeeland Pkwy
Huizenga Park
Hoogland Park
Paw Paw Drive Park
Paw Paw Dr
Zeeland Christian School
Lincoln School
Cityside Middle School
Zeeland Public Schools Athletics
Zeeland West
Zeeland East High School
N Colonial St
N Jefferson St
N Ottawa St
N Franklin St
N Elm St
N Carlton St
S State St
S Elm St
S Church St
S Centennial St
S Wall St
S Lee St
S Lindy St
S Jefferson St
S Taft St
S Pine St
S Frost St
S Peck St
S Maple St
S Park St
S Division St
S Sanford St
S Woodlawn Ct
S Goodrich St
S Fairview St
S 100th St
84th Ave
Case Karsten Dr
James St
Chicago Dr
Perry St
CITY OF ZEELAND
EXISTING NON-MOTORIZED FACILITIES
ZEELAND
FEEL THE ZEEL

EXHIBIT VIII

CITY OF ZEELAND

NON-MOTORIZED SYSTEM PROPOSED IMPROVEMENTS

ZEELAND
FEEL THE ZEEL

City of Zeeland

LEVEL OF TRAFFIC STRESS
Level of stress
- 1 LTS
- 2 LTS
- 3 LTS
- 4 LTS

Proposed Bicycle Facilities
- Proposed Shared Use Path
- Proposed On-Street Bike Lanes
- Proposed Bicycle Route
- Proposed Marked Shared Lane

NON-MOTORIZED SYSTEM REGIONAL CONNECTIVITY
- Macatawa River Greenway
- Existing Share Use Path
- Existing Paved Shoulder
- Regional Connector

ATTACHMENT A

City of Zeeland Non-Motorized Plan

Comments received as of April 3, 2019

- Facebook comment from Bill Bron – 03/13/19
- Email comment from Theodore Start – 03/13/19
- Comments from Ottawa County Planning and Performance Improvement – 03/21/19
- Comments from Nate Koster – 03/22/19
- Comments from Pedal Holland – 03/26/19
- Comments from Brian Stauffer – 03/28/19

Tim Maday

From: Susan Moore
Sent: Wednesday, March 13, 2019 8:11 AM
To: Tim Klunder; Tim Maday
Subject: FB Comment - Non-Motorized Pathway

Forwarding on a comment received on this:

Bill Bron Most of the streets are not even wide enough for two way traffic and parking on both sides.

Susan Moore
Administrative Assistant
City of Zeeland
Phone: 616.772.0870

Tim Maday

From: Start, Theodore <Theodore.Start@gentex.com>
Sent: Wednesday, March 13, 2019 11:42 AM
To: Tim Maday
Subject: Non-motorized System Plan

Hello Mr. Tim Maday,

My name is Ted Start and I am a city of Zeeland resident. I also happen to be quite a bicycling enthusiast (I am big advocate and brand ambassador for Main St. Bicycle Co.) so this plan draft is very exciting for me to hear. An infrastructure addition that I would be most excited about would be a tunnel or bridge for cyclists/pedestrians to safely cross over Business-196 preferrably at Fairview Rd to 88th Ave. This is the main artery for all Zeeland resident mountain bikers (which there is a surprisingly high concentration of in town) to ride over to the Upper Macatawa Recreation Area which has an excellent single track mountain bike trail.

Thank you for hearing my comments on the draft; I greatly appreciate the opportunity.

Ted Start
CE EA 723t Team Lead

GENTEX
CORPORATION
A Smarter Vision®

Paul Sachs
Director

Shannon Virtue
Assistant Director

Ottawa County®
Planning & Performance Improvement

March 21, 2019

Timothy Klunder, City Manager
City of Zeeland
21 S. Elm Street
Zeeland, MI 49464

Dear Mr. Klunder,

This letter is in regards to the City of Zeeland's draft Non-Motorized Pathway Plan. One of the County's goals is to expand Ottawa County's regional non-motorized network and increase cross-jurisdictional connectivity. To help accomplish this, the Planning and Performance Improvement Department have several comments on the draft Plan for your consideration:

1. Please note that according to Federal Highway Administration (FHWA) standards, a separated pathway or shared use path are defined as being 8 feet or wider. As such, Ottawa County has been applying this standard when updating all non-motorized pathway data and maps. Anything that is less than 8 feet wide has been considered a sidewalk.

2. From a regional connectivity perspective, please consider partnership opportunities with Zeeland Township to introduce additional pathway connections from the City of Zeeland to the Upper Macatawa Natural Area from the north side, perhaps from Byron Road.

3. Consider cross-jurisdictional connectivity by partnering with Holland Township. To accomplish this, perhaps there are opportunities to connect pathways in Huizenga Park to the pathways along 104th Avenue and 96th Avenue. As such, users may then access Holland Township and subsequently, the City of Holland. Also, consider completing the connection from W. Roosevelt Ave to the existing pathway in Holland Township on Felch Street.

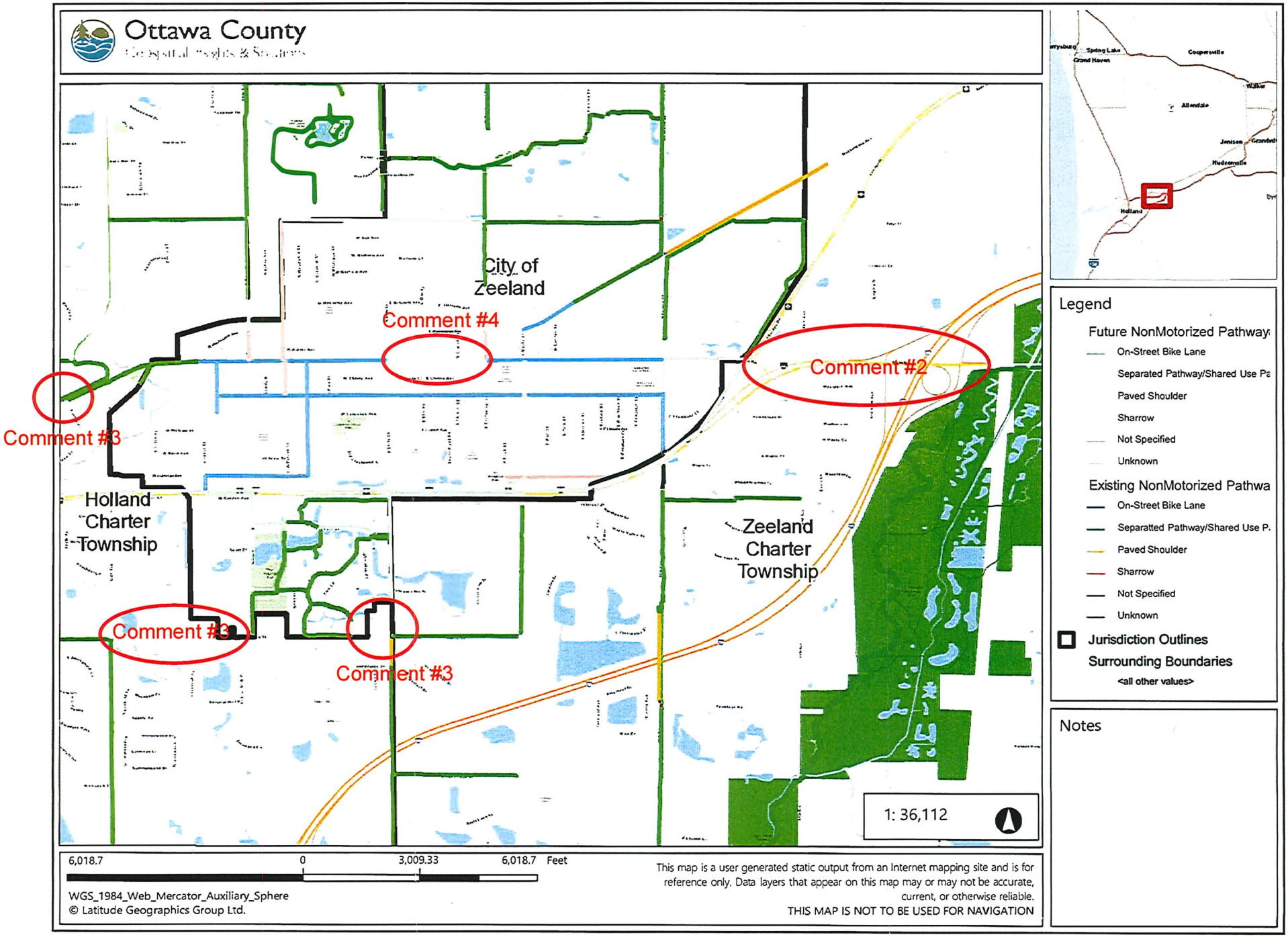
4. Analyze opportunities to expand the non-motorized network within the City of Zeeland – specifically connecting east and west. To do this, consider expanding the "proposed on-street bike lane" to connect E. Main Street and W. Main Street, which will then complete access from one side of the City to the other, and then into neighboring communities.

Thank you for the opportunity to provide feedback. If you have any questions on these suggestions, please feel free to contact Danielle Bouchard, land use planning specialist, at (616) 738-4852 or at dbouchard@miottawa.org.

Sincerely,

Danielle Bouchard

Danielle Bouchard
Land Use Planning Specialist


Ottawa County
City of Zeeland
Comment #4
Comment #2
Comment #3
Holland Charter Township
Zeeland Charter Township
Comment #3
Comment #3
1: 36,112
Legend
Future NonMotorized Pathway
On-Street Bike Lane
Separated Pathway/Shared Use Pa
Paved Shoulder
Sharrow
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Surrounding Boundaries
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© Latitude Geographics Group Ltd.
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Tim Maday

From: Nathan Koster <nathankoster@gmail.com>
Sent: Friday, March 22, 2019 9:50 AM
To: Tim Klunder; Tim Maday
Subject: Non-Motorized System Plan Comments
Attachments: Image 3-21-19 at 11.46 AM.jpg; Image 3-21-19 at 11.47 AM.jpg

Hello,
Thank you for accepting public comment regarding the City of Zeeland's non-motorized plan. I really appreciate the thorough detail and thought that went in to plan it as well as the future vision.

I particularly liked the vision of connecting the city from West to East and South to North and the plan to make the city, as a whole, a more friendly and safe place for families and children!

When in the meeting, I brought up the fact that I feel that Main Street has great potential for putting in bike lanes and "sharrows" to connect the city and allow people to safely travel downtown. The immediate response was to divert this traffic to Central Street, which is less busy. However, the city has invested a lot of money into its downtown and I feel that keeping Main Street as the focus will do better job of promoting our retail and restaurants, and bring more people to downtown.

The second part of the presentation regarding putting safe crossings over/under Chicago Drive/Business Loop 196 was very good; I really like the idea of making this a priority to connect south and north Zeeland. Prioritizing a crossing at 101st is great to give families access to Huizenga Park. The second crossing at Peck Street I think is also very important, as there are already a large number of children that cross there daily. This can also connect to the sidewalk that runs down 92nd Ave to Perry Street, which then runs all the way to the backside of Huizenga Park. However, the only issue with that route would be the crossing at Perry St and 96th Street as this is a blind intersection for pedestrians and not safe for families and children. Only considering one of the crossings I think would be shortsighted, as both I think are essential for the safety of children and families of Zeeland.

Finally, I feel like the city should reconsider a safe crossing of Business Loop 196 at Fairview Road. I know this was originally viewed as more of a recreational crossing, which was not the aim of the city's direction. However, with the neighborhoods on the south side of the intersection, I think the argument can be made that there are/would be a number of commuters and families using this crossing if it were safer. Paired with the use this intersection receives from employees of many of the industrial businesses on their breaks or before/after work to access the Upper Macatawa Natural Area, this intersection sees a lot of traffic both automotive and pedestrian. Also, when you consider that access to the Upper Macatawa Natural Area will potentially ultimately connect to the trail systems all the way to Rockford, MI and much further north via the multi-use paths: there is a great potential for downtown Zeeland to be a stop for many people utilizing this trail network. As the trail is now, a safe crossing could make downtown Zeeland a big stopping point for cycling tourism. As mentioned in the meeting, if there are regional connection grants available for making a safe crossing at Fairview Road, I think this should be explored and implemented.

Lastly, I have attached to my comments a "heatmap" of the City of Zeeland. This data is from the app Strava, and it shows the current commuting and recreational use of the streets. This is based on live data and interaction of the app by cyclists already riding to and from Zeeland. As you can see, the areas that I

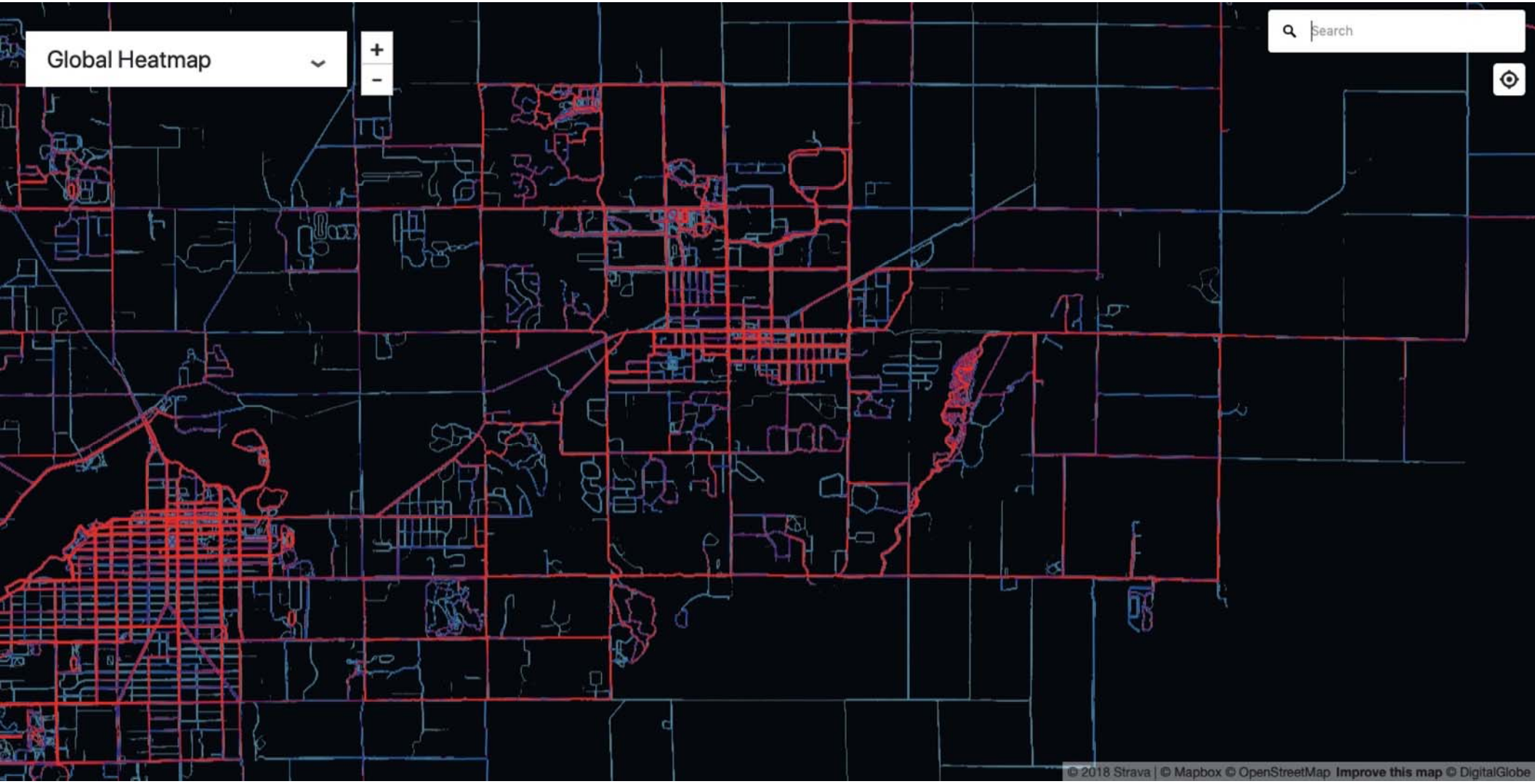
highlighted in my comments are major areas that are already being used. The blue to red coloring shows low to high traffic. The darker and more bold the red, the higher the traffic. Increasing the safety to these sectors will not only benefit the people already using them but also the people who would like to use them but currently are concerned for their safety.

Again, thank you for accepting public comments on the proposed non-motorized plan for the City of Zeeland. Thank you for the detail and thoughtfulness that went into this plan. I look forward to seeing what the city is going to adopt and I hope you consider my concerns moving forward.

If you have any questions for me or would like more of my input, please contact me at nathankoster@gmail.com or 616-283-7994

Best Regards,

Nate Koster
61 W Cherry Ave Zeeland, MI 49464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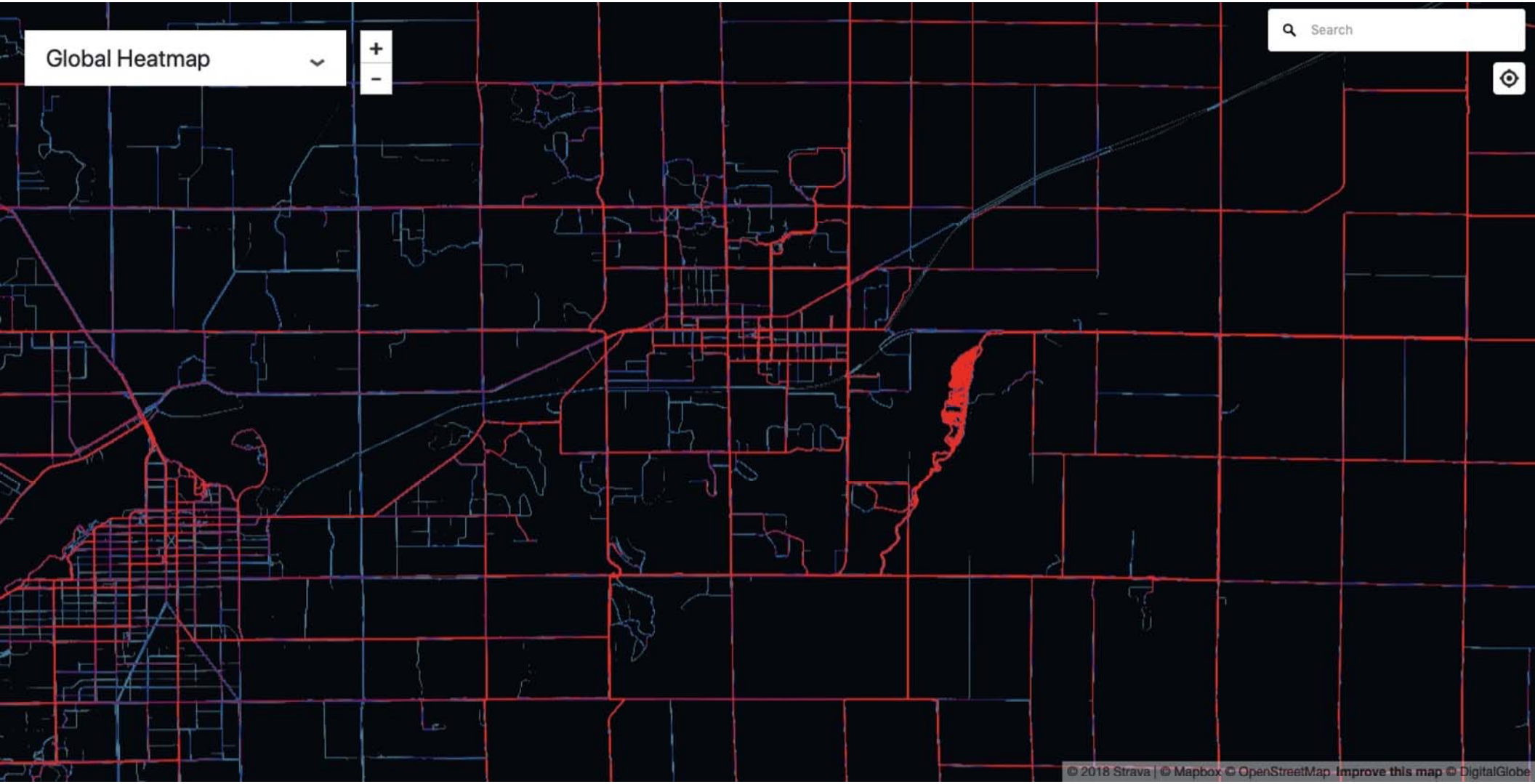
© 2018 Strava | © Mapbox © OpenStreetMap Improve this map © DigitalGlobe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Pedal Holland · PO Box 1583 · Holland, Michigan 49422-1583

Tim Klunder, City Manager
Tim Maday, Community Development Director
City of Zeeland
21 S. Elm Street
Zeeland, Michigan 49464

March 26, 2019

Dear Mr. Klunder and Mr. Maday:

Pedal Holland seeks to make bicycling an easy choice for transportation and recreation for all members of our community. As such, we offering the following comments in hopes of helping create the most useful system possible for the greatest number of users of all ages and abilities. We're grateful that you're giving detailed consideration to non-motorized transportation users' needs.

- There are two places in the plan where sharrows are presented as the treatment of choice, on **Franklin** between Main and Washington and on **Centennial** also between Main and Washington. Pedal Holland no longer recommends sharrows be considered a core component of a bike network as more recent studies have not indicated safety or ridership benefits, though they can be helpful communication and "permission" tools.

  It may be worthwhile to consider if the volumes and speeds in these two places would lend themselves to an Advisory Bike Lane treatment. ABLs are an experimental protocol under the FHWA that are in use in the City of Grand Rapids (Jefferson Ave.) and tentatively planned for use in the City of Holland (Central Ave.). Centennial seems like an especially promising location for this configuration.

Advisory Bike Lane on Jefferson in Grand Rapids

Alternatively, because **Franklin** is a potential route to the middle school it may be helpful to widen the sidewalk and improve the crossing in that area, acknowledging that this is where students are more likely to ride.

- On the proposed designated bike route on **Jefferson**, we recommend neighborhood greenway-style traffic calming and robust crossing treatments such as RRFBs or HAWK signals, especially near the middle school on Roosevelt/Felch. The neighborhood greenway treatment may be beneficial on **Central** as well.
- Naming additional recommended bike routes and adding wayfinding signage will help define the network and increase usability.
- We recommend improving crossings on the north end of **State** and in the industrial area and encourage consideration of tools such as a Leading Pedestrian Indicator near the high school and at other crossings where bike/ped traffic is heavier or is desired. There may be spots in the industrial area where mid-block bike/ped crossings would be desirable.
- **State Street** is difficult to ignore as it is part of the main regional connector route through central Ottawa County. We recognize that this would be an extremely complicated project, but recommend including non-motorized remediation in long-term plans for this area. A separated facility may make sense here if you have the right-of-way.
- For pedestrian safety, consider removing the slip lane at **State/Washington**, especially if there is a change to the truck routes with the new roundabout on **Washington**.
- **All southern entry points to the city remain difficult**. Although the proposed grade-separated facility would be a tremendous safety improvement, we recommend coordinating with MDOT to improve safety at all of these crossings (similar to what has been done at **104th**). We are urgently concerned about the reported crossing of the business loop by schoolkids at **Maple**. There is a strong desire of our membership to see an enhanced crossing at **Fairview/88th** at the business loop and to facilitate access to the Upper Macatawa Natural Area and the greenway/trails system as a whole. The **Peck Street** crossing is a general favorite of our membership.
- The **core downtown area** remains accessible to only adult bicyclists (level 2). We recommend remediating this in three ways. <u>First</u>, adding striped bike lanes on **Elm** north of **Main** to provide a comfortable north-south route through the center of the downtown. (There should be room for 12' traffic lanes and 4+' bike lanes within the current curb cut.) Although this would eliminate street parking, there are no shops fronting this part of the street and there is ample, directly-adjacent off-street parking that is reportedly under-utilized. This would also connect well to the *woonerf* already installed on **Elm** by City Hall. There may be room for additional treatments here since Elm is due for resurfacing in the next 5 years.

  <u>Second</u>, continue **Main Street** bike lanes between **State** and **Elm.** This would again require removal of desirable on-street parking, but there is also ample parking at the public lot near North Street CRC.

  <u>Third</u>, add well-signed, high-quality bike parking at the edges of the downtown area to allow people who are uncomfortable riding in the street to conveniently park their bikes and walk the remainder of the way to their destination. (Pedal Holland can provide recommended bike parking specs, if that is helpful.) The goal here is to allow a convenient way for people to either comfortably bypass the downtown or access it on foot if they are unwilling to ride with traffic through town.

- We recommend that an ordinance instituting a fine for stopping, standing, or parking in bike lanes be included as part of this plan. Blocked bike lanes are a preventable source of bicyclist injury and death, and it is easier to get off on the right foot by implementing this when bike lanes are first installed than after people have gotten into bad habits.

Thank you for your consideration. Please don't hesitate to contact us if we can assist with this process in any way.

Sincerely,

Meika Weiss
Pedal Holland Founding Board President
616.540.9865

Tim Maday

From: Brian Stauffer <BrianS@70x7liferecovery.org>
Sent: Thursday, March 28, 2019 11:53 AM
To: citymgr@cityofzeeland.com.; Tim Klunder
Cc: Tim Maday; meika.weiss@gmail.com; abodbyl-mast@miottawa.org
Subject: Non-motorized Plan

Hi Tim (an error message is popping up for the City Manager email, Tim Maday please forward to Tim Klunder if you have a better email- thanks),
Glad to have a reason to be in touch with you again. Meika asked Aaron of Ottawa County Parks and Recreation who might be a connection with the Upper Macatawa Natural Area Mountain Bike Trails in relation to your non-motorized plan. I sent her the message below and she suggested I share this with you too. Hope you are doing well and please let me know if I can help in any other way.
Thanks,
Brian

Hi Aaron and Meika,

I read the plan and am glad to help as I humbly think we have some good connections here (I worked with City Mgr, Tim Klunder on the development of Zeeland's Northside Pathway, bike commuted Holland to Zeeland to work for 32 years, Upper Macatawa Mountain Bike Trail Co-coordinator, ODC/Macatawa Greenway Board/Committees, Ottawa County Parks Foundation Board - Sorry couldn't resist the list ;).

The Upper Macatawa Natural Area is well-used by Zeeland area residents, in fact, I've even been told by a couple different parties that they moved to the Zeeland area because of the mountain bike trails. Most people coming from town seem to cross BL196 at Fairview/88th and ride or walk/run the bike path down to Frontage Rd. and go east to 84th Ave. and the park entrance. The BL196 crossing is very busy there with turn lanes adding to the challenge, but a confident, patient biker or walker/runner has minimal trouble while it might be intimidating to the less confident. A bridge at Peck would be cool even though more serious cyclists and walkers/runners probably won't go out of their way to go back west to it. Bridges are expensive and can't be everywhere, but from Peck, it's a long way and a bike path to Fairview would be important for an Upper Mac destination. Right now, I bike through the trailer park if coming from that vicinity. Once on 88th Ave., the paved path is very nice (especially for the confident since it narrows on the I196 overpass). Frontage Road to the east then has very little traffic and is fine for serious bikers while maybe not as safe for children, less confident bikers, or walkers.

As you probably know, the paved pedestrian path through Upper Mac connects to the northeast to the path on Byron Road and on to the Kent Trails. From the park entrance, it continues southwest to Adams St. and will eventually continue on to Holland via the Macatawa Greenway. The same connections mentioned for the Mountain Bike trails would be important for Greenway connections. Eventually, there should be a Greenway trail connection possible at State St/96th Ave where a tunnel under BL196 would be really helpful too.

Not being sure exactly what you need, hope this is helpful.

Thanks,
Brian

Brian Stauffer

Executive Director, Holland
Cell – 269-512-4835
Office – 616-796-0685 ext. 102

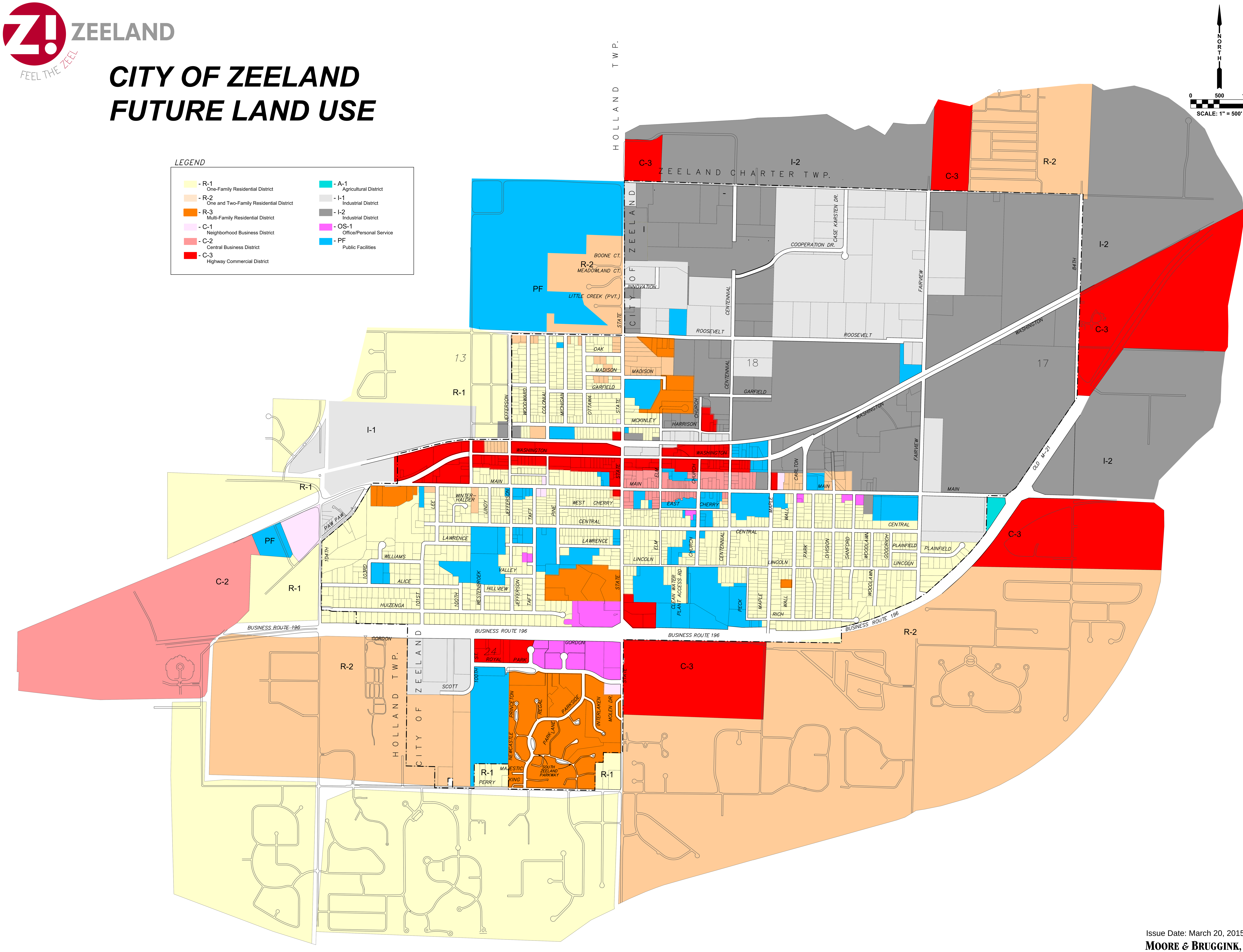
70x7 Life Recovery

Our Mission – To Restore Dignity, Purpose and Hope to a Recovering Community One Relationship at a Time

ATTACHMENT B

ZEELAND
FEEL THE ZEEL

CITY OF ZEELAND
FUTURE LAND USE



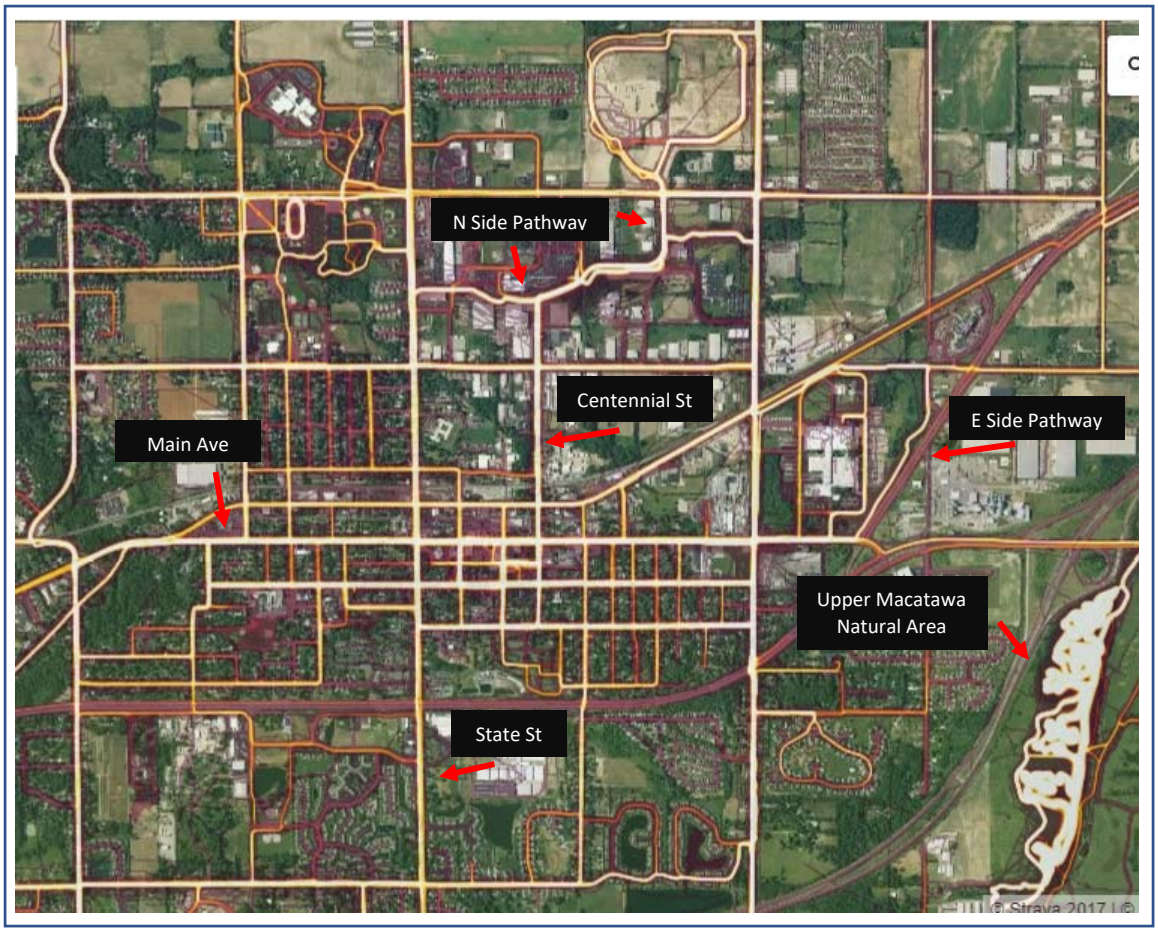
LEGEND
- R-1 One-Family Residential District
- R-2 One and Two-Family Residential District
- R-3 Multi-Family Residential District
- C-1 Neighborhood Business District
- C-2 Central Business District
- C-3 Highway Commercial District
- A-1 Agricultural District
- I-1 Industrial District
- I-2 Industrial District
- OS-1 Office/Personal Service
- PF Public Facilities
NORTH
0 500 1000
SCALE: 1" = 500'
HOLLAND TWP.
ZEELAND CHARTER TWP.
CITY OF ZEELAND
WASHINGTON
MAIN
CENTRAL
BUSINESS ROUTE 196
STATE
ROOSEVELT
FAIRVIEW
CENTENNIAL
CHURCH
OLD M-21

Issue Date: March 20, 2015

MOORE & BRUGGINK, INC.
Consulting Engineers
2020 Monroe Avenue N.W.
Grand Rapids, Michigan 49505-6298
Phone: (616) 363-9801 Web: www.mbce.com

ATTACHMENT C

Zeeland Strava User Heatmaps



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