Grand Valley State University Non-motorized Transportation Plan Summary of Recommendations

Part 1

Prepared for:



Facilities Planning

Prepared by:



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*Non-motorized Transportation Plan Map (this is a large map) may be downloaded from the Project Page at www.greenwaycollab.com/gvsu.htm

*Please note that Part 2 will include policies and programs for non-motorized transportation on campus.

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1. Introduction

Grand Valley State University's Allendale campus has the foundation to be a great place for walking and bicycling. The campus itself is very compact so that most trips on campus are all within easy walking and bicycling distance. There is also high density off-campus housing within easy bicycling distance to campus. Complementing the walkability of the campus is an excellent bus system. This system supports a large population of students who live off campus and links students who live on-campus to off-campus resources.

The campus has undergone fundamental changes over the past few decades. The University has grown dramatically and become more of a residential institution. But, much of the campus and the surrounding residential and commercial development have an infrastructure built with an automotive commuter in mind. Thus, while there has been increased attention to pedestrian and bicycle safety and accommodation on campus over the past decade, these efforts are fighting structural barriers.

This project is a result of a desire to look at the Allendale campus bicycle and pedestrian accommodations in a comprehensive manner. The proposals in this document were developed with GVSU Facilities Planning in conjunction with the GVSU Parking, Transportation and Traffic Committee. Prior to the commencement of the project, Facilities Planning had identified a number of known problems that this project should address. The goal was to address these issues such that when completed, the non-motorized circulation on campus made sense as a system.

This document is a summary of the recommendations that are the outcome of a five month study. The inventory and analysis, alternatives and preliminary recommendations are documented in a series of PowerPoint presentations that were utilized in the planning process. This document identifies near-term opportunities to improve the physical environment, guides long-term development and makes recommendations on how to develop a network that supports non-motorized transportation.

Due to funding constraints, the project has been divided into two parts. Part 1, includes a master plan overview and specific area recommendations with design guidelines. Part 2 will include policies and programs for non-motorized transportation on campus.

The document is divided into three main segments:

Master Plan Overview

Provides proposals for a range of bicycle and pedestrian facilities that accommodate all user types and helps to reduce vehicular traffic on North and South Campus Drive.

Specific Area Recommendations

Provides specific design proposals for the following corridors, 48th Avenue, West Campus Drive, Pierce Street and North and South Campus Drive.

General Design Guidelines

Outlines key elements of proposed non-motorized facilities.

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2. Master Plan Overview

The purpose of this plan is to develop an approach for accommodating non-motorized modes of travel on GVSU's Allendale Campus and between the campus and the surrounding community.

Key Issues:

Conflicts on North and South Campus Drive

The existing transportation system pushes most of the motorized traffic entering from Lake Michigan Drive onto North and South Campus Drive. This sets up numerous conflict points between pedestrians moving east-west across campus and motor vehicles moving north-south.

Non-motorized Links Between Campus and Off-Campus Housing

West Campus Drive and Pierce Street provide east-west non-motorized links between campus and offcampus student housing located along 48th Avenue. Currently, the only non-motorized connection between these areas is a paved shoulder on the south side of West Campus Drive

48th Street Reconstruction

48th Street runs north-south along the west end of campus and links to a number of student housing developments. Students who live in the off-campus housing wishing to reach campus on foot or by bike need to move along and across 48th Street. Currently, there is only an incomplete sidewalk on the west side and narrow paved shoulders on 48th Street.

Recommendations

General recommendations are provided on a Campus Circulation Plan. Detailed recommendations are provided by dividing the campus into quadrants: North-East, North-West, South-East and South-West. The complete Non-motorized Transportation Plan Map (this is a large map) may be downloaded from the Project Page at www.greenwaycollab.com/gvsu.htm.

Topics

- 2.A Campus Circulation Plan
- 2.B North-East Campus Recommendations
- 2.C North-West Campus Recommendations
- 2.D South-West Campus Recommendations
- 2.E South-East Campus Recommendations
- 2.F Neighborhood Connectors



2A. Campus Circulation Plan

Campus Circulation

- Primary Vehicle Route
 - Primary Bicycle Route
 - Primary Pedestrian Routes
- Secondary Vehicle Route
- Bicycle Connector Routes
 - Pedestrian Pathways

General Campus Circulation Recommendations:

1. Minimize motor vehicle traffic on North and South Campus Drive

Direct daily commuter traffic entering campus from Lake Michigan Drive onto Laker Village Drive to minimize conflicts between motor vehicles and pedestrians on North and South Campus Drive and improve the flow of bus traffic. A roundabout at the intersection of Ravine Center Drive and North Campus Drive will provide an opportunity for wayfinding. At this point people may be directed to the parking lots via Ravine Center Drive and Laker Village Drive. A roundabout will also eliminate the current default straight through movement of this intersection as well as accommodate the high number of left turning movements from Ravine Center to North Campus Drive. In addition to these measures, vehicular access to the parking lots from North and South Campus Drive should be eliminated. North and South Campus Drive's traffic though will not be restricted as there they are necessary to access some parts of campus. They are also signature roads that are useful for introducing visitors and prospective students to the campus.

2. Provide north-south bicycle links on campus

Currently there are no convenient ways for a bicyclist to travel north and south on campus, as the sidewalks are generally filled with pedestrians at class change times and there are no designated on-road facilities. A bicycle path may be constructed paralleling North and South Campus Drive. Elimination of access to the parking lots as noted under Item1, will minimize conflicts between bicyclists and motor vehicles at intersections. A second primary pathway should also be provided that roughly parallels Laker Village Drive.

3. Slow speeds of motor vehicle traffic

Slower motor vehicle speeds are desirable on campus as they reduce the likelihood of serious injury or death should there be a crash involving a motor vehicle and a pedestrian or bicyclist. The most effective way to slow speeds is through the physical design of the roadway. Roundabouts and crossing islands are proposed throughout campus for their dual purpose as effective traffic control devices as well as their ability to reduce speed.

4. Improve pedestrian connections between Laker Village and campus

By reconfiguring the orientation of some of the parking lots between Campus Drive and Laker Village Drive pedestrian access between campus and housing will be safer and more pleasant. Currently, the walkways that serve this route run along roadways and frequently cross parking lot isles.

5. Provide non-motorized links between off-campus housing and campus

A combination of wide bike lanes and sidewalks are proposed on West Campus Drive, Pierce Street and 48th Avenue to provide safe and convenient access from the off-campus housing along 48th Avenue to campus. In addition, a bike route has been identified that would permit bicyclists living further west of campus a low stress way to access campus that avoids Lake Michigan Drive.

6. Enhance shared space

In Laker Village a number of bicycle and pedestrian pathways experience frequent motorized vehicle traffic. For these areas physical barriers are proposed rather than the current signage. In the North Living Center there are a number of pathways that are open to motorized traffic where the design and degree of access favor the motor vehicle over the desired primary use by non-motorized traffic. In these areas tighter controls are proposed on motorized vehicles.



Recommendations:

- 1. Evaluate placing future roundabout at intersection of Ravine Center Drive and North Campus Drive.
- 2. Remove all vehicular access to selected parking lots from North and South Campus Drive.
- 3. Add signage at shared street entrance to notify vehicles that they are entering a shared space.
- 4. Restrict vehicular use to university and maintenance vehicles only.
- 5. Add enhancement features, such as bump-outs with trees as well as site furnishings, to restrict vehicles to shared spaces only (see Section 3.E Shared Space Enhancements, page 21).
- 6. Restrict vehicular access beyond turnaround.
- 7. Add curb ramp where the pathway meets the driveway.
- 8. Add enhancement features, such as bump-outs with trees as well site furnishings, to restrict vehicles to shared spaces (see Section 3.E Shared Space Enhancements, page 21).

TRANSPORTATION FACILITIES						
	Primary and Local Roads					
	Shared Roadway					
\bigcirc	Potential Roundabout					
	Potential Parking Lot R	Reconfiguration				
	Bus Stop					
NON-MOTORIZED TRANSPORTATION FACILITIES						
Bicycle Facilities						
	Existing Paved Should	ers/Bike Lanes				
	Potential Paved Shoulders/Bike Lanes					
_	Potential Bike Path					
•••••	Potential Bicycle Connector Routes					
Pedestra	in Facilities					
	 Existing Walkways 					
	 Potential Primary Pedestrian Routes 					
	Potential Hiking Trails					
Bicycle and Pedestrain Facilities						
_	Seperated Use Path					
Road Crossing Improvements						
۲	 Potential Road Crossing Improvements 					
Bicycle Parking Facilities						
BC	BC Potential Near-term Bike Center Location					
CP	CP Potential Covered Parking					
Campus Landcover						
	Building	Recreation Field				
	Water	Golf Course				



2.C – North West Campus Recommendations

Recommendations:

- 1. Align proposed pathway with existing signalized pedestrian crossing
- 2. Potential bike center at Ravine Apartments and near the water tower in the near-term, in the long-term explore potential locations for a more centralized location for the bike center
- 3. Evaluate placing future roundabout at intersection of West Ravine Center Drive and Laker Village Drive
- 4. Removing outer row of parking to fit bicycle path
- 5. Add buffer between parking lot E and Laker Village Drive
- 6. Place landscaped island at the end of isles where pedestrian walkways are recommended
- 7. Add 8' bike path along the edge of the existing sidewalk to minimize impact on wetland and evaluate moving the retaining wall closer to the golf tee to fit the pathway
- 8. Place landscaped islands at the end of isles where pedestrian walkways are recommended
- 9. Place separate-use path close to road to minimize impact on wetland area, approximately 500' of boardwalk may be needed





2.D – South West Campus Recommendations

Recommendations:

- 1. Evaluate placing roundabout at intersection of West Campus Drive and South Campus Drive.
- 2. Place path close to road to minimize impact on woodland area.
- 3. Place landscaped islands at the end of isles where pedestrian walkways are recommended.
- 4. Evaluate if movable gates are necessary to help prohibit non-authorized vehicles from entering Laker Village Apartments off of Laker Village Drive.
- 5. Add shared space enhancement features to restrict vehicles from interior pathways.
- 6. Rearranging the parking lots orientation so they are parallel to the flow of pedestrian traffic with oneway vehicular flow and sidewalks at the end of the isles instead of parking.
- 7. Place covered bicycle parking adjacent to pathway and at the end of the apartment buildings, begin with 20% of the bike parking as covered and add more with demand.
- 8. Relocate bus-stop to roadway (see 3.D North and South Campus Drive Recommendations, page 20).

TRANSPORTATION FACILITIES						
	Primary and Local Roads					
	Shared Roadway					
\bigcirc	Potential Roundabout					
	Potential Parking Lot F	Re	econfiguration			
	Bus Stop					
NON-MOTORIZED TRANSPORTATION FACILITIES						
Bicycle Facilities						
	Existing Paved Should	de	ers/Bike Lanes			
	Potential Paved Shoulders/Bike Lanes					
_	Potential Bike Path					
•••••	Potential Bicycle Conr	ne	ector Routes			
Pedestra	in Facilities					
	Existing Walkways	Existing Walkways				
	Potential Primary Pedestrian Routes					
	Potential Hiking Trails					
Bicycle a	nd Pedestrain Faciliti	e	5			
_	 Seperated Use Path 					
Road Crossing Improvements						
۲	Potential Road Crossing Improvements					
Bicycle Parking Facilities						
BC	BC Potential Near-term Bike Center Location					
CP	CP Potential Covered Parking					
Campus	Landcover					
	Building		Recreation Field			
	Water		Golf Course			



2.E – South East Campus Recommendations

Recommendations:

- 1. Evaluate placing roundabout at intersection of North Campus Drive, West Campus Drive and South Campus Drive
- 2. Reconfigure drop-off in front of Kirkhof Center and the Performing Arts Center to minimize conflict with pedestrian route. Move existing parking to parking lot between South Campus Drive and Laker Village Drive.
- 3. Carry main pedestrian route between the Kirkhof Center and the Performing Arts Center.
- 4. Evaluate placing future roundabout at intersection of Pierce Street and South Campus Drive.

TRANSPORTATION FACILITIES					
Primary and Local Roads					
Shared Roadway					
O Potential Roundabout					
Potential Parking Lot Reconfiguration					
🗐 🛛 Bus Stop					
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Potential Road Crossing Improvements					
Bicycle Parking Facilities					
BC Potential Near-term Bike Center Location					
CP Potential Covered Parking					
Campus Landcover					
Building Recreation Field					
Water Golf Course					

2.F – Neighborhood Connections

Neighborhood Connectors are non-motorized routes that use low volume local roads and pathways to link key destinations. These routes are attractive to bicyclists and pedestrians who are willing to take a slightly longer route to avoid walking and bicycling along busy roads. The routes may not be obvious so they are demarcated with signage that lists destinations and distances along the route.

Bicycle and Pedestrian Guide signs could be used to help guide students to a neighboring town and/or local residents to campus.





3. Specific Area Recommendations

The following corridors and focus areas were highlighted because they provide some of the main connections across campus and pose some of the most challenging issues that require more detailed recommendations.

Focus Areas

- $3.A 48^{th}$ Ave
- 3.B West Campus Drive

3.D – North and South Campus Drive

3.E – Shared Use Areas

3.C – Pierce Street





3.A – 48th Avenue Recommendations

3.B – West Campus Drive Recommendations



Key Recommendations:

- Add bike lanes in both directions by paving the shoulder on the north side of the road
- Add a wide 8' sidewalk along the south side of the street
- Evaluate if a separated bike path is necessary in the long term
- Incorporate bioswales along roadway when possible
- Add a combined pedestrian and golf cart crossing island at Meadows Golf Course entrance and remove part of the existing wall to improve visibility at intersection
- Add a speed table where the pathway intersection with a driveway



3.C – Pierce Street Recommendations



3.D – North & South Campus Drive Recommendations



3.E – Shared Space Enhancements

A shared space is a common space created to be shared by pedestrians, bicyclists and low-speed motor vehicles. A large amount of pedestrian traffic and narrow streets with strategically placed trees, planters and other obstacles help to slow motorists and make the street available for public use.

Enhanced Features of Shared Spaces:

Living Center Apartments and Residence Drive (Combination of Shared and Restricted Spaces) Add signage at shared street entrances

- Detectable warning strips need to be incorporated everywhere a pedestrian is either entering or leaving a space shared with vehicles
- Add temporary furniture to narrow shared street in vehicular restricted areas (tables, benches)
- Add bump outs with trees to narrow shared street in vehicular restricted areas
- Add covered bicycle parking to narrow shared street in vehicular restricted areas
- Constrict access and sign pathways that are restricted to motor vehicles

Laker Village Apartments (Restricted Space)

- Add more prominent black and white regulatory signage at pathway entrances prohibiting vehicles
- Detectable warning strips need to be incorporated everywhere a pedestrian is either entering or leaving a space shared with vehicles
- Widen crosswalk pavement marking across Laker Village Drive to the width of the existing pathways
- Add movable gates at the entrances from Laker Village Drive
- Add temporary furniture along pathways







4. Design Guidelines

The following design guidelines provide direction on how the various elements proposed in the previous sections should be implemented. This section discusses issues and defines current best practices for bicycle and pedestrian facility design. The following design guidelines should be consulted when planning new facilities or reconstructing or modifying existing facilities.

Topics

- 4.A Bicycle Parking
- 4.B-Roundabout
- 4.C Speed Table
- 4.D Separated-Use Path

4.A – Bicycle Parking Guidelines

The lack of a secure parking space discourages many people from using their bikes for basic transportation. When sufficient bike parking is not provided, theft becomes a concern and it leads to bikes being locked up to sign posts, benches and other street furniture. When bicycles are parked in these spaces, they often disrupt pedestrian flow because the bikes impede the walkway. Bicycles also get impounded by local enforcement when parked in these areas causing an even greater deterrent to bicycle use. Bicycle parking needs to be visible, accessible, plentiful and convenient. If any of these criteria are not met, there is a good chance cyclists will not use the facilities and will park their bikes wherever they feel it will be safest.

<u>Definition of a Bicycle Parking Space-</u> A bicycle parking space is an area two feet by six feet or the area occupied by a bicycle when using a bicycle parking device as designed.

<u>Short-Term Bicycle Parking -</u> Short-term bicycle parking is defined as a rack to which the frame and at least one wheel can be secured with a user-provided U-lock or padlock and cable. This type of parking is appropriate for short term parking at locations such as libraries, and cafeterias and other places where typical parking duration is less than two hours.

<u>Long-Term Bicycle Parking-</u> A long-term bicycle parking space is defined as protecting the entire bicycle and its components from inclement weather, theft or vandalism. It is to be located where it will serve the needs of cyclist who leave their bicycles unattended for extended periods of time, such as faculty, staff or residents.

Number of Parking Spaces

The following are guidelines of the number of parking spaces to be provided by a building use. Please note that a station is a faculty, student or staff work/learning area.

Academic Buildings	l bicycle parking space per 8 stations
Arenas	1 bicycle parking space per 60 stations
Commons Buildings	1 bicycle parking space per 40 stations
Library	1 bicycle parking space per 8 stations
Museum	1 bicycle parking space per 10 stations
Office/Research	1 bicycle parking space per 10 stations
Performance Halls	1 bicycle parking space per 60 stations
Recreation Buildings	1 bicycle parking space per 9 stations
Residential Housing	1 bicycle parking space per 3 beds

The standards were drawn from multiple sources and verified based on actual bicycle parking usage on the University of Michigan's central campus. These standards may need to be periodically revisited as bicycle use increases.

Uncovered Bicycle Racks

Uncovered Bicycle Racks are the primary bike parking approach for areas where people are expected to park their bikes for only a few hours.

Design-Generally, bicycle racks of the inverted "U" design are considered the best models. The rack should be constructed from a square tube, flat bar, or some other material that is resistant to pipe cutters. Alternative designs may be considered for special situations, although they should function similar to the inverted "U" design. The key elements are that they provide at least two contact points for a bicycle and be a shape and size that would permit locking through the frame and one wheel with a standard U-Lock or cable.



Location- The hoops should be placed on a hard surface with ample lighting and high visibility to discourage theft and vandalism. Racks should be placed to avoid conflicts with pedestrians.

Covered Bicycle Parking

Covered Bike Parking is desirable for both long-term and short-term bicycle storage. Basic bicycle racks should be placed under an overhang whenever possible, and specific covered bicycle parking should be created when needed. Covered Bicycle Parking should be available in areas where bikes are kept for an extended period of time, such as residential apartments or at large commercial centers where employees and customers will utilize the covered spaces.

Design- The covering for bicycle parking will vary depending on the location. In addition to a roof, complete or partial side enclosures should be provided to minimize exposure to windblown rain and snow. The design of the racks is the same as for the basic uncovered bicycle hoops. When creating covered parking, there is also the opportunity to incorporate a green roof or solar panels into the rooftop to add to the functionality of the structure.



Location- Covered Bike Parking should be incorporated whenever there is opportunity to do so. Long-term covered bike parking should be located within 400' of the building it is intended to serve. Centralized locations further than 400' are also acceptable. The long-term goal is to provide covering for up to 75% of the bike parking that serves residential halls based on demand.

Bike Station

Bike Stations are premium secured bike parking and maintenance facilities intended for transit stations located in high density areas. They are intended primarily to serve transit riders who will disembark and then retrieve their bike and continue onto their final destination. They will also serve as a centralized bike parking solution for bicyclists who are not using the transit station but whose final destination is near the bike station.

Services:

- bicycle repair shop
- short and long term bicycle rental
- sell bicycle accessories
- sell bicycles (new and used)
- provide compressed air

Programs:



- Refurbish abandoned and donated bicycles and loan/rent them out to faculty/staff, students, departments, visitors and alumni for long term and short term periods
- Offer bicycle safety and maintenance workshops

4.B – Roundabout Design Guidelines

Roundabouts

In many situations, roundabouts have several advantages over typical intersection design: vehicles move at slower speeds, traffic flows more smoothly, and reduced pavement enhances aesthetics and offers the opportunity for landscaping in the central and splitter islands. There are however, serious drawbacks to roundabouts for those with vision impairments, and two-lane roundabouts are problematic for bicycles in particular. Roundabouts, especially larger ones, can present significant out-of-direction travel for pedestrians. Depending on the nature of the surrounding land uses and the design of the roundabouts, pedestrians may attempt to walk directly across the center of the roundabout.

Because there are no traffic control signals to provide a pedestrian "walk" signal, pedestrians wait for an appropriate gap in traffic and cross. The splitter or diversion islands provide a crossing island for the pedestrian, breaking the road crossing into two stages so that they are only dealing with one direction of traffic at a time. This system works quite well for pedestrians without vision difficulties. Studies have shown a reduction in pedestrian crashes for single lane roundabouts and about the same number for multiple lane roundabouts as compared to a traditional signalized intersection. Pedestrians with vision impairments often find roundabouts very intimidating as the audible queues are sometimes insufficient to judge a suitable gap in traffic. Research is currently underway to determine the most appropriate way to accommodate pedestrians, with visual impairments, in roundabouts. Preliminary data indicates that raised crosswalk are helpful in increasing the yield rates and that hybrid pedestrian signals should be used where there are multi-lane crossings.

Multi-lane roundabouts are especially problematic for bicyclists. Studies have shown that while single lane roundabouts have about the same number of bicycle crashes when compared to traditional signalized intersections, multi-lane roundabouts have significantly more. Because of this, design guidelines recommend allowing bicyclists who are traveling in the roadway approaching the roundabout to exit the roadway prior to the roundabout and navigate the roundabout as a pedestrian would. More confident bicyclists may remain in the roadway and merge with the motor vehicles.

Design Guidelines:

- Roundabout approaches should include bicycle entrance and exit ramps to give bicyclists the option of biking on a sidewalk bikeway as well as the roadway.
- Roundabouts should include pedestrian crossing islands on all entering roadways.
- The use of roundabouts should be accompanied by an education campaign regarding the issues involving pedestrians with vision impairments and motorist's responsibility when they see a pedestrian using a white cane.
- The bicycle and pedestrian safety issues should be carefully evaluated for any multiple lane roundabouts.
- The latest research on accommodating pedestrians with visual impairments in roundabouts should be consulted before designing and constructing a roundabout.
- Bicycle and pedestrian pavement markings and signs should be regularly evaluated for every roundabout.



Non-motorized Design Considerations for Roundabouts

4.C – Raised Crosswalk Design Guidelines

Key Elements:

- 1. The yield markings are set back from the ladder crosswalk to minimize the potential for a multiple threat crash.
- 2. Where crossing signs other than the R1-5/ R1-5a "Yield Here to Pedestrians" are used, yield lines should be omitted.
- 3. Sightlines are kept clear of vegetation.
- 4. A 2' wide detectable warning strip is used at the base of the ramps.
- 5. A speed table with 6' long approach ramps and a 4" high table is placed under the crosswalk to bring travel speeds to approximately 25 MPH.
- 6. When retrofitting existing roadways, maintaining drainage along the curb may present challenges in meeting ADA ramp requirements.

Applications

Generally used on relatively low volume, low speed roads where sufficient gaps in the motorized traffic exist. This crosswalk design should be used in areas where traffic speeds typically exceed posted speeds. Should only be used as a part of a traffic calming program.

Example



Example from Michigan State University's Campus

4.D – Separated-use Path Design Guidelines

Key Elements:

- 1. A separated use trail is ideal when there is significant use by both bicycles and pedestrians. Providing a lane specific to walkers or joggers minimizes conflicts with cyclists moving at much faster speeds.
- 2. Ideally, the bicycle path is separated from the pedestrian path where room allows.
- 3. Where the two trail s are adjacent it is important to use contrasting pavement markings, tactile detection strips and/or a change in surface material help to distinguish the pedestrian only lane from the bike path
- 4. The pedestrian path can be phased in after the initial path construction.
- 5. If the pedestrian path will be used by runners a crushed aggregate surface may be desirable

Examples

