<table>
<thead>
<tr>
<th>Past Flood Levels:</th>
<th>Flood Events:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood of 2009: 40.84'</td>
<td>100 Year Flood: 38.20'</td>
</tr>
<tr>
<td>Flood of 1997: 39.50'</td>
<td>Major Flood: 30.00'</td>
</tr>
<tr>
<td>Flood of 2011: 38.81'</td>
<td>Minor Flood: 18.00'</td>
</tr>
<tr>
<td>Flood of 2010: 36.99'</td>
<td>Action Called: 17.00'</td>
</tr>
</tbody>
</table>

Current River Height: 14.73'
Fargo-Moorhead Flooding Results in Mass Buyouts:

Flood of 2009: 40.84'
Call of Action
Fargo-Moorhead Flooding Results in Mass Buyouts:

Flood Buyout Count: **538** Parcels

The past flood events have lead to:
- Mass Buyouts
- Levee Repair
- Levee Construction
- The FM Diversion
Thesis Statement:
I propose a design for a Multimodal Greenway in the Red River Corridor of the Fargo-Moorhead Metropolitan area. I intend to demonstrate methods to increase local commuter options, reduce automobile traffic, and promote a healthier community.

Project Goals:

Designing for Alternative Transportation.
• Connect people to destinations by providing more sustainable alternative routes to motor vehicle transportation.
• Create strong connections to the existing public transit.
• Create safe, comfortable trails connecting larger green spaces along the Red River.
• Improve existing transportation system with introduction of a multimodal greenway.

Designing for the Community.
• Strengthen social bonds by creating destinations for community gathering and collaboration of all ages.
• Improve the quality of life and overall health of local users with sustainable choices.
• Change local commuter habits to more sustainable ones.

Designing for the Environment.
• Design a multimodal greenway to encourage users to engage and interact with the environment.
• Create more naturalist habitat.
• Design for flooding.
Site Selection:

The site is located on river front parcels adjacent to the Red River in Moorhead, Minnesota, from I-94 to Main Avenue. Excluding Gooseberry Park, the rest of the parcels within the multimodal greenway make up 103 acres. Flooding has been a large issue in the past in the Fargo-Moorhead Metropolitan area. With the introduction of the greenway, I plan to use the land to produce a flood protection infrastructure by incorporating naturalistic wetlands. In addition the multimodal greenway provides a strong opportunity for local commuters to change current commuter habits to healthier more sustainable forms that can easily coexist with and benefit the current transportation systems of the metropolitan area. The multimodal greenway will become an escape from the busy city to a safe naturalistic trails to sustainable travel located in the parcels highlighted in the below isometric.

Total Acreage: 103 acres
Site Flood Levels:

100 Year Flood Event:
Approximate Elevation 900'

Major Flood Event:
Approximate Elevation 892'

Minor Flood Event:
Approximate Elevation 880'
Site Analysis:

Crash Incidents Involving Pedestrians and Motor Vehicles:

- Most Incidents
- Least Incidents

Existing Bike Trails and Shared Use Paths:

- Bike Routes

Existing Bus Routes and City Destination Points:

- Bus Routes
- Colleges
- Shopping Malls
- Grocery Stores
- Downtown
- Greenway Site
How A Multimodal Greenway Could Help

Fargo-Moorhead Metropolitan Council of Governments

2014 Long Range Transportation Plan

How can the addition of a multimodal greenway benefit the Fargo-Moorhead Metropolitan area? Reading into Metro COG’s 2014 Long Range Transportation Plan I found many reasons why the metropolitan area would benefit from the introduction of a greenway such as the following:

• Vehicle miles traveled per year would lower
• Lower carbon emissions and improved air quality
• Lower traffic levels and road noise
• Faster emergency vehicular response time
• Lower infrastructure maintenance costs in roads and parking facilities
Encouraging More Involvement:

**The Dero Zap Program**

Participants of the program are entered to win prizes depending on their personal level of activity in the program. Local supporting businesses may offer discounts to customers who participate or incorporate insurance benefits to employees who participate.

**Zap Scanners:**
Redesigned to maintain a sense of place for users along the Multimodal Greenway

1. **Attach the free rigid tag to the front wheel of your bicycle.**

2. **Scanners detect users as they pass by.**

3. **Use Dero’s web app to track your activity.**

**Note:** There are also handheld tags available for participants who prefer to walk or roller blade.

www.dero.com
By introducing a multimodal greenway with progressive flood control and an incentive program we can change transportation patterns. Improving the health of the community by lowering the number of vehicles on the road, lower traffic levels for safer streets and emergency response time as well as the city’s budget for infrastructure such as street repair and additional parking. It can also dramatically effect individual health by increasing ones physical activity and relations in the community and lower the average vehicle miles traveled in the metropolitan area. Lowering the number of vehicle miles traveled in the metropolitan region means lowering the traffic levels which will cut down on carbon emissions improving air quality and noise pollution. Once established I expect great success in number of users and improvements to the community as well as future expansion to include all the parcels adjacent to the Red River.
Master Plan:
Master Plan:

Bus Routes
Concordia
Bike Routes
Existing Parks
Main Trail
Secondary Trail
Wetlands
Prairie
Mowed Turf

Pedestrian Bridge
Zap Scanner
Master Plan:

Bus Routes
Concordia
Bike Routes
Existing Parks
Main Trail
Secondary Trail
Wetlands
Prairie
Mowed Turf

Community Center
Bus Stop
Boardwalk
Zap Scanner
Pedestrian Bridge Site Plan:

Note: The bridge is built up to the major flood level with an elevation of 893', so that it can be used year round or at least most of the year.

Pedestrian Bridge Transition Section Cut:
Boardwalk Perspective:

Light Pole

1
Community Center Site Plan:

- Main Trail
- Secondary Trail
- Wetlands
- Prairie
- Mowed Turf

Main Trail:
- Wetlands
- Secondary Trail
- Prairie
- Mowed Turf

Community Center:
- Bike Shares
- Mile Marker
- Roof Top Lawn Bowling
- Fire Pit
- Stone Sign
- Bike Racks
- Bike Shares

Playground:
- Bench
- Trail Light
- Trail Light with Bench
- Flagstone around seating areas and bends along the crushed stone path
- Boardwalk
- Bench
- Mile Marker
- Roof Top Lawn Bowling
- Fire Pit
- Stone Sign
- Bike Racks
- Bike Shares

Bench:
- Trail Light
- Trail Light with Bench
- Flagstone around seating areas and bends along the crushed stone path
- Boardwalk
- Mile Marker
- Roof Top Lawn Bowling
- Fire Pit
- Stone Sign
- Bike Racks
- Bike Shares
Community Center Perspective:

Stone Sign

Bike Shares

Moorhead Greenway
Community Center

www.kvly.membercenter.worldnow.com
Crushed Stone Path:

Mile Markers

1. Mile Markers are placed along the trails to allow users to navigate easily.

2. Numbers cut out of metal bands.

Benches

Note: Some benches may be attached to park lamps depending on locations.

Flagstone around seating areas and bends along the crushed stone path.
**Typical Trail Types:**

- 8' Asphalt Bike Trail or 6' Crushed Stone Trail Maintenance Lawn/Prairie
- 8' Asphalt Bike Trail or 6' Crushed Stone Trail Prairie/Wooded
- 8' Asphalt Bike Trail or 6' Crushed Stone Trail Maintenance Lawn/Wetlands

**Wetland Section Cut**

- 6' Boardwalk

**Note:** Lowest elevation for the river to overflow into the wetlands is 887'
Conclusion:

With the city's property growth along the Red River due to the current buyouts we can do more than simply construct new levees. We can use the properties to develop an uninterrupted multimodal greenway that can coexist with flood protection measures. Introduction of such a greenway would become an asset to the city as well as its residents in improving the transportation of individuals and the overall community health of the metropolitan region.
GROWING GREENWAYS:
A Multimodal Trail System For Moorhead, Minnesota

Questions?