Fargo Great Rides Bike Share Extension Through Winter: A Feasibility Study

Ali Rahim Taleqani
Upper Great Plains Transportation Institute (UGPTI)
North Dakota State University
Agenda

• Introduction
• Literature Review
• Research Methodology
• Findings and Discussion
• Conclusion
INTRODUCTION
Bike Sharing Background

- An emerging alternative!
- Eco-friendly and convenient means of transportation
- Bike share program in Fargo
- Fargo ranked 28th in nation for bike score
- Great Rides Bike Share rolls past 143,000 rides – (101 bikes/ 11 stations)
- Winter cycling
Objective

– To gauge the potential Fargo community’s support for the extension of the bike share program during winter
– To evaluate the current Fargo bike share operation, performance and level of satisfaction
LITERATURE REVIEW
Literature Review

• Sustainability
• Urban Livability
• Public Health
• Winter Cycling
Methodology

• Survey of users composed of analysis of existing operation and evaluation of the demand for winter season service.
  – 24- questions
    • Demographic questions
    • Existing operation
    • Winter operation demand

• Qualtrics (online)
• Between 10/27/ 12/01
• 657 responses / 67 partial responses
FINDINGS AND DISCUSSION
Gender & Age

Gender vs. Membership Distribution

Response Rate: 95.6%

<table>
<thead>
<tr>
<th>Gender</th>
<th>Membership Status</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>Annual Member</td>
<td>341</td>
</tr>
<tr>
<td>Female</td>
<td>Never Held</td>
<td>239</td>
</tr>
<tr>
<td>Female</td>
<td>No Longer Member</td>
<td>6</td>
</tr>
<tr>
<td>Male</td>
<td>Annual Member</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>Never Held</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>No Longer Member</td>
<td>3</td>
</tr>
</tbody>
</table>

Age Distribution

Response Rate: 97%

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-19</td>
<td>271</td>
</tr>
<tr>
<td>20-24</td>
<td>268</td>
</tr>
<tr>
<td>25-29</td>
<td>86</td>
</tr>
<tr>
<td>30-34</td>
<td>29</td>
</tr>
<tr>
<td>35-39</td>
<td>11</td>
</tr>
<tr>
<td>40-44</td>
<td>7</td>
</tr>
<tr>
<td>45-49</td>
<td>4</td>
</tr>
<tr>
<td>50-54</td>
<td>1</td>
</tr>
<tr>
<td>55-59</td>
<td>3</td>
</tr>
<tr>
<td>60-64</td>
<td>4</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>5</td>
</tr>
</tbody>
</table>
Current Bike Use

Enrolled riders

81% student
18% guest
1% member

Number of Students by Rides

Students at least

Source: Office of Fargo Great Rides Bike Share
Bike Access

- Both: 17%
- Great Rides bike share bicycle: 55%
- My own bicycle: 11%
- Neither: 17%

Bike Riding Profile

- More than 5 times a week: 20.7%
- 3 to 4 times a week: 16.3%
- 1 to 2 times a week: 16.3%
- 1 to 3 times a month: 14.7%
- Never: 32.6%
- Less than 1 time a month: 25.0%
- 3 to 4 times a month: 8.4%
Safety & Satisfaction

![Safety & Satisfaction Chart]

- Very unsafe: 2%
- Unsafe: 1%
- Neither safe or unsafe: 11%
- Safe: 48%
- Very safe: 38%

- Very unsatisfied: 3%
- Unsatisfied: 3%
- Neutral: 15%
- Satisfied: 51%
- Very satisfied: 28%
<table>
<thead>
<tr>
<th>Stations</th>
<th>Barry Hall (BH)</th>
<th>Fercho YMCA (FY)</th>
<th>Great Northern Bicycle Co (GN)</th>
<th>High Rise Complex (HR)</th>
<th>MATBUS Center Downtown (MC)</th>
<th>Memorial Union (MU)</th>
<th>Renaissance Hall (RH)</th>
<th>Sanford Medical Center (SM)</th>
<th>University Village (UV)</th>
<th>US Bank Plaza (US)</th>
<th>Wallman Wellness Center</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.51%</td>
<td>0.04%</td>
<td>0.05%</td>
<td>9.94%</td>
<td>0.03%</td>
<td>0.58%</td>
<td>0.17%</td>
<td>0.04%</td>
<td>5.41%</td>
<td>0.12%</td>
<td>0.14%</td>
</tr>
<tr>
<td></td>
<td>0.06%</td>
<td>0.42%</td>
<td>0.05%</td>
<td>0.14%</td>
<td>0.02%</td>
<td>0.07%</td>
<td>0.04%</td>
<td>0.07%</td>
<td>5.34%</td>
<td>0.12%</td>
<td>0.03%</td>
</tr>
<tr>
<td></td>
<td>0.03%</td>
<td>0.06%</td>
<td>0.46%</td>
<td>0.13%</td>
<td>0.03%</td>
<td>0.24%</td>
<td>0.04%</td>
<td>0.04%</td>
<td>5.19%</td>
<td>0.12%</td>
<td>0.05%</td>
</tr>
<tr>
<td></td>
<td>0.35%</td>
<td>0.07%</td>
<td>0.14%</td>
<td>11.39%</td>
<td>0.08%</td>
<td>11.39%</td>
<td>0.13%</td>
<td>0.14%</td>
<td>5.41%</td>
<td>0.29%</td>
<td>0.07%</td>
</tr>
<tr>
<td></td>
<td>0.04%</td>
<td>0.03%</td>
<td>0.19%</td>
<td>9.94%</td>
<td>0.04%</td>
<td>6.57%</td>
<td>0.28%</td>
<td>0.04%</td>
<td>5.19%</td>
<td>0.40%</td>
<td>0.12%</td>
</tr>
<tr>
<td></td>
<td>0.57%</td>
<td>0.07%</td>
<td>0.19%</td>
<td>0.05%</td>
<td>0.09%</td>
<td>6.57%</td>
<td>0.41%</td>
<td>0.28%</td>
<td>5.19%</td>
<td>0.40%</td>
<td>0.34%</td>
</tr>
<tr>
<td></td>
<td>0.15%</td>
<td>0.04%</td>
<td>0.04%</td>
<td>0.05%</td>
<td>0.02%</td>
<td>0.30%</td>
<td>0.41%</td>
<td>0.03%</td>
<td>5.19%</td>
<td>0.10%</td>
<td>0.05%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.07%</td>
<td>0.07%</td>
<td>0.03%</td>
<td>0.25%</td>
<td>0.06%</td>
<td>0.06%</td>
<td>5.19%</td>
<td>0.15%</td>
<td>0.06%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why Ride a Bike!?
Trip Purpose

Purpose of Trips

- Commuting to and from work: 6%
- Commuting to and from school: 29%
- Cycling to shopping: 5%
- Cycling to cultural activities: 3%
- Cycling for errands and appointments: 9%
- Cycling for recreation: 20%
- Cycling for fitness or exercise: 12%
- Cycling to visit friends: 13%
- Other (Please specify): 3%

Graph showing the distribution of trip purposes with percentages.
Factors Preventing from Using Bike Share

- 1: 17%
- 2: 18%
- 3: 13%
- 4: 26%
- 5: 1%
- 6: 7%
- 7: 5%
- 8: 7%
- 9: 6%
Alternative Means of Transportation

- Personal vehicle (sole passenger) 42%
- Personal bicycle 17%
- Walking 10%
- Carpool (2+ passengers) 7%
- Public transportation 4%
- Bike rental 6%
- Taxi 0%
- Would not make trip 1%
- Other (please specify) 0%

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY  NDSU
As a result of my use of Great Rides Bike Share, I use ...

- About the same (bike sharing has had no impact)
  - Bus: 32%
  - Personal Vehicle: 43%
  - Walk: 41%

- Less often
  - Bus: 24%
  - Personal Vehicle: 21%
  - Walk: 40%

- Much less often
  - Bus: 5%
  - Personal Vehicle: 6%
  - Walk: 5%

- I did ride the .../walk before, and I do not ...
  - Bus: 0%
  - Personal Vehicle: 0%
  - Walk: 0%

- I have changed how I use ...
  - Bus: 6%
  - Personal Vehicle: 7%
  - Walk: 4%
As a result of my use of Great Rides Bike Share, I have been getting...

- 45% Much more exercise
- 44% More exercise
- 7% About the same exercise as before
- 3% Less exercise
- 3% Much less exercise
Smartphone App

Likeliness to use "B-cycle Now" app

- More than 75%: 19%
- 50% - 75%: 14%
- 25% - 50%: 6%
- Less than 25%: 10%
- Never: 51%
Winter Cycling

Average Temperature vs. Number of Riders by Month

- Low (°F)
- High (°F)
- Rides

Month | Low | High | Rides
--- | --- | --- | ---
March | -11 | 75 | 6668
April | 15 | 82 | 28058
May | 30 | 87 | 13787
June | 44 | 92 | 6707
July | 42 | 91 | 5516
August | 42 | 96 | 18665
September | 93 | 38858 | 34
October | 97 | 25094 | 22

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY NDSU
Winter Operations vs. Experience

- Yes: 30%
  - I can't judge: 3%
  - No: 14%
  - Yes: 14%

- Maybe: 15%
  - I can't judge: 5%
  - No: 20%
  - Yes: 20%

- No: 4%
  - I can't judge: 6%
  - No: 5%
  - Yes: 5%
Cleared Bike Paths and Sidewalks

- Yes: 82%
- Maybe: 12%
- No: 6%
Potential Dangers

Major Potential Dangers to Cyclists in Fargo

- Violations, driving errors, reckless driving
- Unsafe/Risky crossing intersections
- Road conditions
- Poor visibility
- Weather conditions
- Unsafe bikes
- Inadequate roadway lighting
- Other (please specify)
Weather Conditions

- Snowfall: 18%
- Rain: 16%
- Thunderstorm: 17%
- Low temperature - Freezing (32 degree F): 18%
- Low temperature - Below Freezing (0 degree F): 19%
- Stronger wind: 3%
- I would use a bike regardless of the weather: 0%
- Other (please specify): 0%
Road Conditions

- Ice: 27%
- Snow-covered/road uncleared: 22%
- Snow and ice ruts on road: 20%
- Slush on road: 17%
- Roads snowy but good traction: 5%
- Wet road, I would use the bike regardless of road conditions: 5%
- Other (please specify): 3%
- Other (please specify): 0%
Willingness to pay an additional payment to improve bike share equipment for winter use

- Yes: 17%
- Maybe: 32%
- No: 49%
- Other: 2%
CONCLUSION
• Female riders are more than male!
• So far bike sharing could not be an alternative for other modes of transportation (not large enough)
• Bike sharing motivates students to ride bikes more often than before
• Needs equipment/system utilization
• Willingness to use the system during winter !(providing that…)
• Road infrastructure / Community awareness

STUDENT FOCUSED • LAND GRANT • RESEARCH UNIVERSITY  NDSU
Future Study

• Location-Allocation Optimization
• Demand study for further geographic expansion
• Special Thanks to:
  – Sara Watson Curry – Director of Operations for Great Rides
  – Ranjit Prasad Godavarthy - UGPTI
  – Jeremy Mattson - UGPTI
  – Preston Gilderhus – NDSU Student Government
Questions & Answers