Valuing the Economic and Health Impact of Bicycling in Wisconsin

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Trail Map

- Part I: Background
- Part II: Health, Air Quality, and Greenhouse Gas Mitigation Impact
- Part III: Economic Impact of Bicycling in Wisconsin
- Part IV: Implications/Conclusions
Part I: Background

Ten Leading Causes of US Deaths per Year

(CDC, 2004)
50% of Americans do not meet physical activity recommendations

2/3 of Americans are overweight or obese

100+ cities in nonattainment--EPA 8-hour Ozone Standards

CARS: substantial emitters of particulate matter and precursors to ozone

50+ cities in nonattainment--EPA PM$_{2.5}$ Standards
Asthma and Air Pollution

- Natural experiment during 1996 Summer Olympic games in Atlanta
- Peak morning traffic decreased 23% and peak ozone levels decreased 28%
- Asthma-related emergency room visits by children decreased 42%
- Children’s emergency visits for non-asthma causes did not change during same period

Friedman et al. JAMA 2001;285:897

1/3 of Wisconsin CO₂ emissions come from transportation sector

US Dept. of Energy, 2005
In the United States…

• 40% of all car trips in the US are **two miles or less**

• 50% of the working population commutes **five miles or less** to work

• more than 82% of trips **five miles or less** are made by personal motor vehicle

NHTS 2001

THE FACTS

• **OBESITY** - a problem of **EPIDEMIC** proportions

• **PHYSICAL INACTIVITY** increasing

• Cities failing to meet **AIR QUALITY** standards

• **GREENHOUSE GAS EMISSIONS** rising

What does this mean for our health and the economy?
Biking for Co-Benefits: Health & $$

Part II: Health Impacts of Bicycling
Personal Fitness and Human Health

if sedentary people meet recommended physical activity standards in WI for 1 year...

$318,589,585

(in Milwaukee and Madison)

- Breast cancer (34%)
- Colorectal cancer (43%)
- Diabetes Type II (31%)
- Heart Disease (47%)
- Stroke (39%)

WHO 2005

Air Quality and Human Health

Reducing 20% of urban short car trips (5 mi or less) with bicycle trips in Milwaukee and Madison

Total Economic Benefit from reduced PM$_{2.5}$: $85,807,200

+ Total Economic Benefit from reduced O$_3$: $3,407,000

= $89,214,200 annually
Greenhouse Gas Mitigation

Reducing CO₂ emissions by commuting by bike instead of by car

20% Madison bikers ≈ $336,577 value**
20% Milwaukee bikers ≈ $821,282 value**

Total value: $1,157,859**

**Based on European Climate Exchange, November 2009

Summary and Implications

• Value of Additional Physical Activity: $318,589,585
• Value of Air Quality Improvement: $89,214,200
• Value of Greenhouse Gas Reductions: $1,157,859
• Significant Implications for the State and Region
• Co-Benefits of Replacing Short Car Trips with Bicycling
Part III: Economic Impact of Bicycle Recreation

Determining how much cyclists contribute to the economy:

Key Questions:

1. What kind of cycling do people do for recreation?
2. How many cyclists in each category?
3. How much do they spend?
What kind of cycling?

• Total days of recreational bicycling in Wisconsin = 8,324,916.
  (Assume 48.7% are non-residents, based on Elroy-Sparta study)

• 2005 UWEX Study: 100,000 recreational bicycle-days on Jefferson County roads.

• Jefferson county:
  • 1.2% of Wisconsin's good biking roads
  • 1.2% of Wisconsin's bicyclists.

How many road cyclists?

Arnold Reinhold Wikipedia Commons
How many trail cyclists?

2008 DNR Trail Pass Survey: 1,226,747 days biking on 636.5 miles of DNR trails.
Extrapolate to all 1,915 miles of trail open to cyclists in Wisconsin = 3,691,034 cycling days on WI trails.

Chequamegon Area Mountain Bike Association

GBCC 2006 Single-day Events and Tours

• Average of 1075 cyclists per event.
• 57 single-day tours/events listed
• Total = 61,289 cycling-days
Multi-day Tours

- Average number of cycling days (cyclists x event days) = 1765.
- 22 multi-day tours listed
- Total = 38,834 cycling-days

BFW WDOT, 2006

How much do they spend?

<table>
<thead>
<tr>
<th>Bicycling Activity</th>
<th>Resident Daily Expenditure</th>
<th>Non-Resident Daily Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadways</td>
<td>$39.57</td>
<td>$53.55</td>
</tr>
<tr>
<td>Trails</td>
<td>$17.99</td>
<td>$33.95</td>
</tr>
<tr>
<td>Single-Day Bike Events/Tours</td>
<td>$76.17</td>
<td>$76.17</td>
</tr>
<tr>
<td>Multi-Day Tours</td>
<td>$80.84</td>
<td>$80.84</td>
</tr>
</tbody>
</table>

How do they spend it?

Wisconsin Resident Trail Cyclists

- Dining and Drink
- Accommodation
- Transportation (gas & auto)
- Retail Shopping
- Govt. Revenue (fees collected)
- Other (miscellaneous retail)
- Grocery and Convenience Stores
- Entertainment

Direct Economic Impact

Cycling Days × $/day = Direct Economic Impact

Stynes 2006
### Direct Economic Impact

<table>
<thead>
<tr>
<th>Bicycling Activity</th>
<th>Total Number of Bicycle Person Days</th>
<th>Direct Impact Residents</th>
<th>Direct Impact Non-Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadways</td>
<td>8,324,916</td>
<td>$168,990,884</td>
<td>$217,104,236</td>
</tr>
<tr>
<td>Trails</td>
<td>3,691,034</td>
<td>$32,045,462</td>
<td>$64,835,708</td>
</tr>
<tr>
<td>Single-Day Bike Events/Tours</td>
<td>61,289</td>
<td>$2,420,987</td>
<td>$2,596,764</td>
</tr>
<tr>
<td>Multi-Day Tours</td>
<td>38,834</td>
<td>$1,281,572</td>
<td>$1,477,229</td>
</tr>
<tr>
<td>Total</td>
<td>12,116,073</td>
<td>$204,738,904</td>
<td>$286,013,937</td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td>12,116,073</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GRAND TOTAL**: $532,883,557

### What sectors are affected?

#### Agricultural Products
- Purchased Inputs (seeds, fertilizer, equipment)
- Employees
- Taxes

#### Wholesale Food Processors/Distributors
- Purchased Inputs (ag produce)
- Employees
- Real Estate
- Taxes

#### Restaurants
- Purchased Inputs (Ingredients, appliances, etc.)
- Employees
- Real Estate (Rent, buildings)
- Taxes

**Economic Interlinkages:**
Many industries affected through intermediate supplies
**Input-Output Model**

- **Indirect Impacts**: For every $ spent in one sector, it accounts for the impacts of this on supplying sectors, and on the labor force.

- **Induced Impacts**: For every $ of output in an industry, a worker is paid. Workers then respend some of their earnings in the economy.

**Total Economic Impact**

\[
\text{Total} = \text{Direct} + \text{Indirect} + \text{Induced}
\]
## Total Economic Impact

### Output Impact

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin Resident</td>
<td>$204,738,560</td>
<td>$69,782,528</td>
<td>$80,255,232</td>
<td>$354,776,064</td>
</tr>
<tr>
<td>Non-Resident</td>
<td>$286,013,440</td>
<td>$98,398,976</td>
<td>$112,129,536</td>
<td>$496,541,696</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$490,752,000</strong></td>
<td><strong>$168,181,504</strong></td>
<td><strong>$192,384,768</strong></td>
<td><strong>$851,317,760</strong></td>
</tr>
</tbody>
</table>

### Employment Impact

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin Resident</td>
<td>3,797</td>
<td>543</td>
<td>717</td>
<td>5,058</td>
</tr>
<tr>
<td>Non-Resident</td>
<td>5,319</td>
<td>763</td>
<td>1,002</td>
<td>7,083</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>9,116</strong></td>
<td><strong>1,306</strong></td>
<td><strong>1,719</strong></td>
<td><strong>13,133</strong></td>
</tr>
</tbody>
</table>

$924 million

### Part IV: Implications and Conclusions
Commuters and Spending

- 0.6% = Wisconsin residents bike to work
- 1.8% = Wisconsin’s federal transportation dollars for bike/pedestrian infrastructure
  - median: 1.41% (range: 0.24% (SC) – 5.40% (RI))
- $4.79 = Wisconsin per capita spending on bike/pedestrian projects
  - median: $4.18 (range: $1.02 (SC) – $38.16 (AK))
- In comparison, 63.3% of Wisconsin’s 2009-11 transportation budget allocated to building new and maintaining existing roadways

Implications

How do our results compare?

- Non-resident bicycle tourism economic impact: $496 million
- Total tourism in Wisconsin: $12.8 billion
  - Small fraction, but still important
- Accuracy? Need for a more comprehensive survey.
- So…Build a paved multi-use bike path at $115,000 per mile? Payback < 2.5 Years
Recreation + Manufacturing, Sales, & Service

| Economic Impact of Manufacturing, Sales, & Services* | $593,787,990 |
| Economic Impact of Tourism & Recreation | $924,211,000 |
| TOTAL Economic Impact | $1,517,998,990 |

$1.5 billion

*BFW & WDOT, 2006, adjusted for inflation

Summary of Findings

| Economic Impact of Manufacturing, Sales, & Services* | $593,787,990 |
| Economic Impact of Tourism & Recreation | $924,211,000 |
| Value of Additional Physical Activity | $318,589,585 |
| Value of Air Quality Improvement | $89,214,200 |
| Value of Greenhouse Gas Reductions | $1,157,859 |

*BFW & WDOT, 2006

- Significant Implications for the State and Region
- Co-Benefits of Replacing Short Car Trips with Bicycling
- Invest in infrastructure to encourage more bicycling in future
- Bicycle recreation – important for Wisconsin’s economy
Thank You!

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