Promoting Walking and Cycling in Los Angeles: Lessons from Europe and North America

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Walking and Cycling: the **MOST** sustainable transport modes

- **MOST environmentally friendly:**
  > Virtually no pollution at all
  > Almost no nonrenewable resources used

- **MOST equitable:**
  > Financially affordable by virtually everyone
  > Physically possible by all but the severely disabled

- **MOST economical:**
  > Minimal private and public costs
  > Although they take more time, they provide exercise that reduces medical costs and greatly extends our healthy life expectancy
WALKING AND CYCLING ARE HEALTHY!

• GREAT source of physical activity:
  • Both for daily travel and for recreation
  • Cheaper, easier, and more dependable than formal exercise routines
  • Can be integrated into daily lifestyle to achieve practical travel needs
Obesity Falls with Increased Walking and Cycling

Share of Trips by Cycling and Walking

Bike Share of Trips in Selected cities in UK, Canada, USA, and Australia (2000-2009)

Bicycle Share of Work Commuters in the USA (2007) and Canada (2006)

Increase in Bike Share of Trips in Cities Around the World

Increase in Bike Share of Trips in Cities Around the World

Trends in Cycling to Work in 9 US and Canadian Cities

Los Angeles (2009): 0.9% (2011): 1.1%

Spatial Variation in Bicycle Share of Work Commuters in New York City Area, 2005-2009

Spatial Variation in Bicycle Share of Work Commuters in Washington, D.C. Area, 2005-2009

Bike Share of Work Commuters in Los Angeles Area, 2006-2010

GIS map by Haofei Liu, UCLA
Walk Share of Work Commuters in Los Angeles Area, 2006-2010

GIS map by Haofei Liu, UCLA
GIS maps created by Southern California Association of Governments
Lots of Potential for Increased Walking and Cycling:

Many daily trips in American and Canadian urban areas are short enough to walk or bike!

• ~27% of all trips in the U.S. were a mile or shorter in 2009
• ~41% of all trips were shorter than two miles
Share of Short Trips by Cycling and Walking

<table>
<thead>
<tr>
<th>Trip distance category</th>
<th>USA</th>
<th>GER</th>
<th>DK</th>
<th>NL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2.5km</td>
<td>36</td>
<td>16</td>
<td>31</td>
<td>29</td>
</tr>
<tr>
<td>2.5km-4.5km</td>
<td>2</td>
<td>12</td>
<td>24</td>
<td>35</td>
</tr>
<tr>
<td>4.5km-6.5km</td>
<td>6</td>
<td>7</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>5km-7.5km</td>
<td>2</td>
<td>9</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>≥7.5km</td>
<td>2</td>
<td>7</td>
<td>18</td>
<td>3</td>
</tr>
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</table>

Percent of trips by cycling and walking

Walking (green) - Cycling (orange)
Europeans cycle for many trip purposes
Women’s Share of Bike and Walk Trips in Europe and North America

<table>
<thead>
<tr>
<th>Country</th>
<th>Cycling</th>
<th>Walking</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>25%</td>
<td>52%</td>
</tr>
<tr>
<td>UK</td>
<td>27%</td>
<td>53%</td>
</tr>
<tr>
<td>Canada</td>
<td>30%</td>
<td>56%</td>
</tr>
<tr>
<td>Denmark</td>
<td>55%</td>
<td>60%</td>
</tr>
<tr>
<td>Germany</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>56%</td>
<td>56%</td>
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</tbody>
</table>
Bicycle share of trips and percentage of female cyclists in large cities

Bicycle share of commuter trips and percentage of female cyclists by local government area in the Melbourne Metro Area

55% of all bike trips in Denmark are by women

Source: Susan Handy
Bike and Walk Share of Trips by Age Group

Percent of trips by foot and bike

Age Group

USA  UK  Germany  Denmark  Netherlands

0-16  15  32  2  19  24
17-29  24  7  2  14  23
30-59  20  1  1  13  18
60-65  21  1  1  13  18
65+  9  1  1  13  28

Walking  Cycling

0-16  15  32  2  19  24
17-29  24  7  2  14  23
30-59  20  1  1  13  18
60-65  21  1  1  13  18
65+  9  1  1  13  28
Cycling for all ages
Make Walking and Cycling Safe for Everyone!

- Especially important for the young, the old, for anyone with disabilities, for the timid or risk-averse
- Women more sensitive to safety than men
- Safety of walking and cycling in the Netherlands, Denmark, and Germany helps explain high levels of walking and cycling there
Cyclist and Pedestrian Fatality and Injury Rates
Trends in Cyclist Fatalities
Trends in Pedestrian Fatalities

Total pedestrian fatalities relative to 1970 (=100)

- USA
- UK
- Denmark
- Germany
- Netherlands
SAFETY IN NUMBERS

• As levels of cycling increase, injury and fatality rates per trip and per km traveled fall dramatically

• Thus, if we can increase cycling, it will almost inevitably be safer
Safety in Numbers: Cyclist fatality rate falls as cycling levels increase.

Decreasing Crash Rate in Portland

<table>
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<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Annual Crashes</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>600</td>
<td>550</td>
<td>500</td>
<td>450</td>
<td>400</td>
</tr>
<tr>
<td>Crash Rate</td>
<td>2,500</td>
<td>5,000</td>
<td>7,500</td>
<td>10,000</td>
<td>12,500</td>
<td>15,000</td>
<td>17,500</td>
<td>20,000</td>
<td>22,500</td>
<td>25,000</td>
<td>27,500</td>
<td>30,000</td>
<td>32,500</td>
<td>35,000</td>
<td>37,500</td>
</tr>
</tbody>
</table>

Daily Bicycle Trips

Crashes/ Crash Rate

Year

Legend:
- Annual Crashes
- Crash Rate
- Bridge Bicycle Traffic
Public Policies *Crucial* to Walking and Cycling

- Pro-car policies in European cities in 1950s and 1960s caused huge decline in walking and cycling
- Dramatic policy turn-around since 1970s to limit car use and promote cycling, walking, and public transport in Dutch, Danish, and German cities
Bridge in Freiburg BEFORE and AFTER reforms

1960s

Today
Typical residential street in Freiburg BEFORE traffic calming reforms

Typical residential street in Freiburg AFTER traffic calming reforms
Cathedral Square in Freiburg BEFORE transport and urban planning reforms

Cathedral Square in Freiburg AFTER transport and urban planning reforms
How to Encourage More Cycling and Walking while Improving Safety

- Better cycling and walking facilities
- Integration of walk/bike with public transport
- Traffic calming of residential neighborhoods
- Mixed-use zoning and improved urban design
- Restrictions on motor vehicle use
- Traffic education and Safe Routes to School
- Traffic regulations and enforcement
Lively pedestrian zone in Québec City

Source: Marie Demers
Conversion of street to pedestrian zone in Santa Barbara

Streets for people instead of cars!
Car-free Broadway in New York City

Times Square

Herald Square
High Line in New York City

...from an abandoned freight line to a popular promenade...
Which crosswalk do YOU think is safer?
Room for pedestrians, cyclists, and cars on this complete street
Santa Barbara coastal path:
Safe and attractive both for cyclists and pedestrians

Conversion of two car lanes to bike path and wider sidewalk

Source: Ralph Fertig
Bikeway in Muenster, Germany with separate walkways on both sides
Superb new bikeway and walkway facilities along St. Charles River in Quebec City

Source: Transports Viables
Bike paths in Dutch cities make it safe and comfortable for all to bike: including women, children, and seniors.
One-way cycle track in The Hague

Source: Peter Furth
Almost 100km of 2-way cycle tracks in Montreal

Separation from traffic via bollards and parked cars

Separation from traffic via concrete barriers

Photo: Peter Furth

Photo: Velo Quebec
Traffic-protected cycle track on 9th Avenue, NYC

- 250 mi of new bike lanes and paths since 2005
- Doubling in bike trips
- Halving of cyclist fatalities from 28 to 14

Photo: NYC DOT
Cycle Track on Pennsylvania Avenue in Washington

Connects the White House with the Capitol
Raised crossing carries a two-way cycle track across a minor street at an intersection in Delft.

Raised crossing, pavement markings, and good signage increase safety of cycle tracks at intersections.
Superb bike crossing at busy intersection in Montreal

Source: Velo Quebec
Red bike lanes for intersection crossings, connected with red brick sidepaths on both sides of every road

Muenster, Germany

Sources: City of Muenster
## Dutch bicycle facility selection matrix

<table>
<thead>
<tr>
<th>Lane Configuration</th>
<th>Average daily traffic (vehicles / day)</th>
<th>Street type and speed limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urban local street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 km/h (19 mph)</td>
</tr>
<tr>
<td>2-way traffic with no centerline</td>
<td>≤ 2500</td>
<td>mixed traffic&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>2000 to 3000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3000 to 5000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 4000</td>
<td>bike lane or cycle track&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>2 lanes (1+1)</td>
<td>any</td>
<td>bike lane or cycle track&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>4 lanes (2 + 2) or more</td>
<td>any</td>
<td>(does not exist)</td>
</tr>
</tbody>
</table>

Trend in Bike Paths and Lanes per 100,000 Population in Nine Large North American Cities, 2000-2010

Kilometers of Lanes and Paths per 100,000 Population

Crucial to provide river crossings for cyclists

Bike bridge over Yarra River in Melbourne, Australia

Bike bridge over Ems River in Muenster, Germany
About 20,000 daily bike trips over Portland bridges.
Provision of cycle track at this key underpass in Montreal: On the way down...

Photo: Velo Quebec
1,100 km of bicycling facilities in Berlin plus 3,800 km of traffic calmed streets = 10% bike share of all trips
Special traffic signals and signs give priority to cyclists.
Four-way all-green signal for cyclists in Portland

How to Use the New Bicycle Signal

1. TO GET A GREEN LIGHT
   Place your bicycle on the marking on the sidewalk, with your wheels directly on the lines.

2. When the bicycle signal here is green...

3. ...cyclists can cross the intersection as shown here.

Bike sensor in pavement
Protected left-turn lane for cyclists crossing Mass Ave to reach Church St. and Brattle St.
Then the cyclist can safety cross Mass Ave to continue onto Church Street or turn right onto Mass Ave going outbound.
Bike boxes and advance stop lines
Green wave for *cyclists* in Odense, Denmark

Troels Andersen, “Cycling in Odense, Denmark”

Raised curb protects bike path from cars

Express bikeways for commuters

Bike speed indicators
Traffic Calming of Residential Neighborhoods

• Speed limited *by law* to 30km per hour (19mph) or less

• *Physical measures* that force cars to slow down:
  • Road narrowing, zigzag routing, chicanes
  • Raised intersections and crosswalks
  • Traffic circles
  • Speed humps and bumps
  • Mid-block closures and artificial dead-ends
  • Bulb-outs at intersections and crosswalks, with sidewalk widening
Why Traffic Calming Saves Lives

Figure 1.1 Probability of fatal injury for a pedestrian colliding with a vehicle

Speed kills!

Convenient bike cut-thru for cyclists
Traffic calming in Québec City and Montreal

Cheap, easy, and very effective traffic diverters

Photo: Transports Viable

Photo: Velo Quebec
Traffic Calming in Freiburg, Germany
Cheap, easy, fast, and effective improvement in cycling and walking safety
Traffic calming turns these streets into bikeways

Bike Boulevards in Portland
(in 15 US cities in 2012)
BIKE TRANSIT INTEGRATION
Over 50,000 buses in the USA now come equipped with bike racks, as here in Santa Barbara.
Bike on LRT in NJ and Minneapolis

Photo: John Boyle

Photo: Metro Transit
Bikes on Caltrain in San Francisco

Photo: San Francisco Bicycling Coalition
Bi-directional cycle track and bike sharing near metro station in Montréal

Source: Vélo Québec
Bike Station next to main train station in Muenster, Germany

Photo: Peter Berkeley
Bike Station next to Union Station in Washington, D.C.

Photo: Ralph Buehler
Bike-transit integration at Alewife Station on Red Line in Boston

300 bike parking spaces in two bike cages at northern terminus of subway line in Boston
Main form of bike-transit integration in Europe for decades
Conversion of Car Parking to Bike Parking
Easy bike rentals at Dutch transit stations

Bikesharing in Paris and Berlin
Nice Ride in Minneapolis

Hubway Bikeshare in Cambridge, Boston, Somerville, and Brookline

Over 20 bike sharing systems in North America

Capital Bikeshare in Washington, DC
Traffic Education

• Improved motorist training, with much more emphasis on how to avoid endangering pedestrians and cyclists

• Compulsory traffic safety lessons for all school children by the age of 10, with testing by traffic police on actual traffic test courses, to ensure safe and defensive walking and cycling by an early age (as in the Netherlands and Germany)
German traffic laws generally favor cyclists and pedestrians over motorists.
Most German and Dutch children take cycling lessons by the 3rd or 4th grade and must pass a police-administered cycling safety test!
Bike Training for Children in New Jersey
Cycling training course for adults

You are never too old to learn!!!
Summer Streets in New York City attracts 200,000 participants on Saturdays in August.
CicLAvia: Safe and fun cycling and walking on 9 miles of car-free streets in Los Angeles

Over 100,000 participants at LA’s fourth annual CicLAvia in October 2012
SomerStreets in Somerville
Bike to School Day in Vieja Valley
Guided Bicycle Tours for Seniors

Troels Andersen, “Cycling in Odense, Denmark”
CONCLUSIONS

• Walking and cycling are the most sustainable means of getting around our cities
• Broad range of environmental, social, economic, and health benefits
• Many ways to increase walking and cycling while making them safer
• Lots of daily trips in American cities are short enough to cover by walking or cycling
• Many cities in Europe and some in North America show what is possible and offer superb examples to follow
New book with MIT Press

http://citycyclingbook.wordpress.com

About the authors:

http://policy.rutgers.edu/faculty/pucher/

http://ralphbu.wordpress.com
Measures to Increase Cycling

1. Provide a comprehensive package of integrated measures
2. Build a network of integrated bikeways with intersections that facilitate cycling
3. Provide good bike parking at key destinations and public transport stations
4. Implement bike sharing programs
5. Provide convenient information and promotional events
6. Introduce individualized marketing to target specific groups
7. Improve cyclist education and expand bike to school programs
8. Improve motorist training, licensing, and traffic enforcement
9. Restrict car use through traffic calming, car-free zones, and less parking
10. Design communities to be compact, mixed-use, and bikeable
Implementation Strategies

1. Publicize both individual and societal benefits
2. Ensure citizen participation at all stages of planning and implementation
3. Develop long-range bike plans and regularly update them
4. Implement controversial policies in stages
5. Combine incentives for cycling and disincentives for car use
6. Build alliances with politicians, cycling organizations, and other bike friendly groups
7. Coordinate bike advocacy and planning through local, regional, and national organizations
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