

# Quantification of Health Benefits for Cycling and Walking

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**Often Urban Environments  
Favor Motorized  
Transportation.....**



## ....and Hinder Walking and Cycling



**However, there are Places that are  
Conducive to Active  
Transportation**



## Why Assess Health Consequences?



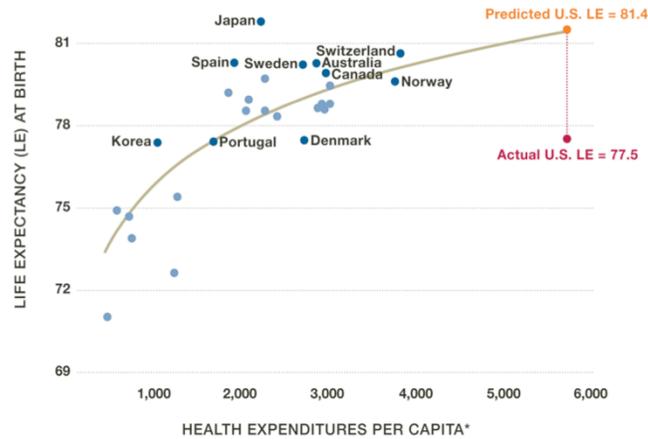
Failure to anticipate the health effects of policy and planning decisions is apparent in examining the health of transportation infrastructure. The Interstate Highway Act of 1956 introduced the development of a transportation infrastructure that has had multiple implications for health, both favorable and unfavorable. Over the last several decades, the transportation infrastructure has focused on road-building, private automobiles, and transportation of goods and has resulted in “an unprecedented level of individual mobility and facilitated economic growth” (APHA 2010, p. 2). It has shaped land-use patterns throughout the U.S. and has implications for air quality, toxic exposures, noise, traffic collisions, pedestrian injuries, and neighborhood physical and social features potentially linked to health (Frank et.al. 2006)

Often the issues we face when making built environment decisions are complex (multifactorial) and interrelated. It’s important to note that different sectors of society will have different value systems and simply identifying “What the problem(s) is/are?” can be quite challenging. Therefore, **defining key concepts** will be crucial for managing the process:

- Necessary for communicating across sectors
- Ensure clarity and consistency in communications
- Provide an opportunity to educate stakeholders about HIA and key concepts

## America Is Not Getting Good Value for Its Health Dollar

The U.S. spends more money per person on health than any other country, but our lives are shorter—by nearly four years—than expected based on health expenditures.



Prepared for the Robert Wood Johnson Foundation by the Center on Social Disparities in Health at the University of California, San Francisco.  
 Sources: OECD Health Data 2007.  
 Does not include countries with populations smaller than 500,000. Data are for 2003.  
 \*Per capita health expenditures in 2003 U.S. dollars, purchasing power parity  
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Total health care spending in the U.S. is already astronomical, and increasing rapidly, with estimated spending of \$2.4 trillion in 2008, \$3.1 trillion in 2012, and \$4.3 trillion by 2016.<sup>1</sup> The health impacts of traffic crashes, air pollution, and physical inactivity alone add hundreds of billions of dollars in costs—costs of health care, lost work days and productivity, and pain, suffering and premature death. The costs of obesity account for approximately nine percent of total U.S. health care spending,<sup>9</sup> and add an estimated additional \$395 per year to per-person health care expenses.<sup>2</sup>

<sup>1</sup> Keehan, S. et al. 2008. Health spending projection through 2017. Health Affairs. Web Exclusive W146:21. February 28.

<sup>2</sup> Sturm R. 2002. The Effects Of Obesity, Smoking, And Drinking On Medical Problems And Costs. Health Affairs, March/April: 245-253.

TABLE 2 THE COST OF TRANSPORTATION-RELATED HEALTH OUTCOMES			
The consequences of inactivity, obesity, exposure to air pollution, and traffic crashes in the U.S. are staggering when viewed in terms of cost. Fortunately, with certain policy changes, these costs are largely preventable.			
The National Health Costs of...	\$\$ (Billions)	Estimate Includes	Source
Obesity and overweight	\$142	<ul style="list-style-type: none"> <li>Healthcare costs</li> <li>Lost wages due to illness &amp; disability</li> <li>Future earnings lost by premature death</li> </ul>	National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Statistics Related to Overweight and Obesity: The Economic Costs. Available at: <a href="http://win.niddk.nih.gov/statistics/index.htm">http://win.niddk.nih.gov/statistics/index.htm</a>
Air pollution from traffic	\$50-80	<ul style="list-style-type: none"> <li>Health care costs</li> <li>Premature death</li> </ul>	Federal Highway Administration. 2000. Addendum to the 1997 Federal Highway Cost Allocation Study Final Report, May 2000. Available at: <a href="http://www.fhwa.dot.gov/policy/hcas/addendum.htm">www.fhwa.dot.gov/policy/hcas/addendum.htm</a>
Traffic crashes	\$180	<ul style="list-style-type: none"> <li>Healthcare costs</li> <li>Lost wages</li> <li>Property damage</li> <li>Travel delay</li> <li>Legal/administrative costs</li> <li>Pain &amp; suffering</li> <li>Lost quality of life</li> </ul>	AAA. Crashes vs. Congestion? What's the Cost to Society? Cambridge, MD: Cambridge Systematics, Inc.; 2008. Available at: <a href="http://www.aaanewsroom.net/assets/files/20083591910.crashesVscongestionfullreport2.28.08.pdf">www.aaanewsroom.net/assets/files/20083591910.crashesVscongestionfullreport2.28.08.pdf</a>

All cost estimates adjusted to 2008 dollars.

Source: American Public Health Association, "The Hidden Health Costs of Transportation" Report prepared by Urban Design 4Health, Inc. February 10, 2010, pg.2

A portion of these costs are attributable to auto-oriented transportation and land use development that inadvertently limit opportunities for physical activity and access to healthy food. Traffic crashes cost us \$180 billion yearly,<sup>1</sup> and the health costs of transportation-related air pollution are between \$50 and \$80 billion.<sup>2</sup> Most often, these potential health costs are not included in the transportation decision-making process and policy framework. These “hidden” health costs of transportation decisions are stacking up to a level that can no longer be ignored. If they are not factored into the decision-making process, these costs will continue to grow and undermine the country’s economic health and our quality of life.

<sup>1</sup> AAA. Crashes vs. Congestion Report. What’s the Cost to Society? Cambridge, MD: Cambridge Systematics, Inc.; 2008. Available at: [www.aaanewsroom.net/assets/files/20083591910.crashesVscongestionfullreport2.28.08.pdf](http://www.aaanewsroom.net/assets/files/20083591910.crashesVscongestionfullreport2.28.08.pdf). Adjusted to 2008 dollars.

<sup>2</sup> Federal Highway Administration. 2000. Addendum to the 1997 Federal Highway Cost Allocation Study Final Report, May 2000. Available at: [www.fhwa.dot.gov/policy/hcas/addendum.htm](http://www.fhwa.dot.gov/policy/hcas/addendum.htm); Adjusted to 2008 dollars.

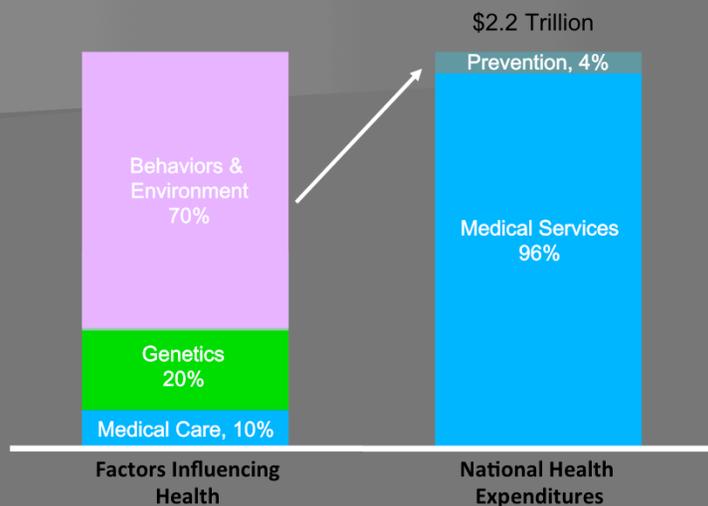


## Chronic Disease and Risk Factors

- 7 out of 10 deaths in the U.S. are from chronic diseases such as heart disease, cancer and stroke
- These chronic diseases are primarily related to four risk behaviors
  - lack of physical activity
  - poor nutrition
  - tobacco use
  - excessive alcohol consumption

Source: <http://www.cdc.gov/chronicdisease/overview/index.htm>

## Current Health Care Spending



*SOURCE: Centers for Disease Control and Prevention, Blue Sky Initiative, University of California at San Francisco, Institute of the Future, 2000*

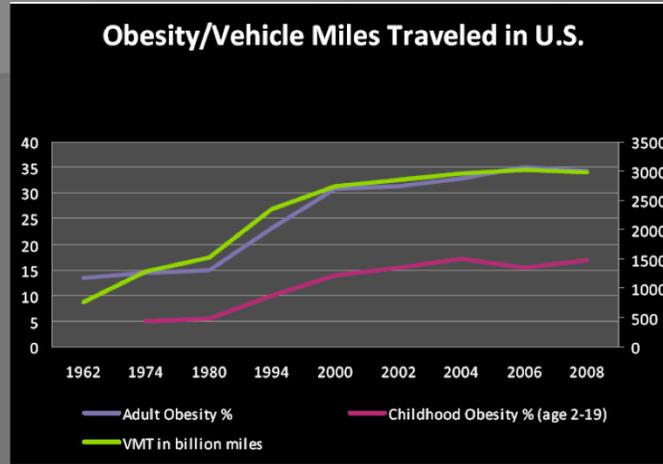
Prevention  
Institute



**“Get more exercise” ...**

Source: Wernham, A. Health Impact Project. [http://www.healthimpactproject.org/resources#presentations\\_webinars](http://www.healthimpactproject.org/resources#presentations_webinars)

## Transportation, Land Use and Obesity



Source of slide: Meehan, L.A from the Nashville Area Metropolitan Planning Organization. Incorporating Health in Regional Transportation Planning. Healthy Communities and Transportation Webinar, American Public Health Association, January 18, 2011.

## Why Walking and Cycling?

### Perfect win-win option

- Reduce inactivity
- Reduce congestion
- Improve road safety
- Improve air quality and noise
- Reduce energy consumption and CO<sub>2</sub>
- More livable communities



## Why Guidance on Economic Assessment?



- Economic evaluation is a standard tool of transport planners so it can help the health sector to speak “their” language
- Public health benefits are likely to be great, esp. if inactive persons can be reached
- Need for a transparent robust methodology

## HEAT

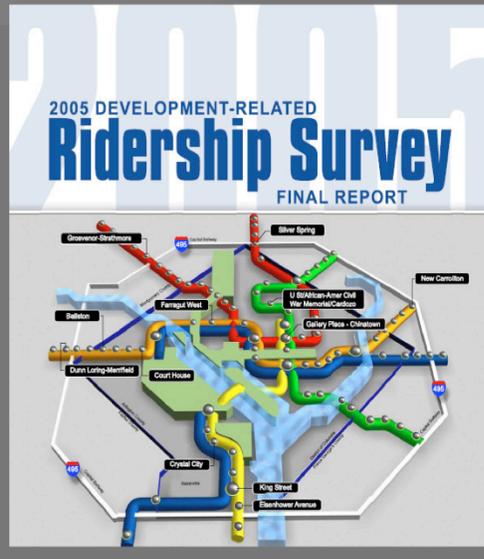
- Developed by the WHO with international experts
- Economic tool to estimate reductions in mortality due to cycling (transportation) and walking (recreation and transportation)
- Very conservative and does not include morbidity
- Currently for adults only

# HEAT

- Can be used for planning new infrastructure, evaluate current or future levels of walking and cycling or even for Health Impact Assessments
- Data inputs for the model:
  - Average amount of time spent walking or cycling
    - Number of people walking and cycling and average distance of trips
    - Average number of steps (walking model only)

# HEAT

- How to get the need inputs
  - Route user surveys
  - Travel surveys
  - Destination based surveys
  - Traffic counts
  - Pedometers



# HEAT

- Outputs of the model
  - Number of lives saved
  - Annual benefit



## Uses in Other Countries

- **Austria: USD: \$570 million per year**
- **Pilsen, Czech Republic: \$1.2 million if 2% of population took up regular cycling**
- **UK/Scotland: \$1.5-3 billion per year if modal share goal of 13% reached**
- **New Zealand: adding cycling and pedestrian facilities to the Auckland Harbour Bridge for a savings of \$900,000 per 1000 regular bike commuters**

## Challenges to Adapting to U.S.

- **US Is much larger and heterogeneous**
- **Travel data only collected nationally every 5 years**
- **Very few local regions collect transport related data**
- **Hard to find good data on bike lanes and sidewalks**



## U.S. Uses

- **HEAT cycling tool has adapted**
- **Paper by Götschi (2012) examined cycling in Portland**
  - By 2040, investments in the range of \$138 to \$605 million will result in health care cost savings of \$388 to \$594 million, fuel savings of \$143 to \$218 million, and savings in value of statistical lives of \$7 to \$12 billion.
  - The cost-benefit ratios for healthcare and fuel savings are between 3.8 and 1.2 to 1



## U.S. Uses

- **Analysis for FHWA on 4 separate communities which ended up in a congressional report**
  - Over the span of 4 years \$25 million was split among four pilot communities: Marin County, CA, Columbia, MO, Minneapolis, MN and Sheboygan County, MI
  - The total number of new bicycling trips that were made in 2010 were compared to the expected number of bicycling trips that would have been made in 2010 given 2007 bicycling rates
  - The expected reduction in economic cost of mortality were predicted to be \$6.9 million per year

## U.S. Uses

- Still need to adapt the HEAT walking tool
- Funding proposal submitted to DNPAO



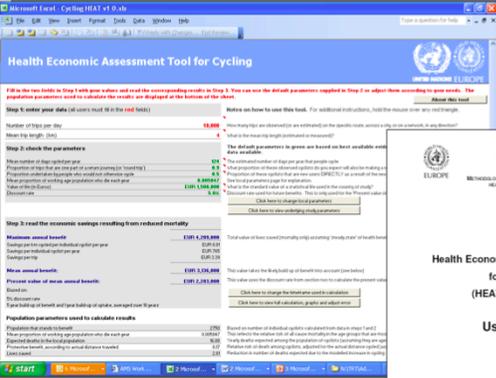
# WHO Guidance and Tool



**ECONOMIC ASSESSMENT OF TRANSPORT INFRASTRUCTURE AND POLICIES**

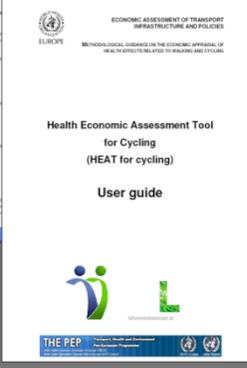
By: Nick Coull  
Sandy Robinson  
Harry Aulder  
Francesca Parry  
Julie Oja

Methodological guidance on the economic appraisal of health effects related to walking and cycling



The screenshot shows the 'Health Economic Assessment Tool for Cycling' interface. It is divided into several sections:

- Step 1: enter your data:** Includes fields for 'Number of days per week' (set to 14) and 'Hours per day' (set to 1.0).
- Step 2: check the parameters:** Lists various parameters such as 'Age (years)' (set to 65), 'Population of people who walk/cycle' (set to 1,000,000), and 'Population of people who walk/cycle who are aged 65+'. It also includes a 'start' button.
- Step 3: read the economic savings resulting from reduced mortality:** Displays calculated values for 'Relative annual benefits' (EUR 1,076,000), 'Net annual benefits' (EUR 3,326,000), and 'Population parameters used to calculate results' (Population aged 65: 270,000).



**Health Economic Assessment Tool for Cycling (HEAT for cycling) User guide**



THE PEP

Download the guidance document and user guide from [www.euro.who.int/transport/policy/20070503\\_1](http://www.euro.who.int/transport/policy/20070503_1)

## Additional Resources

- **Report to the U.S. Congress on the Outcomes of the Nonmotorized Transportation Pilot Program SAFETEA-LU Section 1807: [http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/ntpp/2012\\_report/final\\_report\\_april\\_2012.pdf](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/ntpp/2012_report/final_report_april_2012.pdf) *Quantification of health benefits of cycling and walking***
- ***Transport, Health and Environment Pan European Programme (THE PEP)* [www.thepep.org](http://www.thepep.org)**
- ***HEPA Europe (European network for promotion of health-enhancing physical activity)* [www.euro.who.int/hepa](http://www.euro.who.int/hepa)**

# Multidisciplinary Team

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**TEAMWORK**

Share Victory. Share Defeat.