



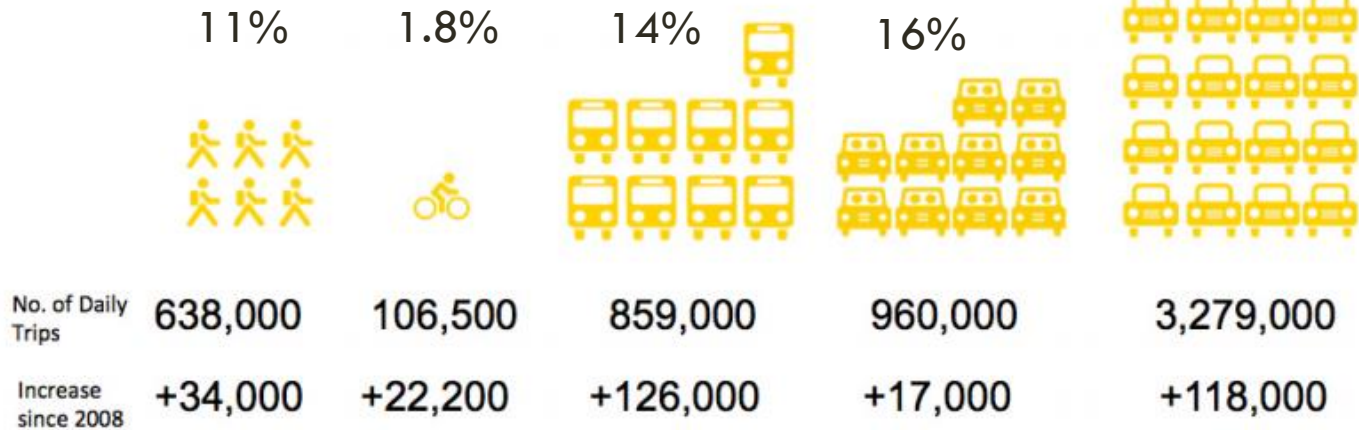
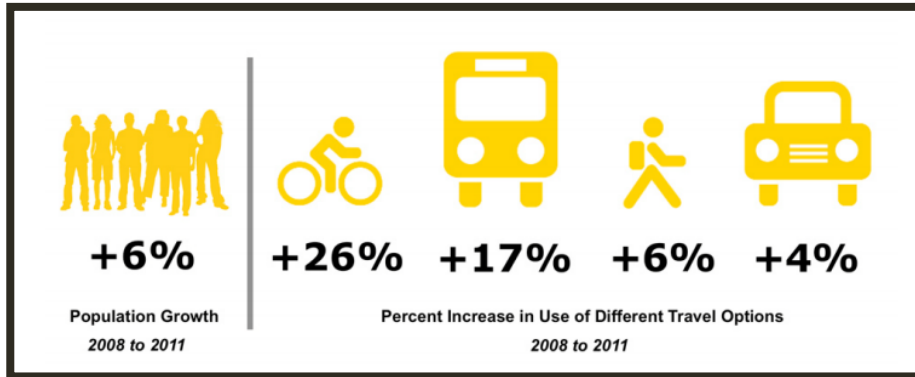
# ACTIVE TRANSPORTATION

Meghan Winters  
Faculty of Health Sciences  
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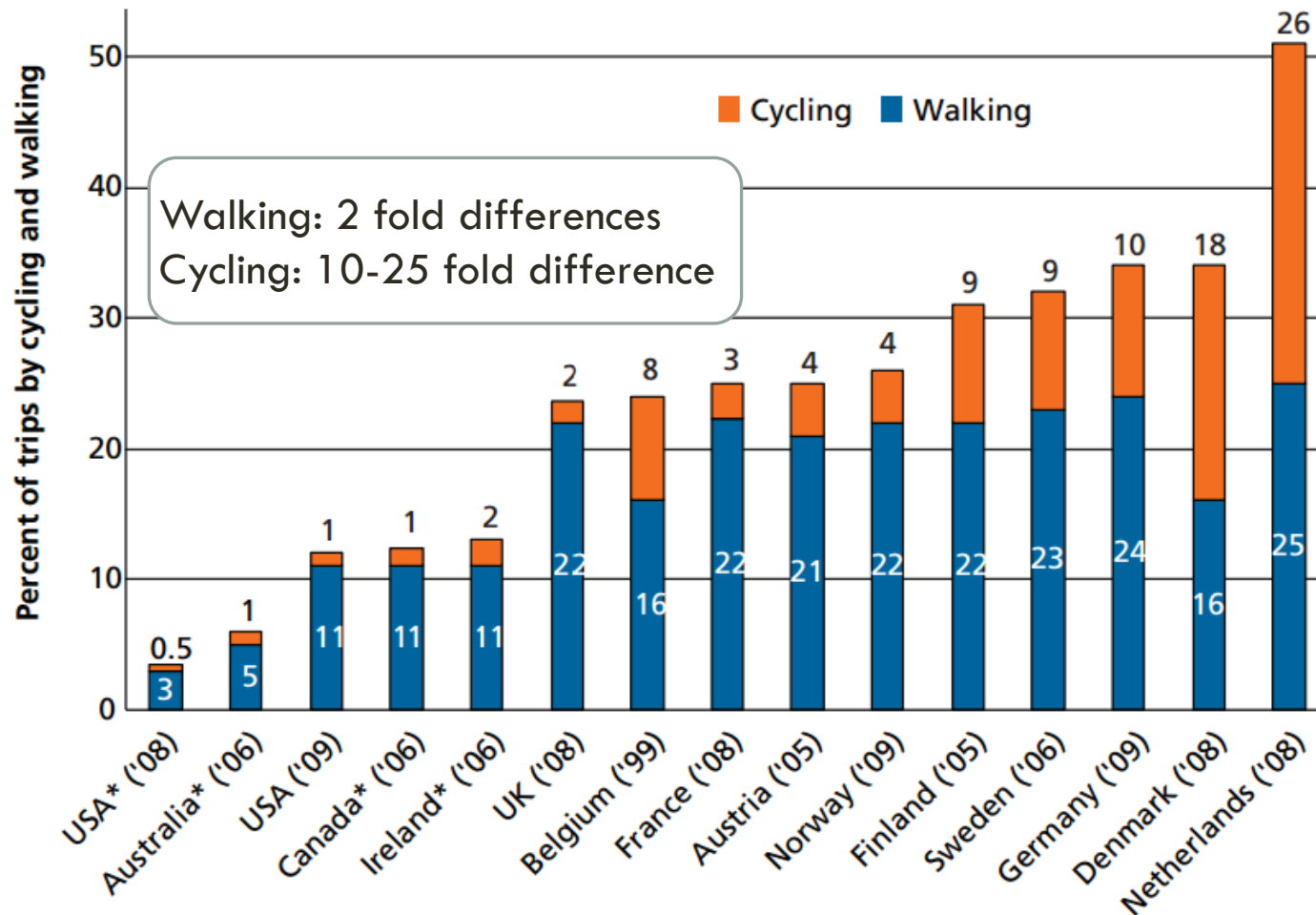
# WHAT IS ACTIVE TRANSPORT?



# ACTIVE TRANSPORT IN METRO VANCOUVER



# CANADA VERSUS ELSEWHERE



# PUBLIC TRANSPORTATION?

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## Walking to Public Transit Steps to Help Meet Physical Activity Recommendations

Lilah M. Besser, MSPH, Andrew L. Dannenberg, MD, MPH

Am J Prev Med 2005;29(4)  
© 2005 American Journal of Preventive Medicine • Published by Elsevier Inc.

0749-3797/05/\$—see front matter  
doi:10.1016/j.ampre.2005.06.010

19 minutes daily walking to and  
from transit

## Relation Between Higher Physical Activity and Public Transit Use

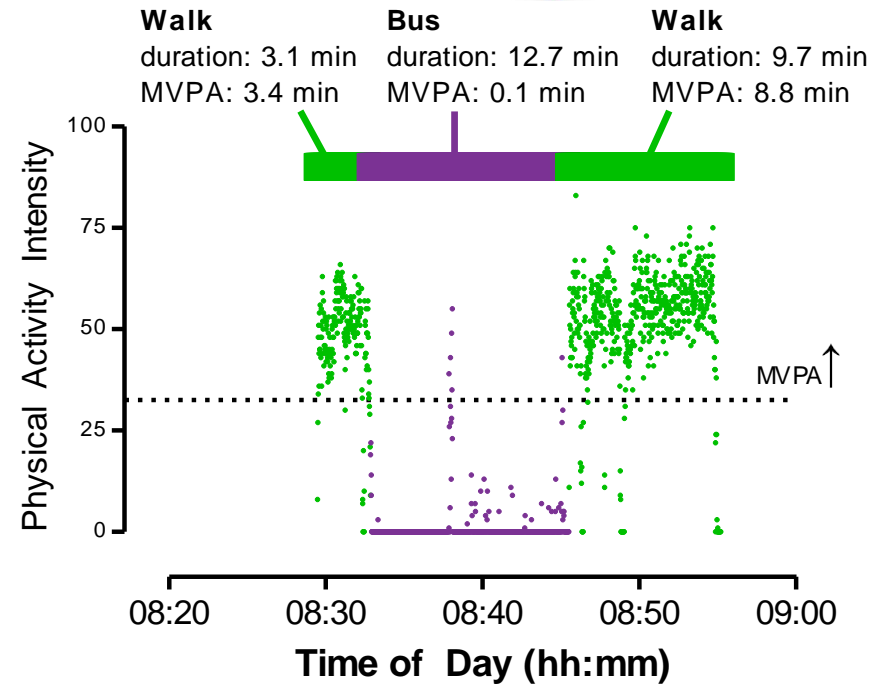
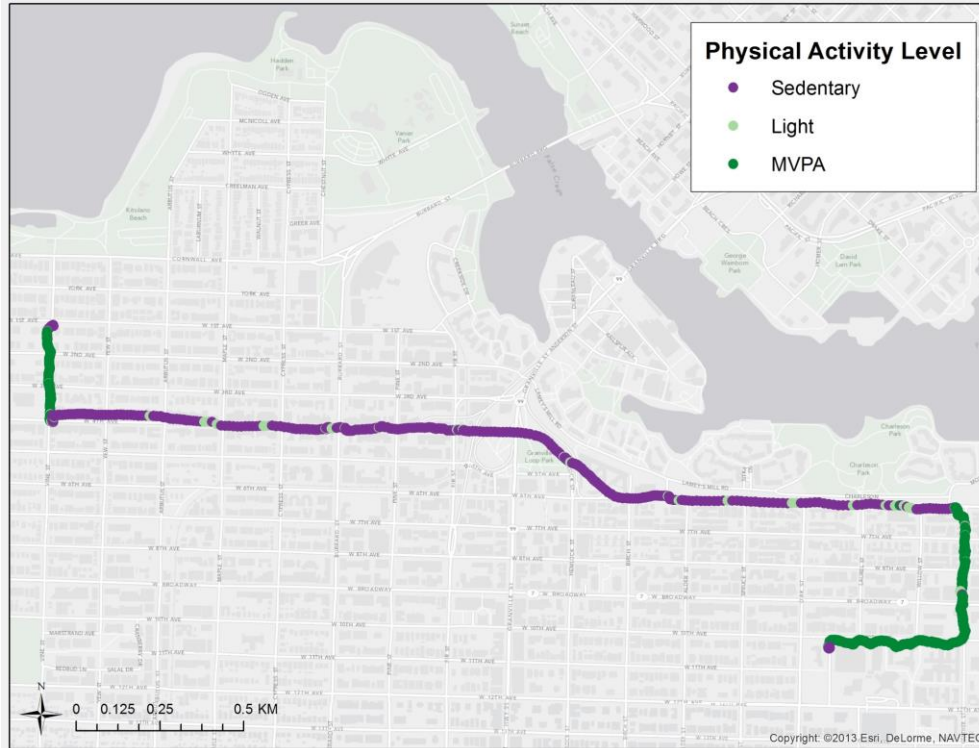
| Brian E. Saelens, PhD, Anne Vernez Moudon, Dr es SC, Bumjoon Kang, PhD, Philip M. Hurvitz, PhD, and Chuan Zhou, PhD

854 | Research and Practice | Peer Reviewed | Saelens et al.

American Journal of Public Health | May 2014, Vol 104, No. 5

12.4 minutes more daily physical  
activity when using transit

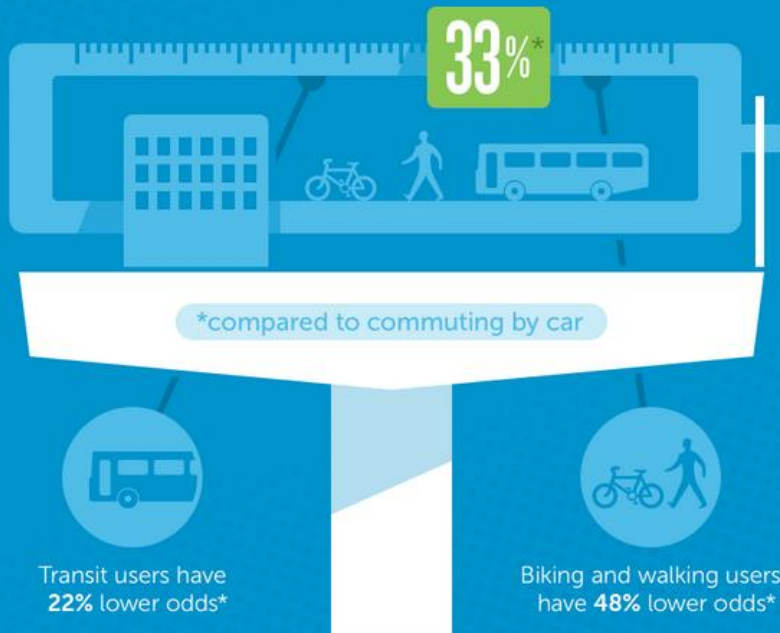
# PUBLIC TRANSPORTATION?



**Transit trips yield just as much physical activity as walking trips do!  
 ~ 9 minutes in kids, ~ 5 minutes in older adults**

# LINKS TO HEALTH

— Using active modes of transportation —  
**FOR COMMUTING**  
— decreases the odds of being —  
**OVERWEIGHT OR OBESE BY**



Compared to car commuters, **cyclists and walkers** are 27% more likely to **report excellent or very good health**



**Cyclists and walkers** are 69% more likely to achieve the recommended 150+ minutes of **moderate or vigorous physical activity per week** compared to those who commute by car



Those who use **active transportation** are **twice as likely** to meet **30+ minutes of daily recommended walking** compared to car users



**Active transportation** users are 40% more likely to **achieve a wellness score of 10+** compared to those who commute by car, indicating a tendency towards more positive lifestyle behaviours (i.e. less likely to smoke, consume more fruits and vegetables and more likely to engage in physical activity)



**Cyclists and walkers** are 17% more likely to **report a strong sense of community belonging**

# LINKS TO HEALTH

**All-Cause Mortality:** Walking 675 MET minutes (equiv to 150 minutes MVPA/week) is associated with a 10-11% reduction in all cause mortality [14 prospective cohort studies (Europe, US, Asia), adjusted for other physical activity, HEAT Consensus workshop, 2013]

**All-Cause Mortality:** Compared to those who don't cycle to work, those who cycle regularly to work (3 hr/wk) have lower mortality (72% of the risk), accounting leisure time physical activity and other health indicators [Source: Anderson et al, 2000, Danish cohort, n=30,000 with 14.5 year followup]

**Cardiovascular disease risk:** Active commuting (walking or cycling) associated with an 11% reduction in cardiovascular risk (13% in women, 9% in men) [Source: Hamer and Chida, 2008, meta analysis of prospective cohort studies, adjusted for leisure PA]

**Absenteeism:** employees who cycle regularly to work are less frequently ill, with > 1 day per year less absenteeism than colleagues who do not cycle to work [Source: Hendrikson et al, 2010, Dutch working population, 1 year followup]

**Obesity:** each additional hour in a car was associated with a 6 percent increase in obesity and each additional kilometre walked with a 5 percent reduction in obesity [Source: Frank et al, 2004, Atlanta]

## School travel literature:

**Cardiovascular risk:** kids who started cycling to school have better fitness profiles, glucose metabolism and CVD risk factor scores, than do kids who did not cycle [Source: Andersen et al, 2011, 334 kids, 6 year followup]

**Active transport is not necessarily a substitute for other physical activity:** Kids who travel to school by active modes also have higher overall physical activity levels [LaRouche et al, 2014]



# PATHWAYS

Walking, Cycling,  
Public Transit

physical activity

injury

exposure to air pollution

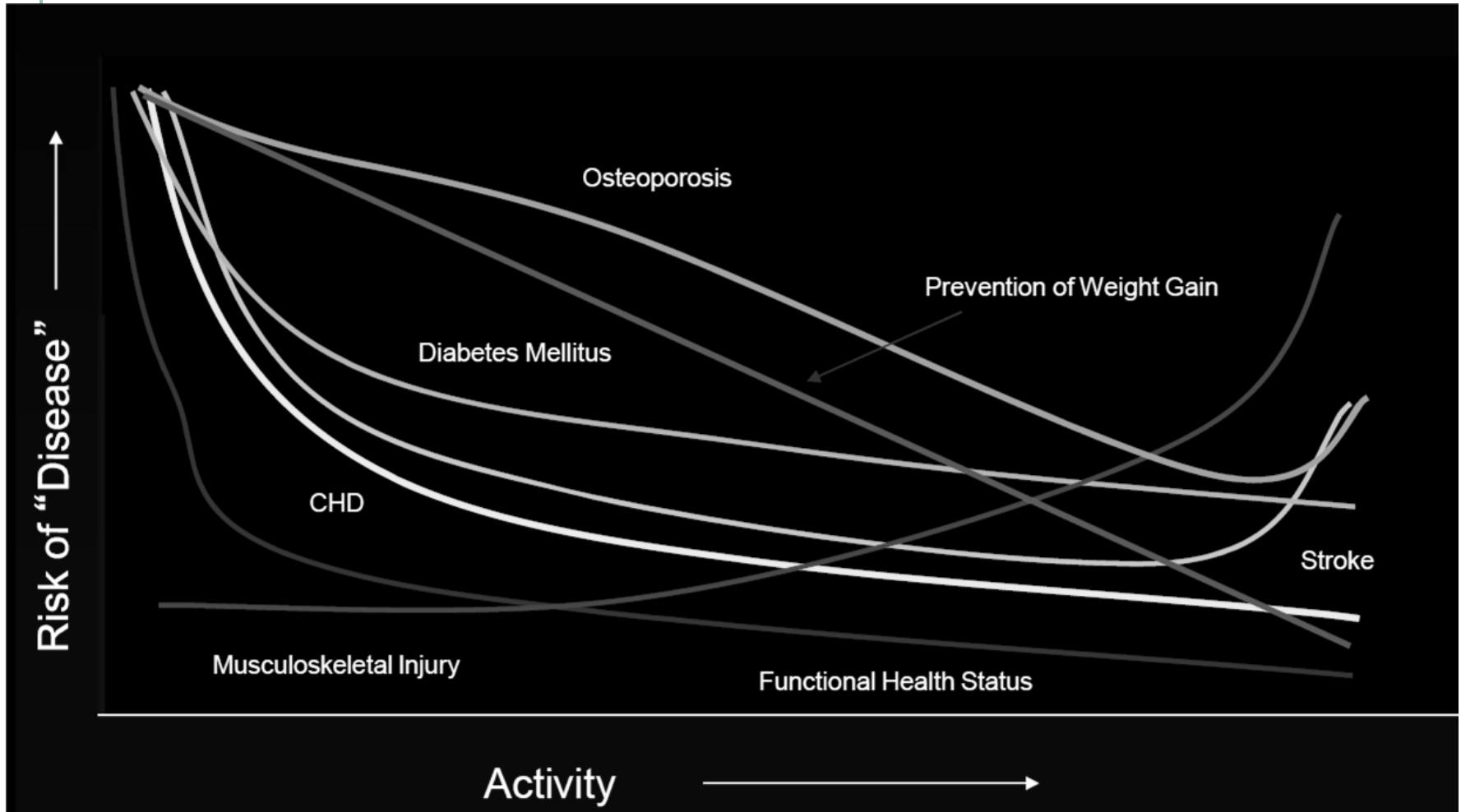
Health outcomes:  
obesity,  
cardiovascular  
disease, breast and  
colon cancer, stroke,  
depression, dementia,  
injury, mortality

social benefits : civic engagement, social  
capital

environmental, transportation-related  
benefits: congestion, GHGs, community  
design, parking

other economic benefits: business,  
absenteeism, ' hidden costs'

# PHYSICAL ACTIVITY & CHRONIC DISEASE



# INJURY RISK IN BC



transit



cycle



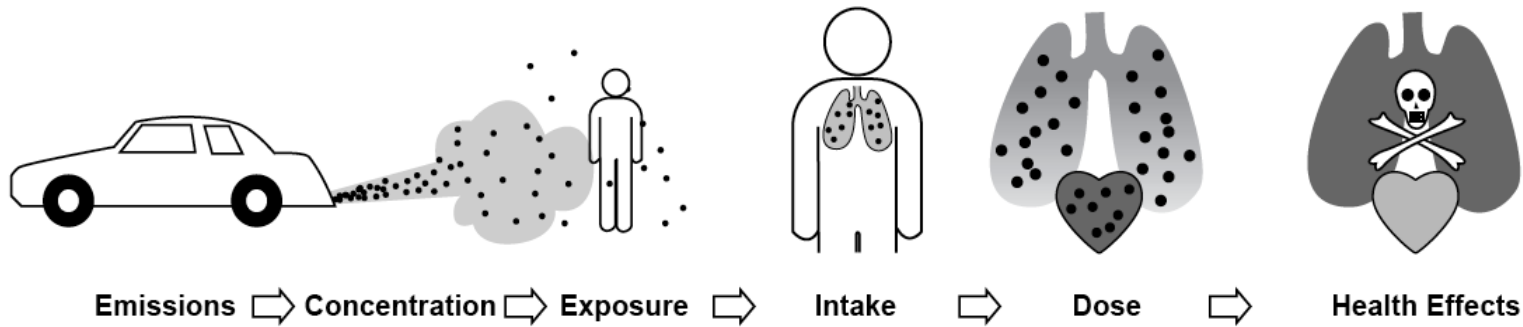
walk



<b>1 death per...</b>	<b>250M trips*</b>	<b>7.2M trips</b>	<b>6.8M trips</b>	<b>10M trips</b>
<b>1 injury per...</b>	<b>n/a</b>	<b>71,000 trips</b>	<b>255,000 trips</b>	<b>140,000 trips</b>

Transit travel carries 1/10 the risk of car travel [Litman, 2015, *Journal of Public Transportation*]

# AIR POLLUTION EXPOSURE



**exposure =  
concentration x  
duration**

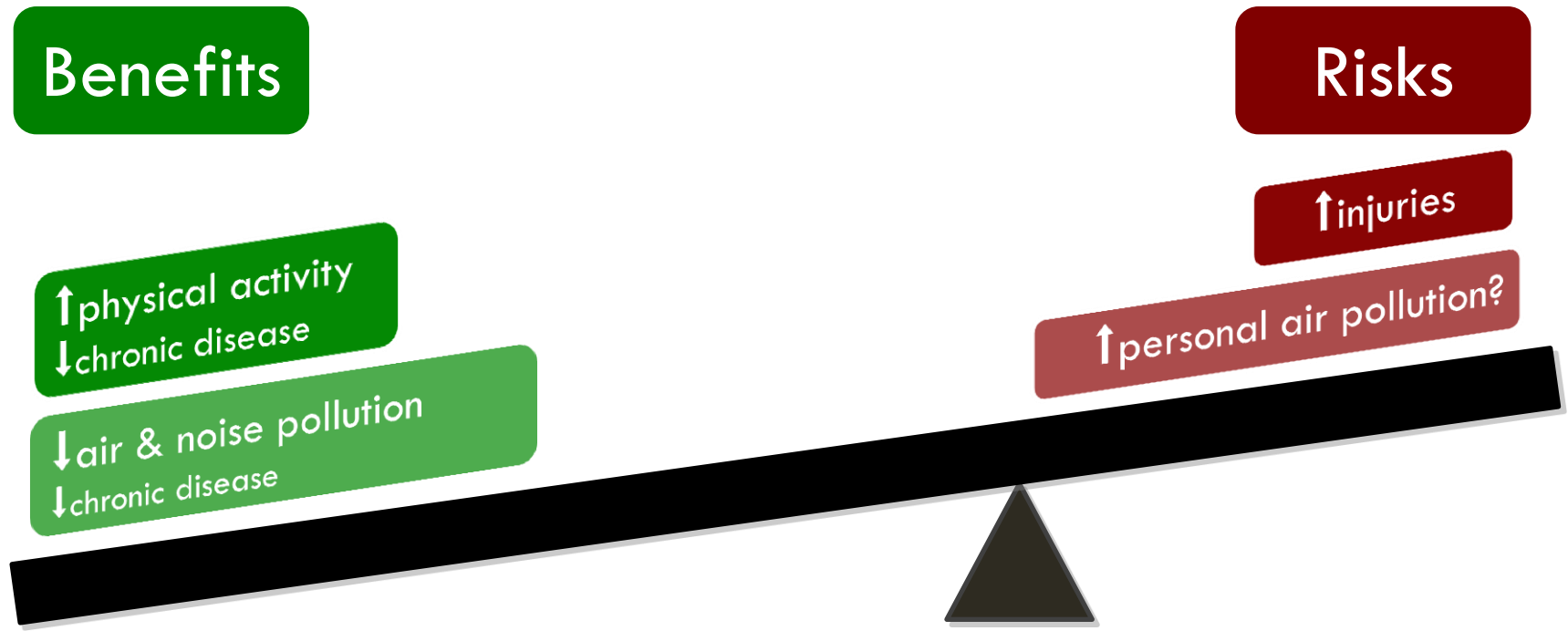
**cyclists ~ same as other  
modes**

**intake =  
exposure x  
inhalation**

**for cyclists: 2-5x higher due  
to increased ventilation**



factors: exertion, pollutant type, proximity to road, route choice → cyclists are willing to detour 400 m (~ 2 blocks) (Winters, 2010)



**9-96: 1**  
**Under of any of these models,  
benefits far outweigh the risks**

Woodcock et al, 2014, 2013, 2009; De Hartog et al, 2010;  
Rabl and de Nazelle, 2012; Rojas-Rueda, 2011;



ELSEVIER

Contents lists available at ScienceDirect

# Preventive Medicine

journal homepage: [www.elsevier.com/locate/ypmed](http://www.elsevier.com/locate/ypmed)

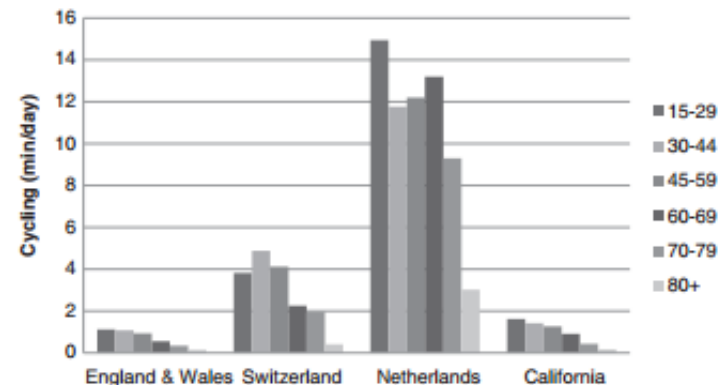
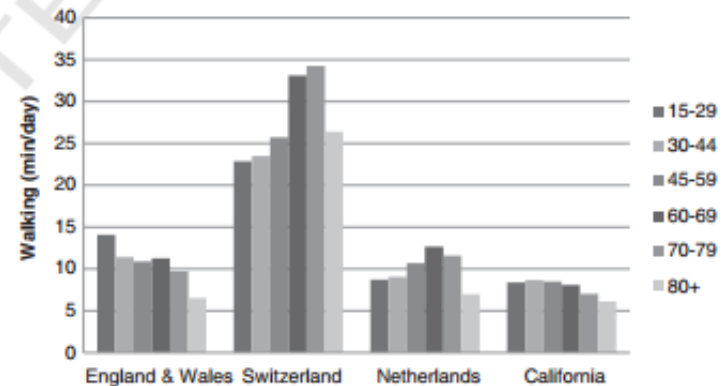


## Contrasts in active transport behaviour across four countries: How do they translate into public health benefits?

Thomas Götschi <sup>a</sup>, Marko Tainio <sup>b,c</sup>, Neil Maizlish <sup>d</sup>, Tim Schwanen <sup>e</sup>, Anna Goodman <sup>f</sup>, James Woodcock <sup>b,\*</sup>

### Integrated Transport and Health Impact Modelling Tool (ITHIM)

- In the UK there are 167,000 deaths related to inactivity (CVD, breast and colon cancer, type 2 diabetes, dementia, depression).
- If the UK population had similar minutes walking and cycling as Switzerland or the Netherlands, this would prevent 10-17,000 deaths.



# HEALTH ECONOMIC ASSESSMENT TOOL (HEAT)

Health economic assessment tools (HEAT) for walking and for cycling



ECONOMIC ASSESSMENT OF  
TRANSPORT INFRASTRUCTURE  
AND POLICIES



“In Toronto, walking prevented 60 deaths per year and cycling 49 deaths per year (2006 levels), representing \$130 to \$478 million in health benefits.

Achieving walking and cycling mode shares of 12% and 6%, respectively, would prevent about 100 additional deaths each year”

# HOW CAN WE PROMOTE ACTIVE TRANSPORT?



1. Infrastructure



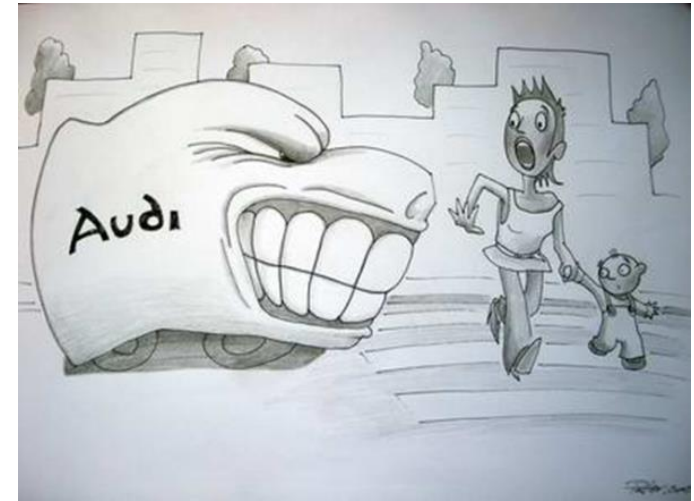
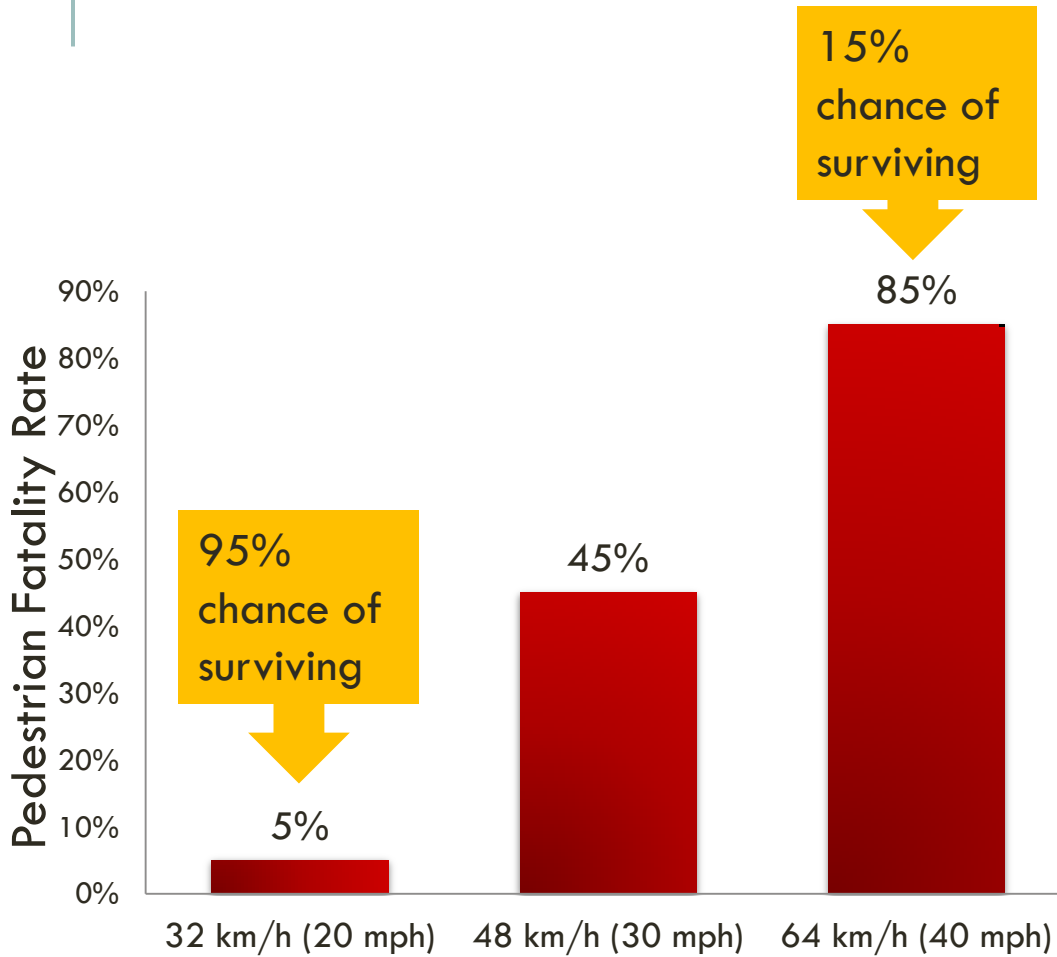
2. Encouragement



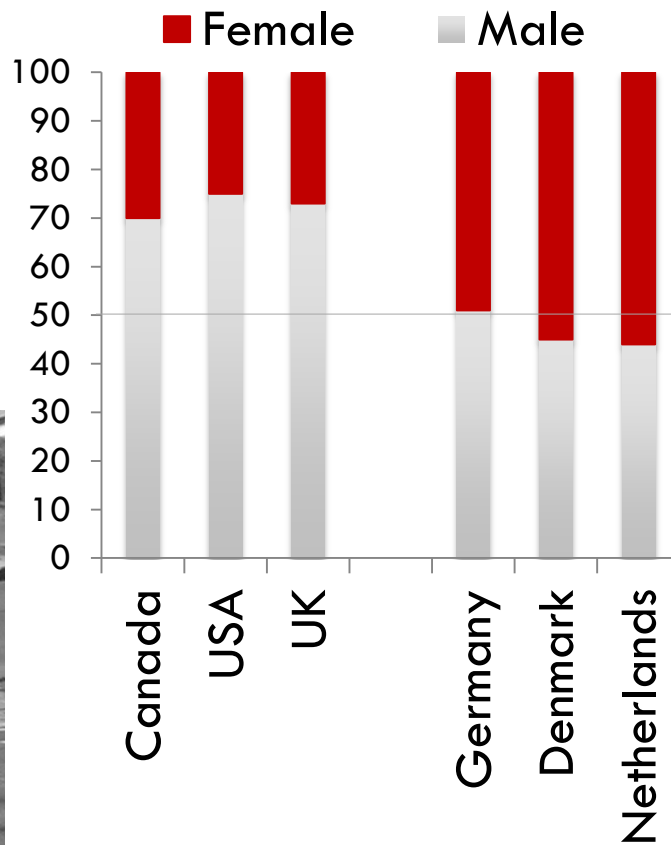
3. Technology



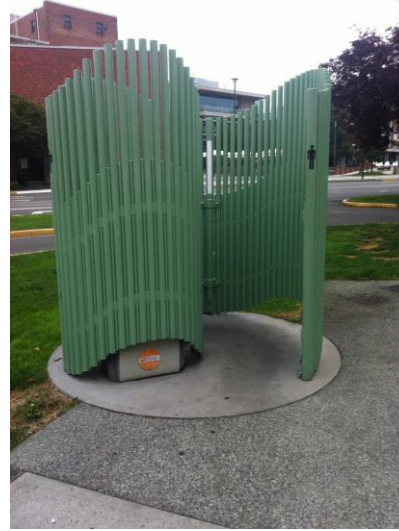
# BARRIERS: SAFETY



# INDICATORS

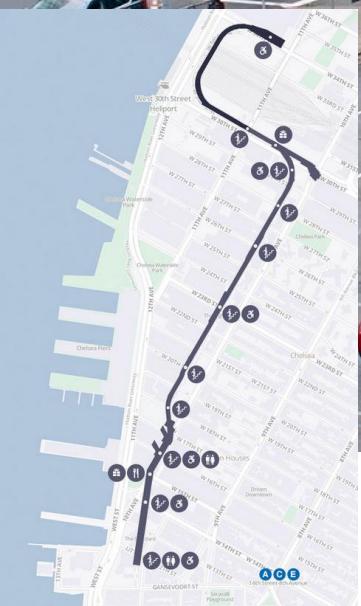


# INFRASTRUCTURE



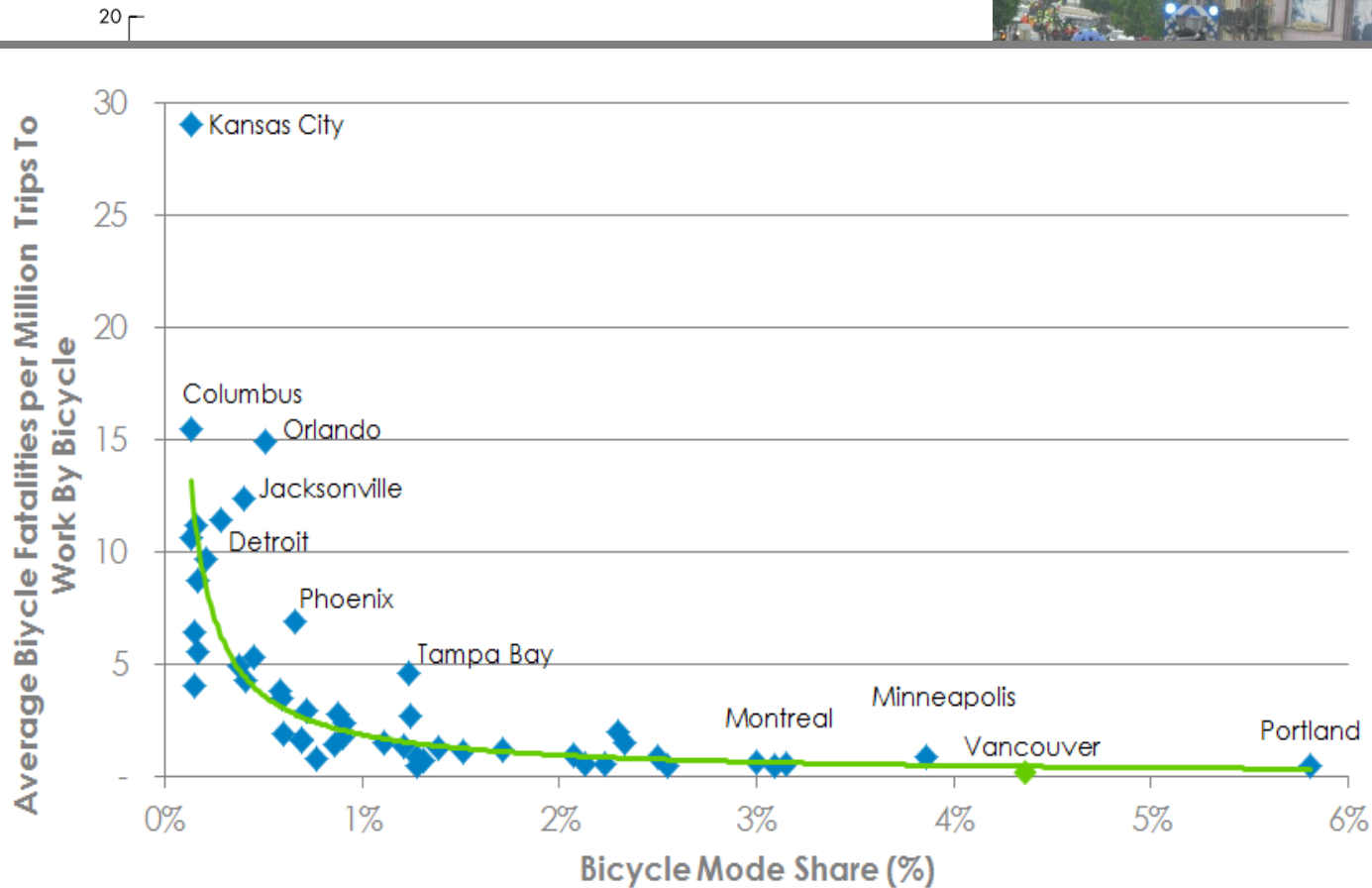


Times Square, Before and After



High Line Park, NYC (image: <http://conexaomundo.com.br/>)

# PROMOTION: SAFETY IN NUMBERS



Source: Urban Systems, 2015

1998.

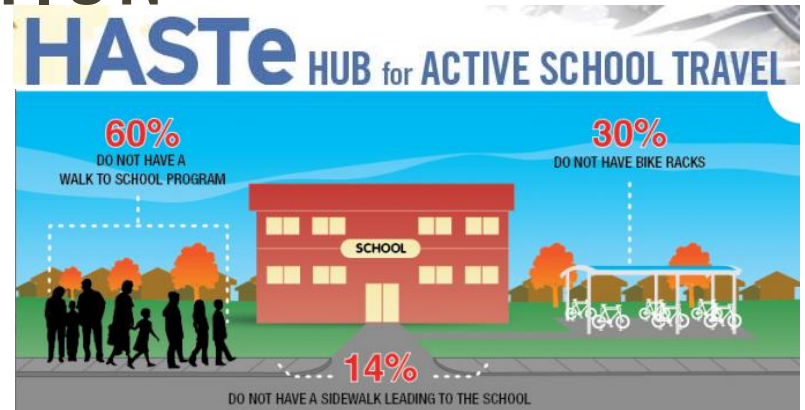
Source: Jacobsen, *Injury Prevention*, 2003

# PROMOTION AND EDUCATION

## Ciclovia



[Sources: Sarmiento, 2010; Torres, 2012; Montes, 2013]



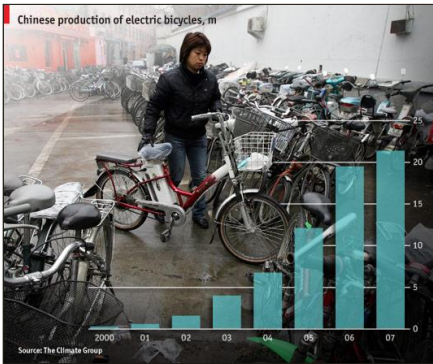
## Active School Travel Programs

## Community Events



# TECHNOLOGY SOLUTIONS

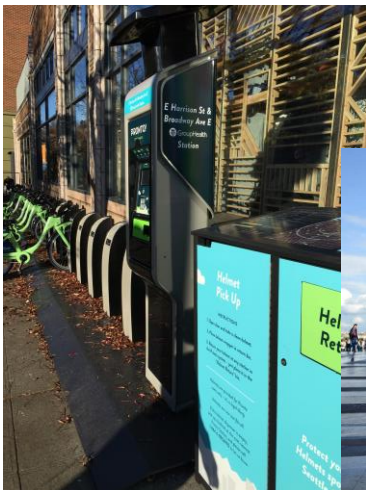
Electric bikes



Car share programs



Bikeshare programs



Rollerbags and granny carts






# POLICY IMPLICATIONS

Active travel is healthy, but we need to mitigate risks.

Evidence exists on how to make it safer:

- building safe infrastructure
- reducing speeds
- promotions and programing
- safety in numbers



***“in spite of the hostile environment in which most cyclists currently ride, the benefits in terms of health promotion & longevity far outweigh the loss of life years in injury on the roads” (British Medical Association)***

**HEALTHY BUILT ENVIRONMENT LINKAGES**  
A TOOLKIT FOR DESIGN • PLANNING • HEALTH



PROMOTING EQUITY • ACCESS • DESIGN FOR ALL AGES

**Cycling in Cities:**  
[cyclingincities.spph.ubc.ca](http://cyclingincities.spph.ubc.ca)

**Healthy Canada by Design:**  
[hcbd-clasp.com](http://hcbd-clasp.com)

**Active Living Research:**  
[Activelivingresearch.org](http://Activelivingresearch.org)

**My Community My Health:**  
[www.myhealthmycommunity.org](http://www.myhealthmycommunity.org)

**FOR MORE INFORMATION**

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