

# Research on Built Environments And Active Living

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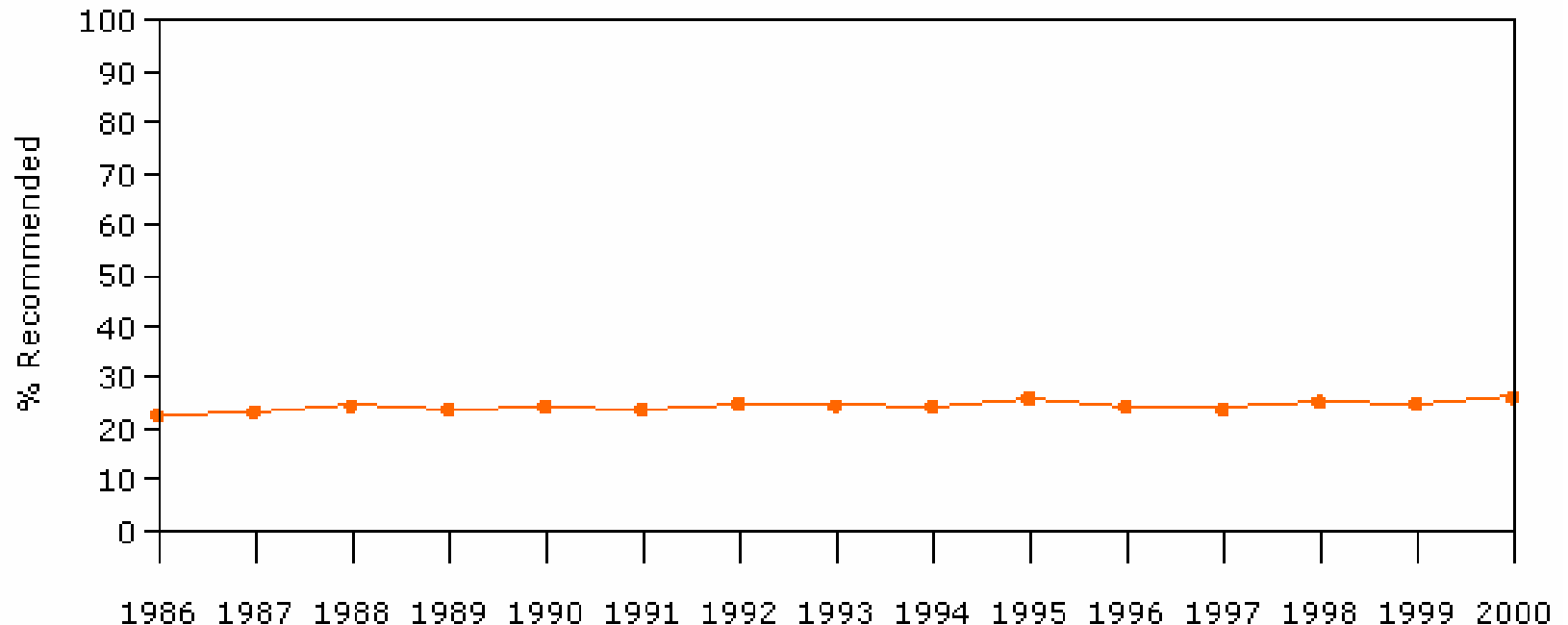
# Physical Inactivity—Should We Care?

- 2 million deaths attributed to inactivity worldwide (WHO, 2002)
- 200,000 deaths attributed to inactivity in the US (Hahn, 1990)
  - Smoking causes about 435,000 deaths
  - Alcohol causes about 100,000 deaths
- 6 % of medical costs in Canada, Australia, Switzerland, Netherlands, US
  - comparable to costs due to tobacco
- Inactivity is playing a role in the obesity epidemic and promoting PA can contribute to solutions



# Promoting exercise has not worked

## Trend in Recommended Physical Activity for U.S. Overall



Source: Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System



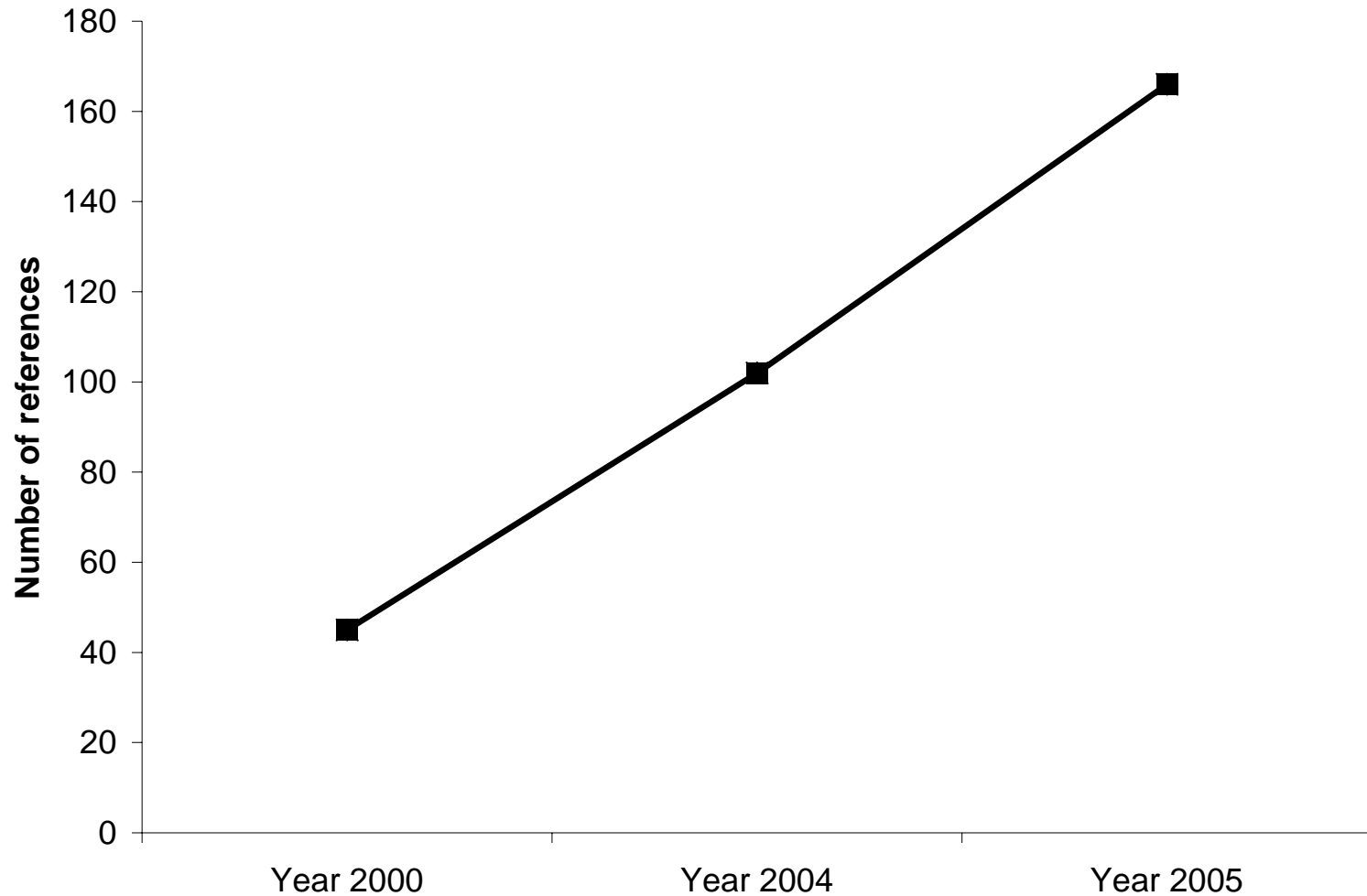
# What is an Activity-Friendly Environment?



A place that makes it easy to choose to be physically active, through planned exercise or routine daily activity.



# # articles on physical activity, sedentary behavior, and obesity with environment or policy content, 2000-2005



# Summary of Research

Studies from 3 traditions

- Planning & transportation studies on walkable communities & active transport
- Health studies on recreation facilities & active leisure
- Transdisciplinary studies of active living environments & total activity



# Summary of Research on Built Environment & Adults' Physical Activity

Built Environment Attribute	Active Transport	Active Recreation or Total Physical Activity
Walkability: mixed land use, street connectivity, residential density	++	0
Sidewalks	?	+
Proximity of recreation facilities (parks, trails, private facilities)	0	++
Aesthetics of recreation facilities	xx	++

Sallis & Kerr. For PCPFS Research Digest. 2007



## **Multiple Pathways from Land Use to Health: Walkability Associations With Active Transportation, Body Mass Index, and Air Quality**

- L Frank, J Sallis, T Conway, J Chapman, B Saelens, W Bachman
- Journal of the American Planning Association, April 2006
- Based on NQLS and King County Travel Survey
- Both studies used same walkability index



## Multiple Pathways from Land Use to Health: Walkability Associations With Active Transportation, Body Mass Index, and Air Quality

- 5% increase in walkability associated with:
  - 32% increase in walking for transport
  - ¼ point decrease in BMI (about 1.25 pounds)
  - 6.5% decrease in vehicle miles traveled
  - 5.6% decrease in oxides of nitrogen (NO<sub>x</sub>) grams
  - 5.5% decrease in volatile organic compounds (VOC) grams
- County government is acting on results



# Preview of NQLS Results

- Comparing high & low walkability neighborhoods in Seattle & Baltimore regions:
  - Total PA mins: 36 v. 29 (\*\*\*)
  - Walking for transport. Stronger for lo-income (\*\*\*)
  - Walking for leisure. More in high-walkable (\*)
  - % Overweight. 50-60% higher risk in low-walkable (\*\*)
  - Social cohesion. Not significant.
  - N'hood satisfaction. Not significant.
  - Quality of life. Not significant.



# What Kinds of Parks Promote Walking?

- Giles-Corti & group studied 1800 adults in Perth, Australia
- 29% used parks for PA
- Parks most likely to be used by walkers if:
  - Nearby
  - Large
  - Attractive
- Attractive parks—trees, water features, birds, varied landscaping



## Trails are cost-effective

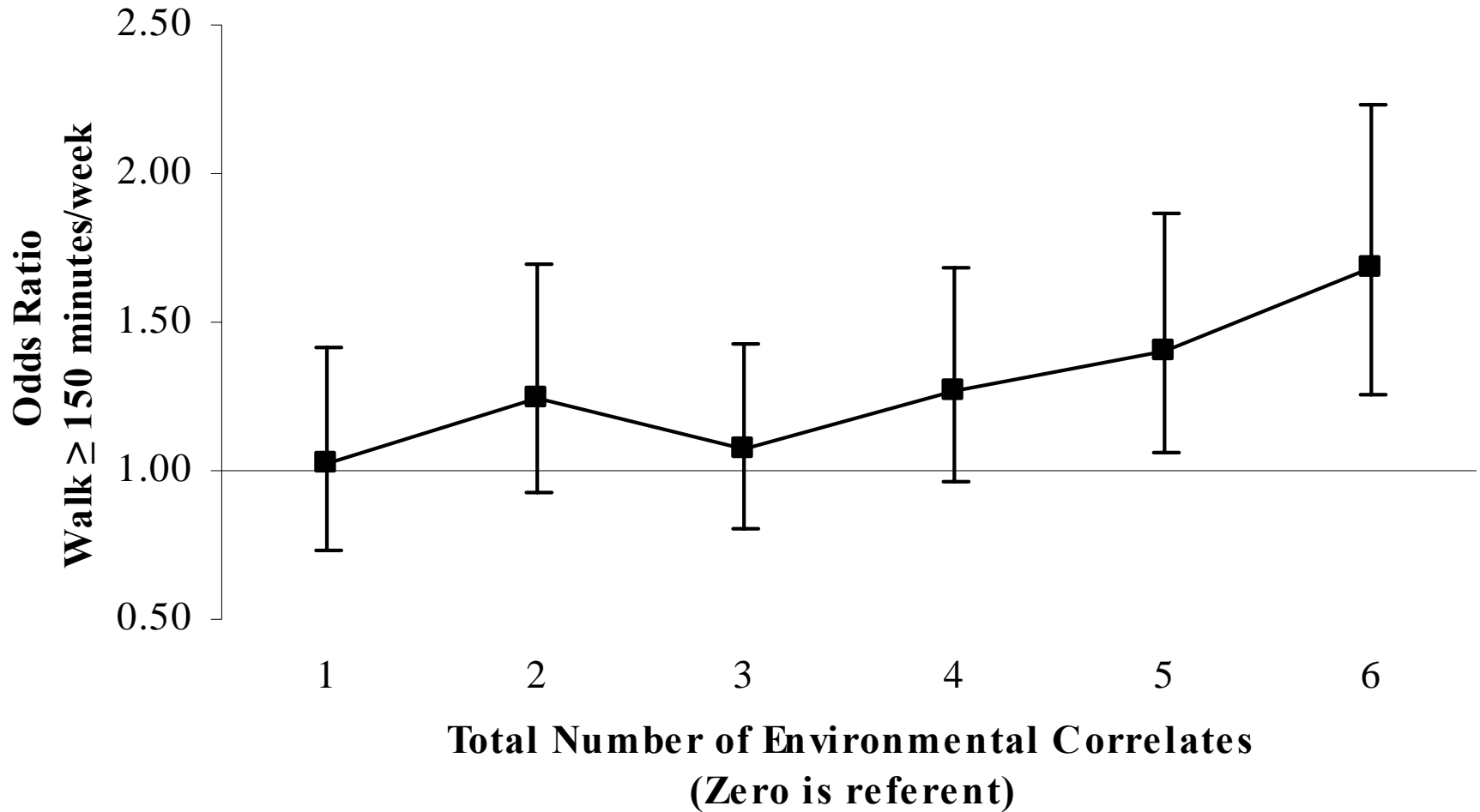
- Wang studied 4 trails in Nebraska (Prev Med, 2004)
- Trail development cost \$300,000, of which 73% was for construction
- Of 4000 trail users, 88% were active at least 3 days per week
- Annual cost per person becoming more active was \$98
  - Inactive people cost \$300-400 more for health care





We can learn from international studies

## Dose Response between Number of Environmental Correlates and Walking (Pooled Urban Sample)



N=8871 adults from 11 countries living in cities >30,000 population

# Summary of Research on Built Environment & Youth Physical Activity

<b>Built Environment Attribute</b>	<b>Active Transport</b>	<b>Active Recreation or Total Physical Activity</b>
Walkability: mixed land use, street connectivity, residential density	+	+
Street connectivity	?	?
Sidewalks	+	+
Proximity of recreation facilities (parks, trails, private facilities)	XX	++
Aesthetics of recreation facilities	XX	+

Sallis & Kerr. For PCPFS Research Digest. 2007



Relation of neighborhood walkability to objectively measured PA in 98 adolescents in San Diego: SCAN. Kligerman, Sallis et al. Am J Health Promotion, 2007

**Explaining moderate to vigorous physical activity for buffer of 0.5 mile around the subjects' homes, by street network distance.**

<u>Variable</u>	<u>p-value</u>	<u>Variance explained</u>
Gender	.048	.04
Ethnicity	.007	.05
Access to rec facilities	NS	.00
<b>Walkability</b>	<b>.008</b>	<b>.05</b>



# Neighborhood Walkability and Active Commuting to School

- 201 parents reported on children aged 4 to 17
- Active commuting to school:
  - 25% in hi-walkable neighborhoods
  - 11% in lo-walkable neighborhoods
- Parent concerns, mostly about traffic, were higher in lo-walkable neighborhoods

*Kerr, et al. MSSE, 2006*



# Summary of Research on Built Environment & Older Adults' Physical Activity

<b>Built Environment Attribute</b>	<b>Active Transport</b>	<b>Active Recreation or Total Physical Activity</b>
Walkability: mixed land use, street connectivity, residential density	+	+
Sidewalks	XX	XX
Proximity of recreation facilities (parks, trails, private facilities)	XX	+
Aesthetics of recreation facilities	XX	XX

Sallis & Kerr. For PCPFS Research Digest. 2007



# Walkable neighborhoods encourage more walking in older adults

Older women who live within walking distance of trails, parks or stores recorded significantly higher pedometer readings than women who did not. The more destinations that were close by, the more they walked.

King, W., *Am. J. of Public Health*  
2003



Photo: Michael Ronkin, ODOT



# Validation of Active Living Approach

- Transportation Research Board—Institute of Medicine panel concluded built environment is related to PA. [www.nas.edu](http://www.nas.edu)
- CDC's Guide to Community Preventive Services recommended land use changes as effective interventions.
- Institute of Medicine recommends mainly environment & policy changes to prevent childhood obesity



## Update on Related Topics

- Crime and perception of crime continue to be inconsistently related to PA.
  - Concern that crime could overcome benefits of walkability
- Low-income and high-minority neighborhoods have less access to parks & other recreation facilities
  - differences in quality of facilities not studied



## Next Steps for Research

- How do activity-friendly neighborhoods work for low-income and minority communities?
- To what extent are observed activity differences due to neighborhood selection?
- What is the supply & demand of walkable neighborhoods?
- How does park quality affect their use?



## Coming from ALR

- Conference, Feb 22-24 in Coronado, CA
- Special issue of American Journal of Health Promotion
- 11 case studies of active living policy inserted in Planning Magazine
  - Copies available on request
- Greater focus on childhood obesity

