The Community Guide

Physical Activity: Street-Scale Urban Design Land Use Policies (2004 Archived Review)

Table of Contents

Review Summary

Intervention Definition

Urban planners, architects, engineers, developers, and public health professionals work together to implement street-scale urban design and land use policies to change the physical environment of small geographic areas (generally a few blocks). Reasons for this include supporting physical activity.

- Policy instruments employed:
  - Building codes
  - Roadway design standards
  - Environmental changes
- Design components:
  - Improved street lighting
  - Infrastructure projects to increase safety of street crossing
  - Use of traffic calming approaches (e.g., speed humps, traffic circles)
  - Enhancing street landscaping

Summary of Task Force Finding

The Community Preventive Services Task Force recommends urban design and land use policies and practices that support physical activity in small geographic areas (generally a few blocks) to increase physical activity.

About the Systematic Review

The Task Force finding is based on evidence from a systematic review of 6 studies (search period 1987 to 2003).

The review was conducted on behalf of the Task Force by a team of specialists in systematic review methods, and in research, practice, and policy related to increasing physical activity.

Summary of Results

Six studies were included in the review.

- The way in which people perceive their environment affects their activities in that environment. Reviewed studies assessed the relationship between perception and activity in the studied areas and populations. The studies also assessed whether improvements in the outdoor environment created the appearance of a safer and more inviting place for physical activity.
- Overall, the median improvement in some aspect of physical activity (e.g., number of walkers or percent of active individuals) was 35%.
- Additional benefits that could have resulted from these interventions:
  - Improvements in green space
  - Increased sense of community and decreased isolation
  - Reductions in crime and stress
- Increased walking and bicycling on urban streets, although beneficial, also increase risk of injury to pedestrian or cyclist, because of increased exposure to motor vehicles.

Study Characteristics

- Included studies used quasi-experimental pre-post or cross-sectional study designs.
- Evaluated interventions all involved issues related to access, aesthetics, and safety (e.g., redesigning streets, installing new lighting, and improving street aesthetics)
- One study each was conducted in the United States, Australia, Belgium, Canada, England, and Germany.

Applicability

This type of intervention is likely to be applicable across diverse settings and population groups, provided appropriate attention is paid to adapting the intervention to the specific setting and target population.

Publications

Heath GW, Brownson RC, Kruger J, Miles R, Powell KE, Ramsey LT, Task Force on Community Services. The effectiveness of urban design and land use and transport policies and practices to increase physical activity: a systematic review. *Journal of Physical Activity and Health*. 2006;3(Suppl 1):S55-76.

Task Force Finding

Intervention Definition

Street-scale urban design and land use policies involve the efforts of urban planners, architects, engineers, developers, and public health professionals to change the physical environment of small geographic areas, generally limited to a few blocks, in ways that support physical activity.

- Policy instruments employed include:
  - Building codes
  - Roadway design standards
  - Environmental changes
- Design components include:
  - Improved street lighting
  - Infrastructure projects to increase safety of street crossing
  - Use of traffic calming approaches (e.g., speed humps, traffic circles)
  - Enhancing street landscaping

Task Force Finding (June 2004)

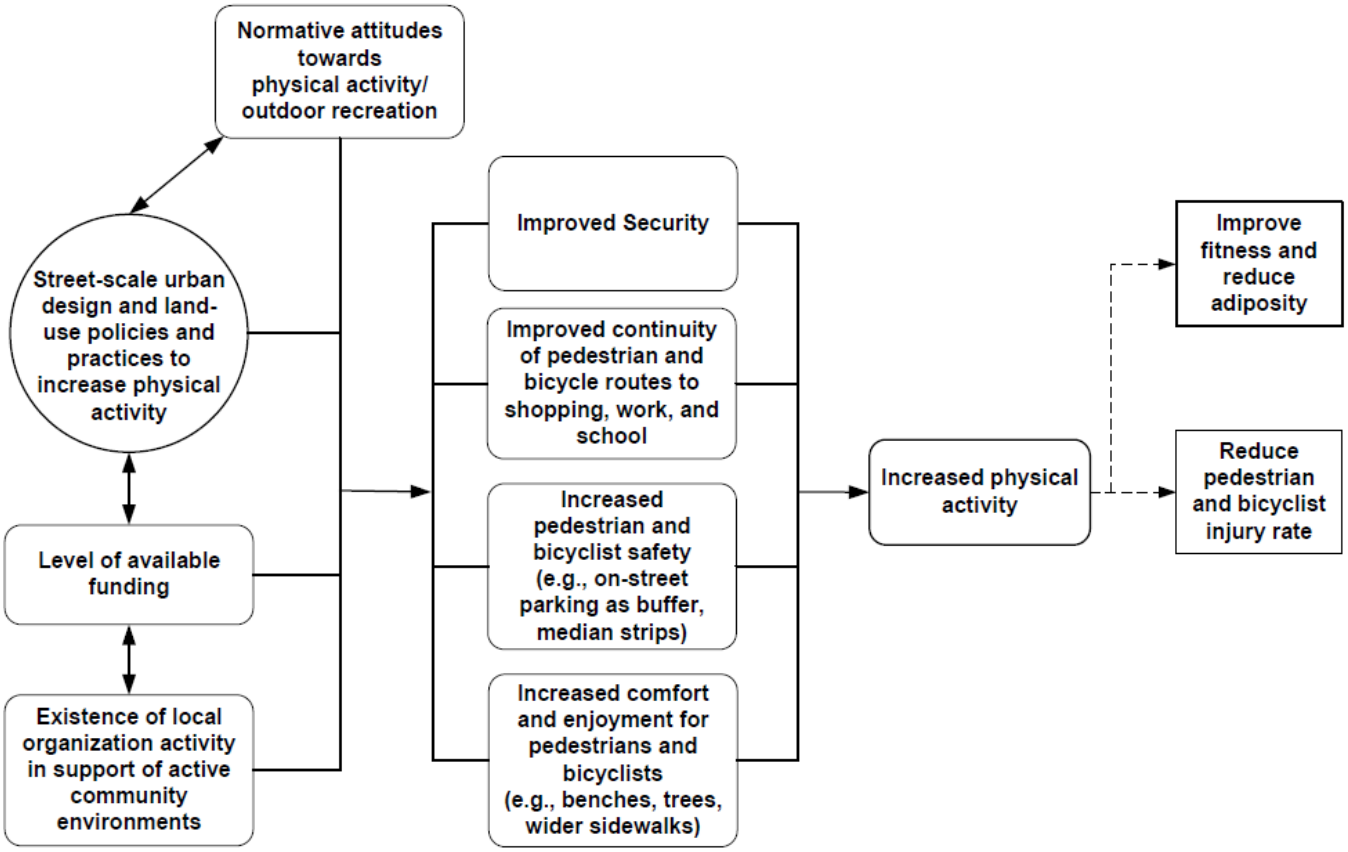
The Community Preventive Services Task Force recommends urban design and land use policies and practices that support physical activity in small geographic areas (generally a few blocks) based on sufficient evidence of their effectiveness in increasing physical activity.

Publications

Heath GW, Brownson RC, Kruger J, Miles R, Powell KE, Ramsey LT, Task Force on Community Services. The effectiveness of urban design and land use and transport policies and practices to increase physical activity: a systematic review. *Journal of Physical Activity and Health*. 2006;3(Suppl 1):S55-76.

Supporting Materials

Analytic Framework



Summary Evidence Table

Study Characteristics	Intervention and comparison elements	Study population description Sample size	Effect measure	Value used in summary	FU time
Author (year): Painter K (1996) **Design suitability**: Least (before-after) **Quality of execution:** Fair	**Location:** Metropolitan London, England (Edmonton, Tower Hamlets, Hammersmith and Fulham) **Components:** identified poorly lit areas and improved the lighting **Comparison:** before and after improved lighting		(Post-Pre)/Pre	Edmonton % change in # of persons using footpath Male 50% Female 64% % change in # persons walking Male 44% Female 45% Tower Hamlets - % change persons walking Male 34% Female 48% Hammersmith and Fulham - % change persons walking Male 101% Female 71%% Total avg net effect % change in persons walking 51%	6 wk
Author (year): MacBeth AG (1999) **Design suitability**: Least (before-after) **Quality of execution:** Fair	**Location:** 6 streets in Toronto, Canada **Components:** Promoted biking, converted 4 lane roads to 2 lane roads with biking and parking, narrowed streets, planted trees **Comparison:** pre and post	Bicyclists	(Post-Pre)/Pre	Bicycle traffic 23%	Approx 2 y

Study Characteristics	Intervention and comparison elements	Study population description Sample size	Effect measure	Value used in summary	FU time
Author (year): DeBourdeaudhuij I (2001) **Design suitability**: Least (Cross-sectional) **Quality of execution:** Fair	**Location:** Ghent, Belgium **Components:** Identified neighborhood and recreational environmental variables correlated with physical activity (walking, moderate activity, vigorous activity) **Comparison:** cross sectional/correlational	**Study population:** Random sample of 1000 Ghent residents *N* = 521	(Post-Pre)/Pre	Significant correlates for walking by gender: Men (*n* = 252) Availability of sidewalks *r* = 0.14* Women (*n* = 269) Land use mix (density) *r* = 0.15* Ease of walking to public transp. *r* = 0.16* Significant correlates for moderate activity by gender: Women (*n* = 269) Land use mix (access to local shopping) *r* = 0.16*	none
Author (year): Ball K (2001) **Design suitability**: Least (Cross-sectional) **Quality of execution:** Fair	**Location:** NSW, Australia **Components:** Perceived environmental aesthetics, convenience, companion walking behavior (walking and non-walking) **Comparison:** cross sectional	**Study population:** Random sample from electronic white pages directory of NSW residents *N* = 3392	(I-C)/C Environmental aesthetics (friendly, attractive, neighborhood, pleasant to walk) I = High aesthetics C = Low aesthetics Environmental convenience (shops in walking distance, parks in walking distance, access to cycling path) I = High convenience C = Low convenience	Environmental aesthetics (OR & 95%CI & *P*value) Aesthetics high 1.00 Aesthetics moderate 0.84 (0.71-0.99) < 0.01 Aesthetics low 0.59 (0.47-0.75) < 0.01 Net intervention effect High (1.00) vs. Low (0.59) = 70% Environmental convenience (OR & 95%CI & *P*-value) Convenience high 1.00 Convenience moderate 0.84 (0.71-1.00) < 0.01 Convenience low 0.64 (0.54-0.77) < 0.01 Net intervention effect High (1.00) vs. Low (0.64) = 56%	none

Evidence Gaps

Additional research and evaluation are needed to answer the following questions and fill existing gaps in the evidence base.

- What community characteristics are needed for optimal use of policy and environmental interventions?
- Does effectiveness vary by type of access (e.g., to a worksite facility or a community facility) or socioeconomic group?
- How can the necessary political and societal support for this type of intervention be created or increased?
- Does creating or improving access motivate sedentary people to become more active, give those who are already active increased opportunities to be active, or both?
- Which neighborhood features (e.g., sidewalks, parks, traffic flow, proximity to shopping) are the most crucial in influencing activity patterns?
- How does proximity of places such as trails or parks to residences affect ease and frequency of use?
- What behavioral changes not involving physical activity can be shown to be associated with changes in physical activity?
- Does an increase in the use of public transportation mean an increase in physical activity or will users drive to the transit stop?
- Can reliable and valid measures be developed to address the entire spectrum of physical activity, including light or moderate activity?
- Does the level or scale of an intervention significantly affect effectiveness?
- What are the effects of each intervention in various sociodemographic subgroups, such as age, gender, race, or ethnicity?
- Do these approaches to increasing physical activity increase awareness of opportunities for, and benefits of, physical activity?
- Are there other benefits from an intervention that might enhance its acceptability?
- Are there any key harms?
- Is anything known about whether or how approaches to physical activity could reduce potential harms (e.g., injuries or other problems associated with doing too much too fast)?
- What is the cost-effectiveness of each of these interventions?
- How can effectiveness in terms of health outcomes or quality-adjusted health outcomes be better measured, estimated, or modeled?
- How can the cost–benefit of these programs be estimated?
- How do specific characteristics of each of these approaches contribute to economic efficiency?
- What combinations of components in multicomponent interventions are most cost-effective?
- What are the physical or structural (environmental) barriers to carrying out these interventions?
- What resource (time and money) constraints prevent or hinder the implementation of these interventions?

Included Studies

The number of studies and publications do not always correspond (e.g., a publication may include several studies or one study may be explained in several publications).

Ball K, Bauman A, Leslie E, Owen N. Perceived environmental aesthetics and convenience and company are associated with walking for exercise among Australian adults. *Preventive Med*. 2001;33:434-440.

DeBourdeaudhuij ID, Sallis JF, Saelens B. Environmental correlates of physical activity in a sample of Belgian adults. *Am J Health Promotion* 2003;18(1):83-92.

Eubank-Ahrens B. A closer look at at the users of Woonerven. In: Moudon A, ed. *Public streets for public use*. New York: Van Nostrand Reinhold Co., Inc, 1987.

Macbeth AG. Bicycle lanes in Toronto. *ITE Journal* 1999;April:38-46.

Painter K. The influence of street lighting improvements on crime, fear and pedestrian street use, after dark. *Landscape and Urban Planning* 1996;35:193-201.

Troped PJ, Saunders RP, Pate RP, et al. Associations between self-reported and objective physical environmental factors and use of a community rail-trail. *Prev Med* 2001;32:191-200.

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