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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

Street-scale urban design and land-use policies and practices to increase physical activity

Normative attitudes towards physical activity/outdoor recreation

Level of available funding

Existence of local organization activity in support of active community environments

Improved Security

Improved continuity of pedestrian and bicycle routes to shopping, work, and school

Increased pedestrian and bicyclist safety (e.g., on-street parking as buffer, median strips)

Increased comfort and enjoyment for pedestrians and bicyclists (e.g., benches, trees, wider sidewalks)

Increased physical activity

Improve fitness and reduce adiposity

Reduce pedestrian and bicyclist injury rate
### Summary Evidence Table

<table>
<thead>
<tr>
<th>Study Characteristics</th>
<th>Intervention and comparison elements</th>
<th>Study population description</th>
<th>Effect measure</th>
<th>Value used in summary</th>
<th>FU time</th>
</tr>
</thead>
</table>
| **Author (year):** Painter K (1996) | **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% | 6 wk |
| **Design suitability:** Least (before-after) | **Quality of execution:** Fair |  |  |  |
| **Author (year):** MacBeth AG (1999) | **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 |
<p>| <strong>Design suitability:</strong> Least (before-after) | <strong>Quality of execution:</strong> Fair |  |  |  |</p>
<table>
<thead>
<tr>
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<th>Study population description</th>
<th>Effect measure</th>
<th>Value used in summary</th>
<th>FU time</th>
</tr>
</thead>
</table>
| **Author (year):** DeBourdeaudhuij I (2001) | **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* | none |
| **Author (year):** Ball K (2001) | **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).


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**Disclaimer**

The findings and conclusions on this page are those of the Community Preventive Services Task Force and do not necessarily represent those of CDC. Task Force evidence-based recommendations are not mandates for compliance or spending. Instead, they provide information and options for decision makers and stakeholders to consider when determining which programs, services, and policies best meet the needs, preferences, available resources, and constraints of their constituents.

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