TRB SPECIAL REPORT

Does the Built Environment Influence Physical Activity?

Examining the Evidence

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Physical inactivity is a major, largely preventable threat to health. The scientific evidence is compelling that regular physical activity—even at moderate levels, such as walking briskly for 30 minutes on 5 or more days per week—reduces the risk of premature mortality and of developing various chronic diseases; improves psychological well-being; and helps prevent weight gain and obesity by keeping caloric intake in balance with energy expenditure.

Despite the scientific evidence, 55 percent of the U.S. adult population fall short of the recommended guidelines, and approximately 25 percent report being completely inactive when not at work. Nearly one-third of high school–age teenagers report not meeting recommended levels of physical activity, and 10 percent classify themselves as inactive.

Study Charge

Concerned about the adverse health effects of physical inactivity, The Robert Wood Johnson Foundation and the Centers for Disease Control and Prevention requested a study to examine how the built environment potentially contributes to reduced levels of physical activity in the United States. The built environment is broadly defined to include land use patterns, the transportation system, and design features that together generate needs and provide opportunities for travel and physical activity.

In response to this request, the National Research Council of the National Academies, under the auspices of the Transportation Research Board and the Institute of Medicine, formed a committee of 14 experts from the transportation and public health communities (see box, page 32). The expertise of the panel members covers such diverse fields as transportation demand and travel behavior, land use planning and regulation, public health, physical activity and education, economics and public policy, safety, and social and behavioral science research and methods.

The study charge was to review the general trends affecting the relationships among physical activity, health, transportation, and land use; to summarize what is known about these relationships, including the strength and magnitude of any causal connections; to draw implications for policy; and to recommend priorities for research.

PHOTO: DAN BURDEN, WALKABLE COMMUNITIES, INC.

Aerial view of suburban development.

Gathering Information

The committee commissioned several papers to explore various aspects of the relationships among land use, transportation, and physical activity.[1] The papers examined long-term trends in land use patterns, travel behavior, employment, and time use related to physical activity levels; critically reviewed the literature on these relationships; and elaborated on the methodological and data challenges.

Other papers addressed the role of social marketing in shaping individual preferences and behavior; the importance of safety and security; institutional

[1] The papers are available online at www.TRB.org/downloads/sr282papers/sr282paperstoc.pdf.

TRB Special Report 282, Does the Built Environment Influence Physical Activity? *Examining the Evidence*, is available from the TRB online bookstore, www.TRB.org/bookstore; to view the book online, go to www.TRB.org/publications/sr/sr282.pdf.

and regulatory forces that affect what is built and where; and educational programs that link public health and urban planning. The committee also drew from a paper on the role of segregation and poverty in limiting choices for physical activity among disadvantaged populations.

In addition, the committee arranged for briefings and held a workshop to involve a broader range of experts from academia, consulting firms, professional associations, advocacy groups, state and federal agencies, congressional staff, and the press.

Role of the Built Environment

In the past half-century or more, technological innovations have reduced the physical requirements of daily life substantially. Automation has led to the decline of physically active occupations; other trends include the introduction of labor-saving devices in the home and the dominance of the automobile for personal travel.

In addition, the steady decentralization of metropolitan-area population and employment to low-density, widely dispersed suburban locations has increased the travel distances to many destinations, such as schools, shopping places, and transit stops. This has made the private vehicle the most practical means of transport. Lifestyle and cultural changes, such as increases in television watching and other sedentary activities, also have played a role in reducing physical activity.

In contrast to the well-documented causal connection between physical activity and health, the role and importance of the built environment in physical activity levels is a relatively new area of inquiry. The literature on the topic is at an early stage of development but is growing rapidly.

PHOTO: DAN BURDEN, WALKABLE COMMUNITIES, INC.

Pennsylvania Avenue serves as major thoroughfare for vehicle traffic and pedestrians in Washington, D.C.

Complex Relationshsips

Shaped by the long-standing policies and the practices of elected officials, policy makers, planners, developers, traffic engineers, and other decision makers, the built environment can facilitate or constrain physical activity. The relationship between the built environment and physical activity, however, is complex and operates through many mediating factors, such as sociodemographic characteristics, personal and cultural variables, safety and security, and time allocation.

Empirical evidence links the built environment and physical activity, but few studies capable of demonstrating a causal relationship have been conducted, and evidence supporting a causal relationship is sparse. Weaknesses in the literature include lack of a sound theoretical framework, inadequate research designs, and incomplete data.

Longitudinal study designs are needed to investigate causal relationships between the built environment and physical activity, as well as studies that carefully distinguish between such determinants of physical activity as personal attitudes, residential location preferences, and characteristics of the built environment. Appropriate measures of the built environment are still in development, and efforts to link the measures to travel and health databases are at an early stage.

Facilitating Activity

Built environments that facilitate more active lifestyles and reduce barriers to physical activity are desirable because of the positive relationship between physical activity and health. Achieving this goal is a challenge for a highly technological society with an extensive built environment that is often expensive to change.

Nevertheless, the built environment is being renovated and rebuilt constantly, and new developments are being constructed. Renovation and construction offer opportunities to institute policies and practices that produce activity-conducive environments.

Many settings offer opportunities to increase physical activity levels—at home, at work, at school, in travel, and in leisure. The built environment can influence physical activity in each of these settings.

The available evidence, however, is not sufficient to identify the changes that would have the most impact on physical activity levels and health outcomes. Research has not yet identified causal relationships that would have enabled the committee to provide guidance about cost-beneficial investments or to state unequivocally that such changes to the built environment would lead to more physical activity or would be the most efficient ways of increasing such activity.

PHOTO: DAN BURDEN, WALKABLE COMMUNITIES, INC.

Marked crosswalks across multilane intersection.

Recommendations

The committee's recommendations are presented in detail in the published report. Given the current state of knowledge and the importance of physical activity for health, the committee urges a continuing and well-supported research effort.

Priorities for research include interdisciplinary approaches and international collaboration; more complete conceptual models; better research designs; and more detailed examination and matching of specific characteristics of the built environment with different types of physical activity. All types of physical activity should be included, to allow substitutions among different types. From a public health perspective, the goal is to increase total physical activity levels.

Other recommendations call for expanding national public health and travel surveys to provide more detailed information about the location of physical activity and travel; evaluating changes to the built environment as natural experiments to be studied for their impacts on physical activity; and emphasizing interdisciplinary education programs at universities to train professionals for research and to prepare practitioners at the intersection of physical activity, public health, transportation, and urban planning.

Federal funding is needed to support high-payoff, but difficult to finance, multiyear longitudinal studies; to establish a rapid response capability to evaluate natural experiments as they arise; and to make recommended additions to national databases if research into important causal connections is to be undertaken. To meet these targeted needs, the committee recommends that the leadership of the U.S. Department of Health and Human Services and the U.S. Department of Transportation work collaboratively to shape an appropriate research agenda and to recommend to Congress a program of research with a defined mission and a proposed budget.

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Roundabout and vegetation median calm traffic in Boca Raton, Florida.