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## Built Environment and Mobility of Older Adults: Important Policy and Practice Efforts

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### Abstract

As people age, they prefer to “age in place.” The concept of aging in place refers to the ability to live in one’s own home, wherever that might be, for as long as one can feel confident and comfortable. Where people live and whether these environments can support them are critical questions for public health and public policy, especially since the baby boomers began to turn 65 on January 1, 2011. Equally important for public policy, those aged 85 and older are the fastest growing population group in the United States. The Health and Aging Policy Fellows Program, with the Centers for Disease Control and Prevention Healthy Aging Program, has supported a project to determine how design features of the built environment can support the mobility of older adults. Mobility refers to physical activity, usually walking, but also encompasses the ability to stay connected to nearby community resources and services. The project’s purpose is to investigate features that support mobility in built environments. This policy brief introduces the realist synthesis method used in the project and selected national initiatives and activities to place this work in a broader context. Given the importance of mobility concerns to older adults, it must be determined without delay which design features support mobility and how local areas can better prepare to support the health of their aging populations.

### Keywords

healthy aging; mobility; neighborhood; public policy

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As people age, they want to “age in place” or live in their homes or communities as long as possible. In 2000, 80% of people aged 65 and older lived in metropolitan areas, with two-thirds of those living in suburbs.<sup>1</sup> Based on population projections, as the baby boomers continue turning 65, between 2010 and 2020, the suburbs will see a 50% increase in people

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aged 65–74.<sup>2</sup> In addition, the fastest-growing segment of the older U.S. population is those aged 85 and older.<sup>3</sup> Are the communities where aging Americans live designed to support people who want to age in place?

There is a growing body of literature that describes how neighborhood environments are associated with health status and health behaviors;<sup>4,5</sup> many of these studies focus on older adults<sup>6</sup> and the design features and walkability of their neighborhoods. Numerous studies and reviews have reported the benefits of physical activity for older adults<sup>7</sup> and have shown that walking is the most common form of physical activity in this population.<sup>8</sup>

The design of sidewalks and streets is important for the health of older adults. Good design can avert injuries from vehicle collisions with pedestrians. In 2009, older adult pedestrians made up 19% of pedestrian deaths caused by impact with a motor vehicle (the highest fatality rate of any age group), yet older adults constituted only 13% of the population.<sup>9</sup> U.S. pedestrian injury rates are estimated to be two and four times as high as in Germany and the Netherlands, respectively, where urban design and traffic-related policies make safer walking and bicycling possible.<sup>10</sup> Furthermore, older adult pedestrians are more susceptible to death and serious injury.<sup>9,11,12</sup> Design features have been documented to be critical for ensuring walkability for accessing services, for physical activity, and for promoting and maintaining social engagement.<sup>13–16</sup>

City and transportation planning policies help determine sidewalk and street conditions. City and transportation planners are aware of the demographic trends.<sup>17–21</sup> Much of U.S. urban infrastructure was built from the 1930s through the 1950s and needs to be refurbished and upgraded.<sup>22</sup> After World War II, urban design focused on the automobile.<sup>23,24</sup> Suburban living emerged, as cities spread out, and people drove further for work and other activities.<sup>25</sup> Because streets and roads need to be renewed, a large majority of people are living in areas originally designed for cars, and the population is aging, it is critical to identify the specific design features necessary to support aging in place. One author (IHY) has been conducting research on neighborhoods and health since the mid-1990s and more recently has focused on how neighborhood design features affect older adults' health.<sup>26–28</sup>

The Health and Aging Policy Fellows Program supports medical and health professionals for 1 or 2 years to gain expertise in U.S. policy-making, with residential (in a congressional, executive branch, or policy organization office in Washington, DC) and nonresidential placement opportunities ([www.healthandagingpolicy.org/index.html](http://www.healthandagingpolicy.org/index.html)). In 2010–2011, the Centers for Disease Control and Prevention (CDC) supported one of the authors (IHY) as a nonresidential fellow to focus on the built environment and mobility. The policy focus of her project is Complete Streets,<sup>29</sup> specifically, conducting a realist synthesis<sup>30</sup> of the evidence that supports connections between complete streets design principles and mobility of older adults. Mobility refers to physical activity, usually walking, but also encompasses the ability to stay connected to nearby community resources and services. The project's purpose is to investigate features that support mobility in built environments. The policy project reviewed and synthesized a body of research evidence. Searching methods precluded us from including all aspects of mobility in the review, such as shuttle services or volunteer driver programs.

In this policy essay, we describe Complete Streets, the realist synthesis method (a relatively new method for synthesizing research and other evidence, with particular applicability for policy and intervention). (Final results of the synthesis are in preparation.) We also describe select initiatives in the United States related to the built environment to place the CDC's Healthy Aging Network and the Health and Aging policy fellow's work in the broader national context.

## COMPLETE STREETS POLICY

Complete streets refers to a set of design features that support safe roads for people of all ages and abilities.<sup>29</sup> These include traffic calming measures, clearly marked pedestrian crosswalks, bike lanes, and seating near public transit stops. In May 2011, House and Senate versions of the Complete Streets Act of 2011 were introduced. This legislation would require that metropolitan planning organizations adopt and implement complete streets policies. It also would require projects that receive federal transportation funding to comply with complete streets design principles. Twenty-six states plus the District of Columbia and Puerto Rico and more than 315 local governments have passed complete streets legislation.<sup>29</sup>

## REALIST SYNTHESIS

Realist synthesis is a method of summarizing evidence for public policy that Ray Pawson of the University of Leeds developed.<sup>30</sup> In contrast to a Cochrane meta-analysis, a realist synthesis begins with a program theory explaining how the intervention or policy would be effective and the conditions under which it would be effective. Although the method is relatively unknown among U.S. public health and biomedical researchers, it has been applied to projects in numerous subject areas in the United Kingdom, Canada, Australia, and New Zealand, including assessing interventions for childhood obesity,<sup>31</sup> effects of housing on mental health,<sup>32</sup> what combination of services best supports homeless people with substance use and mental health disorders,<sup>33</sup> and approaches to retain health workers in rural areas.<sup>34</sup>

To conduct a realist synthesis of the research on design features in built environments that support mobility, the authors searched the Web of Science and PubMed databases as well as the grey literature (unpublished material such as technical reports and white papers) and identified 115 peer-reviewed articles and two reports to include in the review.

The conceptual framework that guided the database search used an ecological model,<sup>35</sup> which considers mobility to be a function of the person, the environment, and interaction of the person with the environment. The model expands upon the ecological model by encompassing elements from the International Classification of Functioning developed by the World Health Organization<sup>36</sup> related to functioning related to biological functions (as individual factors), activity and actions, and participation (Figure 1). Physical impairments, activity limitations (or disability), and participation restrictions can represent negative functioning at each of these three levels. For example, an older adult with diabetes mellitus may experience pain due to peripheral neuropathy (impairments in body structures) that leads to severe difficulty in walking (lower extremity limitations that affect activities) that

restricts involvement in life situations (participation restriction). It is important to distinguish between factors that the community organizations and citizens can influence, which can be thought of as micro factors, and what factors may be external to the immediate community, which can be thought of as macro factors, such as political factors (e.g., federal tax policies or safety regulations), economic factors (e.g., federal or state transportation budgets), social factors (e.g., demographics of a community), or even technological factors (e.g., high-speed Internet).

This framework illustrates the importance of the built environment and the multiple interactions influencing mobility. In particular, the model expands thinking about mobility beyond the biological and individual factors and begins to explore the consequences at the community and societal level. Other depictions indicating important foci in the process are possible, and it is not meant to represent causal associations. The synthesis will be able to provide information and evidence about environmental strategies that policy-makers can consider when implementing policy strategies.

To prepare for the synthesis, the conceptual framework was translated into a series of codes. These codes were applied to text segments in the articles and reports and catalogued using NVIVO 8 (QSR International [Americas] Inc., Cambridge, MA). The extent of the support for each aspect of the conceptual framework was examined, and a program theory was generated to describe how the nodes are interrelated. The synthesis will be written for two audiences: one academic and one policy-making. The policy version will be distributed to policy-makers and other interested policy organizations (e.g., National Complete Streets Coalition, AARP, American Planning Association, American Public Health Association). The policy project also fits within the broader context of national initiatives and CDC Healthy Aging Program-related activities.

## NATIONAL INITIATIVES

Over the past several decades, national and international movements such as the Healthy Cities and Healthy Communities projects have positively influenced policy and environmental efforts in the United States.<sup>37</sup> Such efforts recognize the need to facilitate behavior change by removing policy and environmental barriers to healthy behavior as well as fostering those policies, rules, procedures, and conditions that support individuals' abilities to make health-promoting choices. Several national initiatives that embrace environmental and policy strategies are described (Table 1), including the *National Prevention Strategy: America's Plan for Better Health and Wellness* (National Prevention Strategy), which has as one of its cornerstones to create healthy and safe community environments;<sup>38</sup> *Healthy People 2020*, which expanded its overarching goals to focus on creating social and physical environments that promote good health for all;<sup>39</sup> and the *The Guide to Community Preventive Services*, which includes recommendations focused on social and environmental policies.<sup>40</sup>

The National Prevention Council, created under the auspices of the Affordable Care Act, released the National Prevention Strategy in 2011.<sup>38</sup> The National Prevention Strategy is a comprehensive plan designed to help increase the number of Americans who are healthy at

every stage of life. It has identified four strategic directions. One of these focuses on Healthy and Safe Community Environments and includes factors such as the availability of resources to meet daily needs (e.g., educational and job opportunities, safe and affordable housing, healthy and affordable foods), community structures (e.g., accessible and safe buildings, parks, transportation), and the natural environment (e.g., absence of toxic substances and other physical hazards). For older adults, the strategies focus on supporting older adults in aging in place and help promote and maintain positive mental and emotional health.

Since 1979, *Healthy People* has established nationwide health-improvement priorities for the United States and provided measurable objectives and goals applicable to national, state, and local levels.<sup>41</sup> The overarching goals of *Healthy People 2020* have been expanded to reflect a multidisciplinary approach to “create social and physical environments that promote good health for all,” embracing alliances with nontraditional partners representing transportation, urban planning, recreation, and environmental health. (For more information, see <http://healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=39>.) In terms of objectives related to enhancing the environment, many of these can be found in the physical activity topic.<sup>39</sup> For example, objectives in *Healthy People 2020* focus on the importance of physical activity for the health and well-being of older adults and acknowledge that older adults may have additional factors that keep them from being physically active, including lack of social support, lack of transportation to facilities, fear of injury, and cost of programs.<sup>42</sup> Several new objectives reflect this emphasis; for example, developmental objectives related to community-scale policies (objective PA-15.1), street scale policies (objective PA-15.2), and transportation and travel policies (objective PA-15.3) seek to increase legislative policies promoting built environments that enhance access to and availability of physical activity opportunities.

*The Community Guide for Preventive Services* is a resource of evidence-based recommendations based on a systematic review process conducted under the leadership of the Task Force on Community Preventive Services, an independent body of public health and prevention experts. The task force has conducted several reviews in this area and found considerable evidence supporting the effectiveness of community-scale urban design and land use policies as interventions that can promote physical activity. Accordingly, the task force recommends design and land use policies and practices that support physical activity in urban areas and enhanced access to places for physical activity.<sup>43</sup>

## CDC HEALTHY AGING PROGRAM

The CDC Healthy Aging Program has several important efforts related to the built environment and mobility of older adults conducted primarily through the Healthy Aging Research Network (Table 1). Since 2001, this network has used a coordinated approach to develop and implement a national agenda related to the research and dissemination of information about aging, focusing on communities and populations that bear a disproportionate burden of illness and disease.<sup>44</sup>

Since its inception, the network has embraced the socio-ecological framework,<sup>45</sup> evaluating how people interact with their environments. This has led to a portfolio of projects directed

at understanding the determinants of physical activity and developing strategies to promote it.

Although initially focused on individuals and groups, Healthy Aging Research Network activities have included policy and environmental projects, such as developing and testing an audit tool,<sup>46</sup> and a study, supported by the Robert Wood Johnson Foundation, investigating neighborhood characteristics and walking behaviors.<sup>47</sup>

The Healthy Aging Research Network also conducted a major outreach effort through a series of conferences and activities concerning evidence-based interventions that the CDC funded. In 2009, the network developed a symposium, “Promoting Environmental and Policy Change to Support Healthy Aging.” Network members went on to sponsor a series of outreach and technical assistance activities supported by the Agency for Healthcare Research and Quality and the CDC. This led to the creation of the Environmental Policy Change Clearinghouse, a searchable, annotated database of more than 130 online resources for healthy aging, healthy communities, the built environment, and mobility. The clearinghouse includes tools, best practices, case studies, and strategies to support local efforts in environmental and policy change for healthy aging.<sup>48</sup>

In 2010, the Healthy Aging Research Network expanded its focus from physical activity to mobility. The network established a working group devoted to mobility, which is undertaking a number of new initiatives such as beginning to create a national research agenda on public health approaches to enhance the mobility of community-dwelling older adults. The Health and Aging Policy Fellows Program is one of these initiatives and will continue to help in advancing environmental and policy efforts to promote mobility in older adults.

## SUMMARY

The aging of the U.S. population will have important health, economic, and social consequences. To help prepare for this, public health professionals are examining locations where older adults will be spending time as they age in place. The design of neighborhood and street environments is important for safety and access. Many of the design principles that Complete Streets promotes are being adopted at the state and local level across the country and could have important implications for older adult health. The Health and Aging Policy Fellows Program, with support from the CDC, has prioritized investigating how Complete Streets policies can support the health and well-being of older people.

## Acknowledgments

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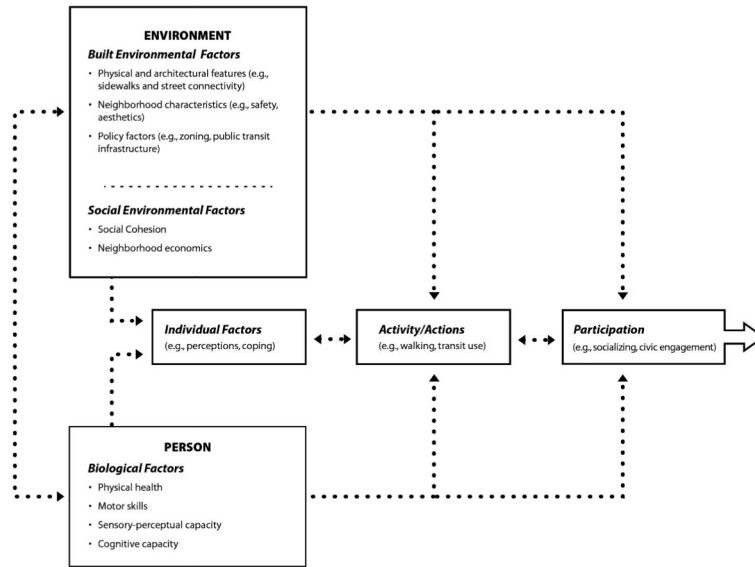
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**Figure 1.** Conceptual framework: factors that promote mobility in older adults.

Table 1

Selected National Initiatives and CDC-Supported Activities

National Initiatives: Healthy Cities and Healthy Communities	
National Prevention Strategy: America’s Plan for Better Health and Wellness <a href="http://www.healthcare.gov/center/councils/nphpphc/strategy/report.pdf">www.healthcare.gov/center/councils/nphpphc/strategy/report.pdf</a>	Created under the Patient Protection and Affordable Care Act in 2011 Designed to help increase the number of Americans healthy at every stage of life Supports aging in place Incorporates Healthy and Safe Community Environments as one of its four cornerstones
Healthy People 2020 <a href="http://www.cdc.gov/nchs/healthy_people.htm">www.cdc.gov/nchs/healthy_people.htm</a>	Incorporates social and physical environments into the overarching goals Includes objectives related to transportation, urban planning, recreation and environmental health Promotes physical activity objectives for older adults Acknowledges physical activity barriers for older adults Encourages enhanced physical activity opportunities via the built environment and transportation and travel policies
The Community Guide to Preventive Services <a href="http://www.thecommunityguide.org/index.html">www.thecommunityguide.org/index.html</a>	Provides evidence-based recommendations from the Community Guide Task Force (independent, nonfederal volunteer body of public health and prevention experts) Includes recommendations focused on environmental policies such as “Design and land use policies and practices that support physical activity in urban areas and increased access to places for physical activity”
CDC and CDC-HAN Network Activities	
CDC HAN Audit Tool (development and testing) <a href="http://www.prc-han.org/docs/HAN-audit-tool-protocol-090309.pdf">www.prc-han.org/docs/HAN-audit-tool-protocol-090309.pdf</a>	Focuses on the relationship between built environment and physical activity in older adults Assesses street-scale factors associated with physical activity (e.g., destinations, sidewalk and intersection conditions)
Robert Wood Johnson Foundation–supported study	Examines neighborhood characteristics and walking behavior in older adults
CDC-HAN outreach efforts	Focuses on evidence-based interventions promoted through conferences and outreach efforts, including “Promoting Environmental and Policy Change to Support Healthy Aging”
CDC-HAN Technical Assistance	Created the Environmental Policy Changes clearing house (searchable database of >130 online resources for healthy aging, healthy communities, built environment and mobility) Makes available tools, best practices, case studies and strategies to support environmental and policy changes toward healthy aging
Health and Aging Policy Fellowship	Promoting and maintaining mobility in older adults, supported by CDC Healthy Aging Program and linked to CDC-HAN Mobility workgroup

CDC, Centers for Disease Control and Prevention; HAN, Healthy Aging Research Network.

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