

**STEP IT UP!**  
**THE SURGEON GENERAL'S CALL TO ACTION**  
**TO PROMOTE WALKING**  
**AND WALKABLE COMMUNITIES**



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
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## Message from the Secretary, U.S. Department of Health and Human Services



Being physically active is one of the most important steps that Americans of all ages can take to improve their health. But only half of adults and about a quarter of high school students get the amount of physical activity recommended in national guidelines. *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities* aims to get Americans walking and wheelchair rolling for the physical activity needed to help prevent and reduce their risk of chronic diseases and premature death. And it supports positive mental health and healthy aging as well.

From the time we take our first steps as children, walking becomes such an important part of our lives that we often take it for granted. As a way to enjoy nature, get the blood moving, or just get from one point to another, for many people, walking is an easy and free way to explore the world.

But for some, access to safe places to walk isn't so simple. Without well-connected sidewalks and paths, or nearby destinations, our daily decision to walk or roll can be a bit tough. And that is especially true for people who need to use assistive devices or wheelchairs.

That is why this *Call to Action* is so important.

The *Call to Action* provides strategies that communities can use to support walking, which we hope will result in long-lasting changes to improve the health and health care of Americans today and of the generations that follow. The *Call to Action* adds to our work to educate, empower, and engage Americans to take control of their health, including initiatives like the *National Prevention Strategy: America's Plan for Better Health and Wellness*, the *National Physical Activity Plan*, *Healthy People 2020*, and the *Healthy Self* campaign.

Like all parents, I am looking for easy, fun ways to keep my family healthy. Walking is an important option, and I believe all Americans want that choice. We need access to safe and convenient places to walk and wheelchair roll and a culture that supports activity where we live, learn, work, and play. As Secretary of Health and Human Services, I urge all areas of society—transportation, community design, education, business, nonprofits, parks and recreation, health care, public health, and the media—to help make our communities more walkable, so that walking is an easy choice for Americans to improve their health.

**Sylvia Mathews Burwell**

Secretary

U.S. Department of Health and Human Services



# Foreword from the Surgeon General, U.S. Department of Health and Human Services



There are many reasons to take a walk. We may walk to school, to work, or even to our places of worship. We may walk to help us think better and relieve stress. Often, we may take a stroll in order to spend quality time with the people and the pets we love most. And, throughout history, we've walked and marched in order to make our voices heard and our presence felt. As your Surgeon General, I celebrate all the many reasons for walking—and wheelchair rolling. Carving out just 22 minutes a day on average or 2 ½ hours a week for physical activity, like brisk walking, can do wonders for your overall health.

That is why I am proud to release *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities*. This *Call to Action* reflects my deep commitment to several key principles for improving the health of our great nation.

First, the *Call to Action* focuses on promoting optimal health *before* disease occurs. As Americans, we lead the world in treating disease. As America's Doctor, I believe we must also lead the world in *preventing* disease. Robust scientific evidence shows that physical activity is critical for both preventing and treating many of the chronic conditions we face today. Being physically active is one of the most important ways to improve health and well-being throughout our lives.

Second, the *Call to Action* is applicable to the health of people at all ages and stages of life. Walking is the most common activity of teens and adults. It requires no specialized skills or equipment and is a great first step (pun intended) for anyone who has been inactive. Taking a walk with family or friends can help our emotional well-being and connect us to our communities. And because active older adults are less likely to suffer from falls, walking is a great way to help us enjoy a good quality of life and live independently for years to come.

Third, the *Call to Action* recognizes that everyone should have access to spaces and places that make it safe and easy for us to walk or wheelchair roll—whether in urban, suburban, or rural settings. This means that the people who design our cities and neighborhoods should include well-maintained sidewalks, pedestrian-friendly streets, access to public transit, adequate lighting, and desirable destinations that are close to home. It also means that law enforcement and community leaders should work closely together to ensure that none of us has to walk in fear for our safety. Walkable communities are good for social connectedness, good for business, good for the environment, and, most importantly, good for our personal health.

My goal for this *Call to Action* is for each one of us to recognize and embrace our role in building the great American community, a place where being physically active is not only easier but also more engaging and fun. Find ways to make walking a part of your daily routine and invite friends, family, and colleagues to join you. Make your voice heard in decisions that affect how your city or town is planned. And support efforts to

build more sidewalks, hiking trails, and public parks. Finally, I encourage you to partner with institutions and organizations that have already embraced this vision in your communities. You can learn more about some of these institutions and organizations on our website at [www.surgeongeneral.gov](http://www.surgeongeneral.gov).

Walking for better health may seem simplistic, but sometimes the most important things we can do are also the easiest and the most obvious. It's time to step it up, America! The journey to better health begins with a single step.

**Vivek H. Murthy, M.D., M.B.A.**

Vice Admiral, U.S. Public Health Service

Surgeon General

U.S. Department of Health and Human Services

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# PROMOTING WALKING AND WALKABLE COMMUNITIES: A STRATEGY TO IMPROVE HEALTH

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One out of every two U.S. adults is living with a chronic disease, such as heart disease, cancer, or diabetes.<sup>1</sup> These diseases contribute to disability and premature death.<sup>2</sup> In addition, the medical treatment of chronic diseases incurs substantial costs for individuals, families, and the nation.<sup>3</sup>

The good news is that many chronic diseases can be delayed, prevented, or managed through healthy behaviors. Along with eating a healthy diet<sup>4</sup> and avoiding tobacco use,<sup>5</sup> people can decrease their risk of chronic disease by being physically active.<sup>6,7</sup> Physical activity can help people with chronic diseases manage their conditions.<sup>7,8</sup> In addition, physical activity reduces the risk of premature death and supports positive mental health and healthy aging—making it one of the most important actions people can take to improve their overall health.<sup>6</sup> To obtain substantial health benefits, the *2008 Physical Activity Guidelines for Americans* recommends that adults get at least 150 minutes of moderate-intensity aerobic physical activity or 75 minutes of vigorous-intensity physical activity, or an equivalent combination, each week and that children and adolescents be active for at least 60 minutes every day.<sup>6</sup>

Despite the many benefits of physical activity, only one-half of all U.S. adults and about one-quarter of high school students meet the guideline for aerobic physical activity in the *2008 Physical Activity Guidelines for Americans*.<sup>9,10</sup> Walking is an excellent way for most people to increase their physical activity. It is a powerful public health strategy for the following reasons:

- Walking is an easy way to start and maintain a physically active lifestyle.
- Walking is the most common form of physical activity for people across the country.
- Walking can serve many purposes. It can be a way to exercise, have fun, or get to school, work, or other nearby destinations.
- Making walking easier can help communities by improving safety, social cohesion, and local economies and reducing air pollution.

To promote walking, community strategies can be implemented where people live, learn, work, and play. Places for walking can be designed and enhanced to improve their walkability. Improving walkability means that communities are created or enhanced to make it safe and easy to walk and that pedestrian activity is encouraged for all people.<sup>11</sup> Improving the walkability of communities can benefit people of all abilities, including those who run, bike, skate, or use wheelchairs. This publication, *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities*, is intended to increase walking across the United States by calling for improved access to safe and convenient places to walk and wheelchair roll, as well as for a culture that supports these activities for people of all ages and abilities.

This *Call to Action* presents five goals and supporting implementation strategies that are grounded in scientific and practice-based evidence. These goals call for action by multiple sectors of society, including transportation, land use, and community design; parks, recreation, and fitness; education (schools, colleges, and universities); business and industry; volunteer and nonprofit; health care; media; and public health. Families and individuals will also need to be involved to achieve these goals.

This *Call to Action* complements existing recommendations to help Americans become more physically active, such as those found in the *National Prevention Strategy: America's Plan for Better Health and Wellness*<sup>12</sup> and the *Solving the Problem of Childhood Obesity Within a Generation: White House Task Force on Childhood Obesity Report to the President*,<sup>13</sup> as well as the national health objectives for physical activity in Healthy People 2020.<sup>14</sup> It also aligns with the goals of initiatives such as *Let's Move!*,<sup>15</sup> the *Go4Life* Campaign,<sup>16</sup> the U.S. Department of Transportation's Safer People, Safer Streets Initiative,<sup>17</sup> the America's Great Outdoors Initiative,<sup>18</sup> and the Partnership for Sustainable Communities.<sup>19</sup>

In addition, this *Call to Action* builds on the *National Physical Activity Plan*,<sup>20</sup> which was developed by public and private partners to provide a comprehensive set of policies, programs, and initiatives that can help all people become more physically active and meet the *2008 Physical Activity Guidelines for Americans*. It also reflects comments received in response to a request for information (78 FR 19491) published in the *Federal Register* on April 1, 2013. More than 750 comments were received from the public, state and local governments, nonprofit organizations, and professional organizations. All comments were carefully considered in the preparation of this *Call to Action*.

The first section of this publication introduces the *Call to Action*. The second section provides information about the prevalence and costs of chronic diseases in the United States and why being physically active is one of the most important steps people can take to decrease their risk of chronic diseases and improve their overall health. It also summarizes the *2008 Physical Activity Guidelines for Americans* and current physical activity levels in the United States. The third section explains why walking is a relevant public health strategy for improving physical activity levels. The fourth section describes barriers to walking. The fifth section shares what communities can do to support walking. The sixth section examines the major gaps in surveillance, research, and evaluation related to walking and walkability. The final section identifies specific goals and strategies to promote walking and walkability in the United States and calls for nationwide action.



# PHYSICAL ACTIVITY: AN ESSENTIAL INGREDIENT FOR HEALTH

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Being physically active is one of the most important steps that people of all ages and abilities can take to improve their health.<sup>6</sup> We know that increasing people's physical activity levels will significantly reduce their risk of chronic diseases and premature death and support positive mental health and healthy aging.<sup>6,7</sup> Increased physical activity can help children and adolescents; young, middle-aged, and older adults; women and men; people of different races and ethnicities; and people with disabilities and chronic health conditions.<sup>6,7</sup>

This section provides a brief review of the prevalence and costs of chronic diseases in the United States and the well-established benefits of physical activity. This section also summarizes the *2008 Physical Activity Guidelines for Americans* and documents the current levels of physical activity in the United States.

## Chronic Diseases in the United States

Chronic diseases are the leading causes of death in the United States and major contributors to years lived with a disability.<sup>2</sup> In 2012, almost 50% of U.S. adults, or 117 million people, were living with a chronic disease, and of this group, about 60 million were living with two or more chronic diseases.<sup>1</sup> Specifically,

- More than 15 million U.S. adults aged 20 years or older (6.4% of the population) had coronary heart disease in 2007–2010.<sup>21</sup>
- In 2010, more than 6 million adults aged 18 years or older (2.6% of the population) reported ever having had a stroke.<sup>22</sup>
- In 2012, more than 29 million people (9.3% of the population) had diabetes, a disease that can lead to other serious health complications, including heart disease, blindness, kidney failure, and lower-extremity amputations.<sup>23</sup>
- More than 1.5 million people were diagnosed with cancer in 2011, and more than 13 million are living with the disease.<sup>24,25</sup>
- During 2011–2012, more than one-third of adults aged 20 years or older and 1 out of every 6 children and adolescents aged 2–19 years had obesity.<sup>26</sup>
  - ▶ Children with obesity have an increased risk of type 2 diabetes,<sup>27</sup> high blood pressure,<sup>28,29</sup> and being obese as an adult.<sup>30–32</sup>
  - ▶ Adults with obesity have an increased risk of coronary heart disease, type 2 diabetes, some types of cancers (e.g., postmenopausal breast, colorectal), osteoarthritis, and stroke.<sup>33</sup>
- About 16 million adults aged 18 years or older and more than 2 million adolescents aged 12–17 years had a major depressive episode in 2012<sup>34</sup> that negatively affected their ability to work, sleep, study, eat, and enjoy life.<sup>35</sup>

Some population groups are disproportionately affected by chronic disease. In general, the prevalence of chronic disease increases with age, varies by race/ethnicity, and is higher among people with lower education or income levels.<sup>36–38</sup>

In addition to negatively affecting the lives of individuals, chronic diseases are costly to the United States. In 2012, health care expenses for people who live in the community were \$1.35 trillion, and chronic diseases ranked as four of the top five most costly conditions.<sup>39</sup> Not surprisingly, as the number of chronic conditions that a person has increases, health care spending also increases substantially.<sup>3</sup>

## Benefits of Physical Activity

Physical activity can reduce illness from chronic diseases and premature death.<sup>7</sup> People who are physically active have about a 30% lower risk of early death than people who are inactive.<sup>7</sup> Even low amounts of physical activity reduce this risk.<sup>7</sup> Conversely, physical inactivity accounts for about 11% of premature deaths in the United States.<sup>40,41</sup> The benefits of physical activity in preventing chronic disease are numerous and well-established.<sup>6,7</sup> Regular physical activity helps prevent risk factors for disease (such as high blood pressure) and protect against multiple chronic diseases (such as heart disease, stroke, some cancers, type 2 diabetes, and depression).<sup>6,7</sup>

### Health Benefits Associated with Regular Physical Activity

Children and Adolescents	Adults
<ul style="list-style-type: none"> <li>■ Improved cardiorespiratory fitness.</li> <li>■ Improved muscular fitness.</li> <li>■ Improved bone health.</li> <li>■ Favorable body composition.</li> <li>■ Improved markers of cardiovascular and metabolic health.</li> </ul>	<ul style="list-style-type: none"> <li>■ Lower risk of early death.</li> <li>■ Lower risk of heart disease and stroke.</li> <li>■ Lower risk of high blood pressure and adverse blood lipid profile.</li> <li>■ Lower risk of type 2 diabetes.</li> <li>■ Lower risk of colon and breast cancer.</li> <li>■ Lower risk of metabolic syndrome.</li> <li>■ Prevention of weight gain.</li> <li>■ Weight loss, particularly when combined with reduced calorie intake.</li> <li>■ Improved cardiorespiratory fitness.</li> <li>■ Improved muscular fitness.</li> <li>■ Prevention of falls.</li> <li>■ Reduced depression.</li> <li>■ Better cognitive function (for older adults).</li> </ul>

Source: 2008 Physical Activity Guidelines for Americans.<sup>6</sup>

Note: Strong evidence supports the association of physical activity with these health benefits.

People living with chronic disease—such as heart disease, diabetes, osteoporosis, cancer, depression, and arthritis—can get a variety of health benefits from being physically active.<sup>7,8,42-54</sup> For example, people with heart disease, type 2 diabetes, or high blood pressure can lessen the severity of their condition, as well as prevent disease progression and premature death.<sup>7,46-50</sup> For other diseases, such as arthritis and depression, physical activity helps people manage or reduce symptoms.<sup>42-45</sup> For example, during 2010–2012, more than 52 million adults were living with arthritis,<sup>55</sup> and this population could potentially reduce joint pain and other

symptoms of arthritis through physical activity.<sup>42,45,56</sup> People with chronic disease often get multiple health benefits from physical activity. For example, for people with type 2 diabetes, increased physical activity can improve insulin sensitivity and blood glucose control, while also reducing other cardiovascular risk factors and improving mobility.<sup>47,50</sup>

Among adults, physical activity is associated with improved quality of life,<sup>7,57,58</sup> emotional well-being,<sup>7,59,60</sup> and positive mental health.<sup>7,59-61</sup> Some evidence suggests that physical activity in children and adolescents can lower levels of anxiety and depression.<sup>7,62-64</sup> It can also help improve health-related quality of life for people with chronic disease.<sup>7</sup> For example, in several cancer survivor groups, physical activity was associated with improvements in physical function, quality of life, and cancer-related fatigue.<sup>65,66</sup>

For adults, regular physical activity helps prevent weight gain, contributes to weight loss (particularly when combined with reductions in calorie intake), and helps with weight maintenance after weight loss.<sup>6,7</sup> Regular physical activity also helps children and adolescents have a more favorable body composition.<sup>6,7</sup>

Academic benefits are also associated with regular physical activity. When schools encourage participation in physical activity as part of physical education, recess, classroom lessons, or extracurricular activities, students can improve their academic performance, as shown by improvements in grades and standardized test scores.<sup>67,68</sup> Physical activity can also help students improve their cognitive skills and their ability to concentrate and pay attention.<sup>67,68</sup>

Regular physical activity is also important for healthy aging.<sup>6</sup> Physical activity helps improve balance, stamina, flexibility, joint mobility, agility, walking, and overall coordination.<sup>69</sup> Regular physical activity can help extend years of active independent life, reduce functional limitations, and reduce the risk of falls.<sup>8,69,70</sup> Physical activity can also help to prevent or delay conditions that are especially worrisome for older adults, such as osteoporosis and muscle loss.<sup>70-72</sup> Physical activity may also delay the onset of cognitive decline in older adults.<sup>7,73-75</sup>

In addition to the health benefits, regular physical activity may be associated with lower health care costs.<sup>76-79</sup> A recent study compared health care expenditures among adults with different levels of physical activity and found that \$117 billion (in 2012 dollars; 11% of aggregate health care expenditures) annually were associated with inadequate levels of physical activity.<sup>76</sup>

## Physical Activity Guidelines for Americans

In 2008, the U.S. Department of Health and Human Services issued the first *Physical Activity Guidelines for Americans*.<sup>6</sup> These guidelines outline the health benefits associated with physical activity and provide guidance for the amount of physical activity needed for substantial health benefits (see box, page 6). People who are inactive and those who do not yet meet the guidelines are strongly encouraged to work toward this goal. Those who are inactive and become more active may reap the most benefits.<sup>7</sup> Adults with disabilities who are unable to meet the guidelines should avoid inactivity and try to get regular physical activity according to their abilities.<sup>6</sup>

## Physical Activity in the United States

In 2013, about 3 out of every 10 U.S. adults reported being inactive during their leisure time (Figure 1), and only one-half reported levels of physical activity consistent with the guideline for aerobic physical activity (Figure 2).<sup>80</sup> Physical inactivity was more common among women; people who were older, black, or Hispanic;

and people with lower levels of education (Figure 1). Conversely, adults who were male, younger, white, or Asian or who had higher levels of education were more likely to meet the aerobic component of the *2008 Physical Activity Guidelines for Americans* (Figure 2). In addition, the percentage of older adults who were inactive increased with increasing age: 35% of those aged 65–74 years were inactive, 47% of those 75–84 years were inactive, and 64% of those 85 years or older were inactive. Conversely, the percentage of older adults who met the aerobic guideline decreased with increasing age: 42% of those aged 65–74 years, 31% of those aged 75–84 years, and 18% of those aged 85 years or older.

## From the *2008 Physical Activity Guidelines for Americans*<sup>6</sup>

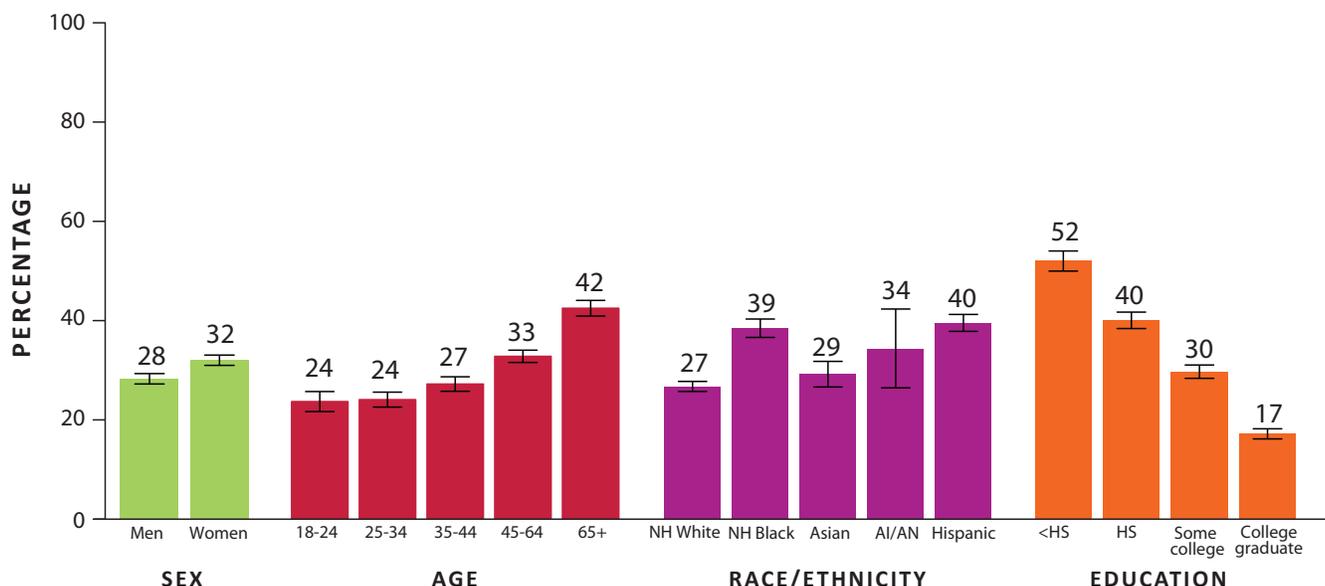
### Key Guidelines for Adults

- All adults should avoid inactivity. Some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits.
- For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.
- For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate-intensity, or 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount.
- Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.

### Key Guidelines for Children and Adolescents

- Children and adolescents should do 60 minutes (1 hour) or more of physical activity daily.
  - ▶ **Aerobic:** Most of the 60 or more minutes a day should be either moderate- or vigorous-intensity aerobic physical activity, and should include vigorous-intensity physical activity at least 3 days a week.
  - ▶ **Muscle-strengthening:** As part of their 60 or more minutes of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days of the week.
  - ▶ **Bone-strengthening:** As part of their 60 or more minutes of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days of the week.
- It is important to encourage young people to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety.

**Figure 1. Percentage of U.S. Adults Aged 18 Years or Older Who Were Inactive During Their Leisure Time, 2013**

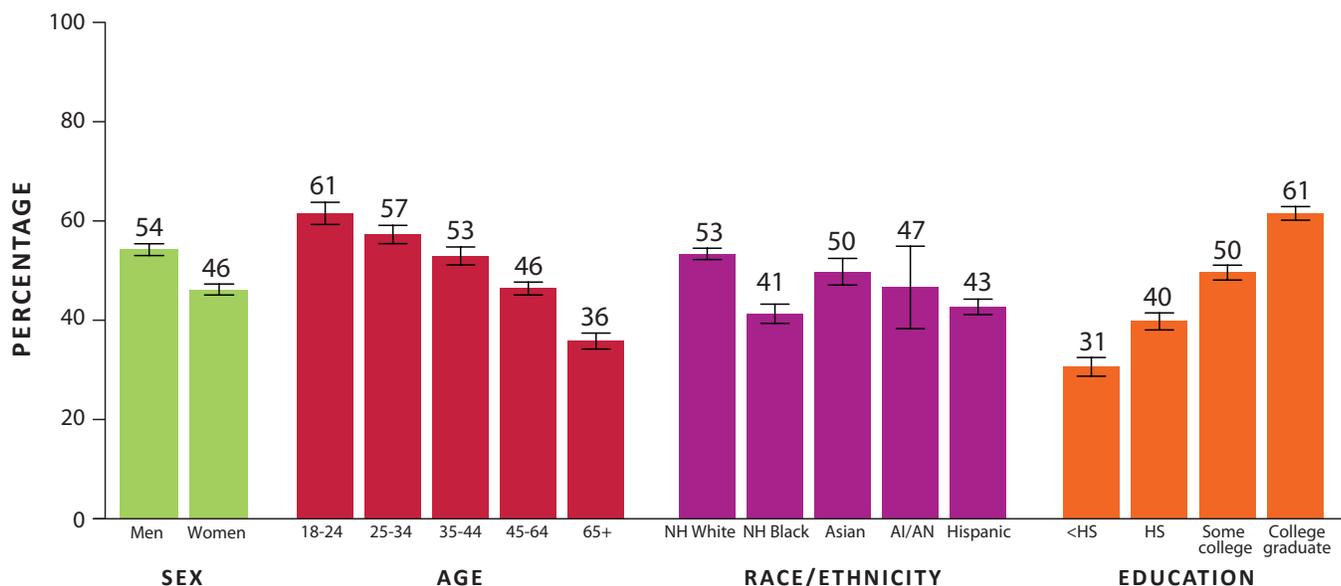


**Abbreviations:** AI/AN, American Indian/Alaska Native; HS, high school; NH, non-Hispanic.

**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS).

**Notes:** Estimates are age-adjusted (except those by age group) to the 2000 U.S. standard population using five age groups: 18–24 years, 25–34 years, 35–44 years, 45–64 years, and 65+ years. Estimates by race are for people who reported only one race. People of Hispanic ethnicity may be of any race. Estimates are not presented for Native Hawaiians or Other Pacific Islanders because the NHIS public-use data sets do not provide the necessary level of detail. Estimates by education are limited to people aged 25 years or older. NHIS questions ask about frequency and duration of light-intensity to moderate-intensity and vigorous-intensity leisure-time physical activity. Inactivity for adults is defined as reporting no leisure-time physical activity that lasted at least 10 minutes. Error bars represent upper and lower bounds of the 95% confidence interval.

**Figure 2. Percentage of U.S. Adults Aged 18 Years or Older Who Met the Aerobic Physical Activity Guideline, 2013**



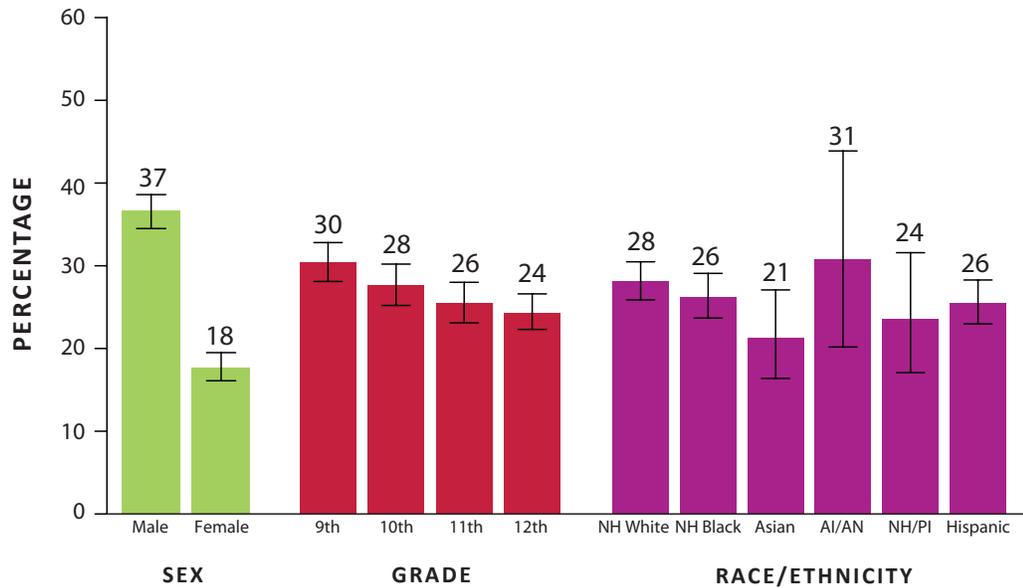
**Abbreviations:** AI/AN, American Indian/Alaska Native; HS, high school; NH, non-Hispanic.

**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS).

**Notes:** Estimates are age-adjusted (except those by age group) to the 2000 U.S. standard population using five age groups: 18–24 years, 25–34 years, 35–44 years, 45–64 years, and 65+ years. Estimates by race are for people who reported only one race. People of Hispanic ethnicity may be of any race. Estimates are not presented for Native Hawaiians or Other Pacific Islanders because the NHIS public-use data sets do not provide the necessary level of detail. Estimates by education are limited to people aged 25 years or older. NHIS questions ask about frequency and duration of light-intensity to moderate-intensity and vigorous-intensity leisure-time physical activities. Meeting the aerobic component of the *2008 Physical Activity Guidelines for Americans* is defined as reporting at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic physical activity a week, or an equivalent combination. Error bars represent upper and lower bounds of the 95% confidence interval.

In 2013, only 27% of high school students reported levels of physical activity that met the guideline for 60 minutes of physical activity a day (Figure 3).<sup>10</sup> Male high school students and students in lower grade levels were more likely to meet the guideline; no differences were observed by race.<sup>10,80</sup>

**Figure 3. Percentage of U.S. High School Students Who Met the Aerobic Physical Activity Guideline, 2013**



**Abbreviations:** AI/AN, American Indian/Alaska Native; NH, non-Hispanic; NH/PI, Native Hawaiian/Other Pacific Islander.

**Source:** Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance System.

**Notes:** Meeting the aerobic component of the *2008 Physical Activity Guidelines for Americans* is defined as reporting at least 60 minutes of “any kind of physical activity that increases your heart rate and makes you breathe hard some of the time” on all days during the 7 days before the survey. Estimates by race are for students who reported only one race. People of Hispanic ethnicity may be of any race. Error bars represent upper and lower bounds of the 95% confidence interval.

# WHY FOCUS ON WALKING AS A PUBLIC HEALTH STRATEGY?

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Strong evidence exists that physical activity has substantial health benefits.<sup>6,7</sup> People can get these benefits through brisk walking or by adding brisk walking to other physical activities.<sup>6</sup> This section reviews the relevance and importance of walking as a public health strategy to increase physical activity levels in the United States.

## Walking Is an Easy Way to Start and Maintain a Physically Active Lifestyle

Walking does not require special skills, facilities, or expensive equipment and is an easy physical activity to begin and maintain as part of a physically active lifestyle.<sup>81</sup> Walking begins early in life and, for the most part, continues throughout the lifespan.<sup>69</sup> Most people are able to walk, and many people with disabilities are able to walk or move with assistive devices, such as wheelchairs or walkers. In addition, walking is a year-round activity that can be done indoors or outdoors.

Walking may be a good way to help people who are inactive become physically active.<sup>6,82</sup> Walking intensity, duration, and frequency are self-determined, and people can tailor their walking patterns to fit their time, needs, and abilities.<sup>82</sup> Walking also has a lower risk of injury than vigorous-intensity activities, such as running.<sup>6</sup> The amount and intensity of walking can be gradually increased over time to minimize the risk of injury, and walking promotion programs can include injury prevention efforts.<sup>6,83</sup>

## Walking Is a Common Form of Physical Activity

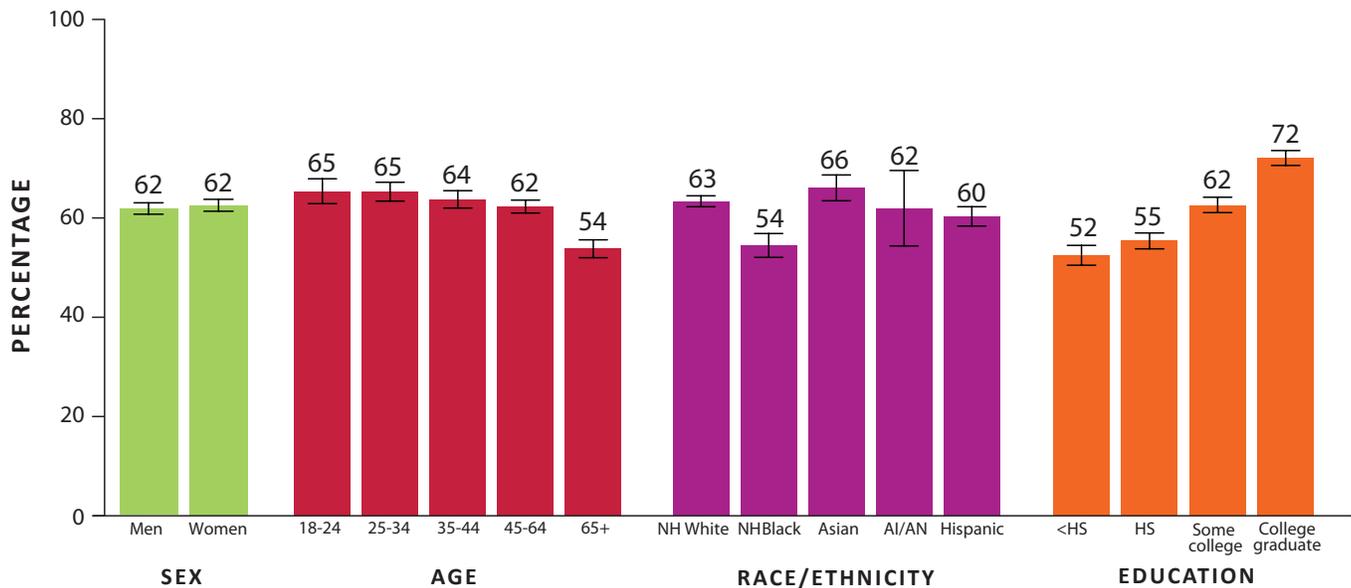
Walking is common among people who are physically active. Among adults who reported any physical activity in 2011, 52% of men and 74% of women reported walking as one of the top two activities in which they participated.<sup>84</sup> Similarly, when high school students were asked about the physical activities they did during the past 12 months, they most frequently reported walking (81% of boys and 87% of girls).<sup>85</sup> Among school-aged youth (6–17 years), about 40% who live 1 mile or less from school reported that they usually walk to or from school on most days.<sup>86</sup>

In 2010, more than 60% of adults reported walking 10 minutes or more in the past week for transportation or leisure.<sup>87</sup> Some groups were more likely to report walking than others (Figure 4).<sup>87</sup> Adults with more education, those who were white



or Asian, and those who were younger were more likely than their counterparts to report any walking. No differences were observed between men and women.<sup>87</sup> Percentages of older adults who reported walking decreased with increasing age: 59% of those aged 65–74 years, 49% of those aged 75–84 years, and 41% of those aged 85 years or older.

**Figure 4. Percentage of U.S. Adults Aged 18 Years or Older Who Reported Any Walking in the Past Week, 2010**



**Abbreviations:** AI/AN, American Indian/Alaska Native; HS, high school; NH, non-Hispanic.

**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS).

**Notes:** Estimates are age-adjusted (except those by age group) to the 2000 U.S. standard population using five age groups: 18–24 years, 25–34 years, 35–44 years, 45–64 years, and 65+ years. Estimates by race are for people who reported only one race. People of Hispanic ethnicity may be of any race. Estimates are not presented for Native Hawaiians or Other Pacific Islanders because the NHIS public-use data sets do not provide the necessary level of detail. Walking is defined as one period of 10 minutes or more in the preceding 7 days. Any walking includes both transportation (“to get some place”) and leisure (“for fun, relaxation, exercise, or to walk the dog”). Error bars represent upper and lower bounds of the 95% confidence interval.

Among people who walked, the average time spent walking was 13 minutes a day or about 90 minutes a week.<sup>87</sup> These average walking times, when walking is done at a brisk pace, provide slightly more than half of the time needed to meet the guideline of at least 150 minutes of aerobic physical activity each week. Not surprisingly, about 60% of people who walked met the guideline by walking alone or in combination with other forms of physical activity (e.g., running, biking), compared with 30% of those who did not walk.<sup>87</sup>

## Walking Is Multipurpose

People walk for many purposes, such as for transportation to get to school, work, a store, or the library or for leisure to have fun, socialize with friends or family, walk their dog, or improve their health. Because walking is multipurpose, it provides many opportunities for people to incorporate physical activity into their busy lives.

In 2010, about half of U.S. adults reported walking during their leisure time and less than one-third reported walking for transportation (Table).<sup>88</sup> Younger adults walked more than older adults for transportation, while walking for leisure was similar across the lifespan until it decreased among adults older than 65 years.<sup>88</sup> Whites and Asians were more likely than Hispanics and blacks to walk during leisure time; whites were less

likely to walk for transportation than members of other racial and ethnic groups. Adults with more education were more likely to walk during leisure time and those with college degrees were also more likely to walk for transportation than those with less education.<sup>88</sup> Understanding these differences may help to increase the effectiveness and reach of interventions that encourage walking.

**Table. Percentage of U.S. Adults Aged 18 Years or Older Who Reported Walking for Transportation or During Leisure Time, 2010**

Characteristics	Transportation % (95% CI)	Leisure % (95% CI)
<b>Sex</b>		
Men	32.0 (30.8, 33.2)	48.5 (47.3, 49.8)
Women	26.9 (25.8, 28.0)	51.5 (50.3, 52.7)
<b>Age (years)</b>		
18–24	39.0 (36.4, 41.7)	48.2 (45.8, 50.6)
25–34	33.2 (31.4, 35.1)	51.7 (49.8, 53.6)
35–44	29.4 (27.8, 31.1)	52.6 (50.6, 54.5)
45–54	27.9 (26.3, 29.6)	51.5 (49.7, 53.3)
55–64	27.9 (26.2, 29.7)	51.7 (49.5, 53.8)
65–74	22.9 (21.0, 24.8)	48.8 (46.4, 51.2)
75–84	18.1 (15.9, 20.4)	38.3 (35.4, 41.2)
85+	13.7 (10.3, 17.2)	33.0 (27.9, 38.0)
<b>Race/Ethnicity</b>		
White, non-Hispanic	28.1 (27.0, 29.2)	51.7 (50.6, 52.8)
Black, non-Hispanic	30.6 (28.6, 32.6)	41.2 (39.1, 43.4)
Asian	33.5 (30.8, 36.2)	52.6 (49.3, 55.8)
American Indian or Alaska Native	29.1 (21.9, 37.5)	52.1 (43.8, 60.4)
Hispanic	32.8 (31.0, 34.8)	47.5 (45.6, 49.4)
<b>Education</b>		
Less than high school	28.8 (27.0, 30.6)	37.7 (35.9, 39.6)
High school graduate	24.1 (22.9, 25.3)	43.6 (42.0, 45.1)
Some college	29.1 (27.7, 30.5)	51.0 (49.5, 52.6)
College graduate	35.0 (33.6, 36.5)	61.0 (59.4, 62.6)

**Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey (NHIS).  
**Notes:** Estimates by race are for people who reported only one race. People of Hispanic ethnicity may be of any race. Estimates are not presented for Native Hawaiians or Other Pacific Islanders because the NHIS public-use data sets do not provide the necessary level of detail. Walking is defined as one period of 10 minutes or more in the preceding 7 days. Transportation walking is defined as walking “to get some place” and walking during leisure is walking “for fun, relaxation, exercise, or to walk the dog.” Numbers in parentheses represent upper and lower bounds of the 95% confidence interval (CI).

# Walking Benefits Communities

Communities can benefit when they implement strategies that make them more walkable, such as making streets pedestrian friendly; building houses, shops, and other destinations close together (mixed land use); and increasing access to public transit. The benefits of improved walkability and more people walking regularly can include making communities safer, supporting social cohesion, reducing air pollution, and benefiting local economies.

## ***Makes Communities Safer***

Communities designed to be walkable often include crossing signals, pedestrian signs, and features to slow vehicle speed.<sup>89-91</sup> These design features can improve safety for pedestrians and all community members. Programs such as Safe Routes to School provide a safe environment for children to walk and bike to school, which can reduce traffic-related injuries among school-aged children.<sup>92</sup> These programs also improve the walking and biking environment around schools for all users.<sup>93</sup>

## ***Supports Social Cohesion***

Walkable communities and communities where more people walk offer opportunities for personal interaction and social involvement.<sup>94</sup> In these communities, people can walk with family members or friends, stop to chat with neighbors while walking their dog, walk to a local store or bus stop with a friend, meet regularly for a group walk, or participate in a “walking meeting” with colleagues. These interactions help strengthen the personal bonds that bring people and communities together, creating more social cohesion.

## ***Reduces Air Pollution***

Communities designed to be walkable have the potential to reduce air pollution and greenhouse gases because people may choose to walk or bike rather than drive.<sup>95,96</sup> Studies have shown that when environments become more walkable, a larger proportion of trips are made by walking or biking.<sup>96,97</sup> One study showed that when people moved to a neighborhood designed to promote physical activity and active transportation, they reported spending less time in their cars and more time walking for transportation.<sup>97</sup> The U.S. Department of Transportation estimated that when communities participating in the Nonmotorized Transportation Pilot Project became more walkable and bikeable, the proportion of walking trips increased by 16% over 5 years and the proportion of biking trips increased by 44%.<sup>96</sup> The study concluded that this shift could potentially result in lower emissions of carbon dioxide, hydrocarbons, nitrogen oxide, carbon monoxide, and particulate matter.<sup>96</sup>

## ***Benefits Local Economies***

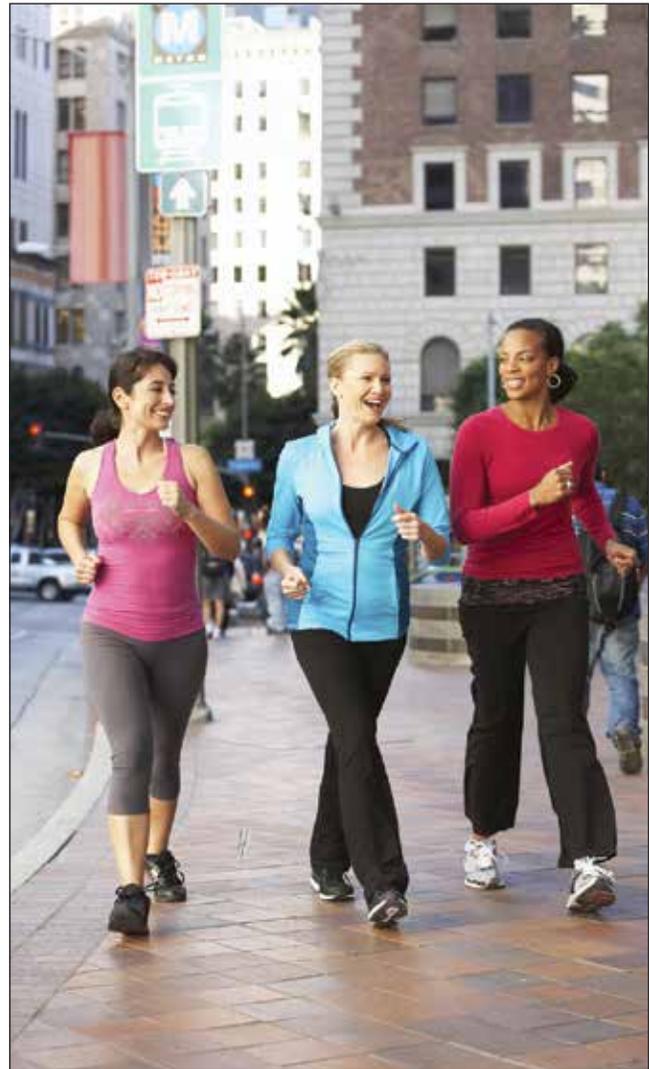
Walkable communities are attractive places for businesses to locate, which may help local economies thrive.<sup>98,99</sup> Features of a walkable community—safer and pedestrian-friendly streets, mixed land use, and access to transit—are associated with economic benefits to the community.<sup>98-100</sup> These benefits include neighborhood revitalization, higher home values, higher levels of retail activity and employment, and lower costs of delivering services such as utilities.<sup>98-100</sup>

# WHY DON'T PEOPLE WALK MORE?

Many more people could meet the *2008 Physical Activity Guidelines for Americans*<sup>6</sup> by initiating walking or increasing the amount they walk. Although walking is a popular form of physical activity and can be easily done by most people, barriers to walking do exist. Understanding these barriers is essential to designing and implementing approaches that promote walking. This section reviews the most significant barriers to walking.

## Not Enough Time to Walk

People report lack of time as one challenge that prevents them from walking or doing other kinds of physical activity.<sup>101,102</sup> Many people spend a significant amount of their day at work. In 2013, a U.S. worker aged 15 years or older worked an average of 7.6 hours on a workday.<sup>103</sup> Over the last 50 years, the percentage of people who work in occupations that require physical activity has progressively decreased,<sup>104</sup> making it difficult for adults to be physically active during work hours. Adults may struggle to meet the current guideline of at least 150 minutes of aerobic physical activity each week as they balance the competing demands of work, home, and caring for themselves and others. However, many adults have some flexibility with their leisure time and may be able to substitute walking for less active pursuits.



Children and adolescents also live busy lives that may make it challenging to meet the guideline of 60 minutes or more of physical activity a day. Schools, which could provide most young people with opportunities to be active, increasingly face competing priorities, as well as time and resource challenges.<sup>105</sup> In 2012, only 58.9% of districts required that elementary schools provide students with regularly scheduled recess.<sup>106</sup> In 2013, only 48.0% of high school students went to physical education classes on at least 1 day during an average week.<sup>10</sup> Outside of school hours, most children have leisure time. For example, young people aged 8–18 years spend an average of more than 4 hours a day watching television.<sup>107</sup> Reducing television viewing and other forms of screen time may be one way to help young people add more physical activity to their lives.<sup>108</sup>

## Safety Concerns

Safety concerns can be a barrier to walking. In 2013, a total of 4,735 pedestrians were killed and an estimated 66,000 were injured in motor vehicle-related crashes.<sup>109</sup> The proportion of vehicle-related pedestrian fatalities has increased in recent years, from 11% in 2004 to 14% in 2013,<sup>110</sup> which further

reinforces the need to consider safety. Thirty-seven states emphasize walking in their State Highway Safety Plans.<sup>111</sup> Although pedestrian safety concerns may be addressed through improvements that benefit all road users (e.g., intersection redesigns that include improved crosswalks as part of other vehicle-related safety enhancements), less than 1% of the funds that states administer from the federal Highway Safety Improvement Program are directed exclusively toward pedestrian and bicycle programs.<sup>111</sup>

Pedestrian deaths and injuries are associated with vehicle-related factors, unsafe driver and pedestrian behaviors, and problematic physical environments. Vehicle-related factors (such as the speed and volume of traffic) and driver behaviors (such as distracted driving, driving under the influence of drugs or alcohol, speeding, and reckless and aggressive driving) all pose significant safety risks to pedestrians.<sup>89,112-114</sup> Pedestrian behaviors associated with risk include use of alcohol, distracted walking, crossing in the middle of a block, and crossing against a traffic light.<sup>89,112,113,115,116</sup>

Physical environments—such as a lack of sidewalks and crosswalks, poor lighting, streets with high-speed traffic, and poorly timed crossing signals—also contribute to increased pedestrian risk.<sup>89,90,113</sup> In 2012, more than 3 out of every 10 people aged 16 years or older reported that no sidewalks existed along any street in their neighborhood.<sup>117</sup> Basic infrastructure elements—such as sidewalks, curb cuts, crosswalks, lighting, and crossings for the visually impaired—are particularly important for the safety of people with visual and mobility limitations, parents with young children in strollers, and older adults.<sup>118</sup>

Perceived traffic dangers may be barriers to walking. In surveys of parents, the most commonly reported barrier for walking to school was distance to school, followed by traffic-related dangers.<sup>119,120</sup> Some studies have shown that traffic-related fears discourage walking among adults,<sup>121,122</sup> but researchers have not determined how this association is modified by other contextual factors, such as walking purpose and characteristics of people who walk.

Fear of crime or perceptions of an unsafe neighborhood may also be potential barriers to walking.<sup>123,124</sup> The evidence is mixed on whether higher levels of documented crime are associated with walking. Some studies have shown that measures of documented violent crime are associated with reduced walking or physical activity among minority groups and some inner-city populations.<sup>125,126</sup> However, other studies have found no association between walking or physical activity when examining documented property crime or perceptions of neighborhood crime.<sup>127,128</sup>

## Community Design

The ways in which communities are designed and built can present barriers to walking. Large distances often exist between home, school, work, stores, and other frequently sought destinations,<sup>129,130</sup> and this distance can limit people's ability to incorporate walking into their everyday activities. Lack of an adequate public transit system can also result in missed walking opportunities. In addition, poorly maintained sidewalks and trails and the introduction of conveniences—such as moving walkways and escalators—may discourage walking.

Research has shown that, on average, people will walk about half a mile to reach a destination.<sup>131,132</sup> When everyday destinations—such as a grocery store, a library, schools, and restaurants—are located too far away from home, walking will not be a convenient option.<sup>121,127,129,133</sup> Several elements of community design contribute to long distances between destinations and the likelihood of walking trips, including sprawling land use patterns and lack of connectivity.<sup>121,134</sup>

The distance between home and school is strongly associated with whether students walk to school.<sup>135,136</sup> In 2009, only about 22% of students in kindergarten through 8th grade reported living less than 1 mile from their school, and 35% of this group reported that they usually walked or biked to school on most school days.<sup>137</sup> In comparison, only 6% of students living 1–2 miles from school and only 2% of those living 2 miles from school or farther usually walked or biked to school on most school days.<sup>137</sup>

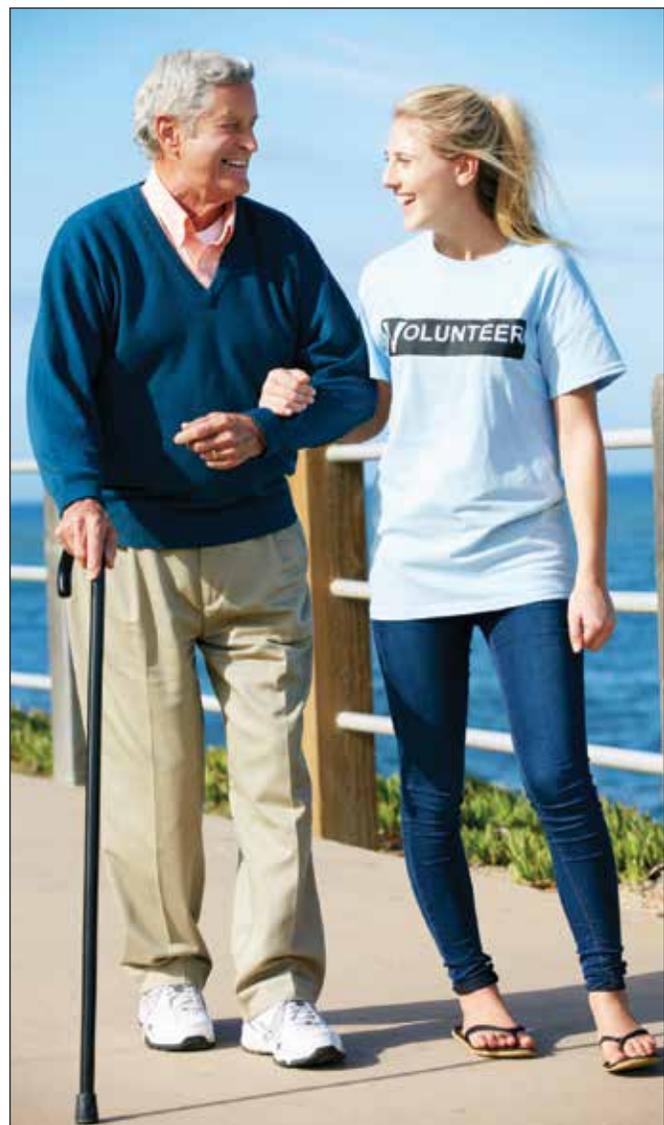
Because people are more likely to walk when they use public transportation (e.g., walking to stops or stations, walking through stations),<sup>129,138-145</sup> the lack of an adequate public transit system may mean that opportunities to walk are lost. People tend to walk more when they have access to high-quality (e.g., convenient, comfortable) public transit systems.<sup>146</sup> Land use patterns, connectivity, and block sizes can affect the ability of public transit systems to provide a viable alternative to driving.<sup>129</sup>

## Disability, Chronic Conditions, and Aging

During 2009–2012, 11.6% of U.S. adults aged 18–64 years reported a disability, with estimates ranging from 1.7% for vision-related disabilities to 5.8% for mobility-related disabilities.<sup>147</sup> Adults with disabilities were more likely to be physically inactive than adults without a disability (47.1% versus 26.1%).<sup>147</sup> Some disabilities can make it difficult for people to walk without assistive devices.

Although many people with disabilities are able to be physically active, additional barriers exist that may limit their participation in some activities. These barriers include limited information about accessible facilities and programs, physical barriers in the environment, physical or emotional barriers to participating in fitness and recreational activities, and lack of training in accessibility and communication among fitness and recreation professionals.<sup>148</sup>

Chronic conditions and age can also make it difficult for people to walk. For example, people with arthritis may find walking painful, and they may be uncertain about how to walk safely without worsening their arthritis.<sup>56,149</sup> For people with asthma, heart disease, and respiratory diseases, symptoms may be exacerbated when walking outdoors because of air pollution.<sup>150,151</sup> Older adults and those who are frail may be reluctant to walk because of concerns about falls and subsequent injury.



# HOW TO INCREASE WALKING AND IMPROVE WALKABILITY

Ultimately, individuals make the decision to walk. However, the decision to walk can be made easier by programs and policies that provide opportunities and encouragement for walking and by improvements to community walkability. Improving walkability means that communities are created or enhanced to make it safe and easy to walk and that pedestrian activity is encouraged for people of all ages and abilities.<sup>11</sup>

This section focuses on community strategies as a way for our nation to support walking and walkability. Strategies at the community level generally have greater reach and result in longer lasting change than strategies focused on individual behavior.<sup>152</sup> These strategies are based primarily on recommendations from the Community Preventive Services Task Force on approaches to increase physical activity in the community<sup>153,154</sup> and supplemented with other evidence from the scientific literature. This section discusses what communities can do to promote walking, the evidence for these strategies, and key roles that different sectors of society can play to support walking and walkability.



Photo courtesy of [www.pedbikeimages.org/](http://www.pedbikeimages.org/)Carl Sundstrom

## Design Communities and Streets that Support Walking

Community and street design policies are recommended approaches for increasing physical activity, including walking.<sup>153,155</sup> Community design can support physical activity, for example, by locating residences within short walking distance of stores, worksites, public transportation, essential services, and schools and by building sidewalks or paths between destinations that are well-connected, safe, and attractive.<sup>153,155</sup> Communities with well-connected street networks have shorter blocks and more intersections, and they make walking along and across roads and between everyday destinations—such as schools, stores, senior centers, health care providers, and homes—direct and convenient.<sup>121,156</sup> Trips served by well-connected pedestrian networks allow people of all ages and abilities to reach their destinations safely and conveniently.

Street design can also support walking and enhance pedestrian safety through measures that improve street lighting and landscaping and reduce traffic speed.<sup>153,155</sup> Sidewalks and features that separate pedestrians from bicyclists and motor vehicles encourage walking and make walking safer.<sup>91,157,158</sup> Pedestrian safety is enhanced through street design features that decrease vehicle speeds and increase the number of safe pedestrian crossings, such as medians and pedestrian crossing islands.<sup>89-91,159</sup>

Transportation and travel policies and practices that create or enhance pedestrian and bicycle networks and expand or subsidize public transit systems can be another approach to encourage walking and biking for transportation. Although the Community Preventive Services Task Force found insufficient evidence for these practices in 2004,<sup>155</sup> more recent reviews conducted by the National Institute for Clinical Excellence<sup>160</sup> and the National Academy of Science's Transportation Research Board<sup>130</sup> found evidence that a variety of transportation policies offer effective ways to promote both leisure-time and transportation-related physical activity.

## **Promote Program and Policy Approaches that Support Walking**

Policies often act as a lever to support environmental change or program implementation. Programs and policies that provide access to places for walking and encourage people to walk can improve walking and walkability. This section reviews some key program and policy approaches that support walking and walkability.

### ***Creation of or Enhanced Access to Places for Walking with Informational Outreach***

Creating or enhancing access to places for physical activity, combined with information to encourage use of these places, is a strategy recommended to increase physical activity.<sup>154,161</sup> Examples of places for walking include public parks; health, fitness, and recreational facilities; schools, colleges, and universities; malls; senior centers; and worksites. Information that can encourage use includes advertisements, promotional messages, and signs. For example, the use of signs called "point-of-decision prompts" that display messages related to the health and weight loss benefits of exercise or point to a nearby opportunity to use the stairs has successfully increased stair walking.<sup>154,161,162</sup> Places for physical activity and informational outreach are complementary efforts that together provide stronger support for physical activity.<sup>163</sup>

### ***Social Support***

Social support interventions increase physical activity by providing supportive relationships for behavior change.<sup>163</sup> They include actions that provide friendship and support (e.g., buddy systems, contracts with others to complete specified levels of physical activity, walking groups).<sup>154,161</sup> The use of social support interventions in community settings is a recommended approach to increase physical activity.<sup>154,161</sup> Consistent with this recommendation, a recent meta-analysis concluded that interventions designed to promote walking in groups increase physical activity.<sup>164</sup> Recommended practices for establishing and maintaining walking groups include canvassing the community, engaging partners, organizing resources, and recruiting walking leaders.<sup>165</sup>

### ***Individually-Adapted Health Behavior Change Programs***

Individually-adapted health behavior change programs teach behavioral skills that help participants incorporate physical activity into their daily routines.<sup>163</sup> These programs are tailored to the specific interests, preferences, abilities, and readiness for change of the participants. They usually incorporate some form of counseling or guidance from a health professional or trainer to help participants set physical activity goals, monitor their progress toward these goals, seek social support to maintain physical activity, use self-reward and positive self-talk to reinforce progress, and use structured problem-solving to prevent relapse to an inactive or low active lifestyle.<sup>163</sup> Programs can be delivered face-to-face or by the use of mail, telephone, or computer technology.<sup>163</sup>

The use of individually-adapted health behavior change programs is a recommended strategy to increase physical activity.<sup>154,161</sup> A Cochrane review found that interventions that included components of individually-adapted health behavior change programs had a positive effect on increasing physical activity.<sup>166</sup> The Cochrane review also noted that telephone support and printed educational materials helped people initiate and increase their physical activity levels.<sup>163,166</sup>

## ***Community-Wide Campaigns***

A community-wide campaign is a concentrated effort to promote physical activity that combines a variety of strategies, such as media coverage and promotions, risk factor screening and education, community events, and policy or environmental changes.<sup>161,163,167</sup> These efforts may include several coordinated activities that, for example, set up walking groups at a worksite or school, build a new walking trail, or provide health risk appraisals and physical activity counseling at the local mall.<sup>163</sup> Community-wide campaigns involve community sectors and partnerships, use communication techniques to develop their message, are large in scale, and require high-intensity efforts with sustained high visibility.<sup>161,163,167</sup>

According to the Community Preventive Services Task Force, community-wide campaigns can be effective in increasing physical activity and are therefore a recommended strategy.<sup>161,168</sup> A Cochrane review that used different criteria for inclusion and exclusion of studies found that the evidence did not support the conclusion that multicomponent community-wide interventions were effective at increasing physical activity.<sup>169</sup> However, the Cochrane review did find that some studies with environmental components (such as walking trails) reported positive program effects (such as observations of more people walking).<sup>169</sup>

## **What Sectors Are Needed to Help Implement Community Approaches?**

Many groups have a role to play to make the United States a nation with safe, easy, and desirable places to walk as part of our daily lives. By working together across sectors of society at local, state, and national levels, we can achieve this goal.<sup>12,20</sup> The 2010 *National Physical Activity Plan* provides overarching strategies, as well as strategies and tactics for various sectors of society, for increasing physical activity across the United States.<sup>20</sup> This plan includes recommendations for transportation, land use, and community design; parks, recreation, and fitness; education (schools, colleges, and universities); worksite (business, industry, and other employers); volunteer and nonprofit; health care; media; and public health sectors.<sup>20</sup> This section briefly describes the roles that each sector can play—and in some cases are already playing—to support walking and walkability.

### ***Transportation, Land Use, and Community Design***

The transportation, land use, and community design sector has a role in walking and walkability by managing federal, state, tribal, territorial, and local resources that support roadways, sidewalks, bikeways, public transit, community planning and zoning, and economic development.<sup>170-172</sup> This sector includes transportation engineers, transportation and community planners, architects, and other design professionals, as well as members of planning commissions and planning boards. Everyone in the United States uses roads, and most people use sidewalks and live in communities that have planned how their land will be used. Nearly everyone is affected by the decisions and plans of this sector.



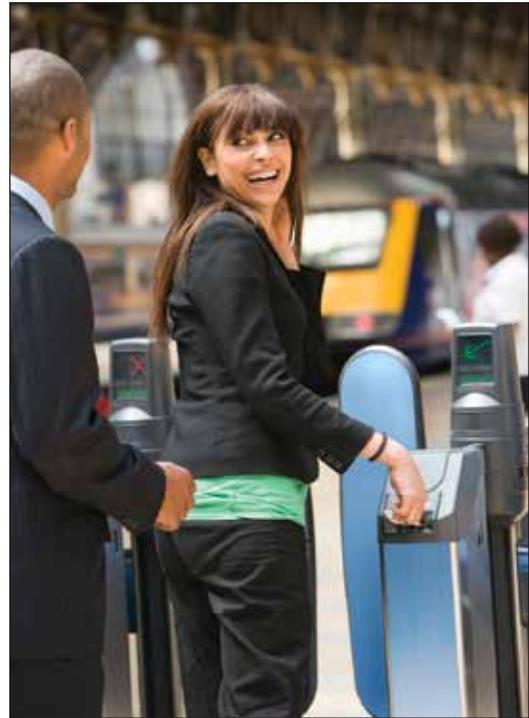
Photo courtesy of the U.S. Environmental Protection Agency

Decisions and plans made by the transportation, land use, and community design sector can affect whether communities and streets are designed to support walking. A 2010 policy statement by the U.S. Department of Transportation (DOT) specifically stated that, “Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems.”<sup>173</sup> This sector can change the design of communities and streets through roadway design standards, zoning regulations, and building codes.<sup>153</sup> This sector can also improve the pedestrian experience through landscaping, street furniture, and building design.<sup>174</sup> It can further ensure that sidewalks and streets are safe and accessible to all pedestrians by including features—such as Americans with Disabilities Act (ADA) curb cuts that reduce barriers to walking or wheeling and audible traffic signals for people with vision impairments—in design plans.<sup>147</sup>

Core principles of some of the approaches used by this sector, such as adoption of policies that promote Complete Streets<sup>158,175,176</sup> and smart growth designs,<sup>177,178</sup> help support the routine design and operation of streets and communities that are safe for all pedestrians, regardless of age, ability, or mode of transport. When linked together, interconnected facilities and design features create connected pedestrian networks that allow people of all ages and abilities to reach their destinations safely and conveniently. Key features found on Complete Streets include sidewalks, bike lanes, special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, and curb extensions.<sup>176</sup> As of December 2014, a total of 30 states and the District of Columbia and 664 regional and local agencies had adopted Complete Streets policies.<sup>179</sup>

The transportation, land use, and community design sector can ensure that efforts designed to promote walking also address safety issues and are accompanied by efforts to prevent injuries and fatalities. Urban design strategies that foster safe neighborhoods, streets, and outdoor spaces to encourage walking and biking and increase access to public transit can simultaneously be designed to reduce injuries and fatalities.<sup>91</sup> This sector can help ensure that plans and policies designed to increase walking incorporate evidence-based strategies for safety, such as those outlined in a publication developed by the Center for Active Design called *Active Design Supplement: Promoting Safety*.<sup>91</sup>

This sector is also integral in the planning and implementation of public transit systems. Use of public transit is associated with increased levels of walking.<sup>129,138-145</sup> For example, a national study reported that people who use public transit walk an additional 21 minutes a day walking to and from a transit stop or station.<sup>144</sup> Creating walkable communities around transit hubs can further encourage walking.<sup>180,181</sup>



However, improvements to community infrastructures, such as improved green space, transportation systems, and walking paths, may result in unintended consequences or inequitable distribution of benefits. Improvements to infrastructure may increase property values and lead to gentrification, where low-income residents are unable to pay increased rents or property taxes and are displaced by people with higher incomes.<sup>182,183</sup> Members of the transportation, land use, and community design sector should consider potential unintended consequences and work to minimize and mitigate these negative effects when they develop and implement community design plans and policies.<sup>184</sup> This sector can also work to ensure an equitable distribution of the benefits of walkability. For example, neighborhoods with a combination of high walkability and low air pollution have been shown to be located predominately in higher-income neighborhoods.<sup>185</sup> In contrast, people living in low-income neighborhoods are disproportionately at risk of pedestrian death.<sup>186</sup> The transportation, land use, and community design sector can help address issues that contribute to these types of disparities.

## ***Parks and Recreational and Fitness Facilities***

Public parks offer people access to places to walk.<sup>187,188</sup> In 2013, nearly 274 million people visited national parks.<sup>189</sup> About 720 million annual visits are made to more than 7,000 state parks in the United States that offer more than 38,000 miles of trails.<sup>190</sup> In addition to national (and other federally owned recreational areas) and state parks, many cities and regions also have local parks. Nearly 40% of people in the United States live within one-half mile of a park boundary.<sup>191</sup> Across the country, nearly 1,900 rail-trails (shared-use trails on converted rail lines or alongside rail lines) cover more than 21,000 miles.<sup>192</sup>

Evidence shows that people who have more access to green environments, such as parks, tend to walk more than those with limited access.<sup>193-196</sup> Better access to parks, playgrounds, and recreational centers also may encourage active transportation, such as biking or walking to the location.<sup>197</sup> Emerging evidence suggests that when parks add more signs and conduct outreach activities, the physical activity of park users increases.<sup>198</sup>

In 2012, more than 30,000 health clubs were being used by more than 50 million people.<sup>199</sup> Living or working close to an exercise facility is related to adoption and maintenance of supervised physical activity programs and overall physical activity.<sup>200</sup> Health and fitness facilities offer group walking programs and access to places for walking. For example, they provide indoor opportunities to walk during inclement weather or for people who prefer indoor or treadmill walking. These facilities can also provide options, such as warm water pools, to make walking safer and more comfortable for people with mobility limitations or chronic conditions such as arthritis. To ensure broad access to these benefits, facilities should be designed, built, and maintained to be accessible to the entire population.

## **Schools**

In the United States, more than 130,000 elementary, middle, and high schools reach about 55 million students and 7.3 million teachers and staff members.<sup>201</sup> Young people spend much of their time in school: 6–7 hours a day for about 180 days a year.<sup>202</sup>

Schools can provide opportunities for physical activity through physical education, recess, after-school activity programs (including sports and physical activity clubs), and physical activity breaks,<sup>105,203</sup> and walking can be incorporated into these opportunities. An Institute of Medicine report on physical activity and physical education in the school environment documented that physical education, recess, and after-school activity programs can increase physical activity among children and adolescents.<sup>105</sup> Evidence is also emerging that classroom activity breaks can increase physical activity among youth.<sup>203-205</sup>

Schools can also encourage walking by promoting safe routes for students to walk to and from school through community-wide approaches. The Safe Routes to School program<sup>206</sup> and other efforts where a group of students walk to school with one or more adults have contributed to increases in children walking to and from school.<sup>207</sup> Walk-to-school programs have also helped to address the safety concerns of parents, a major challenge to children walking to school.<sup>208</sup> Efforts can also be made to improve safety for those walking to school, such as building entrances and exits that do not flow directly into streets and setting up bus lanes that do not create safety hazards for children.

Opening school facilities, such as gyms, playgrounds, fields, and tracks, to the community during nonschool hours (often referred to as shared use or joint use)<sup>209</sup> is a promising strategy to increase access to physical activity and recreational facilities<sup>210</sup> and increase physical activity levels.<sup>211-213</sup> Community members of all ages can use these facilities for many different physical activities, including walking, and opening these facilities to the community can also encourage walking from homes to these locations.

## **Colleges and Universities**

In the United States, more than 7,000 colleges and universities<sup>214</sup> reach about 21 million students and employ nearly 4 million staff members.<sup>201</sup> Colleges and universities can promote a campus walking culture by creating pedestrian-friendly campuses, adopting and implementing policies that support walking, promoting walking clubs and group events, and providing classroom instruction.

Walkable campus strategies help students, faculty, and staff members adopt active living behaviors on campus.<sup>215</sup> Leaders of the campus community can work together on strategies to address environmental factors that influence active living and walkability challenges, such as long distances between buildings and bus stops, lack of sidewalks, and safety concerns associated with vehicle traffic. They can also work together to redesign the campus to ensure that common destinations, such as libraries and bookstores, are within walking distance of campus housing and lecture halls.

Colleges and universities can also educate and train future professionals to recognize their role in promoting walking and walkable communities for people of all ages. This training can be directed to students in health disciplines (such as health care and public health), as well as to students in other relevant fields (such as architecture, transportation, urban design, and business).

## **Worksites**

Almost 150 million U.S. adults participate in the labor force.<sup>216</sup> Many adults spend a significant amount of the day at a workplace—an average of 7.6 hours on a workday in 2013.<sup>103</sup> Worksites can encourage physical activity and walking through a multilevel approach.<sup>217</sup>

Worksites can offer employees physical access to opportunities and supports for physical activity, including walking. Providing access to on-site facilities (e.g., gyms, locker rooms, showers) or to employer-subsidized, off-site exercise facilities is associated with physical activity among employees.<sup>218,219</sup> The use of active workstations, such as treadmill desks or workstations that encourage short periods of activity, have been shown to reduce sedentary behavior<sup>220,221</sup> and increase walking during office hours.<sup>222</sup> However, access to walking opportunities by itself may not be sufficient to motivate employees to walk more; informational outreach to support these opportunities can help promote use.<sup>161</sup>

Worksites can also adopt policies that enhance physical activity opportunities. For example, one study found that permitting physical activity during paid work hours combined with education or free access to an on-site gym increased physical activity.<sup>223</sup> A meta-analysis reported that offering worksite physical activity programs during company-paid time resulted in larger improvements in physical fitness than programs offered outside company-paid time.<sup>224</sup> Paid activity breaks have also been associated with improved employee perceptions of productivity.<sup>225</sup>



Incorporating short periods of physical activity into the workday routine has shown modest but consistent benefits in increasing physical activity in the workplace.<sup>226</sup> Several groups, such as the National Coalition for Promoting Physical Activity and the American Council on Exercise, have promoted policies that include brief activity breaks, flexible schedules, and walking meetings as potential strategies to increase participation in worksite physical activity.<sup>227-229</sup>

Worksite health promotion programs can also promote physical activity and walking. These programs can conduct health risk appraisals for employees that include a physical activity assessment. When combined with feedback and education, these assessments can be effective in increasing physical activity among employees.<sup>230,231</sup> Studies have also shown that health promotion teams or committees that represent employees can help employers develop, implement, and sustain worksite efforts.<sup>229,232,233</sup> Worksite health promotion programs designed to promote walking can include individually-adapted health behavior change programs as one component.<sup>161</sup>

Worksite health promotion programs should include ways to support and sustain employee participation. Incentives and rewards, such as employee recognition and free water bottles, pedometers, and T-shirts, can be used to encourage employees' interest and participation in physical activity programs.<sup>229</sup> Social support programs can also be used at the worksite.<sup>161</sup> For example, worksites can set up walking clubs or buddy systems for groups of employees to walk together during breaks or lunch.

## ***Volunteer and Nonprofit Organizations***

The United States has 2.3 million nonprofit organizations,<sup>234</sup> including those that work to address the needs of underserved populations or people with special needs. The volunteer and nonprofit sector encompasses a vast diversity of organizations across the country that differ in size, mission, and reach. Volunteer and nonprofit groups can provide access to facilities, programs, and information to promote walking. For example, they can open their facilities and walking programs to the wider community for free or at low cost, or they can organize social support programs. Organizations with facilities can link with evidence-based programs that are tailored to particular groups, such as minority populations or people with mobility limitations (e.g., GirlTrek, Walk With Ease),<sup>235,236</sup> to offer free or low-cost walking programs.

Because of their reach and the trusted relationship that volunteer and nonprofit organizations have with their members, these organizations can serve as messengers to share information about the benefits of walking and walking programs and ways to improve walkability. For example, pedestrian safety groups can provide valuable information, expertise, and support for best practices that can help enhance access to safe locations for walking. Conservation and environmental groups can develop and share educational programs that teach people how to make the environment walkable and livable.

## ***Health Care***

Health care professionals include people working in medicine, nursing, chiropractic, social work, mental health, nutrition, occupational therapy, and physical therapy, as well as allied health personnel, such as community health workers. A large proportion of people have contact with a health care professional each year. In 2012, almost 80% of U.S. adults visited a health care professional sometime in the past 12 months,<sup>9</sup> and 75% of all children had contact with a health professional at sometime in the past 6 months.<sup>237</sup>

Professional organizations and recommendations from the U.S. Preventive Services Task Force (USPSTF) indicate that health care professionals have a role to play in counseling their patients about physical activity. Walking is an especially good activity for health care professionals to promote because most of their patients

can walk, and walking can be easily modified to a person's abilities. Professional organizations, such as the American College of Preventive Medicine<sup>238</sup> and the American Academy of Pediatrics,<sup>239</sup> encourage counseling as part of routine care for patients.

The USPSTF recommends behavioral counseling for adults who are overweight or obese and who have additional cardiovascular disease risk factors,<sup>240,241</sup> as well as for anyone aged 6 years or older who screens positive for obesity.<sup>242,243</sup> Physical activity is an integral component of these moderate to highly intensive behavioral interventions. Although the USPSTF does not recommend that clinicians offer intensive behavioral counseling related to physical activity to all patients, it does recommend that clinicians selectively counsel patients on the basis of their professional judgment and patient preferences.<sup>244-246</sup>

Health care professionals who want to counsel patients about physical activity have several challenges, including limited time; reimbursement issues; lack of practical tools; and insufficient knowledge, skills, and confidence that counseling is effective.<sup>247-249</sup> Additional training and education for health care professionals about the importance of physical activity and how to help patients formulate a physical activity plan may help overcome some challenges. Health care professionals can also access existing tools and guides to help them counsel their patients about physical activity.<sup>239,250</sup> In addition, they can review resources specifically designed to help them discuss physical activity with patients with chronic conditions or disabilities.<sup>250-252</sup> Finally, programs such as Exercise is Medicine recommend that health care professionals write prescriptions for physical activity and provide information on local resources and support systems.<sup>250</sup> These efforts can include referring patients to certified exercise professionals to oversee their exercise program.<sup>250</sup>

## Media

Media outlets include mass media (e.g., television, radio, outdoor advertising), small media (e.g., brochures, posters), and social media (e.g., Facebook, Twitter, Pinterest, blogs). Each month, 287 million people watch television and 204 million use a computer to access the Internet.<sup>253</sup>

The media can be effective in influencing attitudes and changing behaviors, including health behaviors.<sup>254-257</sup> However, evidence on the effectiveness of stand-alone mass media campaigns to increase physical activity is inconsistent.<sup>161,258,259</sup> According to the Community Preventive Services Task Force, insufficient evidence exists to determine the effectiveness of stand-alone mass media campaigns to increase physical activity at the population level.<sup>161,258,259</sup> However, media campaigns have been part of effective multicomponent interventions. Mass media education campaigns, combined with other intervention strategies, were effective in increasing physical activity among adolescents<sup>260</sup> and walking among adults.<sup>261,262</sup>



## ***Public Health***

Public health focuses on protecting the health of entire populations and population sectors in locations ranging from local neighborhoods to entire countries and regions of the world.<sup>263</sup> Public health professionals often work in federal, state, or local governments.<sup>264</sup> In their efforts to promote population health, they typically partner with other groups and organizations, such as departments of transportation, health care professionals, academic institutions, public safety agencies, local planning agencies, human service and charity organizations, education and youth development organizations, recreational and arts organizations, economic and philanthropic organizations, and environmental agencies and organizations.<sup>265,266</sup>

Public health professionals conduct research and evaluate programs to determine what works to promote and sustain physical activity, including walking. They can summarize findings about what community approaches work to increase walking and walkability. These findings and related recommendations can be used by other sectors of society to plan and implement interventions.

In addition to identifying evidence-based strategies, public health professionals can help other sectors design and implement interventions.<sup>265</sup> They can convene partners across multiple sectors to learn from each other and to develop strategic action plans that efficiently use each partner's expertise and resources. Public health professionals at federal, tribal, state, and local levels can share best practices and tools and provide technical assistance, training, and funding.

Public health professionals also collect data about walking and walkability to measure and monitor changes over time. They can assess and monitor pedestrian behaviors and environmental features that influence pedestrian safety. These data are important in the planning and evaluation of programs to support safe walking and promote walkability.



# GAPS IN SURVEILLANCE, RESEARCH, AND EVALUATION

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Existing research provides an evidence base about what works to increase walking in the United States. However, additional surveillance, research, and evaluation work is needed to maximize the success of community approaches and address disparities in walking and walkability. Lack of economic analyses is a gap across both research and evaluation. This section identifies major gaps in what is currently known.

## Surveillance

Public health surveillance is the ongoing, systematic collection and use of health data to plan, implement, and evaluate public health practice.<sup>267</sup> It provides data to monitor health behaviors and environmental and policy supports over time. These data can also be used to support decisions about how to allocate resources and to evaluate the effect of various programs and interventions.

### *Walking*

Walking among adults is assessed through self-report in several surveillance systems, such as the Behavioral Risk Factor Surveillance System,<sup>84</sup> the National Health Interview Survey (NHIS),<sup>87</sup> and the National Household Travel Survey.<sup>86</sup> However, these systems collect data in different ways, which can make comparisons difficult. For example, the NHIS Cancer Control Supplement collects information on the number of minutes that people walk,<sup>87</sup> whereas the National Household Travel Survey collects information on the number of trips made by walking.<sup>268</sup> Systems also vary in the type of walking assessed—whether for leisure<sup>84,87</sup> or for transportation.<sup>268</sup>

Walking data at the community level are available for selected geographic areas that are part of larger state systems and have a sufficient number of survey respondents to produce stable estimates.<sup>269</sup> Improvements to existing surveillance systems are needed to establish standard and valid measures of walking that can be used across systems at national, state, regional, and local levels.

Surveillance systems that assess walking among children and adolescents mainly collect data on walking for transportation. For school-aged youth, walking for transportation is systematically monitored at national and state levels and in selected localities with populations of more than 1 million people.<sup>86,270,271</sup> The National Youth Physical Activity and Nutrition Survey assessed walking in a national sample of high school students in 2010,<sup>85</sup> but this survey has not been repeated.

The number of people who walk on public streets can be monitored through counts of pedestrians.<sup>111,272,273</sup> Traditionally, these numbers have been collected manually. However, continuous monitoring programs are more likely to use electronic methods, such as infrared counters and video or laser counting technology.<sup>272</sup> A continuously emerging field is the development of methods that can supplement data from these devices with information from wireless devices and cell phone networks. Although pedestrian counts may help researchers conduct surveillance of a local transportation corridor or a sample of corridors, no standard method exists to collect these counts.<sup>111</sup> Methods that use pedestrian counts as part of national surveillance will also require further research on the best ways to compile and analyze these data.

## Walkability

A walkable community is one where it is safe and easy to walk and where pedestrian activity is encouraged.<sup>11</sup> Conducting surveillance of walkability in the United States can be challenging. No single measure exists to measure walkability because it is defined by many local features. These features, however, can be measured and monitored. Examples of local neighborhood features include attractive scenery, convenient places to walk to (such as shops and restaurants), and safety features (such as street lighting).<sup>127,134,274</sup> Other examples of features that can be monitored, particularly for wheelchair rolling, include the condition of routes, such as sidewalks, in terms of surface condition, slope, and other barriers.<sup>275</sup>

No national surveillance system routinely and comprehensively monitors local neighborhood features of a walkable community. Some indicators of walkability are compiled in current databases and available at the Census Block Group level. A Census Block Group is a cluster of blocks, which is the smallest geographical entity for which census data are tabulated.<sup>276,277</sup> Environmental features of a walkable community—such as residential and employment density, land use diversity, access to destinations, and distance to transit—are available at the Census Block Group level in a database available from the U.S. Environmental Protection Agency.<sup>278</sup> A database available from the U.S. Department of Housing and Urban Development contains a calculated feature of walkability—neighborhood block density—and combines it with data on housing and transportation affordability at the Census Block Group level.<sup>279,280</sup>

Questionnaires and on-the-ground audits are the main tools used to directly assess features of community walkability. However, questions about walkability have not been included as routine core components of any national surveillance system. Some features of walkable communities have been assessed on topic-specific surveys or survey supplements.<sup>117,281</sup> For example, the 2012 National Survey of Bicyclist and Pedestrian Attitudes and Behavior assessed the presence of sidewalks and perceptions of safety.<sup>117</sup> The 2015 NHIS Cancer



Photo courtesy of [www.pedbikeimages.org/](http://www.pedbikeimages.org/)Dan Burden

Control Supplement is assessing the presence of places to walk (e.g., paths, sidewalks), the presence of places to walk to (e.g., shops, public transit, houses of worship), and perceptions about neighborhood safety.<sup>281</sup> In addition, several validated self-report questionnaires<sup>282</sup> can assess the perceived characteristics of the environment associated with physical activity. However, the length of most of these questionnaires precludes them from being considered for existing surveillance systems, where survey time is often limited. Although questionnaires with 7 or 9 items exist,<sup>281,283</sup> shorter questionnaires are needed to increase the feasibility of routinely assessing key features of the environment as part of core questions in surveillance systems.

On-the-ground audits of environmental supports can be used to examine the presence (or absence) of features that support walking, such as the presence and quality of parks, recreational facilities, and sidewalks.<sup>282</sup> Although several on-the-ground audit instruments exist, consistent evidence on which aspects of the environment should be examined is lacking. These types of audits are also difficult to conduct on a wide scale and therefore may be limited as surveillance tools. Narrowing their focus may improve their feasibility for surveillance use.

As audit tools are piloted in states and cities, additional information can be collected on their feasibility as surveillance tools. For example, in 2014, a multimodal collaboration led by the Federal Highway Administration, the Federal Transit Administration, the National Highway Traffic Administration, the Federal Railroad Administration, and the Federal Motor Carrier Association was initiated to conduct at least one walk/bike road safety assessment in every state.<sup>284</sup> Findings from this project can provide further information in this area. In addition, future research should examine the use of technological approaches that provide images of neighborhood walkability features. For example, techniques such as imagery-based geographic mapping may help reduce the time and cost of conducting on-the-ground audits of walkability.<sup>285-289</sup>

To connect behavior to walkability and other measures of the built environment, location data from diverse sources (e.g., health studies, surveillance systems) need to be geographically coded (or “geocoded”). Currently, national surveys—such as the National Health and Nutrition Examination Survey, the NHIS, and the National Household Travel Survey—collect residential address data, and these data have been geocoded for analyses in restricted data centers. However, residential address data do not adequately capture where most physical activity takes place.<sup>290,291</sup> To better characterize environmental influences on walking and physical activity, continued data integration is needed. More data are needed to identify the places where people are active—known as “activity spaces”—and the extent to which these activity spaces influence walking.<sup>290,291</sup> Surveillance data can support the research needed to determine the interrelationships between activity spaces, physical activity levels, and pedestrian safety (e.g., traffic exposure, rates of collisions involving pedestrians).

Surveillance of supports for walking and walkability are especially needed at worksites and schools, where adults and children spend much of their time. No national surveillance system currently monitors walking or physical activity supports in the workplace, although worksite physical activity is a national health objective.<sup>14</sup> The most recent estimates available are from the 2004 National Worksite Health Promotion Survey, which estimated that only 19.6% of worksites offered a physical activity program.<sup>292</sup> For schools, some data on walking supports, such as state guidance on policies related to shared use and walking to and from school, are collected.<sup>106</sup> However, more specific information about these policies and how they are implemented is needed.

## Research

Research is needed to identify and advance the most effective approaches to increase walking and to understand how effectiveness varies on the basis of community characteristics. In particular, strategies that increase walking in communities or population subgroups with low levels of physical activity need to be identified. For example, for older adults, research is needed to identify barriers to walking, determine why these barriers exist, and develop specific strategies to increase walking in this population.<sup>72</sup>

Research is also needed to examine the relationship between increased walking and the risk of pedestrian injury. One study suggested that the risk of pedestrians being hit by motor vehicles is lower when more people walk,<sup>293</sup> but this relationship might depend on many other factors. Although many factors have been found to influence pedestrian risk,<sup>294</sup> additional research is needed to systematically assess and monitor these factors, including vehicle characteristics (e.g., electric or combustion engine),<sup>295</sup> pedestrian characteristics, driver and pedestrian behaviors, and environmental characteristics.<sup>296,297</sup>

Existing research demonstrates that broadly defined or multicomponent approaches increase physical activity,<sup>155,161,163</sup> but it is rarely known which set of individual elements are most effective, necessary, or sufficient to achieve a positive effect while minimizing any negative effects, such as injuries. For example, street design is one way to encourage safe walking,<sup>155</sup> but which elements (e.g., improved street lighting, landscaping, features to slow vehicle speed) are most important is unclear.

Effective communication can be a way to increase the likelihood that individuals, families, and other social groups will participate in programs or use particular locations to walk.<sup>161</sup> The combined approach of increasing opportunities or places to be physically active and conducting informational outreach has been shown to increase physical activity, including walking.<sup>153,154,161</sup> However, researchers are not sure which specific messages or combination of messages and other intervention components, such as walking programs and access to places to walk, are best for populations that vary in age, location, race/ethnicity, and socioeconomic status.

Recently, several wearable devices that track physical activity patterns have been introduced to the market, with the idea that devices can educate and motivate people to be more active.<sup>298</sup> Wearable devices may need to be combined with other strategies to promote health behavior change.<sup>298</sup> Research is needed to determine the most effective behavioral change strategies to pair with these devices.<sup>298</sup>

Conducting research into environmental approaches to promote physical activity can be challenging. Incorporating true experimental designs, such as randomly assigning people to neighborhoods and following them over time, is not practical.<sup>163</sup> However, researchers in this area can take advantage of natural experiments in communities where environmental changes are planned.<sup>163,299</sup> They can also capitalize on existing community models that are successful in increasing access and opportunities to be physically active and determine how these models differ from those that are less successful.

A collaborative research agenda that identifies the most important research questions could maximize the use of limited resources. Collaborators would include partners in transportation, community design, environmental health, physical activity and public health practice, and academic research. Stakeholders who would likely use the resulting data, such as decision makers and advocacy groups, should also be part of developing the research agenda.

## Evaluation

Communities across the country are implementing a variety of interventions that promote walking, but many of these interventions are not being adequately evaluated. Evaluations are necessary because they can help decision makers identify and correct problems before, during, and after implementation; assess whether an intervention is working; determine the cost-effectiveness of an intervention; justify the continued existence of an intervention; and inform other interested communities about successes and challenges. Plans for evaluation should be incorporated early in the development process so that critical questions are identified by stakeholders, appropriate data are collected, adequate resources are allocated, and results are shared in a way most useful to stakeholders.<sup>300</sup> Tools such as the CDC Framework for Program Evaluation are available to help programs with the evaluation process.<sup>300</sup>

Evaluation data would be strengthened by the use of common metrics across studies to allow comparison of the relative cost and effectiveness of various interventions. Communities need tools and protocols to measure cost, equity, and behavioral and health outcomes (including injury data) reliably and consistently. They also need help comparing how local programs were implemented against how the original program was designed.

Evaluations of interventions designed to promote walking should include a pedestrian injury component to ensure that increased walking does not have detrimental effects on pedestrian safety. Likewise, evaluations of traffic safety interventions should address the effectiveness of the intervention to support walking. An interdisciplinary approach that includes evidence and input from city planners, community groups, and public health and engineering professionals can lead to productive solutions that increase walking and ensure safety.

## Economic Analysis

Estimating the economic cost of inadequate levels of physical activity in the United States and the costs of initiatives to increase those levels can help policy makers justify health program decisions. Studies have provided national estimates of the health care expenditures associated with lower levels of physical activity.<sup>76,78</sup> Future research could develop national estimates to quantify additional economic costs,<sup>301</sup> such as lost productivity from premature death and disability associated with illness and lower worker productivity.

The economic risks and benefits of physical activity and of walking initiatives, programs, and policy efforts are needed to guide decisions about resource allocation and program efforts. A recent review concluded that improving opportunities for walking and biking seemed to be a cost-effective way to increase physical activity.<sup>302</sup> However, the available evidence was limited to a small number of studies.<sup>302</sup> Future interventions to promote physical activity should collect data (e.g., on resources used, costs, effects) to support economic analyses.<sup>302,303</sup>

Studies that examine the cost-effectiveness of physical activity interventions usually focus on the health-related benefits associated with changes in physical activity. Calculations of the economic benefits of these interventions may need to include other potentially quantifiable savings that result from changes in environmental design or program implementation.<sup>304-306</sup> Although some benefits (such as increased social interaction) may be difficult to directly quantify in economic terms, studies have quantified economic benefits related to factors such as fuel savings<sup>307</sup> and reduced air pollution.<sup>308</sup> For example, when two studies included additional benefits, they found that the economic benefits of community design change to promote physical activity outweighed the cost.<sup>307,308</sup> Future research should explore how to best quantify and include these additional benefits in the economic evaluation of programs designed to promote physical activity.

# THE CALL TO ACTION

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This section presents five goals, with related strategies to support walking and walkability in the United States. Implementation of these strategies will not only make it easier and safer for people to walk, but many of these strategies will also make it easier and safer for people of all ages and abilities to use a wheelchair, ride a bike, and be active in other ways. To achieve these goals, we will need to work together across many sectors of society, including transportation, land use, and community design; parks, recreation, and fitness; education; business and industry; volunteer and nonprofit; health care; media; and public health.<sup>20</sup> Collaborative work is needed to amplify and extend existing efforts, as well as to undertake new initiatives to support these goals. Families and individuals will also need to be involved to make the United States a walkable nation.

## Goal 1. Make Walking a National Priority

Everyone has a role to play to make walking a national priority. To make more communities walkable and help more people walk enough to reap health benefits, we need increased collaboration within and across sectors, such as transportation, community planning, and public health. Resources and supports, financial and otherwise, will be needed for this effort. Partner engagement and mobilization at national, state, tribal, territorial, and local levels can help to forge a national walking movement.

### ***Strategy 1A. Encourage people to promote walking and make their communities more walkable.***

Walking regularly with friends, family members, and others can motivate other people to walk more. People can build relationships and encourage walking by forming or joining walking groups and by offering to create opportunities for walking, such as a walking program in a local mall<sup>309</sup> or a neighborhood walk-to-school program.<sup>165</sup>

People can help make their communities more walkable in a variety of ways. They can volunteer to clean up places where people walk or organize group cleanup efforts in their neighborhoods. They can also support the use of violence prevention programs<sup>310</sup> to improve the safety of neighborhoods.



People can join citizen advisory boards that try to improve safety by modifying environments, such as making intersections and crosswalks safer, improving lighting, increasing visibility for walking, and improving enforcement of traffic laws. Individuals and groups can also participate in community and transportation planning processes at regional or local levels to encourage plans and policies that promote walk-friendly environments.

A variety of resources, including users' guides, workbooks, manuals, action guides, and tool kits, can help people who want to improve walking and walkability in their communities.<sup>311-317</sup> These resources offer guidance related to messaging, participation in local planning efforts that identify best sites for walking paths and sidewalks, promotion of community trail development and its use among youth and adults, implementation or advocacy of programs that close streets to automobile traffic on designated days, and collaboration with the broader community to mobilize groups with shared interests to support walking.<sup>311-317</sup>

People can promote walking and walkability in their neighborhoods and communities by doing the following:

- Walk with friends, family, and work colleagues on a regular basis.
- Participate in organized activities, such as joining a walking group or leading a walk-to-school program.
- Join or help mobilize a cleanup effort to make places where people walk safe and attractive.
- Participate in community activities to reduce crime and violence.
- Join advisory boards, nonprofits, and community planning processes to support safe and convenient places to walk.

### ***Strategy 1B. Create a walking movement to make walking and walkability a national priority.***

Several national efforts already support walking, physical activity, and improved places to walk and be active, including the *National Physical Activity Plan*,<sup>20</sup> *Designed to Move*,<sup>318</sup> *Partnership for Active Transportation*,<sup>319</sup> *Convergence Partnership*,<sup>320</sup> and *Every Body Walk!*<sup>321</sup> Working individually and together, these groups are creating a movement to improve walking and walkability. Similarly, many federal efforts support strategies that can improve walking (e.g., the *National Prevention Strategy*;<sup>12</sup> *Safer People, Safer Streets* initiative;<sup>17</sup> *Let's Move!* campaign;<sup>15</sup> *Go4Life* campaign;<sup>16</sup> *Partnership for Sustainable Communities*<sup>19</sup>). By agreeing on goals and objectives for a national walking movement, these groups could amplify the impact of their efforts. In addition, creating a federal interagency workgroup or leveraging existing workgroups to focus on walking could help establish and sustain a successful national walking movement.

Opportunities to walk and create safe, easy, and attractive places to walk will require cross-sector collaboration at state and local levels. Transportation planners and local or state organizations with health-related missions should work together to add health as a goal in planning.<sup>322,323</sup> At federal, tribal, state, and local levels, the public health sector can also play a role in forming and convening partnerships. These partnerships can link people to services; mobilize community and cross-sector coalitions; share best practices; develop and disseminate tools and resources; conduct community-wide campaigns; and provide financial and technical assistance to worksites, schools, and communities to promote physical activity among people of all abilities. Professionals and leaders from all sectors can champion communities that are safe and walkable for all users. For example, pediatricians can champion safe routes for physical activity opportunities, including walking or biking to school.<sup>324</sup>

Organizations with facilities (e.g., faith-based organizations, YMCAs, parks and recreation departments, senior centers) can link with programs that are tailored to particular communities, such as underserved groups or people with mobility limitations, to offer walking programs. Pairing community volunteer groups—such as connecting older adults with local school district volunteers to walk with children to and from school—can offer walking opportunities across generations.

All sectors of society, including transportation, community design, education, business, nonprofit, parks and recreation, health care, public health, and the media, can work together to make walking a national priority. These sectors can do the following:

- Build on existing national plans and collaborations to make walking a national priority.
- Create a federal interagency workgroup or leverage existing workgroups to focus on creating safe, easy, and attractive opportunities to walk.
- Compile and synthesize existing tool kits and make them easily available to meet specific community needs.
- Convene and support state and local partnerships between sectors that promote walking and walkability.
- Link organizations and programs to ensure that underserved groups and people with disabilities have opportunities to walk.

## Goal 2. Design Communities that Make It Safe and Easy to Walk for People of All Ages and Abilities

People should be able to walk almost anywhere. Designing communities to encourage pedestrian activity will make it safer and easier for all users, including those with mobility limitations and other disabilities. Supportive design can be implemented in large and small communities in diverse geographic areas.

### ***Strategy 2A. Design and maintain streets and sidewalks so that walking is safe and easy.***

Streets can be designed to provide safe and easy places that encourage walking.<sup>157,158</sup> They can include sidewalks; provide space for people to walk, use wheelchairs, bike, and drive; and use trees, curbs, or physical space to separate pedestrians from bicyclists and motor vehicles. Traffic safety can be enhanced by using design features that decrease vehicle speeds (e.g., speed humps, reduced speed zones, signal modifications) and increase the number of safe pedestrian crossings (e.g., medians, pedestrian crossing islands).<sup>90,159,325</sup> Technical guidance and specific information related to the design of walkable urban thoroughfares has been published by the Institute for Transportation Engineers.<sup>326</sup>



Making streets safer and easier for people who walk also makes them safer and easier to use for people of all ages and abilities, including those who use wheelchairs and walkers.<sup>327</sup> In addition, sidewalks and streets can be designed to specifically address barriers for people with disabilities. Examples include using ADA curb cuts to improve accessibility for people with mobility limitations or those who use assistive devices and audible traffic signals for people with vision impairments. Communities should ensure that all sidewalks have a plan for upgrades to comply with the ADA, as required by the U.S. Department of Justice.<sup>328,329</sup>

Regular maintenance of sidewalk quality and safety can increase their use. Sidewalks with cracks, holes, or uneven surfaces pose tripping hazards. Other hazards, such as overgrown vegetation, storm runoff, or unplowed snow, may force pedestrians into high-speed traffic. Keeping sidewalks free from hazards is an important long-term commitment for the safety of those who use them. Particular attention should be given to maintenance of sidewalks in low-income and minority communities, where some sidewalks may be more likely to be of lower quality.<sup>330</sup> The appeal of sidewalks can also be improved through the use of street lighting and landscaping (e.g., street trees, planters).<sup>174</sup> The special needs of older pedestrians should also be considered; features such as benches and traffic islands that account for slower walking paces and reduced agility can be added.<sup>331</sup>

Community planners and designers, community stakeholders, transportation professionals, and government agencies can encourage walk-friendly environments by doing the following:

- Design streets, sidewalks, and crosswalks that encourage walking for people of all ages and abilities.
- Improve traffic safety on streets and sidewalks.
- Keep existing sidewalks and other places to walk free from hazards.



Photo courtesy of [www.pedbikeimages.org/](http://www.pedbikeimages.org/)Julia Diana

## ***Strategy 2B. Design communities that support safe and easy places for people to walk.***

Walkable communities can be created through many community design principles and supportive policies. Community design should encourage developers to build residences, worksites, schools, parks, businesses, shopping districts, public transit systems, and health care facilities within walking distance of each other.<sup>332,333</sup> Community design can also ensure that streets are well-connected, blocks are not too long, and pedestrians can choose from several alternative routes.<sup>121,127,134</sup> Alternative routes can allow pedestrians to avoid heavily trafficked roads that are less safe to cross and are a source of exposure to air pollution. Communities can adopt policies, such as Complete Streets,<sup>158,175,176</sup> that support the routine design and operation of streets that are safe for all pedestrians regardless of age, ability, or mode of transport.

Another way to make walking easier is to support a well-maintained public transit system that is within easy walking distance of residences, worksites, and shopping and entertainment destinations in communities where development patterns have made public transit financially feasible.<sup>130,160</sup> Public transit should be safe, efficient, and easy to use for all users, including people with disabilities. Building walkable communities around transit hubs can further encourage walking.<sup>180,181</sup>

Communities can improve safety for pedestrians through design features and traffic laws.<sup>91,294</sup> Reducing vehicle speeds where people walk can improve safety.<sup>334</sup> Beyond physical design features of streets to decrease vehicle speed, states and localities can enforce existing speed limits and consider policies that reduce speed limits where many people walk.<sup>325</sup> Policies intended to reduce other types of risky driving, such as alcohol-impaired driving,<sup>335</sup> can also be enacted.

Communities can also support walking and other outdoor physical activities by implementing and maintaining design features that reduce opportunities for crime and violence and promote a sense of ownership and safety. For example, efforts to clean, plan, and maintain vacant lots have been associated with reductions in violence and crime.<sup>336</sup> In addition, fewer crimes are committed on streets that are appropriately lighted and in clear view of windows.<sup>91</sup>

Community planners and designers, transportation professionals, community stakeholders, public health professionals, and government agencies can design safe, easy, and attractive places to walk by doing the following:

- Adopt community planning, land use, development, and zoning policies and plans that support walking for people of all ages and abilities.
- Locate schools, worksites, businesses, parks, recreational facilities, and other places that people regularly use within walkable distance of each other.
- Support crime and violence prevention through environmental design and maintenance.
- Reduce speed limits and enforce traffic laws in areas where walking is common.
- Support safe, efficient, and easy-to-use public transit systems and transit-oriented development.

## Goal 3. Promote Programs and Policies to Support Walking Where People Live, Learn, Work, and Play

Walking is easiest when it is built into everyday activities and locations where people spend their time. Two locations that may be especially important are schools and worksites, where youth and adults spend much of their time. Other community locations and organizations—such as colleges and universities, faith-based organizations, health clubs and fitness facilities, parks, recreational centers, nonprofit organizations, community organizations, shopping malls, and senior centers—can also help promote walking through their facilities, programs, and policies.

### ***Strategy 3A. Promote programs and policies that make it easy for students to walk before, during, and after school.***

Making it safe and easy for students to walk before, during, and after school can create opportunities for youth to get some, if not all, of the recommended amount of daily physical activity on school days. Schools can provide opportunities to be physically active before, during, and after school, such as walk-to-school programs, walking clubs, physical education, recess, and physical activity breaks. Teachers and program leaders can promote and ensure inclusion of all students by modifying physical education and other school programs for students who have disabilities or chronic health conditions.<sup>337</sup>



Photo courtesy of [www.pedbikeimages.org](http://www.pedbikeimages.org)/Dan Burden

Schools can increase access to safe places for students and their families to be active by establishing safe routes to after-school activities and negotiating shared use agreements with local parks and recreation departments, Boys & Girls Clubs, YMCAs, or other community organizations and locations. School wellness committees (which include teachers, parents, and community members) should be involved in school walking efforts, and school district wellness policies are important sources of support for these activities.

Strategies that increase walking in school settings have the potential to affect a significant number of adults as well. Schools are a worksite for millions of teachers, administrators, and staff members.<sup>201</sup> In addition, schools can increase walking among community residents through formal shared use agreements that make school gyms, playgrounds, sport fields, and tracks available after school, on weekends, and during the summer.<sup>210,338</sup>

Schools can increase walking by doing the following:

- Implement Safe Routes to School or similar walk-to-school programs.
- Provide daily physical education for students in grades K–12 and daily recess for elementary students.
- Encourage walking opportunities for students and staff as part of regular classroom activities.
- Make gyms, fields, and tracks available before, during, and after school for students and staff and encourage their use through activities such as walking and fitness clubs and other school-related events.
- Establish formal policies or agreements, such as shared use agreements, to make school facilities available to community residents or to allow schools to use nearby community facilities, such as fields and parks.

### ***Strategy 3B. Promote worksite programs and policies that support walking and walkability.***

Worksites can implement worksite health promotion programs that can improve the health of their employees and their bottom line.<sup>339,340</sup> As part of these efforts, worksites can provide places to walk and implement programs and policies that encourage and support walking.

Worksites with sufficient resources can provide on-site equipment and facilities for walking, such as treadmills, changing areas, and showers. However, lower-cost options—such as promoting walking meetings, walking breaks, and the use of stairs and nearby trails, paths, or walking loops—can be used by most worksites. Employers can also provide maps of nearby walking routes and information about places to walk indoors during inclement weather.

In addition, worksites can provide access to places to walk, and they can implement programs and policies that make it possible for employees to walk and be physically active.<sup>219</sup> Worksite policies that encourage brief activity breaks, flexible schedules, and walking meetings have been identified by several groups as potential strategies that can support employees' efforts to be active.<sup>227-229</sup> Incentives, such as free activity trackers or partial subsidies for off-site gym memberships, can help employees meet and sustain their personal physical activity goals. Employers can support the use of health risk appraisals that include feedback and education, individually-adapted health behavior change programs, or social support programs.<sup>217,230,231</sup>

Employers can also incorporate approaches that integrate occupational safety and health protection with health promotion programs (e.g., Total Worker Health<sup>341</sup>). These approaches could promote physical activity as a way to help prevent worker injury and illness and advance health and well-being. Worksites should also ensure that their programs consider employees with functional limitations and disabilities and offer incentives that accommodate employees regardless of abilities, work shifts, or location.<sup>229</sup>

Finally, walkability and access to public transit are important factors for businesses to consider when selecting new worksite locations. Economic development professionals can help employers look for locations in walkable communities. In established locations, senior business leaders can look for ways to participate in local planning discussions that seek to make the surrounding community more walkable. Employers can also be influential and effective advocates for more walkable communities, which benefit their employees and the entire community.

Employers can increase walking by doing the following:

- Provide access to facilities, locations, and programs to support walking.
- Use policies and incentives to encourage walking, such as flextime, paid activity breaks, or discounts for off-site exercise facilities.
- Establish walking clubs or competitions that encourage and motivate employees to meet individual or team goals.
- Consider walkability and access to public transit when selecting new worksite locations.
- Engage in community planning efforts to make the communities around worksites more walkable.

### ***Strategy 3C. Promote community programs and policies that make it safe and easy for residents to walk.***

In addition to schools and worksites, other community locations and organizations can also play a role in promoting and supporting walking. These include colleges and universities, faith-based organizations, health clubs and fitness facilities, recreational facilities, parks, shopping malls, nonprofit organizations, and community organizations, such as YMCAs, Boys & Girls Clubs, and senior centers. To foster the use of these locations by people with disabilities, communities should ensure that locations meet ADA design standards<sup>118</sup> and work to enhance and maintain locations that are safe and accessible for all users. Ensuring safe routes to locations can further improve accessibility and encourage walking to locations.<sup>197</sup>

Locations and organizations can provide access to safe places—such as walking trails, indoor facilities, parks, and playgrounds—where walking can be separated from busy streets. For example, colleges and universities can create pedestrian streets and walkways that provide all users a safe place to walk. For older adults, readily available locations for walking, such as shopping malls and walking paths in retirement communities, provide safe opportunities for walking.<sup>331</sup> Malls can be attractive places for walking, especially for middle-aged and older adults, because features such as safe and climate-controlled environments, level surfaces, and well-lit restrooms can help overcome some barriers to walking.<sup>309</sup>

Organizations can also provide access to walking programs that accommodate a range of interests and abilities and help users overcome barriers to participation. Removing barriers may be particularly effective for less active groups. Organizations can offer programs that are specifically designed for people who may be concerned about how to safely be physically active, such as people with arthritis.<sup>56,149,236</sup> For people with mental health conditions, peer-to-peer support programs for whole health wellness can include such

activities as walking groups and sharing of information on how to find community walking spaces that are free or low cost and accessible.<sup>342</sup> People for whom cost may be a barrier to participation also need affordable options for physical activity.<sup>343</sup> In addition, organizations that integrate informational outreach or social support into their walking programs may be able to increase participation.

Community locations and organizations can increase walking by doing the following:

- Provide safe and convenient access for all users to community locations that support walking, such as walking trails, parks, recreational facilities, and college campuses.
- Offer walking programs that address barriers, including physical limitations and safety concerns.
- Promote the availability of safe, convenient, and well-designed community locations and programs that promote walking.
- Offer evidence-based walking programs that are free or low cost.
- Set up walking groups, buddy systems, and other forms of social support for walking that provide multiple opportunities to walk each week.



## Goal 4. Provide Information to Encourage Walking and Improve Walkability

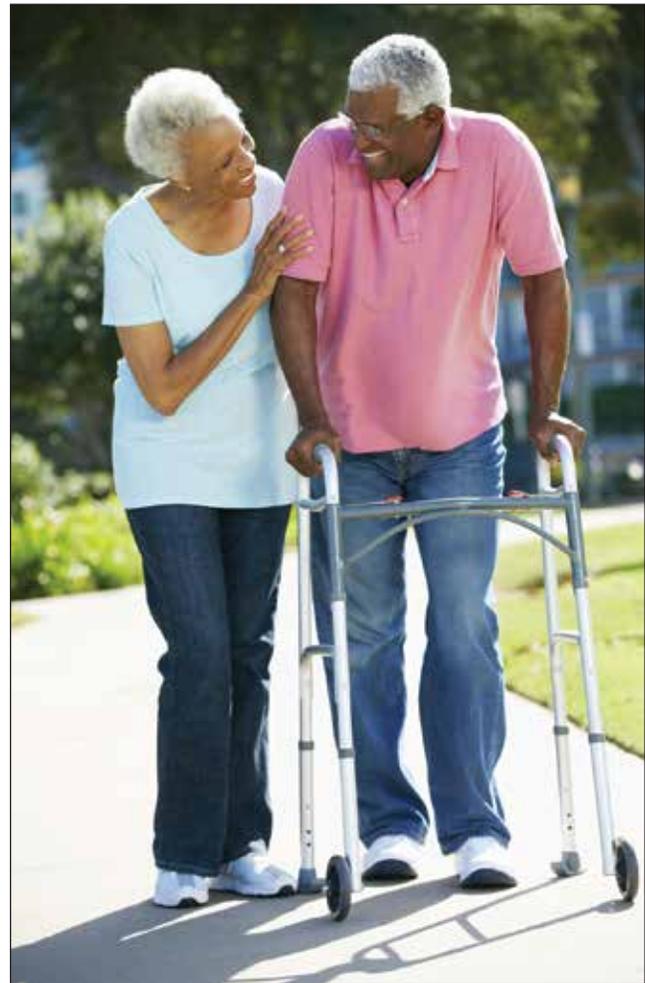
Easy-to-understand and relevant information about how walking can provide substantial health benefits can motivate people to walk. To complement health information, local groups can help increase awareness about safe and accessible places to walk in the community. This information is especially effective when it is tailored to individual needs and used in conjunction with community designs, programs, and policies that promote walking. Another way to promote walking is to train current and future professionals from a variety of disciplines about the importance of walking and how to promote it within their profession.

### ***Strategy 4A. Educate people about the benefits of safe walking and places to walk.***

Education about the importance and benefits of physical activity and walking should be shared by a variety of trusted messengers. Information should be easy to understand and shared through a variety of channels. Special efforts should be made to reach people who are the least physically active, such as girls, older adults, adults with lower levels of education, and people with mobility limitations and other disabilities.<sup>9,147</sup>

Health care professionals can assess patients' physical activity levels and educate patients across their lifespan about the importance of physical activity. They can also help their patients understand that walking is a good way to get the physical activity they need for health. Tracking physical activity as a key piece of health information can help make discussions about physical activity a regular part of a health care visit.<sup>344,345</sup> Clinical programs, such as the Exercise as a Vital Sign initiative, can prompt health care professionals to collect and review patients' physical activity levels to facilitate counseling and referral.<sup>346</sup>

Counseling about walking may be especially important for adults who are at higher risk of chronic disease, such as those who are overweight or obese and who have additional risk factors for cardiovascular disease.<sup>240,241</sup> Many tools and resources are available to help facilitate physical activity counseling, such as the American Academy of Pediatrics' *Bright Futures* guidelines and the *Exercise is Medicine Healthcare Providers' Action Guide*.<sup>239,250</sup> Resources are also available to help health care professionals discuss physical activity with patients with disabilities.<sup>251,252</sup>



Education can take place in a variety of locations, depending on where people spend their time. Physical education and health education classes in schools can provide students in prekindergarten through 12th grade with opportunities to acquire the knowledge, attitudes, and skills necessary to integrate physical activities, including walking, into their daily lives.<sup>347,348</sup> Worksites are a good place to reach employed adults. Educational materials and seminars can help employees learn about the benefits of walking and strategies for incorporating walking into their daily lives. Colleges and universities can promote walking as part of an active lifestyle for students, faculty, and staff. Senior centers, volunteer and nonprofit organizations, and health care organizations can ensure that older adults learn about the benefits of walking for their health, vitality, and independence. Many locations can provide easy-to-read signs and maps to encourage people to walk. Pedestrian safety organizations can provide valuable information, expertise, and education about best practices for pedestrians.<sup>294,349</sup>

Teachers and professors, health care professionals, public health professionals, employers, volunteer and nonprofit organizations, community organizations, and transportation departments can help educate people about the benefits of walking by doing the following:

- Establish physical activity as a key health indicator tracked by health care professionals.
- Have health care professionals offer physical activity counseling to their patients, especially those at high risk.

- Integrate walking and other types of physical activity into school, college, and university curricula.
- Provide signs and maps to help people find safe places to walk and provide information on accessibility for people with mobility or other limitations.
- Educate pedestrians about how to walk safely and the risks of alcohol-impaired and distracted walking.
- Provide employees with tailored messages about walking in and around the worksite.

### ***Strategy 4B. Develop effective and consistent messages and engage the media to promote walking and walkability.***

One way to reach a large number of people with information and motivational messages about walking is through the media. Media outlets can shape public opinion and support efforts to improve community walkability by spotlighting problems and solutions in compelling, credible ways. In 2012, 7 out of every 10 people (71%) in the United States said they watched television news, read a print newspaper, or listened to radio news on the previous day.<sup>350</sup> In addition to these mass media channels, social marketing interventions and population-specific media can reach distinct groups.<sup>351</sup>

To be most effective in increasing knowledge and awareness, media campaigns that promote walking and walkability should be used as part of broader community-wide campaigns.<sup>163</sup> These campaigns can include individually-adapted health behavior change programs and activities, social support and self-help groups, and policy or environmental changes.<sup>163</sup> Because groups within the general population receive information and are influenced in various ways, an effective media strategy will need to determine which messages resonate best with specific groups in the population and then segment, focus, and tailor appropriate messages for each of these groups.

Important partners for messaging and media efforts include traditional media professionals, as well as those who use social media channels. These partners can do the following:

- Provide public education and awareness campaigns to promote walking and walkability and link these campaigns with other activities meant to increase walking.
- Tailor campaign messages and activities to resonate with specific audiences.
- Use relevant communication channels (mainstream and social media and emerging technologies, such as walking apps and video games) to market walking and walkability.

### ***Strategy 4C. Educate relevant professionals on how to promote walking and walkability through their profession.***

Health care professionals, teachers, community planners, and transportation professionals can help improve walking and walkability when they have the knowledge and understanding about how to promote walking and walkability. Health care professionals should receive training to help them provide physical activity counseling. Schools should offer professional development training to teachers and administrators on ways to incorporate physical activity into regular classroom activities and throughout the school day.<sup>337,352,353</sup>

Colleges and universities are in an ideal position to educate and train future professionals to recognize their role in promoting walking and walkable communities to benefit people of all ages and abilities. This training can be directed to students in health disciplines, such as health care and public health, as well as to students in fields such as architecture, transportation, urban design, and business. In addition, physical activity, public



health, and urban and regional planning programs can provide opportunities for students to be introduced to healthy community design principles during their training and to learn how to best work together to create and maintain walkable communities.

Interdisciplinary training through continuing education is also needed for current community planners, economic development professionals, and public health practitioners. Urban and regional planners will benefit if they are able to analyze and use physical activity and health data.<sup>322,323</sup> Public health professionals need to understand the intricacies of the built environment and how to best use data resources across different disciplines, as well as how to work with city planners and transportation engineers.<sup>354,355</sup>

Public health professionals, health care professionals, employers, community planners, school districts, teachers, and academic institutions can support the training of professionals by doing the following:

- Include information on physical activity and behavioral counseling in the training, continuing education, and accreditation process for all health care professionals.
- Provide training to administrators and classroom teachers on ways to incorporate walking throughout the school day.
- Integrate walking and walkability as part of the higher education curricula across majors to promote interdisciplinary training.
- Offer continuing education opportunities that promote walking and walkability for relevant professionals.

## Goal 5. Fill Surveillance, Research, and Evaluation Gaps Related to Walking and Walkability

To increase walking and support walkable communities, decision makers need information to help them plan, implement, and evaluate interventions. Data can help decision makers learn who is walking, where they are walking, and for what purposes; what walking supports already exist in the community and what supports are needed; what interventions can be used to increase walking; how well these interventions work once implemented; and what influence these interventions have on pedestrian injuries. Data can also be used to determine the costs and cost benefits of interventions.

### ***Strategy 5A. Improve the quality and consistency of surveillance data collected about walking and walkability.***

To help with planning and evaluation, decision makers at local, state, and national levels need easy access to data on walking and walkability. Measures of walking and walkability should be valid and reliable across different data systems, settings, and research studies. Systematically collecting data on the characteristics of people who walk and those who do not walk, the places where people walk and why, and the reasons why people do not walk will help decision makers identify high-need areas for interventions and assess how current interventions are working.

In addition to better data on pedestrian activity and volume, many communities also need better data on the circumstances of vehicle crashes involving pedestrians. They also need better guidance on best practices for implementing pedestrian counting programs, and projects such as the Federal Highway Administration's Bicycle-Pedestrian Count Technology Pilot Program are working to address these needs.<sup>284</sup>

Conducting surveillance of community walkability can be challenging. Although data resources are available for assessing some features of walkability (e.g., distance to transit, block density, land use diversity),<sup>278,279</sup> no current surveillance system routinely and comprehensively monitors local neighborhood features of a walkable community. Additional research is needed to develop brief survey and on-the-ground audit tools or technological approaches that capture the most relevant aspects of walkability to measure and monitor. Surveillance of supports for walking and walkability may be especially important in settings where adults and youth spend the majority of their time, such as worksites and schools.

Partners in transportation, community design and planning, physical activity, public health, information technology, engineering, business, education, and academic research can work together to do the following:

- Establish standard and valid measures of walking and expand their use in health, transportation, and other relevant surveillance systems at national, state, and local levels.
- Develop feasible surveillance tools and methods to measure supports for walking in various settings, such as the community, worksites, and schools.
- Collect data on pedestrian exposure and pedestrian injury through relevant national, state, and local surveillance systems.
- Add measures of walkability to national, state, and local surveillance systems.
- Make user-friendly data easily available to decision makers.

## **Strategy 5B. Address research gaps to promote walking and walkability.**

Much is known about the benefits of walking, but less is known about the types of community approaches that help people walk more. More studies are needed to identify the individual elements of broadly defined multicomponent interventions that are most effective in improving walking or walkability. Studies are needed to determine what motivational and communication strategies best help people initiate and maintain walking. In addition, studies are needed to examine the relative effectiveness and cost-effectiveness of different types of walking interventions, whether these effects vary by population or setting characteristics, and the costs of implementing interventions.

Studies are needed to explore how aspects of the built environment interact with community interventions to improve walking or walkability. Studies are also needed to examine the relationship of increased walking or improved walkability with the risk of pedestrian injury. Researchers can take advantage of data from natural experiments to answer some of these questions.<sup>163</sup> In addition, data that link environmental and policy supports with walking behavior are needed to guide best practices for walkable communities.



Partners in transportation, community design and planning, public health, information technology, engineering, and academic research can work together to do the following:

- Develop a collaborative research agenda with partners across sectors.
- Determine what specific aspects of community approaches are most important for improving walking and walkability.
- Identify which walking interventions work best in different types of settings and communities, especially those in which people have low levels of physical activity.
- Determine the relationship between increased walking and pedestrian injury risk and how other factors influence this relationship.
- Determine the costs and cost benefits of walking interventions for individuals and communities.
- Further define the links between environmental and policy supports and walking.

## ***Strategy 5C. Evaluate community interventions to promote walking and walkability.***

Communities across the country are implementing a variety of interventions that are intended to promote walking, but many of these interventions are not being adequately evaluated. During program planning and implementation, evaluation findings can help decision makers identify and correct problems in a continuous improvement cycle. Ultimately, outcome evaluation results can determine whether the intervention increased walking and whether it was cost-effective.

Evaluation results are often needed to maintain funding and justify the continued existence of an intervention. When evaluation results are shared broadly, others implementing similar interventions can incorporate lessons learned into their own work. Results can be shared through informal networks, written reports, or tool kits that outline best practices for implementing an intervention.

Health and economic assessment tools can help when planning and evaluating an intervention. During the planning phase, health impact assessments can be used to estimate the potential health outcomes of an intervention before it is implemented.<sup>356,357</sup> Economic assessment tools, such as the Health Economic Assessment Tool<sup>358</sup> and the Integrated Transport and Health Impact Modelling Tool,<sup>359</sup> can help assess the economic effects of policies and interventions and model the future effects of planned interventions.

Partners in transportation, community design and planning, public health, information technology, engineering, education, business, and academic research can work together to do the following:

- Include plans and resources for evaluation in the intervention planning process.
- Use real-time evaluation results to improve interventions and their implementation.
- Include standard measures for walking, walkability, and costs in evaluations to improve the comparability of results.
- Develop, improve, and use tools, such as audit tools, health impact assessments, and economic assessments, to enhance planning and evaluation processes.
- Create a clearinghouse or similar mechanism to broadly share evaluation results, best practices, and other tools developed as a result of evaluations.

# CONCLUSION

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Physical activity can help prevent and reduce the effects of serious, common, and costly chronic diseases, and it has many additional health benefits.<sup>7</sup> The *2008 Physical Activity Guidelines for Americans* outlines the amount of physical activity needed to achieve substantial health benefits.<sup>6</sup> However, many people across the United States do not get enough physical activity to realize these benefits. Only one-half of all U.S. adults and one-quarter of all high school students meet the guideline for aerobic physical activity.<sup>9,10</sup>

Promoting walking offers a powerful public health strategy to increase physical activity. With this report, the U.S. Surgeon General calls on Americans to be physically active and for the nation to better support walking and walkability for people of all ages and abilities. To improve walking and walkability, communities need to be designed to make walking safer and easier; programs and policies need to be available to support and encourage walking; and individuals and families need to support each other to become and stay active.

Implementing this vision will not be a small task. Many partners are already involved, but more engagement is needed to increase the reach, breadth, and impact of these efforts. The dedication, ingenuity, skill, and concerted efforts of many partners across many different sectors will be required. Walking is an easy and inexpensive way to improve the health and well-being of all Americans. Now is the time to step it up and make walking a national priority.



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