

# Active Transportation

## Making the Link from Transportation to Physical Activity and Obesity

During the past four decades, the obesity rate for children ages 6 to 11 has more than quadrupled (from 4.2% to 17%), and it has more than tripled for adolescents ages 12 to 19 (from 4.6% to 17.6%).<sup>1,2</sup> Regular physical activity can reduce the risk for obesity and help people lead longer, healthier lives. Yet studies show that less than half of U.S. children and adolescents meet the recommended guidelines of at least 60 minutes of daily moderate-to-vigorous physical activity.<sup>3-5</sup> The same studies indicate that less than 10 percent of adults in the U.S. get the recommended 30 minutes of moderate-to-vigorous physical activity per day.<sup>6-8</sup>

Walking and bicycling for daily transportation are important sources of physical activity, but they have declined dramatically over the past few decades. Between 1977 and 1995,<sup>a</sup> the number of all walking trips decreased by 32 percent, and there was a similar decrease in trips made by adults walking to work.<sup>9</sup> Adults walk for only 21.2 percent of trips that are one mile or less, and children walk for only 35.9 percent of trips to school that distance.<sup>10</sup> Reversing the decline in rates of walking and biking for transportation, especially for short trips, presents a major opportunity for improving health among children, adolescents and adults.

Transportation investments can either support or impede walking and bicycling in neighborhoods and near schools, depending on how they are implemented. Evidence is accumulating about how infrastructure improvements, programs that aim to manage neighborhood road traffic, and efforts to make streets and sidewalks safer for active travel influence travel patterns among both children and adults. This research brief presents an overview of findings demonstrating the potential impact of infrastructure investments and other transportation programs on walking and bicycling for transportation, and on related health outcomes. It focuses on public transit, greenways and trails, school-related infrastructure and programs, pedestrian and bicycle facilities, and efforts to manage car traffic.

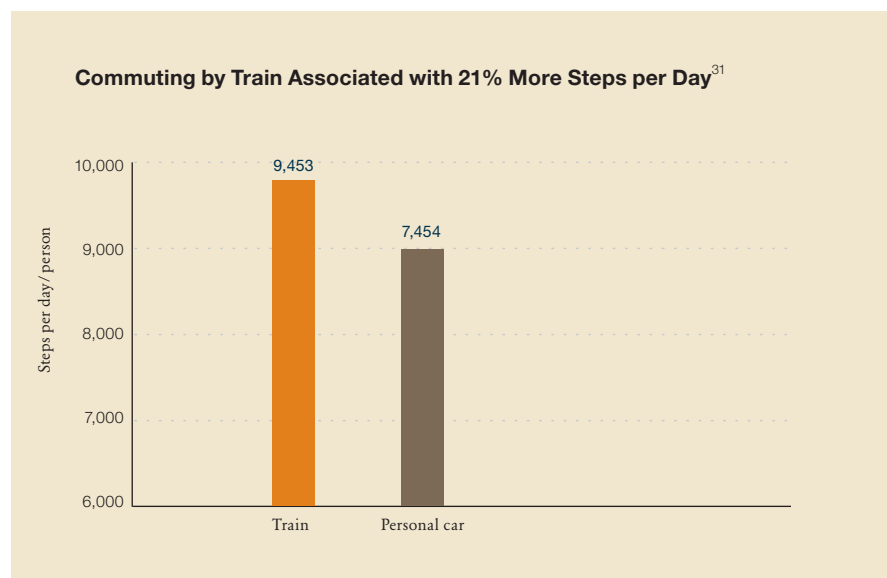
<sup>a</sup> For purposes of this analysis, 1995 was the most recent year with available, comparable data.



## Key Research Results

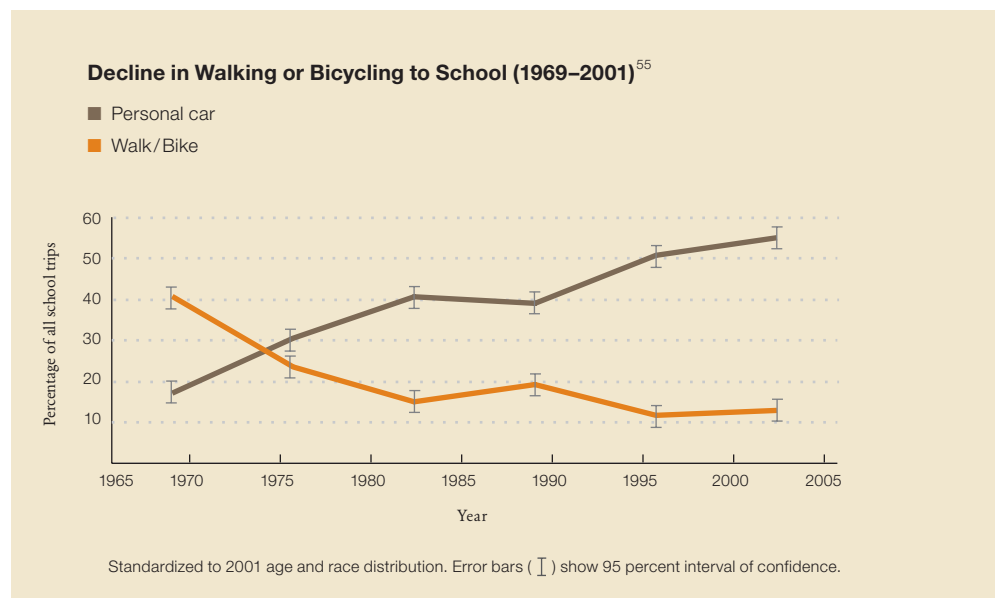
### Public transit use is linked with higher levels of physical activity and lower rates of obesity

- People who used public transportation (i.e. subways, commuter rails, light rails, buses, trolleys, etc.) for any reason were less likely to be sedentary or obese than adults who did not use public transportation.<sup>11-13</sup> Nationwide, 29 percent of those who use transit were physically active for 30 minutes or more each day, solely by walking to and from public transit stops.<sup>14</sup> Similarly, transit users took 30 percent more steps per day and spent 8.3 more minutes walking per day than did people who relied on cars.<sup>15</sup> Conversely, reliance on the automobile for travel was associated with higher obesity rates at both the county<sup>16</sup> and individual level.<sup>17-20</sup>
- With few exceptions,<sup>21</sup> proximity to public transit stops was linked to higher transit use and higher levels of physical activity among adults.<sup>22-26</sup> A study conducted in Salt Lake City, Utah, found that 18.8 percent more residents used the rail system after a new rail stop opened in their area.<sup>27</sup>
- The physical activity associated with transit use saves money. According to one study of obesity-related medical costs, the extra walking related to transit use was estimated at a lifetime savings of \$5,500 per person in 2007 dollars.<sup>28</sup> When accounting for decreases in quality of life, such as disabilities related to obesity, the estimated savings were even higher.<sup>29,30</sup>



## Walking or biking to school can help kids be more active overall

- Most studies of children and adolescents indicate that walking or bicycling to school is related to higher overall physical activity.<sup>32</sup> However, the percentage of school-age children nationwide who commute to school by walking or bicycling decreased by 68 percent from 1969 to 2001.<sup>33, 34</sup>
- Parents' perceptions of the transportation route between home and school were among the key factors determining whether children walk or bike to school.<sup>35, 36</sup> Perceived safety from traffic and crime have been associated with higher rates of children walking and bicycling to school.<sup>37, 38</sup> A survey in Melbourne, Australia, found that children ages 5 to 6 and ages 10 to 12 whose parents believed they had to cross several roads to get to play areas were between 40 percent and 60 percent less likely than other children to walk or bicycle to school or parks at least three times per week.<sup>39</sup>
- Promotional and educational programs helped increase rates of biking and walking to school.<sup>40-42</sup> Parental safety concerns about traffic tend to be a common obstacle to biking and walking to school,<sup>43-45</sup> but addressing safety behaviors and concerns through educational programs appears to be a promising strategy. For example, US Walk to School programs have been associated with higher walking rates.<sup>46</sup> Additionally, the WalkSafe program, an educational injury-prevention program in Miami-Dade County, Fla., has led to children who are more likely to engage in safe pedestrian behaviors (e.g., stopping and looking when crossing the street) or avoid unsafe behaviors (e.g., mid-street crossing and darting out) than were those who did not participate, a change which was sustained over time.<sup>47</sup>
- Efforts promoted by programs such as Safe Routes to School, including building sidewalks, crosswalks and traffic-control devices around schools, have been linked to both increases in the percentage of students who walked to school<sup>48-52</sup> and reductions in the percentage of students being driven to school.<sup>53</sup> Up to 39 percent of the land in large U.S. urban areas is within one-half mile of a public school, so physical improvements in neighborhoods surrounding schools provide safer walking environments not just to students, but also to residents in the surrounding neighborhoods.<sup>54</sup>



## Sidewalks and bicycle lanes promote physical activity

- More and better-quality sidewalks are associated with adults having both higher rates of walking and of meeting physical activity recommendations,<sup>56-61</sup> and with a lower likelihood of being overweight.<sup>62-64</sup> Similarly, the presence of bicycle lanes and paths is positively related to cycling,<sup>65</sup> and to more adults meeting physical activity recommendations.<sup>66-70</sup> Cities that invest in bicycle facilities exhibit higher levels of bicycle commuting.<sup>71</sup>
- A survey of more than 11,500 participants in 11 countries found that residents of neighborhoods with sidewalks on most streets were 47 percent more likely to get moderate-to-vigorous physical activity at least five days per week for at least 30 minutes each day than were residents of neighborhoods with sidewalks on few or no streets.<sup>72</sup> A review of 16 studies found that people who reported having access to sidewalks were 20 percent more likely to be physically active than those reporting no access to sidewalks.<sup>73</sup>
- One study of cities across the country estimated that, for every 1 percent increase in the length of on-street bicycle lanes, there was a 0.31 percent increase in bicycle commuters.<sup>74</sup> Studies conducted in Minneapolis, Minn., and Portland, Ore., showed that bicyclists were willing to go farther than they would normally in order to use safe bicycle infrastructure.<sup>75-77</sup>
- Two studies found that facilities for bicycle parking, personal showering and locker storage at destinations were a promising strategy for promoting cycling and walking.<sup>78,79</sup> The monetary value of the benefits of having destinations with facilities to support walkers and bicyclists was calculated at between \$0.96 and \$1.92 per bicycle trip.<sup>b</sup>



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**Multi-use trails are associated with increases in walking and bicycling, especially in urban areas and among lower-income populations**

- Building multi-use trails can lead to short- and long-term increases in walking and cycling, especially on urban-area trails and trails that connect population centers with desirable destinations, such as downtowns.<sup>81-83</sup> Furthermore, trails have been shown to be particularly beneficial in promoting physical activity among women and people in lower-income areas.<sup>84</sup>
- With few exceptions,<sup>85</sup> living near trails or having trails in one's neighborhood has been associated with people being 50 percent more likely to meet physical activity guidelines<sup>86,87</sup> and 73 percent to 80 percent more likely to bicycle.<sup>88</sup> In a nationally representative study, individuals who reported using trails at least once per week were twice as likely to meet physical activity recommendations as were those who reported using trails rarely or never.<sup>89</sup> In a sample of pre-adolescent girls, proximity to trails was related to 4.8 percent more physical activity and a 1.4 percent lower body mass index.<sup>90</sup>
- The financial gain of the health benefits related to trail use outweighed the cost of building and operating the trails.<sup>91,92</sup> For example, in Lincoln, Neb., every \$1 invested in trails was estimated to save \$2.94 in direct medical costs from a societal perspective.<sup>93</sup>

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**Traffic calming and safety measures protect residents and facilitate walking and bicycling**

- Fast and heavy traffic is commonly cited by youth and adults as a barrier to walking and cycling.<sup>94-98</sup> Infrastructure changes that decrease vehicle speeds, increase the attention of drivers and enhance pedestrian safety are known as traffic-calming devices. Devices such as speed bumps and visibility aids can improve pedestrian and bicyclist safety. Other devices, including reductions in the number or width of car lanes, sidewalk extensions into traffic lanes at street crossings, and space for cars to park along the roadway, can help pedestrians but may be detrimental for bicyclists.
- Several recent reviews have examined how traffic-calming influences the risk of crashes involving pedestrians, and that of automobile crashes resulting in injuries. One found that traffic-calming substantially reduced the risk of crashes involving pedestrians,<sup>99</sup> while another did not detect reductions in crashes involving pedestrians after such changes.<sup>100</sup> The second of these reviews, along with a third one, suggested that traffic-calming efforts resulted in 11 percent to 15 percent lower rates of automobile crashes with injuries.<sup>101,102</sup> Traffic calming on residential streets may have a greater effect than doing so on main streets.<sup>103</sup>
- With few exceptions,<sup>104</sup> high levels of vehicular traffic have been associated with lower rates of physical activity in nearby areas.<sup>105,106</sup> Accordingly, some of the benefits of traffic calming included increased walking and cycling, and enhanced opportunities for outdoor play among children and adolescents.<sup>107-111</sup> In one study, the number of observed pedestrians increased after the introduction of neighborhood traffic calming, and 20 percent of respondents reported they walked more in the area as a result of the calming effort.<sup>112</sup>

<sup>b</sup> The study estimated that the benefits of workplace amenities for bicyclists were equivalent to making the trip shorter by 6 minutes. The monetary value was estimated assuming a value of time that was half the average 2006 U.S. hourly wage rate of \$19.29. The calculated amount accounts for items the commuters perceive as of monetary value: reduced stress, less money spent on gasoline, lower travel time, etc.

## Conclusion

- A substantial body of research shows that certain aspects of the transportation infrastructure—public transit, greenways and trails, sidewalks and safe street crossings near schools, bicycle paths, traffic-calming devices, and sidewalks that connect schools and homes to destinations—are associated with more walking and bicycling, greater physical activity and lower obesity rates.
- Beyond improving local travel options, transportation infrastructure investments that support physical activity can result in increased recreational opportunities, improvements to individuals' health and decreased health care costs.
- In combination with infrastructure investments, programs that raise awareness and complement pedestrian and bicycle facilities are promising options for supporting physical activity. Specifically, Safe Routes to School programs and the management of traffic in local neighborhoods and around schools have been shown to affect physical activity among children, adolescents and adults.
- Fast vehicle traffic is a significant barrier and danger to bicyclists and pedestrians. Measures to slow down traffic and to help pedestrians negotiate busy streets can be effective in increasing physical activity and improving safety.
- Addressing the decades-long decline in walking and bicycling for transportation requires changing the physical characteristics of our communities. Federal, state and local policies and funding that support the type of infrastructure investments and programs identified in this brief can help slow and perhaps even reverse this decline.

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*Active Living Research*, a national program of the Robert Wood Johnson Foundation, stimulates and supports research to identify environmental factors and policies that influence physical activity for children and families to inform effective strategies to prevent childhood obesity, particularly in low-income and racial/ethnic communities at highest risk. Active Living Research wants solid research to be part of the public debate about active living.

This report was prepared by Daniel A. Rodríguez, Ph.D., MST, associate professor of city and regional planning and director of the Carolina Transportation Program at the University of North Carolina, Chapel Hill, with support from the Active Living Research staff. Peer review was provided by Andrew Dannenberg, M.D., M.P.H., Centers for Disease Control and Prevention; Susan Handy, Ph.D., University of California, Davis; and Anne Vernez Moudon, Dr. es Sc., University of Washington.

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**Active Living Research**  
San Diego State University  
3900 Fifth Avenue, Suite 310  
San Diego, CA 92103–3138

[www.activelivingresearch.org](http://www.activelivingresearch.org)