

## **Factors Preventing Walking to Near-Home Destinations by Transportation Walking Status, U.S. Adults, 2022**

Tiffany J. Chen<sup>1</sup>, Hatidza Zaganjor<sup>1</sup>, Miriam E. Van Dyke<sup>1</sup>, Jennifer L. Matjasko<sup>1</sup>, and Geoffrey P.  
Whitfield<sup>1</sup>

<sup>1</sup>Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention  
and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, U.S.A.

### **Abstract**

Increasing transportation walking (i.e., walking to get to and from destinations) is a key strategy for increasing physical activity, but what is not well understood are factors preventing people who do not walk for transportation from initiating that practice and current transportation walkers from maintaining or increasing this behavior. This study describes factors preventing adults who report walking or not walking for transportation from regularly walking to destinations near home. National data from the 2022 *SummerStyles* survey included 3,955 U.S. adults who indicated factors preventing them from regularly walking to places within a 10-minute walk of their home, selecting all that apply from 11 environmental, access, or individual factors, or “None of the above.” We estimated weighted prevalence for each factor and conducted pairwise *t*-tests to identify significant differences ( $p < .05$ ) by transportation walking status. About 31% of adults not walking for transportation in the past 7 days reported having no places to walk to within a 10-minute walk, more than double the prevalence among transportation walkers (14%). Compared to transportation walkers, more adults not walking for transportation reported individual factors (i.e., 24% preferred driving or being driven, vs. 19%; 23% reported inconvenience, vs. 19%), while more transportation walkers reported environmental factors (e.g., 40% reported hot or humid conditions, vs. 34%) or none of the factors. These findings suggest those not walking for transportation may need varied interventions, such as mixed land use for near-home destinations and individual supports, to meet their needs for transportation walking.

**Keywords:** walking, transportation, active transport, physical activity

Physical activity provides a variety of physical and mental health benefits, including reduced risk of chronic disease, depression, and anxiety (U.S. Department of Health and Human Services, 2018). The *Physical Activity Guidelines for Americans*, second edition, recommends adults engage in  $\geq 150$  minutes of moderate-intensity or moderate-equivalent aerobic physical activity per week (aerobic guideline), preferably spread throughout the week, for substantial health benefits (U.S. Department of Health and Human Services, 2018). Despite this, only about half of U.S. adults met the aerobic guideline from nonoccupational activity in 2019 (Ussery et al., 2021). Walking has been reported as the most common nonoccupational aerobic physical activity for U.S. adults across many demographic groups (Watson et al., 2015). Prevalence of walking was higher among people who met the aerobic guideline than for people who did not (Ussery et al., 2017). *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities* promotes walking as a key public health strategy for increasing physical activity and an accessible, multipurpose activity for many people to incorporate into their lives in different ways that work for them (U.S. Department of Health and Human Services, 2015), such as walking 10 minutes for transportation.

Transportation walking (i.e., to get to and from destinations such as work, stores, or public transit) is a potential source of activity for meeting the aerobic guideline. Between 2005 and 2015, the proportion of U.S. adults who reported any transportation walking increased modestly from 28.4% to 31.7%; however, the average minutes per week of transportation walking decreased, and the prevalence of walking enough minutes to meet the aerobic guideline also decreased (Ussery et al., 2018). Various factors may prevent the initiation or increase of transportation walking in the U.S., including lack of time, safety concerns, unsupportive community design, and actual or perceived physical ability (U.S. Department of Health and Human Services, 2015).

It is not well understood which specific factors prevent initiating this behavior among those who do not walk for transportation and preclude maintaining or increasing transportation walking among those who do walk for transportation (i.e., transportation walkers). The objective of this study is to describe factors preventing U.S. adults who report walking or not walking for transportation from regularly walking to destinations near home. Understanding the factors that prevent transportation walking is important for planning interventions to promote walking and increase physical activity.

## Methods

Porter Novelli conducted the 2022 *Styles* surveys using Ipsos' KnowledgePanel<sup>®</sup>, a continuously replenished online panel of about 60,000 noninstitutionalized U.S. panelists who are recruited randomly by mail using probability-based random sampling by address (Porter Novelli, n.d.). Our study used 2022 *SummerStyles* data of respondents aged 18 or older from the survey's summer wave, fielded from May 31 to July 6, 2022. The *SummerStyles* survey was sent to 5,990 households that

completed the initial 2022 *SpringStyles* survey wave. The final *SummerStyles* sample had 4,156 adult respondents (response rate 69.3%), and respondents received around \$5 in cash-equivalent reward points. Data were weighted to match 2021 U.S. Current Population Survey proportions using eight factors (gender by age, household income, race/ethnicity, household size, education, Census region, metro status, and parental status of children 11–17 years old). Our final analytic sample was 3,955 adults, excluding 201 adults who were missing data on transportation walking status, factors preventing walking to near-home destinations, or inability to walk, or who reported being physically unable to walk. Our analysis involved the examination of precollected data licensed from Porter Novelli Public Services and was considered exempt from Institutional Review Board assessment at the Centers for Disease Control and Prevention.

## Measures

To assess factors preventing walking to destinations near home, respondents were asked, "Which of the following prevent you from regularly walking to places within a 10-minute walk of where you live?" and asked to select all that apply or "None of the above." Response options included "Unpleasant or unhealthy environment (e.g., trash, noise, pollution)," "Cold or icy conditions," "Hot or humid conditions," and "Feeling unsafe for any reason" (henceforth, environmental factors); "Sidewalks are missing or poorly maintained," "Crosswalks are missing or too far apart," and "There are no places within a 10-minute walk of where I live" (henceforth, access factors); and "Inconvenient (e.g., too far, takes too long, unfamiliar)," "My physical abilities or fitness," "Do not like walking," and "Prefer driving or being driven" (henceforth, individual factors). We grouped these into environmental, access, and individual factors based generally on the socioecological model of active living (Sallis et al., 2006).

For transportation walking status, respondents were asked, "In the past 7 days, how many days did you walk for transportation? This is walking you might have done to travel to and from work, to do errands, or to go from place to place." Respondents could indicate 0 to 7 days per week, or "I am not physically able to walk." Respondents were also asked for the approximate duration in minutes they walked for transportation each day. Respondents were categorized as transportation walkers if they reported 1 to 7 days per week and were not missing a duration response. Those who reported 0 days per week were categorized as not walking for transportation.

## Statistical Analysis

We estimated weighted prevalence and 95% confidence intervals (CIs) for all factors preventing U.S. adults from walking to places within 10 minutes of home, stratified by transportation walking status. We conducted pairwise *t*-tests to assess significant differences between those walking versus not walking for transportation, with  $\alpha = .05$ . Analyses were conducted using SAS-callable

SUDAAN (version 11.0; Research Triangle Institute) to account for survey weights.

**Results**

Weighted and unweighted characteristics of respondents are presented in the Supplemental Table.

**Supplemental Table. Respondent Characteristics, 2022 SummerStyles (n=3,955)\***

Characteristic	n	Unweighted %	Weighted % (95% CI)†
<b>Age (years)</b>			
18–34	574	14.5%	29.3 (27.4–31.4)
35–49	1,102	27.9%	23.7 (22.2–25.3)
50–64	1,123	28.4%	24.9 (23.4–26.4)
65+	1,156	29.2%	22.1 (20.8–23.4)
<b>Sex</b>			
Male	1,990	50.3%	49.4 (47.5–51.2)
Female	1,965	49.7%	50.6 (48.8–52.5)
<b>Race/ethnicity</b>			
White, NH	2,853	72.1%	63.0 (61.0–64.9)
Black, NH	354	9.0%	11.6 (10.4–13.0)
Hispanic or Latino	442	11.2%	16.9 (15.3–18.6)
Asian, NH	163	4.1%	5.9 (5.0–7.0)
Another or 2+ races, NH	143	3.6%	2.6 (2.1–3.2)
<b>Education level</b>			
High school graduate or less	1,151	29.1%	36.6 (34.7–38.5)
Some college	1,110	28.1%	27.3 (25.7–29.0)
Bachelor's degree or higher	1,694	42.8%	36.2 (34.4–37.9)
<b>Income</b>			
Less than \$50,000	934	23.6%	28.4 (26.6–30.2)
\$50,000–\$99,999	1,180	29.8%	30.0 (28.3–31.8)
\$100,000 or more	1,841	46.6%	41.6 (39.8–43.5)
<b>Region</b>			
Northeast	699	17.7%	17.2 (15.8–18.6)
Midwest	891	22.5%	20.9 (19.4–22.4)
South	1,414	35.8%	37.9 (36.1–39.8)
West	951	24.1%	24.1 (22.5–25.7)
<b>MSA status</b>			
Nonmetro	497	12.6%	13.1 (11.9–14.4)
Metro	3,458	87.4%	86.9 (85.6–88.1)
<b>Transportation walking status‡</b>			
No	2,697	68.2%	66.8 (65.0–68.6)
Yes	1,258	31.8%	33.2 (31.4–35.0)

Abbreviations: CI, confidence interval; MSA, metropolitan statistical area; NH, non-Hispanic.

\*201 adults were excluded due to missing responses to transportation walking status, factors preventing walking, or being unable to walk, or a response of being unable to walk. Those excluded were distributed differently by education and income compared to the analytic sample (chi-square  $p < .05$ ), representing more adults with lower education and income.

†Weighted to the total U.S. population as estimated by the 2021 U.S. Current Population Survey proportions using eight factors (gender by age, household income, race/ethnicity, household size, education, census region, metro status, and parental status of children 11–17 years old).

‡Transportation walking status was determined by reported transportation walking in the past 7 days. Adults who do not walk for transportation were distributed differently by age, race/ethnicity, income, region, and MSA status (chi-square  $p < .05$ ), representing more older, Non-Hispanic White, middle-income adults, residents of the South, and residents of nonmetro areas compared to adults who walk for transportation (with more younger, non-White, lower-income adults, residents of the Northeast, and residents of metro areas).

There were significant differences by transportation walking status for seven of the 11 factors preventing walking to near-home destinations (Table 1).

Table 1. Prevalence of Factors Preventing Regular Walking to Near-Home Destinations, by Transportation Walking Status, 2022 SummerStyles (n=3,955)

Factor Type	Factors*	Weighted Prevalence % (95% CI)	
		Adults who do not walk for transportation†	Adults who walk for transportation†
Environmental	Hot/humid	34.2 (32.1—36.4)‡	39.6 (36.3—42.9)‡
	Unsafe	13.4 (11.9—15.2)‡	16.8 (14.3—19.6)‡
	Cold/icy	11.4 (10.1—12.8)‡	16.2 (14.0—18.5)‡
	Unpleasant/unhealthy environment	4.8 (3.9—5.9)‡	8.6 (6.8—10.8)‡
Access	No places within 10-minute walk	30.5 (28.5—32.6)‡	13.9 (11.9—16.2)‡
	Sidewalks missing or poorly maintained	17.4 (15.7—19.2)	16.4 (14.1—19.1)
	Crosswalks missing or too far apart	6.1 (5.0—7.4)	6.1 (4.7—8.0)
Individual	Prefer driving/being driven	23.9 (21.9—25.9)‡	18.7 (16.1—21.5)‡
	Inconvenient	22.8 (20.9—24.8)‡	18.8 (16.2—21.7)‡
	Abilities/fitness	10.9 (9.6—12.3)	9.8 (8.0—11.9)
	Do not like walking	7.3 (6.1—8.6)	5.5 (4.1—7.4)
None of the above		18.3 (16.5—20.1)‡	26.0 (23.2—29.0)‡

Abbreviation: CI, confidence interval.

\*Question and response text: Which of the following prevent you from regularly walking to places within a 10-minute walk of where you live? Hot or humid conditions; feeling unsafe for any reason; cold or icy conditions; unpleasant or unhealthy environment (e.g., trash, noise, pollution); there are no places within a 10-minute walk of where I live; sidewalks are missing or poorly maintained; crosswalks are missing or too far apart; prefer driving or being driven; inconvenient (e.g., too far, takes too long, unfamiliar); my physical abilities or fitness; do not like walking.

† Transportation walking status was determined by reported transportation walking in the past 7 days.

‡ For each factor, prevalence estimates with the same superscript symbol are statistically different at  $p < .05$ .

Three factors were reported more by those not walking for transportation versus those who are transportation walkers: the access factor of not having places within a 10-minute walk of where they live (30.5% vs. 13.9%), and the individual factors of preferring driving or being driven (23.8% vs. 18.6%) and inconvenience (22.8% vs. 18.9%). Four environmental factors were reported more by transportation walkers: hot or humid conditions (39.6% vs. 34.3%), feeling unsafe for any reason (16.8% vs. 13.4%),

cold or icy conditions (16.1% vs. 11.3%), and an unpleasant or unhealthy environment (8.6% vs. 4.8%). “None of the above” was also reported more by transportation walkers (26.0% vs. 18.2%). The Supplemental Figure visually depicts Table 1’s significantly different prevalence estimates by transportation walking status for environmental, access, and individual factors that prevent walking to destinations near home.

## Discussion

About 31% of adults who do not walk for transportation—more than double the prevalence of transportation walkers—reported having no places within a 10-minute walk as a factor preventing walking to near-home destinations. They were also more likely to report individual preferences for driving and inconvenience of walking. Transportation walkers more often reported environmental factors or none of the listed factors. Our findings suggest adults not walking for transportation may benefit from land use decisions that expand the variety of near-home destinations and interventions both to improve convenience of transportation walking and to change people's preferences.

To our knowledge, our study is the first to explore factors preventing transportation walking, specifically to places within 10 minutes from home, by transportation walking status. Previous studies have broadly examined environmental correlates in various countries by walking purpose (Dadpour et al., 2016; Inoue et al., 2010; Lee & Moudon, 2006; Owen et al., 2004; Saelens & Handy, 2008; Whitfield et al., 2019). Evidence consistently supports residential density (Lee & Moudon, 2006; Saelens & Handy, 2008), mixed land use (Saelens & Handy, 2008), and route connectivity for neighborhood walkability (Inoue et al., 2010; Owen et al., 2004)—as well as utilitarian destinations (Lee & Moudon, 2006; Saelens & Handy, 2008; Whitfield et al., 2019) and shorter distances to destinations (Dadpour et al., 2016; Owen et al., 2004; Saelens & Handy, 2008) as environmental correlates of transportation walking. Weather (Dadpour et al., 2016), safety (Saelens & Handy, 2008), built environment aesthetics (Dadpour et al., 2016), and sidewalks (Owen et al., 2004; Whitfield et al., 2019), among others, could also be important. A study on individual attitudes demonstrated an interaction with environmental correlates, such that a walkability measure and positive environmental characteristics were associated with transportation walking only in people with positive walking attitudes (Yang & Diez-Roux, 2017). Our findings augment previous research by identifying which factors might specifically influence adults who do not walk for transportation when they are deciding whether to walk for transportation near home. The magnitudes of prevalence and difference by transportation walking status may signify the extent to which each factor drives decisions. For example, not having destinations near home was identified by almost one-third of those not transportation walking, more than twice as often than by transportation walkers—emphasizing how nearby destinations may be essential for regular transportation walking.

Notably, our findings on differences by factor types may fit into Alfonzo's hierarchy of walking needs, a framework that uses a social-ecological model of walking to describe decisions to walk (Alfonzo, 2005). In Alfonzo's hierarchy, feasibility of walking is the most basic need limiting further considerations of needs. Environmental urban form (built environment) characteristics are then placed in an ordered hierarchy (lower-level to higher-level: accessibility, safety, comfort, pleurability) where lower-

level needs typically must be met before considering higher-level needs for walking, and individual-, group-, and regional-level (e.g., respectively: biological, sociocultural, and geographical) attributes moderate walking decisions (Alfonzo, 2005). Individual attributes or psychological factors (e.g., attitudes, self-efficacy) may influence how many levels must be satisfied before deciding to walk (Alfonzo, 2005). The higher prevalence of not having destinations near home among those not walking for transportation may indicate that regular transportation walking is not feasible, and higher prevalence of individual factors may indicate that they may need more or all built environment characteristics fulfilled in Alfonzo's hierarchy to initiate walking. Compared to those who do not walk for transportation, it is possible that some transportation walkers reporting higher prevalence of environmental factors may feel their lower-level needs (e.g., accessibility) are sufficiently met and are considering higher-level needs (e.g., safety, comfort, and pleurability) in walking decisions. More than one-fourth of transportation walkers (compared to 18% of those not transportation walking) reported "None of the above," which may indicate their transportation walking needs were met or their relevant factors were not response options.

However, it is also possible that transportation walkers may not be voluntarily walking if walking is their only available form of transportation. Their higher prevalence of environmental factors may be due to their exposure to and observations of conditions in the walking environment, which may not be observable by those who do not walk for transportation. Regardless, environmental supports are needed to address factors across Alfonzo's hierarchy. Interventions including trees (for shade and aesthetics) and green spaces (Dadpour et al., 2016) may improve comfort or pleurability and counteract heat to influence decisions to walk. Prioritizing mixed land use and proximity of destinations could provide more convenient, accessible places to walk to (Dadpour et al., 2016; Saelens & Handy, 2008), just as well-connected pedestrian and transit transportation systems (Dadpour et al., 2016; Lee & Moudon, 2006; Owen et al., 2004) could provide more enjoyable and convenient alternatives to driving or being driven; the Community Preventive Services Task Force recommends strategies that combine at least one land use intervention (e.g., diverse and accessible local destinations nearby, such as stores, healthcare, banks, and social clubs) with at least one transportation system intervention (e.g., pedestrian infrastructure, such as sidewalks or trails, intersection design, and landscaping) to increase physical activity (Guide to Community Preventative Services, 2017). Since individual attitudes may moderate how people respond to environmental supports for transportation walking (Yang & Diez-Roux, 2017), people who prefer or are accustomed to cars for transportation (Dadpour et al., 2016) may need additional support to walk for transportation, beyond improved walking environments. Individual supports (i.e., behavior change guidance to incorporate routine walking) could compliment environmental supports (Schmid et al., 2021), particularly for the higher prevalence of adults not walking for

transportation who reported preferring driving and inconvenience.

Some limitations exist for our study. First, the survey question asks about only home-based walking (i.e., “within a 10-minute walk of where you live”) and does not specify walking purpose, so reported factors are specific to home-based walking and could vary by respondent interpretation. Second, 11 response options were listed, none of which were factors about social influences, so options were not comprehensive. Third, only past 7-day transportation walking was assessed, whereas factors preventing regular transportation walking were assessed; some regular transportation walkers could be missed by the past 7-day assessment. Fourth, 2022 *SummerStyles* was fielded in the summer, so respondents may have been subject to priming effects when responding about hot or humid conditions, with possible opposite effects for cold or icy conditions. Fifth, our supplementary analyses suggest that there are important sociodemographic differences in walking for transportation. It was beyond the scope of our current study to extensively consider the nature of these differences and is an important next step for research on this topic.

### Conclusion

Among adults who did not walk for transportation in the past 7 days, almost one-third do not have destinations near home to regularly walk to. Prevalence of individual factors preventing walking to near-home destinations was higher for those not walking for transportation than for transportation walkers, and prevalence of environmental factors was higher for transportation walkers than those not walking for transportation. Understanding factors preventing walking to near-home destinations is valuable for planning environmental, access, and individual interventions to promote walking and increase physical activity. Focused efforts on near-home destinations may be particularly important.

### Correspondence should be addressed to

Tiffany J. Chen, MSPH  
Division of Nutrition, Physical Activity, and Obesity  
National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention  
4770 Buford Highway NE, MS S107-5  
Atlanta, GA 30341

[pgi8@cdc.gov](mailto:pgi8@cdc.gov)

404-498-2590

- Tiffany J. Chen: [0000-0002-2326-0986](tel:0000-0002-2326-0986)
- Hatidza Zaganjor: [0000-0001-8596-712X](tel:0000-0001-8596-712X)
- Miriam E. Van Dyke: [0000-0002-8684-2860](tel:0000-0002-8684-2860)
- Jennifer L. Matjasko: [0000-0002-0005-1401](tel:0000-0002-0005-1401)
- Geoffrey P. Whitfield: [0000-0002-3991-8690](tel:0000-0002-3991-8690)

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### Author Contributions

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### Author Note

Miriam E. Van Dyke is now at the Division of Healthcare Quality Promotion, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA.

### Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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