

Physical Activity: Park, Trail, and Greenway Infrastructure Interventions to Increase Physical Activity

Community Preventive Services Task Force Finding and Rationale Statement Ratified July 2021

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CPSTF Finding and Rationale Statement

Intervention Definition

Park, trail, and greenway infrastructure interventions improve the built and natural environments by creating or enhancing public locations for physical activity, relaxation, social interaction, and enjoyment. Locations include the following:

- Parks—designated public areas that often combine greenery with paths, facilities for physical activity and recreation, and places for relaxation and social interaction.
- Trails or greenways—routes for walking, hiking, or cycling in urban, suburban, or rural areas (e.g., “rails to trails” conversion projects). These may involve street conversions that provide opportunities for walking and cycling (most often in urban areas).

Infrastructure improvements may be combined with one or more of the following interventions:

- Community engagement to ensure community participation in intervention planning
- Public awareness activities (e.g., banners, flyers, promotional campaigns, event days)
- Programs that offer structured opportunities for physical activity and social interaction (e.g., walking groups, exercise classes, organized sports)
- Access enhancements including transportation connections, street crossings, and expanded hours of operation

CPSTF Finding (July 2021)

The Community Preventive Services Task Force (CPSTF) recommends interventions that combine park, trail, or greenway infrastructure improvements with one or more additional interventions to increase physical activity and infrastructure use. Additional interventions may engage the community, increase awareness, expand programs, or enhance access. Sufficient evidence shows these interventions increase the number of people who engage in moderate-to-vigorous physical activity. Evidence also shows meaningful increases in the number of people who use the park, trail, or greenway.

CPSTF finds insufficient evidence to determine the effectiveness of infrastructure improvements alone (i.e., implemented without additional interventions) for increasing physical activity. Evidence shows inconsistent results for physical activity (considered the primary outcome) and meaningful increases in the number of people who use the park, trail, or greenway following infrastructure improvements.

CPSTF finds the economic benefits exceed the cost for park, trail, and greenway infrastructure interventions to increase physical activity and use.

Rationale

Basis of Finding

The CPSTF findings are based on a systematic review of 38 studies (published through July 2020). The review combined 26 studies of park, trail, or greenway interventions identified from a published systematic review (Hunter et al. 2019; search period through August 2016) with 12 studies identified in an updated search that used the same search terms (search period August 2016 to July 2020).

The systematic review team divided the included studies into two categories, as was done by Hunter et al. (2019):

1. Infrastructure interventions (21 studies) that combined park, trail, or greenway improvements with one or more additional interventions (i.e., community engagement, awareness activities, programming, access enhancements)
2. Infrastructure improvements without additional interventions (17 studies)

Within each category, the review team considered evidence by the location of infrastructure evaluated (park, and trail or greenway; see Table 1), and the physical activity measure used.

Table 1. Type of Infrastructure Evaluated

Infrastructure Type	Combined with Additional Interventions	Infrastructure-only
Park	12 studies	14 studies
Trail or greenway	9 studies	3 studies
Total	21 studies	17 studies

The review team was not able to calculate overall summary effect estimates for either of the categories because of differences in how studies measured or reported physical activity outcomes. CPSTF findings are based on summary effect estimates from 7 of the included studies that used similar measures for moderate or vigorous physical activity and an overall assessment of findings from the 31 remaining studies. Community Guide methods were used to determine overall direction of effect.

Infrastructure Interventions Combined with Additional Interventions

Twenty-one studies provided one or more outcome measures for park, trail, or greenway infrastructure improvements combined with additional interventions. Subsets of these studies provided common effect estimates for changes in moderate or vigorous physical activity (MVPA) in the study location (7 studies) and changes in the number of people using the park, trail, or greenway infrastructure (9 studies). Findings from these subsets are summarized below (Table 2).

Table 2. Effects of Infrastructure Interventions Combined with Additional Interventions

Outcome	Number of Studies	Median Study Effect Estimate	Direction of Effect
Relative change in the number of participants engaged in moderate or vigorous physical activity in the park, trail, or greenway (%)	7	17.0% (IQI: -3.3% to 29.1%)	Favors the intervention
Relative change in the number of people using the park, trail, or greenway (%)	9	18.3% (IQI: -2.4%, 130.6%)	Favors the intervention

IQI = interquartile interval

CPSTF also assessed physical activity outcomes for all 21 studies that combined infrastructure interventions with additional interventions. CPSTF evaluated the evidence for infrastructure interventions overall and for interventions conducted in 1) parks or 2) trails and greenways. Study effect estimates were categorized by outcome: physical activity in the improved infrastructure, total physical activity, and whether participants met recommended daily or weekly physical activity levels; study outcomes that did not fit into these groups were considered together (i.e., leisure time

physical activity, time spent in active travel). Studies that provided multiple measures of change in physical activity were included in all relevant categories (see Table 3).

Table 3. Summary of Study Findings for Infrastructure Interventions Combined with Additional Interventions

Outcome	Number of Studies	Direction and Reported Statistical Significance of Study Outcomes	Overall Direction of Effect
Overall (21 studies)			
Physical activity in the intervention location	11	3 favorable and significant, 4 favorable, and 4 no change	Favors the intervention
Total physical activity	4	2 favorable and significant 1 favorable, and 1 unfavorable	Favors the intervention
Physical activity meeting recommended levels	4	1 favorable and significant and 3 favorable	Favors the intervention
Other measures of physical activity	7	3 favorable, 4 no change, and 1 unfavorable	Inconsistent results
Park Subset (12 studies)			
Physical activity in the infrastructure location	9	3 favorable and significant, 3 favorable, and 3 no change	Favors the intervention
Total physical activity	0	Not Reported	Not Applicable
Physical activity meeting recommended levels	2	2 favorable	Favors the intervention
Other measures of physical activity	4	1 favorable, and 3 no change	Inconsistent results
Trail and Greenway Subset (9 studies)			
Physical activity in the infrastructure location	2	1 favorable, and 1 no change	Inconsistent results
Total physical activity	4	2 favorable and significant, 1 favorable, and 1 unfavorable	Favors the intervention
Physical activity meeting recommended levels	2	1 favorable and significant, and 1 favorable	Favors the intervention
Other measures of physical activity	4	2 favorable, 1 no change, and 1 unfavorable	Inconsistent results

Studies included in this review reported few outcomes beyond changes in physical activity and infrastructure use. One park study evaluated mental health and well-being across three different measurement scales (i.e., moods and feelings, anxiety, and depression) and reported no changes. One greenway and trail study estimated changes in CO2 emissions in the local area of the intervention and showed no change. One greenway and trail study assessing use showed favorable post-only single group results while one park study showed increased use compared to the control group.

Combined interventions included infrastructure improvements and at least one additional intervention, categorized as access (13) studies, community engagement (7 studies) programming (4 studies), or promotion (4 studies). Park infrastructure interventions involved building new structures (8 studies), renovating existing structures (8 studies), and adding signage (2 studies). These strategies were not mutually exclusive as interventions often renovated existing structures and introduced new park spaces at the same time. Greenway and trail infrastructure interventions created new greenways and trails (6 studies), extended existing greenways and trails (2 studies), or added signage (1 study).

Studies of infrastructure interventions combined with additional interventions were conducted for fewer than 12 months (5 studies), 12 to 24 months (11 studies), or more than 24 months (4 studies). Few studies provided repeated measurements over time, but effects on physical activity and infrastructure use were greater for studies conducted between 12 to 24 months than they were for shorter or longer studies.

Infrastructure Only Interventions

Seventeen studies provided one or more outcome measures on the effectiveness of park, trail, or greenway infrastructure improvements when implemented without additional interventions. Physical activity outcomes reported in the included studies could not be combined to provide summary effect estimates. A subset of the studies provided common effect estimates for changes in the number of people who used the park, trail, or greenway infrastructure (9 studies). Findings from this subset are summarized below (Table 4).

Table 4. Summary Estimate for the Effect of Infrastructure-only Interventions on Park, Trail, and Greenway Use

Outcome	Number of Studies	Median Study Effect Estimate	Direction of Effect
Relative change in the number of people using the park, trail, or greenway (%)	9	32.1% (IQI: (-10.9%, 335.9%))	Favors the intervention

IQI = interquartile interval

One additional study used a different effect measure and reported a meaningful increase in park use following improvements to provide shaded areas.

CPSTF also assessed the evidence for infrastructure only interventions overall and for interventions conducted in 1) parks or 2) trails and greenways. Studies providing multiple measures of change in physical activity were included in all relevant categories. Results are summarized in Table 5.

Table 5. Summary of Study Findings Examining the Effectiveness of Infrastructure-only Interventions on Physical Activity

Outcome	Number of Studies	Direction and Reported Statistical Significance of Study Outcomes	Overall Direction of Effect
Overall (17 studies)			
Physical activity in the infrastructure location	10	2 favorable and significant, 3 favorable, 4 no change, and 1 unfavorable	Inconsistent results
Total physical activity	5	1 favorable, 3 no change, and 1 unfavorable	Inconsistent results
Physical activity meeting recommended levels	0	Not Reported	Not Applicable
Other measures of physical activity	6	3 favorable, 2 no change, and 1 unfavorable and significant	Inconsistent results
Park Subset (14 studies)			
Physical activity in the location	10	2 favorable and significant, 3 favorable, 4 no change, and 1 unfavorable	Inconsistent results
Total physical activity	2	1 favorable, and 1 no change	Inconsistent results

Outcome	Number of Studies	Direction and Reported Statistical Significance of Study Outcomes	Overall Direction of Effect
Physical activity meeting recommended levels	0	Not Reported	Not Applicable
Other measures of physical activity	3	3 favorable	Favors the intervention
Trail and Greenway Subset (3 studies)			
Physical activity in the Location	0	Not Reported	Not Applicable
Total physical activity	3	2 no change, 1 unfavorable	Inconsistent results
Physical activity meeting recommended levels	0	Not Reported	Not Applicable
Other measures of physical activity	3	2 no change, 1 unfavorable and significant	Inconsistent results

Studies reported few outcomes other than changes in physical activity and infrastructure use. Four additional outcomes were reported in two of the park studies. One study found a significant improvement in participants’ self-reported measure of overall health, as well as a significant increase in their perception of park safety following intervention. Another study found no change in participants’ self-reported well-being, but a favorable increase in perceptions of community cohesion.

Infrastructure-only interventions implemented in parks created new parks (1 study), added new structures (3 studies), renovated existing structures (7 studies), or combined new construction with renovations (2 studies). Greenway and trail interventions created new (1 study) or extended existing greenways and trails (2 studies).

Applicability and Generalizability Issues

The CPSTF assessment on applicability of the evidence on effectiveness focused on infrastructure interventions combined with additional interventions (21 studies).

Intervention Settings

The CPSTF finding is applicable to urban and suburban settings in the United States. Studies were conducted in the United States (14 studies), Australia (3 studies), the United Kingdom (2 studies), Canada (1 study), and the Netherlands (1 study). Half of the study interventions were implemented in urban areas (10 studies). The remaining studies were conducted in both urban and suburban (5 studies), suburban (2 studies), and rural (1 study) areas; three studies did not report this information. Additional studies are needed to examine the effectiveness of these interventions when implemented in rural settings and Indian Country.

Population Characteristics

The CPSTF finding is applicable to the general U.S. population. Demographic characteristics, however, were incompletely captured or reported. Only six studies provided information on age of study participants. Most participants were adults (mean 57.5%, 4 studies), followed by children (mean 29.9%, 3 studies), teenagers (mean 14.4%, 3 studies), and older adults (mean 6.0%, 4 studies). Thirteen studies provided data on gender and reported a similar distribution of females (median 54.4%) and males (median 45.9%).

Demographics for race and ethnicity were incompletely captured or reported, though nine of 14 studies conducted in the United States provided some information. In studies that collected information at the individual level, study participants were White (median 44.9%; 7 studies), Black or African American (median 52.6%; 6 studies), Hispanic or

Latino (50.0%, 79.2%; 2 studies) or Asian (0.6%, 10.1%; 2 studies). Five studies provided demographic characteristics of the community with residents who self-identified as Black or African American (median 27.0%; 4 studies), Hispanic or Latino (44.7%; 1 study), or White (45.4%, 47.3% 2 studies). None of the included studies provided stratified assessments of effectiveness by these characteristics. The CPSTF finding is likely applicable to interventions implemented in racial and ethnic minority communities.

Included studies provided limited information about individual or neighborhood socioeconomic status (SES). Participants in two U.S. studies provided information on annual household income (53.3% and 64.0% reported annual incomes less than \$35,000). Four U.S. studies reported community-level data on the proportion of households with incomes at or below poverty thresholds (median 32.2%; 4 studies). One study provided individual-level education data, with 75.1% of the sample reporting 16 years or more of education. Three studies provided community-level information on education (9.3% of participants had not graduated high school in one study, 91.5% had a college education in one study, and one study showed 44% had a high school diploma/GED).

Intervention Characteristics

The CPSTF finding is applicable to new or enhanced infrastructure for parks, trails, and greenways. Interventions conducted in parks (12 studies) and greenways and trails (9 studies) had similar effects on outcomes for physical activity and infrastructure use.

The CPSTF finding is likely applicable to the range of additional interventions coordinated with infrastructure improvements. The majority of studies added interventions to enhance access (13 studies), followed by community engagement (7 studies), programming (4 studies), and promotion (4 studies). Small numbers of studies and overlap of additional interventions limited CPSTF assessments on the effectiveness of specific combinations. Physical activity and use outcomes were similar for studies adding one additional intervention to the infrastructure improvement (14 studies) or two or more additional interventions (7 studies).

Data Quality Issues

Study designs used to evaluate infrastructure interventions combined with additional interventions included randomized controlled trials (1 study), other designs with a concurrent comparison group (10 studies), before-after designs with a comparison group (4 studies), time-series (2 studies), and before-after designs without a comparison group (4 studies). The most common limitations assigned, according to [Community Guide quality scoring methods](https://www.thecommunityguide.org/sites/default/files/publications/methods-ajpm-data-collection.pdf) [https://www.thecommunityguide.org/sites/default/files/publications/methods-ajpm-data-collection.pdf], were for sampling issues (14 studies), confounding (13 studies), data analysis issues (12 studies), and intervention and study description (10 studies).

Infrastructure-only designs included randomized controlled trials (1 study), other designs with a concurrent comparison group (3 studies), before-after designs with a comparison group (6 studies), and before-after designs without a comparison group (7 studies). The most common limitations assigned, according to [Community Guide quality scoring methods](https://www.thecommunityguide.org/sites/default/files/publications/methods-ajpm-data-collection.pdf) [https://www.thecommunityguide.org/sites/default/files/publications/methods-ajpm-data-collection.pdf], were for sampling issues (15 studies), intervention and study description (9 studies), and confounding (7 studies).

Overall, most (23 of 38) of the included studies were natural experiments in which researchers attempted to match intervention locations and neighborhoods with similar non-intervention locations and neighborhoods. However, researchers frequently noted differences in demographic characteristics, use of parks, trails, or greenways, and

measures of physical activity between intervention and comparison locations and communities at baseline. Baseline differences complicated assessments of change attributable to the evaluated interventions.

Potential Benefits

The CPSTF review considered evidence for a broad range of outcomes but found few included studies that evaluated additional benefits of park, trail, or greenway infrastructure interventions on mental health or well-being (Cummins et al., 2018, Dobbinson et al. 2020), quality of life, perceptions of safety or crime (Cohen et al. 2014), community cohesion (Dobbinson et al., 2020), or environmental outcomes (Goodman et al. 2014).

Benefits described in the broader literature included potential reductions in violence (Kondo et al. 2018) and urban heat effects (Gago et al. 2013), and improvements to air pollution (Nowak et al. 2006, Hartig et al. 2014) and water quality and stormwater management (Center for Watershed Protection 2017). These benefits were discussed in relation to greenspace improvements or overall greening (e.g., total green space from all sources) rather than specific infrastructure improvements.

CPSTF postulated additional potential benefits could include increased community appeal, enhanced economic development, and increased community satisfaction and resilience. They noted infrastructure improvements also may be used by groups in the community (e.g., exercise and walking groups, bicycle clubs, nature groups) as a common location for health-related and recreational activities.

Potential Harms

None of the included studies for the effectiveness or economic reviews described or examined potential harms of park, trail, or greenway infrastructure interventions alone or in combination with additional interventions. Two potential harms were described in the broader literature. One harm resulted from long-term and persisting inequities in the distribution of resources to communities with lower incomes, including resources to create and support infrastructure improvements and additional interventions (Wolch et al 2005, Rigolon et al. 2018, Sefcik et al. 2019). The other potential harm related to displacement or exclusion of current residents from neighborhoods if infrastructure improvements increased community appeal and demand for services, homes, and rental properties and resulted in gentrification (Wolch et al. 2014, Richardson et al. 2019, Rigolon et al. 2020, Jelks et al. 2021).

The Department of Housing and Urban Development (HUD) defines gentrification as a form of neighborhood change that occurs when higher-income groups move into low-income areas, potentially altering the cultural and financial landscape of the original neighborhood (HUD 2018). One study of parks, greenways, preserves, gardens, or recreation areas built in the United States or Europe during 1990-2019 found the infrastructures were associated with increases in an index of gentrification (Anguelovski et al. 2022). A study of parks built during 2000-2015 in ten U.S. cities found an association between park infrastructure and gentrification (Rigolon et al. 2020). Two studies of new U.S. parks projects (Compton et al. 2020) and new trails and greenways projects (Compton et al. 2019) found that large projects were associated with increases in property values, particularly for trails and greenways. Increased property values are associated with higher rents for current tenants and increased property tax burden for homeowners.

The findings from these studies raise CPSTF concerns about inequities in the distribution of resources to communities with lower incomes, and with gentrification and displacement associated with large park, trail, and greenway projects.

Economic Evidence

The economic evidence shows benefits exceed the cost for park, trail, and greenway infrastructure interventions to increase physical activity and use. The systematic review only included studies reporting cost-benefit or cost-effectiveness information. The review excluded studies based on hypothetical projects—those where parks, trails, or greenways, or their modifications were proposed but not implemented. The review also excluded studies that did not assess either the economic benefits from improved health due to increased physical activity or the value of the infrastructure to users for recreation or relaxation.

The economic review included seven cost-benefit studies and one cost-effectiveness study (search period through March 2022). The eight included studies evaluated only the infrastructure component of the interventions; none provided economic information for additional interventions implemented to increase community engagement, public awareness, programming, or access. All monetary values are in 2021 U.S. dollars.

Studies were conducted in the United States (1 study), Australia (2 studies), Czech Republic (1 study), Italy (1 study), Spain (1 study), and the United Kingdom (2 studies). Economic benefits were derived from improved health due to physical activity (4 studies) or from the value of the infrastructure to users for recreation or relaxation (5 studies). One study from the United Kingdom provided cost-effectiveness evidence; the remaining seven studies provided cost-benefit evidence.

The economic review team assessed the quality of estimates from each study based on the following:

- Whether drivers of cost or drivers of benefit were included in the estimate; and
- How well measurement and estimation methods met the following criteria:
 - Actual versus modeled outcomes
 - Inclusion of benefits derived from observed changes in physical activity or use of the infrastructure
 - Where modeled, parameters of the model drawn from research literature and adapted to the local area (e.g., parameters determining effect of physical activity on future disease and cost)
 - Estimation used standard methods established in the evaluation literature (e.g., stated preference, travel cost)
 - Appropriate time horizons used to calculate benefits
 - Appropriate discounting of future values
 - Avoided duplication in the count of similar benefits
 - Performed sensitivity analysis

Intervention Cost

- The median one-time capital cost for park, trail, and greenway infrastructure interventions was \$8,679,850 (IQI: \$3,324,633 to \$29,554,218), and the median annual maintenance cost was \$34,570 (IQI: \$14,377 to \$116,069), based on 7 estimates from 7 studies.
- The most frequently assessed limitations for intervention cost estimates (6 good quality, 2 fair quality) were missing capital or maintenance costs.

Intervention Benefit

- The median annual benefit was \$994,000 (IQI: \$166,837 to \$4,708,862), based on 7 estimates from 7 studies.

- The most frequently assessed limitations for intervention benefit estimates (4 good quality, 3 fair quality) were missing health benefits from physical activity, missing mental health benefits, possibility of double counting, and inadequate sensitivity analysis.

Cost-Effectiveness

- The cost per disability-adjusted life year (DALY) averted was \$23,254, based on 1 study.
- The cost per DALY estimate was good quality, though it did not account for benefits from improved mental health.

Cost-Benefit

- The median benefit to cost ratio was 3.1 (IQI: 2.9 to 3.9), based on 7 estimates from 7 studies. Six benefit-to-cost ratio estimates were greater than 1 and one estimate was less than 1. All values within the IQI were greater than 1.
- Of the 7 cost-benefit estimates, 3 were of good quality and 4 were of fair quality.

The systematic economic review finds economic benefits exceed the cost for park, trail, and greenway infrastructure interventions to increase physical activity and use. There were not enough studies to determine cost-effectiveness.

Considerations for Implementation

The following considerations for implementation are drawn from studies included in the existing evidence review, the broader literature, and expert opinion, as noted below.

As elements of neighborhoods and the built environment, parks, trails, and greenways are modifiable social determinants of health (Healthy People 2030). Studies and implementation guidance (generally focused on parks) identified in the broader literature describe public health and community opportunities to engage in the planning, allocation, and evaluation of these community improvements to advance health equity.

Equitable park access can be defined as the just and fair quantity of, and proximity and connection to, quality parks and programs that are safe, inclusive, culturally relevant and welcoming to everyone (National Recreation and Park Association 2020). To achieve this, decision makers may use health equity principles to guide park priorities and investments in ways that involve and sustainably benefit communities (Cole et al. 2019).

Equity-based park guidelines emphasize cross-sector partnerships, community engagement, and strategic data collection and analysis (National Recreation and Park Association 2020, Trust for Public Land 2020). When cities, counties, and public health departments form partnerships across multiple sectors (e.g., city planning, parks and recreation, transportation, cultural affairs, local arts community, healthcare including mental health, local nonprofits and businesses, law enforcement, public works, and other private sector partners) early in the process, they can coordinate community-wide planning and align their goals and vision (Cole et al. 2019, National Recreation and Park Association 2020, Trust for Public Land 2020). These cross-sector partnerships may tap into a broad network of expertise, and community relationships and resources.

Engaging with the community to expand representation on park advisory committees increases inclusivity and helps ensure the ideas, experiences, socio-cultural identity, and history of a cross-section of the community are reflected in the planning, design, installation, and maintenance of the park (Cole et al. 2019, Eldridge et al. 2019). Collecting and analyzing data as part of the planning process may help identify existing inequities and barriers to park distribution,

access, use, and benefits among residents who have been excluded or marginalized. Follow-up assessments identify persisting issues and evaluate progress towards addressing barriers and inequities (National Recreation and Park Association 2020).

Several organizations offer implementation guidance for incorporating equity into parks, greenway, and trail interventions.

The [National Recreation and Park Association](https://www.nrpa.org/) [https://www.nrpa.org/] advocates for parks and recreation throughout communities with emphasis on health and wellness, equity, and conservation.

- [Equity and Accessibility](https://www.nrpa.org/our-work/Three-Pillars/equity/) [https://www.nrpa.org/our-work/Three-Pillars/equity/]
- [Creating Equity-Based System Master Plans](https://www.nrpa.org/publications-research/best-practice-resources/creating-equity-based-system-master-plans/) [https://www.nrpa.org/publications-research/best-practice-resources/creating-equity-based-system-master-plans/]

The [Trust for Public Land](https://www.tpl.org/) [https://www.tpl.org/] works to create recreational spaces and provides a tool kit for collaborating with communities in the development of parks.

- [The Toolkit for Health, Arts, Parks, and Equity](https://www.tpl.org/the-toolkit-for-health-arts-parks-and-equity) [https://www.tpl.org/the-toolkit-for-health-arts-parks-and-equity]

The [Safe Routes Partnership](https://www.saferoutespartnership.org/safe-routes-school) [https://www.saferoutespartnership.org/safe-routes-school] provides fact sheets, toolkits, and infographics to help communities implement active travel to parks.

- [Safe Routes to Parks](https://www.saferoutespartnership.org/healthy-communities/saferoutestoparks) [https://www.saferoutespartnership.org/healthy-communities/saferoutestoparks]
- [Equity Resources](https://www.saferoutespartnership.org/healthy-communities/equity/equity-resources) [https://www.saferoutespartnership.org/healthy-communities/equity/equity-resources]

The [Rails to Trails Conservancy](https://www.railstotrails.org/) [https://www.railstotrails.org/] provides implementation and equity guidance relevant to trails and greenways.

- [Equitable Investment in Trails, Walking and Biking](https://www.railstotrails.org/build-trails/trail-building-toolbox/funding/equitable-investment-in-trails-walking-and-biking/) [https://www.railstotrails.org/build-trails/trail-building-toolbox/funding/equitable-investment-in-trails-walking-and-biking/]

The [City Parks Alliance](https://cityparksalliance.org/) [https://cityparksalliance.org/] is a network of leaders in urban parks and recreation that shares research and tools, including those promoting health equity and environmental practices.

- [Equitable Park Funding Hub](https://cityparksalliance.org/funding-hub/) [https://cityparksalliance.org/funding-hub/]
- [Land and Water Conservation Fund](https://cityparksalliance.org/resource/land-and-water-conservation-fund/) [https://cityparksalliance.org/resource/land-and-water-conservation-fund/]

[Healthy Places by Design](https://healthyplacesbydesign.org/socially-connected-communities-solutions-for-social-isolation/) [https://healthyplacesbydesign.org/socially-connected-communities-solutions-for-social-isolation/] works to advance community-led action across the country. They provide reports and action guides for local government leaders and organizations as well as information about their Community Action model.

- [Socially Connected Communities Action Guides](https://healthyplacesbydesign.org/socially-connected-communities-solutions-for-social-isolation/) [https://healthyplacesbydesign.org/socially-connected-communities-solutions-for-social-isolation/]
- [Community Action Model](https://healthyplacesbydesign.org/community-action-model/) [https://healthyplacesbydesign.org/community-action-model/]

The [Prevention Institute](https://preventioninstitute.org/) [https://preventioninstitute.org/] has developed a toolkit for community-based organizations, including a park equity toolkit tip sheet and a webinar series.

- [Advocacy Toolkit for Park Equity, Life Expectancy, and Power Building](https://preventioninstitute.org/tools/advocacy-toolkit-park-equity-life-expectancy-and-power-building) [https://preventioninstitute.org/tools/advocacy-toolkit-park-equity-life-expectancy-and-power-building]

Park, trail, and greenway interventions may be linked or coordinated with other elements of the built environment including two CPSTF-recommended approaches to increase physical activity:

- [Built Environment Approaches Combining Transportation System Interventions with Land Use and Environmental Design](https://www.thecommunityguide.org/findings/physical-activity-built-environment-approaches) [https://www.thecommunityguide.org/findings/physical-activity-built-environment-approaches] (2016)
- [Interventions to Increase Active Travel to School](https://www.thecommunityguide.org/findings/physical-activity-interventions-increase-active-travel-school) [https://www.thecommunityguide.org/findings/physical-activity-interventions-increase-active-travel-school] (2018)

[Greening-without-Gentrification](https://www.ioes.ucla.edu/wp-content/uploads/Greening-without-Gentrification-report-2019.pdf) [https://www.ioes.ucla.edu/wp-content/uploads/Greening-without-Gentrification-report-2019.pdf] proposes strategies to prevent or reduce the possible harms of gentrification or displacement of current residents following the establishment of large parks, trails, or greenways.

This CPSTF review focused on infrastructure interventions (with or without additional interventions). Only studies evaluating new construction or improvements to infrastructure were included. CPSTF did not examine interventions to increase physical activity in, or use of, existing infrastructure. These interventions might focus on activities to engage the community, increase awareness, expand programming, or enhance access. CPSTF also did not examine interventions to support use of existing locations by other groups in the community (e.g., exercise and walking groups, bicycle clubs, nature groups, park prescriptions from health care providers).

Evidence Gaps

CPSTF identified several areas that have limited information. Additional research and evaluation could help answer the following questions and fill remaining gaps in the evidence base.

Additional intervention studies are needed to clarify the inconsistent evidence on effectiveness of new or enhanced park, trail, or greenway infrastructure when implemented without additional interventions.

Overall

- How effective are infrastructure improvements alone, or in combination with additional interventions, in improving the following outcomes:
 - Fitness
 - Mental health including measures of anxiety, depression, and well-being
 - Perceptions of social cohesion and connectiveness
 - Injuries
 - Quality of life
 - How effective are infrastructure improvements alone, or in combination with additional interventions, when implemented in rural settings, Indian Country, and in communities with lower incomes or different levels of educational attainment?
- Which characteristics of infrastructure improvements are consistently effective in increasing physical activity and use?
- Which additional interventions, or combinations of interventions, are most effective at increasing physical activity and use?
- How effective are park, trail, and greenway infrastructure improvements alone, or in combination with additional interventions, in reducing perceptions of crime, and improving perceptions of safety among members of the community?

- Which interventions, or combinations of interventions, are most effective in addressing barriers to use of parks, trails, and greenways among the following populations?
 - Communities with lower incomes
 - Older adults
 - People with disabilities

Park interventions

- Which park improvements (e.g., signage and other wayfinding aids, park-based trails, indoor or outdoor fitness centers, ball fields and courts, skateparks) are consistently effective in increasing physical activity and the number of people who make use of the location?
- Which additional interventions, or combinations of interventions, are most effective at the following:
 - increasing physical activity in parks or in the community
 - increasing use of parks
 - improving mental health outcomes

Trail and greenway interventions

- Which infrastructure improvements (e.g., signage and other wayfinding aids, pedestrian focused enhancements, cycling enhancements, pedestrian and cycling enhancements) are consistently effective in increasing physical activity and the number of people who make use of the location?
- Which additional interventions, or combinations of interventions, are most effective at the following:
 - increasing physical activity in the trail or greenway, or in the surrounding community
 - increasing use of the trail or greenway
 - improving mental health outcomes

Economic Evidence Gaps

- The following questions are proposed as priorities for economic research and evaluation:
 - What is the cost-effectiveness of park, trail, and greenway interventions?
 - What are the economic effects of neighborhood displacement on residents from historically disadvantaged racial and ethnic populations and populations with lower incomes?
- Remaining questions for research and evaluation identified in the economic review include the following:
 - What are the costs and benefits for additional interventions (e.g., promotion, access, community engagement) when implemented in combination with park, trail, and greenway infrastructure interventions?
 - What are the economic benefits from improved mental health and well-being due to park, trail, and greenway infrastructure interventions?
 - What are the economic outcomes of interventions implemented in rural areas?
 - How does compliance with the Americans with Disabilities Act of 1990 and other regulations supporting access for people with disabilities impact costs?

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