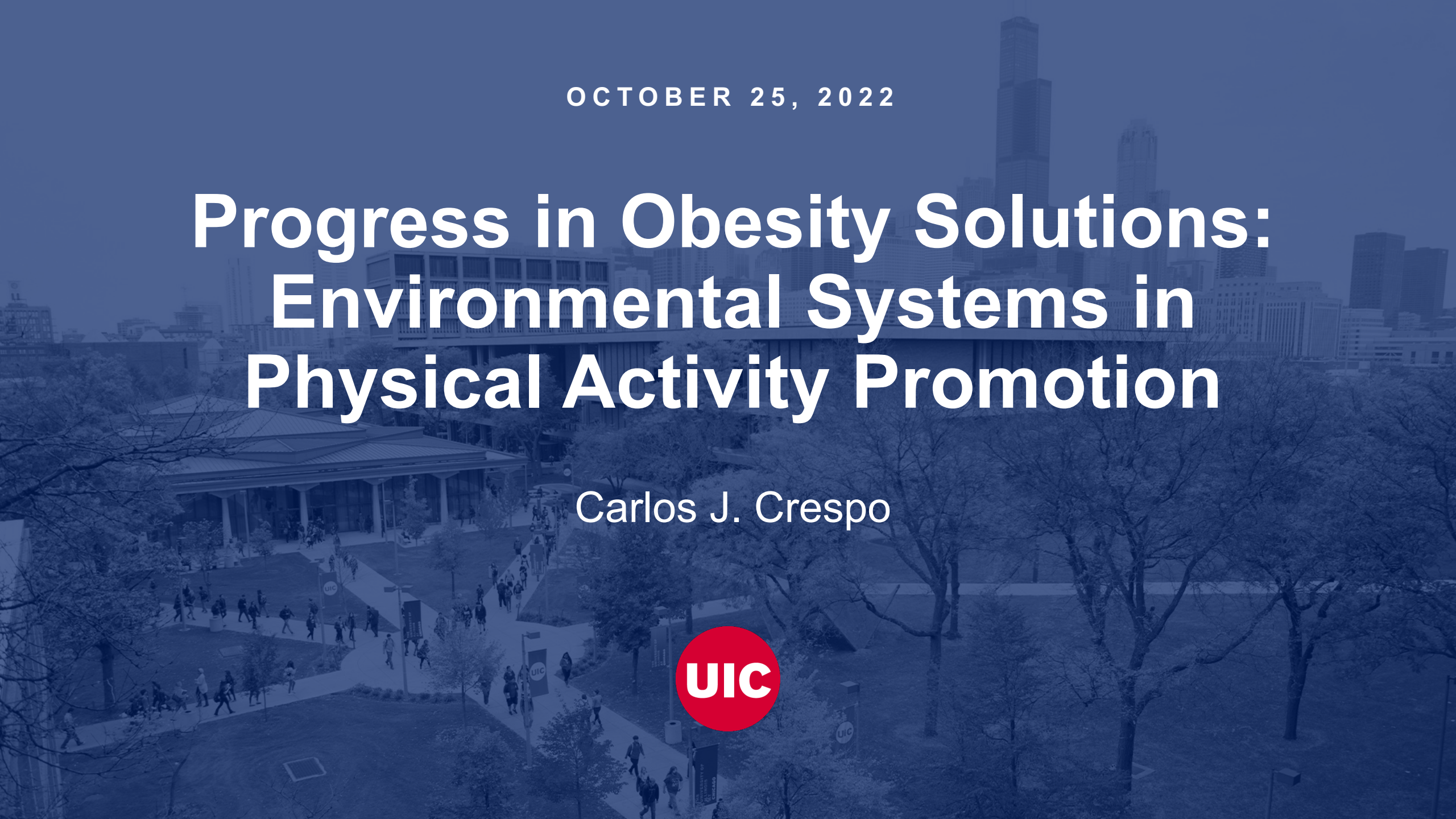


OCTOBER 25, 2022

Progress in Obesity Solutions: Environmental Systems in Physical Activity Promotion

Carlos J. Crespo

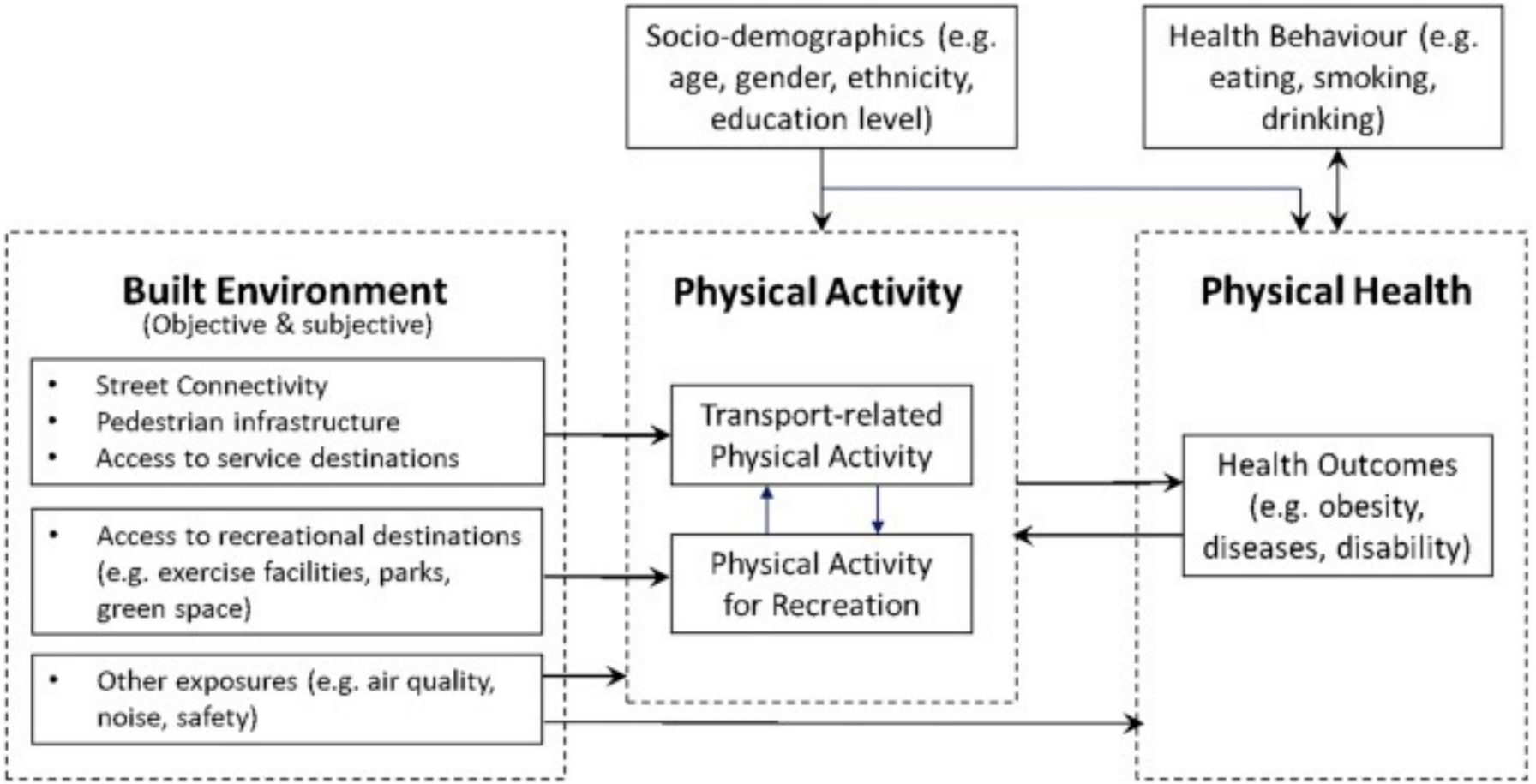
UIC

I have no conflict of interest to disclose

Major Points: Environmental Systems and Physical Activity

1. Social Environment
2. Built Environment
3. Community Guide
4. Recommendations

Conceptual model. Interactions among socio-demographics, built environment, physical activity and physical health



Source: Song S. et al., Neighbourhood Built Environment, physical activity, and physical health among older adults in Singapore: A simultaneous equations approach, Journal of Transport & Health, 18, 2020

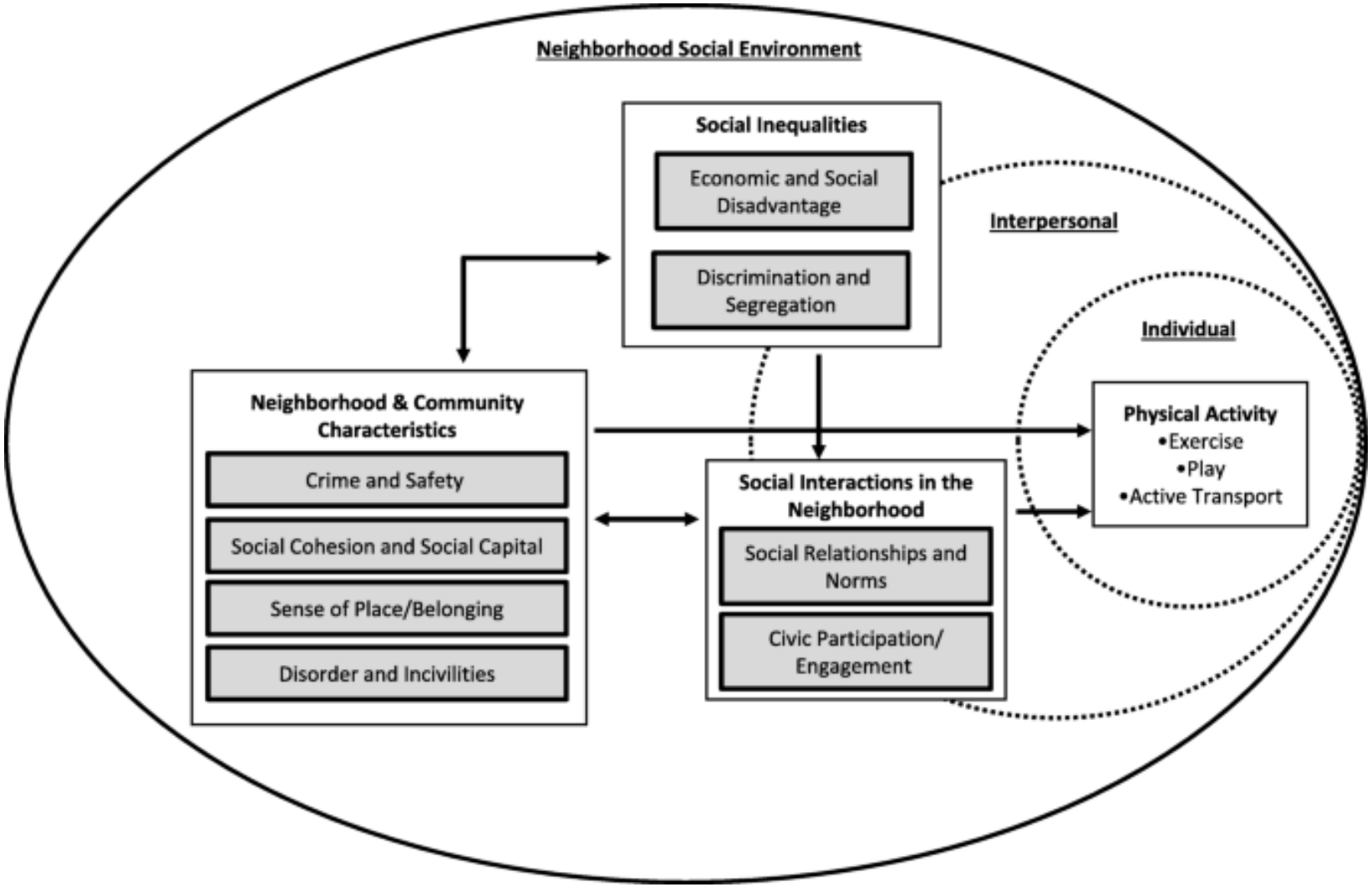
Social Environment and Physical Activity

Social Systems and Physical Activity

- SOCIAL SYSTEMS HAVE EMERGED AS DETERMINANTS OF PHYSICAL ACTIVITY IN ADULTS.
- THE REMOVAL OF BARRIERS SUCH AS UNAFFORDABLE FACILITIES AND UNAVAILABLE CHILDCARE, HIGH CRIME RATES, FEAR FOR PERSONAL SAFETY AND CULTURALLY INAPPROPRIATE ACTIVITIES ARE OF PRIMARY IMPORTANCE.
- SOCIAL SUPPORT FROM FAMILY, PEERS, COMMUNITIES AND HEALTHCARE PROVIDERS HAS RESULTED IN MODEST IMPROVEMENTS ACROSS CULTURES, AGES AND GENDERS IN SELECTED SETTINGS, BUT THE DEFINITION OF SPECIFIC INTERVENTIONS AND THEIR OUTCOMES DESERVE ADDITIONAL ATTENTION.

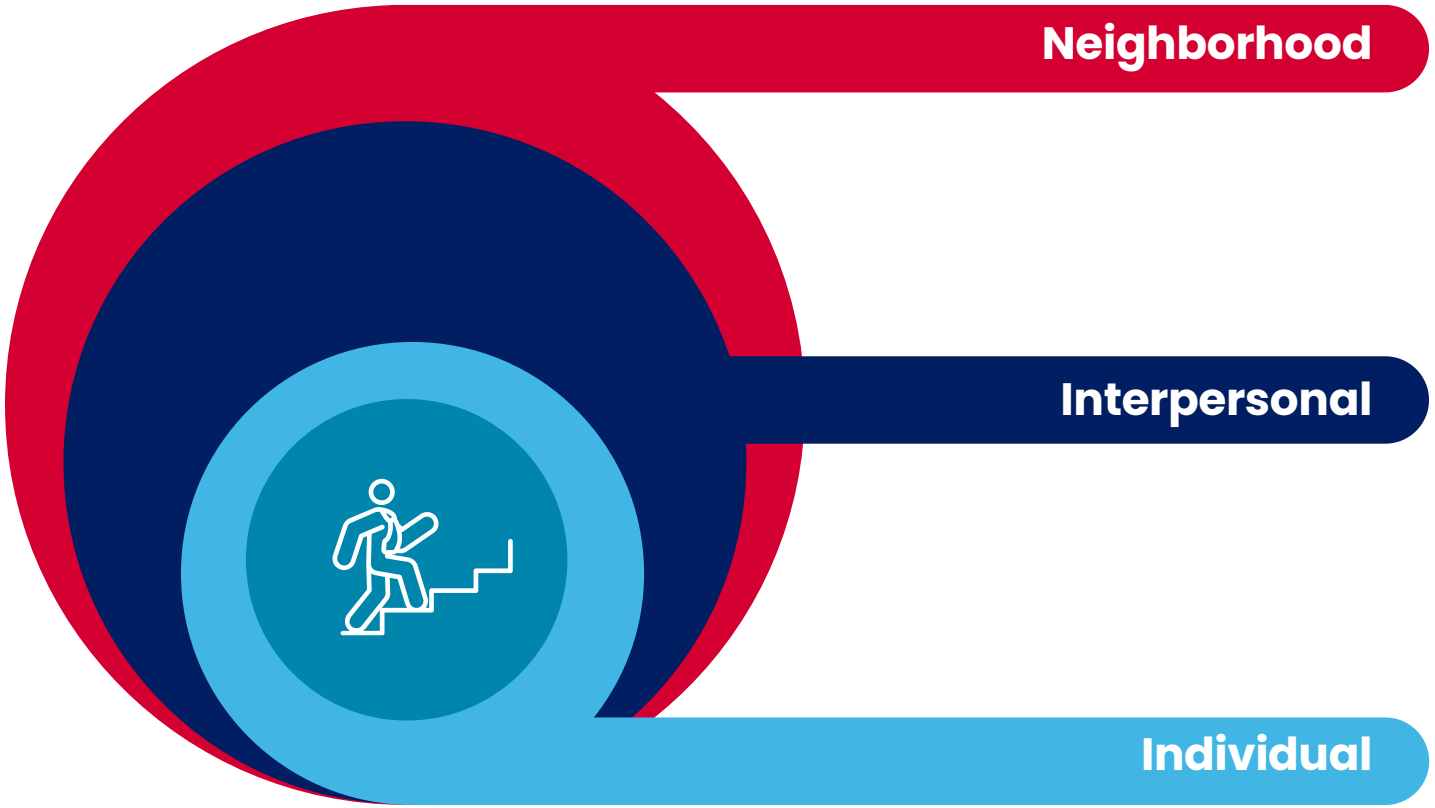
*Source: Seefeldt, V., Malina, R.M. & Clark, M.A. Factors Affecting Levels of Physical Activity in Adults. Sports Med **32**, 143–168 (2002).*

Conceptual Model of the Neighborhood Social Environment and Physical Activity - Measurements



*Source: Kepper, M.M., Myers, C.A., Denstel, K.D. et al. The neighborhood social environment and physical activity: a systematic scoping review. Int J Behav Nutr Phys Act **16**, 124 (2019). https://doi.org/10.1186/s12966-019-0873-7. Adapted from McNeill et al. (2006) Soc Sci Med and Suglia et al. (2016) J Urban Health*

Neighborhood Social Environment and Physical Activity



- Community Characteristics
- Crime, Incivility and Safety
- Sense of Place and Belonging

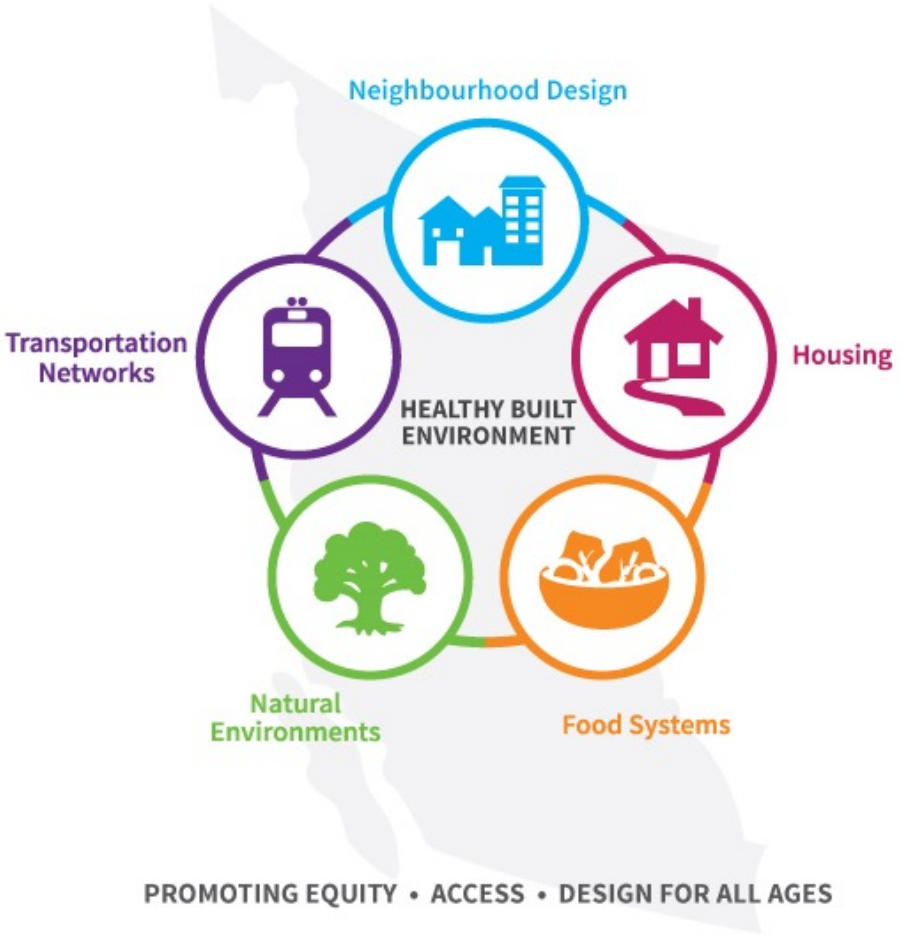
- Social Interactions
- Social Inequalities
- Civic Participation

- Exercise and Sports
- Play and LTPA
- Active Transport

Built Environment

Background: Impact of the built environment on health

- The built environment includes all of the physical parts of where we live, work and play such as homes, buildings, streets, open spaces, and infrastructure.
- The built environment influences a person's level of physical activity, e.g., no sidewalks and bicycle or walking paths contribute to sedentary habits.
- These habits lead to poor health outcomes such as obesity, diabetes, and other chronic diseases



Source:CDC.https://www.cdc.gov/nceh/publications/factsheets/impactofthebuiltenvironmentonhealth.pdf

Elements of the Built Environment System

TRANSPORTATION

LAND USE

URBAN DESIGN

SERVICE FACILITIES

Elements of the Built Environment System

TRANSPORTATION

- Bike facilities
- Walkability
- Connectivity
- Public transit stations
- Urban greenway

LAND USE

URBAN DESIGN

SERVICE FACILITIES

Elements of the Built Environment System

TRANSPORTATION

LAND USE

- Green open space
- Population density
- Mixed-use: diversity

URBAN DESIGN

SERVICE FACILITIES

Elements of the Built Environment System

TRANSPORTATION

LAND USE

URBAN DESIGN

SERVICE FACILITIES

- Shops and stores supply
- Recreation and fitness facilities
- Food market supply

Elements of the Built Environment System

TRANSPORTATION

LAND USE

URBAN DESIGN

- Neighborhood design
- Urban sprawl
- Urban renewal projects

SERVICE FACILITIES

Elements of the Built Environment System that Influence Physical Activity

TRANSPORTATION

- Bike facilities
- Walkability
- Connectivity
- Public transit stations
- Urban greenway

LAND USE

- Green open space
- Population density
- Mixed-use - diversity

URBAN DESIGN

- Neighborhood design
- Urban sprawl
- Urban renewal projects

SERVICE FACILITIES

- Shops and stores supply
- Recreation facilities
- Food market supply

But wait, there is more

Cleanliness

Harmony and variety of buildings

The condition of individual buildings

Potentially dangerous sites

Greenery and plantings

Parks and other open space

The streetscape

Signage

Lighting

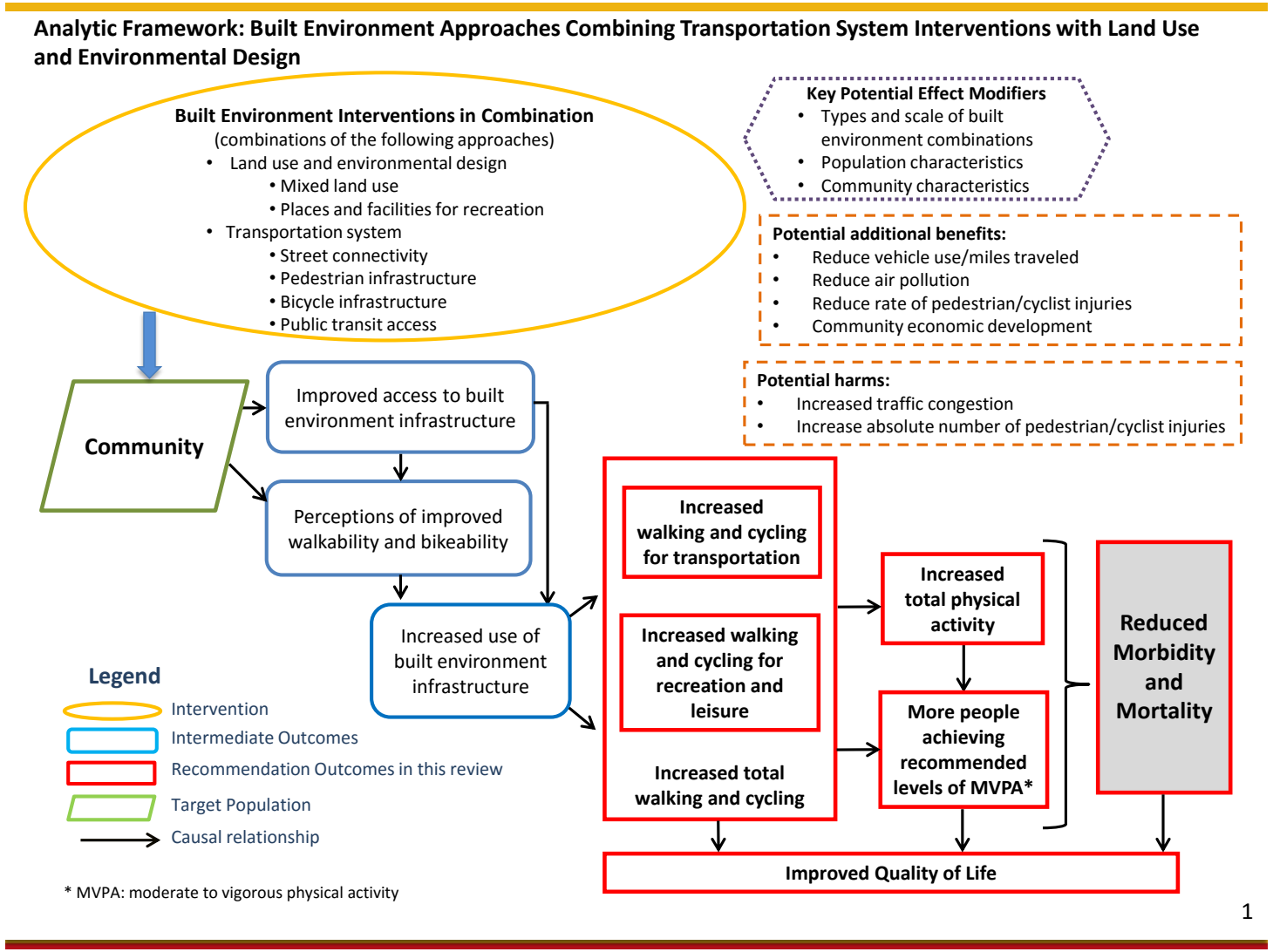
Traffic

Parking

Influence of the Social and Built Environment on Physical Activity

Evidence-based Recommendations
The Community Guide
Community Preventive Services Task Force

The Community Guide: Systematic Review Analytic Framework



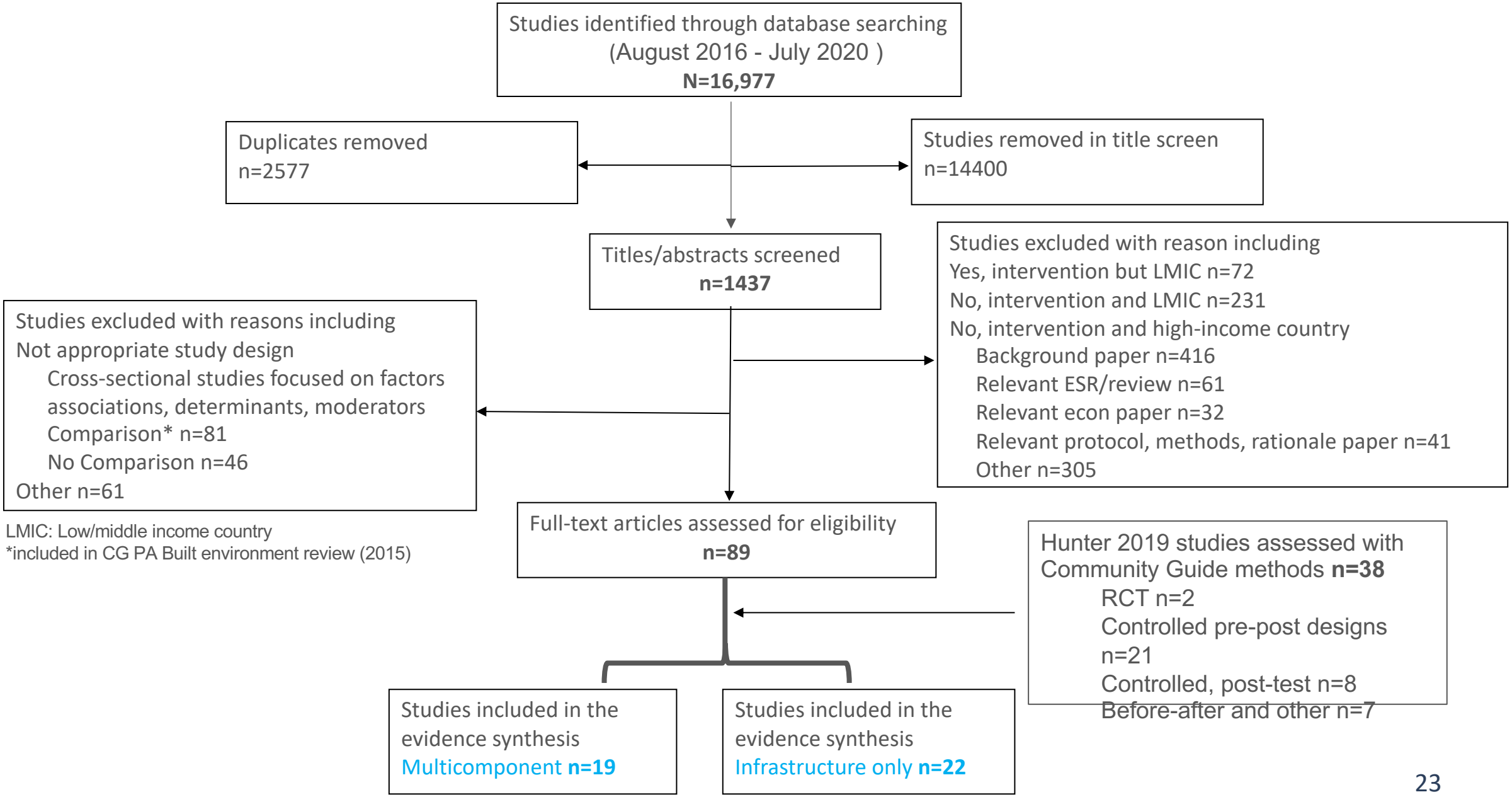
Physical Activity: Built Environment Approaches Combining Transportation System Interventions with Land Use and Environmental Design

Source: https://www.thecommunityguide.org/findings/physical-activity-built-environment-approaches.html

Community Guide Review Research Questions

- How effective are “park” infrastructure interventions, alone or in combination with additional interventions at:
  - Increasing physical activity?
  - Improving mental health and well being?
  - Improving quality of life?
  - Reducing morbidity and mortality?
- Do “park” infrastructure interventions improve outcomes for the following
  - Increasing the number of people using the location?
  - Reducing injuries?
  - Improving social outcomes (e.g., reducing crime and violence)?
  - Improving environmental outcomes?
- Does the effectiveness of “park” infrastructure interventions vary by:
  - Type of infrastructure?
  - Combination with additional interventions?
  - Setting and demographic characteristics of the community?

Parks Review (2021) - Update Search Yield



LMIC: Low/middle income country
*included in CG PA Built environment review (2015)

Overall Body of Evidence (N=41)

Intervention Type	Multicomponent Subset	Infrastructure only Subset
Park-based	9 studies	14 studies
Greenway and trails	10 studies	3 studies
Urban greening	4 studies	6 studies
Total*	**23 studies**	**23 studies**

*Categories are not mutually exclusive

Multicomponent Subset: Additional Interventions

Interventions	Examples
Programming additions/changes	Activities for children, families, seniors
Access improvements	Extending park hours
Promotion of use	Advertising park improvements
Community engagement	Involving community members in improvement decisions

Analyses and Presentation Decisions: Legend for Tables

Direction and Significance	Symbol
Favorable direction, statistically significant ($p < 0.05$)	++
Favorable direction	+
No change	ø
Unfavorable direction	-
Unfavorable direction, statistically significant ($p < 0.05$)	--

Findings from the Report to the Community Preventive Service Task Force on the Effectiveness of Combined Built Environment Changes and Physical Activity

Projects (natural experiments) were the primary form of evidence considered for the CPSTF conclusion

Category of Evidence on Effectiveness	Transport walk/bike	Recreation walk/bike	Total Walking	Total Physical Activity	Various MVPA	MVPA Meeting Recommended Levels
Projects (11 studies)	Favorable	Mixed	Not enough information	Not enough information	Not enough information	Not enough information
Sprawl Studies (6 studies)	Favorable	Not enough information	Not enough information	Not enough information	Not enough information	Not enough information
Neighborhood Comparisons (7 Studies)	Favorable	Favorable	Not enough information	Not enough information	Not enough information	Not enough information
Summary Score Comparisons (66 studies)	Favorable	Favorable	Favorable	Mixed	Favorable	Favorable

MVPA: Moderate to Vigorous Physical Activity

Evidence-based recommendations

Land use and environmental design interventions:

- **Mixed land use environments that increase the diversity and proximity of local destinations**
- **Access to parks, and other public or private recreational facilities**

Transportation system:

- **Street connectivity**
- **Sidewalk and trail infrastructure**
- **Bicycle infrastructure**
- **Public transit infrastructure and access**

The Community Preventive Services Task Force

- The CPSTF recommends park, trail, and greenway infrastructure interventions combined with additional interventions, such as structured programs or community awareness, to increase physical activity.

- A systematic review of evidence shows interventions lead to a 18.3% median increase in the number of people who used the parks, trails, or greenways and a 17% median increase in the number of people who used them to engage in moderate-to-vigorous physical activity

Recommendations

Combined Built Environment Features Help Communities Get Active

- The Community Preventive Services Task Force recommends combined built environment approaches to increase physical activity.
- These approaches combine new or enhanced transportation systems (e.g., pedestrian and cycling paths) with new or enhanced land use design (e.g., proximity to a store, access to a public park) to promote physical activity among residents.

Source: https://www.thecommunityguide.org/news/combined-built-environment-features-help-communities-get-active.html