INTERVENTION TABLE 21

Community Design

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
United States						
Wells, Yang (2008) Georgia, Florida, Alabama	Accessibility and presence of neighborhood land-use mix before and after a move to a newly designed neighborhood. Homes were built by Habitat for Humanity and families were relocated to new areas **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street network (accessibility) *Complex:* Not reported	**DESIGN:** Prospective cohort study **DURATION:** Not reported **SAMPLE SIZE:** 70 women total post-move; 32 women pre-and post-move; all women received housing through Habitat for Humanity in 4 towns in Southeast USA **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Digiwalker2 pedometers (step counts) 3. Geographic Information System [GIS] data (street griddedness, total length of street, total area of network buffer zone, number of intersections, number of cul-de-sacs, land-use mix and density, neighborhood type) 4. Activity log (physical activity) 5. 2000 Census and 2000 Census Transportation Planning Package (land-use, population, household, and employment density) **DATA COLLECTION:** Data were collected in 2003–2006. Post-move neighborhoods were characterized as either neo-traditional (porches, sidewalks, high density, mixed-land use) or suburban (large lots, no sidewalks, no shared recreation space). Data was captured using a using a Network Buffer Zone (NBZ). 2000 Census data were computed at the level of census tract or Traffic Analysis Zone (TAZ). Trained researchers collected sociodemographic data. Female head of household completed a brief activity log for 4 days; two weekdays and a full weekend. Steps per week were calculated based on 3 days of data. **LIMITATIONS:** Activity logs used self-reporting; data availability was limited; sample was not randomly selected; sample size was modest; pedometer-based walking data prevents an examination of neighborhood effects; pedometers cannot capture all kinds of activity	Adults Female, mean age of 37.6 (range 23-60) 77.1% African-American, 17.1% White, 5.7% Other (Asian, Latina, Native American), Mean annual income $15,967 (lower income) [evaluation sample] **ELIGIBILITY:** Written informed consent was acquired from each participant. **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** Researchers were from Cornell University and the University of Oregon. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not reported **ADOPTION:** Not reported **IMPLEMENTATION:** Not reported **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** 1. Labor and supplies for building. 2. Land for building 3. Moving costs **FUNDING:** Robert Wood Johnson Foundation and the Bronfenbrenner Life Course Center at Cornell University **STRATEGIES:** Not reported	**PHYSICAL ACTIVITY:** 1. (n=32) With respect to land-use mix, increases in the service-jobs-to-residents ratio from pre-to-post-move were associated with fewer steps per week (31,820 fewer steps per week, or 4,645 fewer steps per day, std. error=11,921.57, p=0.013). 2. (n=32) In terms of street network patterns, moving to an area with fewer cul-de-sacs was associated with about 5,303 more steps per week (757 more steps per day, std. error=2,219.76, p=0.025). 3. (n=70) Levels of walking in neo-traditional neighborhoods were slightly higher (62,207 steps/week) than in the suburban neighborhoods (58,617 steps/week) but not significantly (p=0.600).

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Li, Harmer (2009), Li, Harmer (2008), Li Harmer (2009) Oregon	Neighborhood walkability (mixed land-use) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Density of neighborhood fast food outlets 2. Density and access to transit stations 3. Neighborhood walkability (street connectivity) *Complex:* Not reported	**DESIGN:** Prospective cohort and cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1221 adults aged 50-75 residing within Portland's Growth Management Boundary; random selection of households from 120 neighborhoods; block groups represented variety of urban forms, in ethnically and socioeconomically diverse populations. **PRIMARY OUTCOME:** Overweight/obesity and physical activity **MEASURES:** 1. In-person Interview (individual level measures: body mass index [BMI] [anthropometric measures of height and weight]; eating out behavior [frequency fast-food / buffets]; eating self-efficacy for fruit and vegetable consumption; fried food consumption; fruit and vegetable consumption; physical activity [assessed with BRFSS questions]; sociodemographics) 2. Geographic Information System [GIS] data (fast food outlet locations and density) 3. Existing geographic databases managed by the Portland Regional Land Information System (land use mix, residential density [number of people per residential acre in each block group], density of street connectivity, density of public transit stations, green spaces). 4. Walkability index (land-use mix, street connectivity, public transit stations, green and open spaces) **DATA COLLECTION:** An in-person interview was used to collect sociodemographic info, dietary and physical activity behaviors, weight and height measurements at baseline (2006-2007) and one year follow-up (2007-2008). Fast-food restaurant information was purchased, compiled, spatially geocoded and integrated within GIS using ArcView software. Land use mix data were generated using existing geographic databases managed by the Portland Regional Land Information System and land use mix index was generated. Walkability was assessed as a composite score. Scores were divided into quartiles, individuals in or above the 75th percentile resided in high walkability neighborhoods. *(continued next page)*	Adults aged 50-75 27% lower- income 92% White 57% Male (evaluation sample) **ELIGIBILITY:** Between 50 and 75 years of age, English speaking, independently ambulatory, and no history of major mental deficits **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the Oregon Research Institute, Willamette University, Oregon State University, and Metro Regional Services, Portland, OR. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The evaluation was supported by a research grant from the National Institute of Environmental Health Sciences. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. (n=1,145) Multi-level analyses show that after adjustment for neighborhood- and resident-level socio-demographic characteristics high walkability was associated with a decrease in 2.65 pounds in weight and 0.62 inches in waist circumference among residents who increased their levels of vigorous physical activity (p<0.05). 2. (cross-sectional data) Using Poisson regression model analyses, a 10% increase in the even distribution of square footage across all land uses (i.e., residential, public [offices and institutions], commercial) was associated with a 25% reduction in prevalence of overweight/obesity (p<0.01). 3. (cross-sectional data) Residents living in high density fast food outlet neighborhoods who visited fast food or buffet restaurants 1 or 2 times weekly or more, were 1.878 (95% CI= 1.063,3.496; p<0.05) times more likely to be obese than those who lived in low density fast food outlet neighborhoods. Similar results for high density fast food outlet neighborhoods compared to low density fast food outlet neighborhoods were found for residents who did not meet recommended levels of physical activity, OR=1.792 (95% CI=1.006, 3.190, p<0.05); reported low self-efficacy in eating healthy food; OR=1.212 (95%, CI=1.057, 1,391, p<0.005) or were non-Hispanic Black residents, OR=8.057 (95% CI=1.705, 38.086, p<0.005). 4. (n=1,145) Multi-level analyses show that after adjustment for neighborhood- and resident-level socio-demographic characteristics a high density of fast-food outlets was associated with an increase of 3.09 pounds in weight and 0.81 inches in waist circumference among residents who frequently ate at fast-food restaurants (p<0.05). 5. A one standard deviation increase in the density of fast-food outlets was associated with a 7% increase in the prevalence of overweight/obesity (p<0.01; from cross-sectional data). **PHYSICAL ACTIVITY:** 6. A one unit increase in mixed land-use was associated with a 5.76 times increase in walking for transportation (p<0.001), a 4.066 times increase in neighborhood walking (p<0.001), 1.495 increase in walking for errands (p<0.047) and 1.463 times increase in meeting physical activity recommendations (p=0.025; all from cross-sectional data). 7. A one standard deviation increase in street connectivity increased walking prevalence by 16% for neighborhood walking (p=0.034), 20% for transportation (p=0.004) and 11% for errands (p=0.025; all from cross-sectional data). *(continued next page)*

(Continued from previous study)						
		LIMITATIONS: Cross-sectional design precludes causality conclusions; observing change in built environment requires long periods of time, which is a challenge in the study of interaction effects of individual and environmental food outlet factors on obesity;factors related to the built environment surrounding participants' places of work or homes, such as absence of sidewalks and neighborhood environment features such as automobile dependent or live and work suburban style environments, were not measured; participants self-reported measures of fast food restaurant visits; because the exact location of each restaurant visit was not recorded, researchers could not verify visits were within the study area				8. The density of public transit stations was associated with more walking for transportation (estimated prevalence = 1.147, p=0.011) and meeting physical activity guidelines (estimated prevalence = 1.069, p=0.03); green and open spaces for recreation was also associated with more neighborhood walking (estimated prevalence = 1.119, p=0.032) and meeting physical activity requirements (estimated prevalence = 1.065, p<0.001; all from cross-sectional data).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
McDonald (2007) United States	Access and ease of travel (i.e., distance, density, time spent in travel) and active transportation **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 6,508 children from 4,394 households **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. National Household Travel Survey (2001NHTS) (all trips motorized or not [trip purpose, mode, time, length], household participant in each trip, individual sociodemographic data, residential density) **DATA COLLECTION:** National Household Travel Survey(NHTS) data, whichprovides trip diaries for 66,000 households, was collected between March 2001 and May 2002. Tour data included trips occurringbetween September and May, beginning before 10:30 in the morning. Each participating household was assigned a "survey day" on which they recorded all trips. This analysis focused on elementary and middle school children. **LIMITATIONS:** Self-reported trips; one requirement for inclusion in the study was that within the tour data the reported average travel speed (computed as self-reported distance divided by self-reported travel time) must be reasonable; this requirement increased the likelihood that self-reported distances were accurate	5-10 year olds, 11-13 year olds, 14% Minority (evaluation sample) **ELIGIBILITY:** For this analysis, all children had to be in elementary and middle school, could not bike to school, could not have a stop longer than 30 minutes, and had to be travelling using reasonable speeds. **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** The research team was from the University of North Carolina at Chapel Hill **THEORY/ FRAMEWORK:** The researchers used a multinomial logic model to understand mode of choice for the trip to school. **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Robert Wood Johnson Foundation's Active Living Research program, the University of California Transportation Center, and United States Department of Transportation Eisenhower Fellowship. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Simple averages show that 48% of students living less than 1.6 km from their school walked compared with a walk rate of 3% for students living more than 1.6 km from their school. 2. The model shows that travel times (a proxy for distance to school) has the strongest effect on the decision to walk to school ($p<0.01$). A 1 minute increase in walk travel time leads to a 0.2% decline in an individual's probability of walking; a 10% increase in walk travel time leads to a 7.5% decrease in walk mode share. 3. Children are much less sensitive to auto travel times. A 1 minute increase in auto travel times leads to a 0.01% increase in the probability of walking; a 10% increase in auto travel time leads to a 0.1% increase in the likelihood of walking. 4. Population density is positively associated with walking, even after accounting for trip distance; however, the relationship is modest. A 10% increase in density for all students in our sample would increase walk mode share by 1.2%. 5. As density increases distance to school decreases ($r=-0.13$, $p<0.01$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Tilt, Unfried (2007) Washington	Access and distance to multiple destinations (land-use mix) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity and aesthetics *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 529 residents of Washington **PRIMARY OUTCOME:** Overweight/obesity and physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Self-report postal survey (frequency of walking trips per month, distance to destinations within 0.5 mile/10-15 minutes/10 block to residence, individual perception of greenness and natural features in neighborhood and satisfaction with these features, importance rating of destinations on individual quality of life, anthropometric data) 3. ArcView Geographic Information Systems (GIS) Network (residential parcels within 0.4-miles of 15 types of destinations [determined through street networks] defined by property boundaries) 4. Normalized Difference Vegetation Index (NDVI) (amount of photo synthetically active light that is absorbed in each 30m x 30m survey pixel, or its greenness) 5. Geospatial data (Washington State Geospatial Data Archive) for City of Seattle (residential parcels, street networks, and the following destinations types: churches, community centers, libraries, p-patches [community garden spaces], parks, playgrounds, post offices, schools, swimming pools, and theaters) **DATA COLLECTION:** Addresses for the postal survey were randomly selected and stratified using the Normalized Difference Vegetation Index and accessibility. GIS analysis excluded highways and used street network rather than straight line distances. Data for banks, bars, grocery stores, and restaurants were obtained with permission from the Urban Form Laboratory at the University of Washington. Self-reported total number of destinations was referred to as subjective accessibility, and total number of natural features was reported as subjective greenness. Frequency of walking was reported using a five-point Likert scale. Satisfaction with greenness was calculated as mean satisfaction of the number of all natural feature items. Destination index score was determined by examining access to a variety of destinations in the neighborhood. **LIMITATIONS:** Data was self-reported, response rate from the surveys was 17.5%	General population **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Washington. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Urban Ecology Program at the University of Washington **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Having a destination within walking distance had a significant positive relation with walking trips per month, BMI was not significantly correlated with walking trips per month ($r=-.08198$, $p=.0701$). 2. In areas with high accessibility, BMI was lower in areas that had high NDVI, or more greenness ($r^2=.129428$, model $p<.0001$; t test of interaction $p=.0257$). Low NDVI areas were associated with overestimation of the number of destinations with walking distance ($F1, 499=11.009$, $p=0.001$). **PHYSICAL ACTIVITY:** 3. There was a strong association between the importance of destination index score and walking trips per month ($r^2=.341410$, $p<.0001$; regression coefficient for importance of destinations index $=0.0197742$, $p<0.0001$). 4. Objective accessibility was related to walking trips per month ($r^2=.051$, $p<.0001$), although objective measures of actual greenness were not.

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Liu, Wilson (2007) Indiana	Access to various types of food retail locations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Presence of vegetation in the neighborhood *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 7,334 subjects from 9 townships in Marion County, Indiana. 6,897 individuals were from more densely populated townships (Center, Wayne, Perry, Lawrence, Washington, and Warren). 437 individuals were from less densely populated townships (Franklin, Decatur and Pike). **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Indianapolis Mapping and Geographic Infrastructure System and Geographical Information System (ArcGIS) data (patient address, network distance along street centerlines) 3. Landsat Enhanced Thematic Mapper plus satellite imagery and Normalized Difference Vegetation Index (NDVI) (neighborhood vegetation) 4. Community design (proximity to food retail locations) 5. 2000 US Census (township density, socioeconomic status [census block data]) 6. 1997 North American Industry Classification System codes (modified) (food retail categories) 7. Marion County Hygiene Grading (food retail locations) **DATA COLLECTION:** Indiana University Medical Group provided researchers with access to a registrar of patients. Marion County Health Department contributed information related to food locations for the county. Patient records previously calculated by medical staff provided researchers with anthropometric data. Neighborhood vegetation was measured in July, 2000. Food retail locations were categorized as large brand-name supermarkets, smaller non-brand-name grocery stores, fast-food restaurants, and convenience stores. **LIMITATIONS:** Racial distribution and restricted geographic barrier limit generalizability; causality cannot be assessed using cross-sectional data	3-18 year olds, 77.2% Minority (evaluation sample) **ELIGIBILITY:** Single individual homes were diluted from the study. In order to be eligible, participants had to maintain residency in Marion County, have their routine check-up and anthropometric data taken on the same day, and they could not be pregnant. Eligible participants could not have congenital heart disease, chromosomal abnormalities, anomalies of the adrenal gland, multiple congenital anomalies, cystic fibrosis, or cerebral palsy. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from Indiana University-Purdue University Indianapolis, Indiana University, and the University of Cincinnati. **THEORY/ FRAMEWORK:** The overall framework for the research is the Health Field Model. This model postulates that health status is a function of social, environmental, economic, and genetic factors. **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. With regard to findings for the Lower Population Density Townships, distance to the nearest supermarket (adjusted odds=1.038, standard error=0.019, p=0.03) was positively associated with risk of overweight. 2. In the Higher Population Density Townships vegetation (adjusted odds=0.899, standard error=1.038, p<0.01) was negatively associatedwith risk of overweight (fully adjusted model).

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Aytur, Rodriguez (2008) United States	Urban containment policies, on state adoption of growth management and density at the population level **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** The sample includes ten states classified as having state-growth-management legislation in place by 1998. **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. U.S. Census of Population (summary file 3, 1990 and 2000) (percentage of the population reporting active transportation to work [bike/ walk], metropolitan statistical area [MSA] population size, demographic data) 2. Behavioral Risk Factor Surveillance System (BRFSS) data (frequency and duration of general physical activity and leisure-time physical activity (LTPA) within past month, common activities participated in within past week and month) 3. Urban Mobility Report (Texas Transportation Institute)(vehicle miles traveled per capita per day) 4. National Resources Inventory (net density) 5. National Survey of metropolitan planning organizations ([unpublished] identify jurisdictions and report year of adoption) **DATA COLLECTION:** Measures were examined both as baseline (1990) and time-varying variables representing change from 1990 to 2002.Secondary data was taken from a national survey (previous research) and subsequent work examining the predominant urban containment frameworks utilized. Urban containment frameworks were categorized 4 ways: weak-restrictive, weak-accommodating, strong-restrictive, and strong-accommodating. States were categorized in two ways: states that mandated the adoption of urban growth boundaries and states that engaged local jurisdiction in some form of urban containment, broadly defined. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; if city size altered the presence or absence of policies, then bias may have been introduced using BRFSS samples; data was self-reported; some of the metropolitan statistical areas did not adopt policies until the 1990s; the imputation method for active commuting outcome assumed a constant average rate of change	Adults, General population **ELIGIBILITY:** MSAs were selected if data could be reconstructed longitudinally with regards to institutional (i.e. urban containment policies), environment, and health policies. Individuals had to speak English and have a home telephone. **EXPOSURE/ PARTICIPATION:** 63 large U.S. metropolitan statistical areas (MSA) located in 31 states provided information.	**LEAD AGENCY:** Researchers were from the University of North Carolina at Chapel Hill. **THEORY/ FRAMEWORK:** Socioecologic framework **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Support was provided by the Robert Wood Johnson Foundation's Active Living Research, the National Institutes for Health and the National Heart, Lung, and Blood Institute Public Health Service Training Grant. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Both enabling state legislation (estimate=-0.09, p=0.0002) and strong urban containment policies (estimate=0.08, p=0.0031) were independently associated with walking or bicycling to work. 2. Strong urban containment policies were independently associated with no LTPA (estimate=-2.40, p=0.0024). 3. Density and vehicle miles traveled per capita were not statistically significant in the final model. 4. Metropolitan areas with strong urban containment policies in states mandating urban growth boundaries showed the steepest decline in the percentage of no LTPA relative to other policy classifications (figure, no statistics). 5. Residents of MSAs with state legislation mandating urban growth boundaries reported approximately 53 additional minutes of LTPA per week, compared with residents of states without policies (p=0.0011). 6. Strong MSA-level urban containment policies were associated with approximately 24 additional minutes of LTPA/week (p=0.0029). 7. State legislation mandating urban growth boundaries (estimate=41.16, p=0.0132) and strong MSA policies (estimate=21.09, p=0.0181) remained independently associated with more minutes of LTPA/week. **POLICY:** 8. 47% of MSAs were classified as having either state growth-management legislation or urban containment policies in place during the study period. Of those with urban containment policies, 83% had adopted policies by 1990, and 17% adopted them between 1991 and 1998.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Berrigan, Troiano (2002) United States	Style of urban environment and development (home age as a proxy) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 14,827 adults **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1.Third National Health and Nutrition Examination Survey (NHANES III) (walking behavior, frequency of leisure-time physical activity (LTPA), home age, rural/urban/suburban locale, region of the country, demographic data, health related activity restrictions) **DATA COLLECTION:** The survey gathered information in a variety of areas.Walking behavior was characterized as low, medium, or high frequency. Respondents answered how often they walked in the past month. Leisure-time physical activity was assessed through individual behaviors over the past month, specifying 8 activities. Urban and environmental factors influencing activity were assessed by using home age as a proxy measure. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; NHANES data is self-reported and may lead to bias	Adults ≥ 20 years, General Population The sample used for the NHANES III is nationally representative of the US population. It oversamples African Americans and Mexican-Americans. **ELIGIBILITY:** Eligible individuals were 20 years of age or older. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the Division of Cancer Control and Population Sciences at the National Institutes of Health. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Authors used past research on density, site design, and building design in relation to walking, bicycling, and transportation to design a study examining leisure-time walking behavior and a proxy for aspects of urban form. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** David Berrigan (author) was supported by a Cancer Prevention Fellowship from the National Cancer Institute while working on this project. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Residents of homes built before 1974 in urban (1946-1973; 16.1%, standard error [se]=0.9, <1946: 16.0%, se=2.1) or suburban (1946-1973: 11.3%, se=1.0, <1946: 12.4%, se=1.4) areas were more likely than residents of newer homes (urban: 11.5%, se=1.0, rural: 11.2%, se=1.0) to walk ≥ 20 times per month. 2. There was no evidence for an association between home age and non-walking leisure time physical activity in urban/ suburban areas. 3. In urban and suburban areas, adult residents of homes built before 1946 (OR= 1.43, 95% CI= 1.03, 1.98) and between 1946 and 1973 (OR= 1.36, 95% CI= 1.13, 1.65) were significantly more likely to be in the higher walking category.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Boer, Zheng (2007) MA, IL, TX, MI, NY, PA, CA, WA	Access and proximity to destinations, density, and diversity of land-use within the neighborhood **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 30,025 individuals from13,012 households (ten largest consolidated metropolitan statistical areas [CMSAs]) **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. New Urbanism Smart Scorecard (residential density, mixed land use, street network, block lengths, street parking, neighborhood housing age) 2. 1995 National Personal Transportation Survey [NPTS] (walking trips, individual and family characteristics, block length) 3. US Census 2000 (population, number of housing units, house age, and block group level data) 4. Census Topologically Integrated Geographic Encoding and Referencing [TIGER] system (block size and street network connectivity) 5. InfoUSA database (business diversity [October 2001 extraction]) 6. United States Historical Climatology Network (HCN) Serial Temperature and Precipitation Data (temperature and rain effects) **DATA COLLECTION:** Data was collected in 2005 and 2006. The Smart Scorecard evaluated different levels of built-environment coding them as excellent, preferred, acceptable, minimal, or "does not apply." The neighborhood was defined using block groups whose centroid was within a one-quarter mile radius of the centroid of the block group of the household. Parking pressure was measured as the number of residents per foot of parkable street length, estimated by street length reported by the TIGER data minus 20 feet from the center roadway of intersecting streets. **LIMITATIONS:** Data sets were not validated; walking trips were self-reported; the Smart Scorecard works well with trends, not fine details; analysis was limited to physical aspects of the environment; not all data sets were comparative temporally	General population **ELIGIBILITY:** This study sought participants with the same NPTS-1995 and Census 2000 block groups. **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** Researchers were from the RAND Corporation. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Walking correlates with the number of businesses in a neighborhood; average walking distance in miles increased from an average low of 0.136 for neighborhoods with 0 businesses to a high of 0.833 miles in neighborhoods with 6-7 businesses. 2. Walking correlates with housing density; average walking distance in miles increased from an average low of 0.139 for a housing density of 0-4 units/acre to a high of 0.84 miles in neighborhoods with a housing density greater than 14 units per acre. 3. Walking correlates with the fraction of four-way intersections; average walking distance in miles increased from an average low of 0.13 for neighborhoods with less than 25% four-way intersections to a high of 0.957 for neighborhoods with 100% four-way intersections. 4. Walking correlates with parking pressure; average walking distance in miles increased from an average low of 0.12 for neighborhoods with 0-0.0077 person/foot to a high of 0.792 miles in neighborhoods with 0.0599-0.4713 person/foot. 5. Higher parking pressure and older median housing age did not significantly affect walking. 6. When block lengths are greater than 400 feet, block length was correlated with fewer walking trips; average walking distance in miles increased from an average of 0.476 in neighborhoods with 600-804 foot long blocks to a high of 0.117 miles for those living in neighborhoods with greater than 2,132 foot long blocks. 7. Moving from block lengths less than 600 feet to 600-804 feet increased the probability of walking(OR= 1.26, 95% CI= 1.04,1.53). 8. Within block lengths of more than 804 feet, there were no significant effects on walking. 9. Moving from two different business types in the neighborhood to three types significantly improved the probability of walking (OR=1.15, 95% CI= 1.001, 1.320). The same effect was found when comparing four with three different business types (OR=1.24, 95% CI= 1.07, 1.44). Additional increases in business diversity were not associated with a significant increase in walking. 10. Living in a neighborhood with a housing density of more than 14 units per acre significantly increased the probability of walking compared to a housing density of 11-14units per acre (OR=2.05, 95% CI= 1.46, 2.89). With a housing density of 11-14 units/acre compared to 7-11 units/acre, the probability towalk was lower (OR=0.80, 95% CI= 0.64, 1.00). 11. The difference between the areas with the lowest percentage of four-way intersections (0-24%) and those with 25%-49% was a 36% increase in walking (OR=1.36, 95% CI= 1.18, 1.58). *(continued next page)*

(Continued from previous study)						
						12. For residents living in areas where 25%-74% of intersections are four-way, the probability to walk was higher at the level of 50%-74% compared to the level of 25%-49% (OR=1.38, 95% CI= 1.09, 1.75). 13. Neighborhoods with 75%-99.9% of the intersectionsas four-way intersections promote walking compared to the level of 50%-74% (OR=1.20, 95% CI= 1.02, 1.41). 14. There was no significant effect on walking at the level of 100% four-way intersections, compared to 75%-99.9%. 15. Walking in neighborhoods with 50%-74% 4-way intersection had an odds ratio for walking of 1.4 (95%CI= 1.09, 1.78) relative to those with 25%-49% 4-way intersections. (Note: p-values not reported)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Frank, Kerr (2007) Georgia	Land use diversity **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to open and recreation spaces 2. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 3161 youth **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality (SMARTRAQ) household travel survey (2-day survey; destinations visited, travel mode and purpose, time of day) 2. ArcView Geographic Information System ([GIS] network buffer) 3. Tax assessor's parcel data (land-use density and mixing of uses, street network files) 4. Census data (land-use density, land-use mix, street network files [street connectivity]) **DATA COLLECTION:** Data used for this study was collected in 2001 and 2002 for the SMARTRAQ. ArcView GIS was used to define a 1-km road network buffer to be developed around each respondent's place of residence. Intersection density and household density scores were categorized by tertiles. The lowest tertile was used as the referent. **LIMITATIONS:** Cross-sectional study design restricts causal inferences; this study was restricted to one geographic region with low-walkability; walking variables were self-reported; the study did not include measures of the pedestrian environment	5-20 year olds (target sample) 38% Minority 20% Lower income 20% had a household income less than $30,000 ~50% Female (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of British Columbia, San Diego State University, and Lawrence Frank & Company. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This work was supported by the Active Living Researcha national program of the Robert Wood Johnson Foundation. Data was based in part from the "Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality" (SMARTRAQ) program funded by the Georgia Department of Transportation Authority, Centers for Disease Control and Prevention, and Environmental Protection Agency. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Living in the top tertiles for residential density (walking ≥ 1 time per 2 days= 2nd tertile; OR= 1.4, 95%CI= 1.0, 1.9, $p<0.05$; 3rd tertile; OR= 2.4, 95%CI= 1.8, 3.2, $p<0.001$; walking ≥0.5 miles/day; 3rd tertile; OR=2.7, 95%CI= 1.7, 4.4, $p<0.001$) and street connectivity (3rd tertile; walking ≥ 1 time per 2 days; OR=1.7, 95%CI=1.3, 2.2, $p<0.001$; walking ≥ 0.5 miles/day; OR=1.8, 95%CI= 1.2, 2.7, $p<0.01$) was significantly related to both walking outcomes, specifically when the odds ratio for density was greater for walking 0.5 miles or more. 2. Land-use mix (walking ≥ 1 time per 2 days; OR=1.8, 95%CI= 1.4, 2.3, $p<0.001$; walking ≥ 0.5miles per day; OR=1.9, 95%CI=1.3, 2.9, $p<0.001$), commercial destinations (walking ≥1 time per 2 days; OR=1.8, 95%CI= 1.4, 2.3, $p<0.001$; walking ≥0.5 miles/day; OR=1.8, 95%CI= 1.2, 2.7, $p<0.01$), and recreation destinations (walking ≥1 time per 2 days; OR= 2.1, 95%CI= 1.7, 2.6, $p<0.001$; walking ≥0.5 miles/ day; OR=2.1, 95%CI=1.5, 2.9, $p<0.001$) within 1-km were all significantly related to walking. *Results for only top tertile;* 3. For 9-11 year olds reporting that they had walked at least once over 2 days, residential density (OR=2.3, 95%CI= 1.2, 4.3, $p<0.05$) and living near recreation or open space (OR=1.8, 95%CI= 1.1, 2.9, $p<0.05$) were significant. None of the variables was significantly related to walking ≥ 0.5 miles per day for this age group. 4. For 12-15 year olds reporting that they walked at least once over 2 days, number of intersections (OR=1.7, 95%CI= 1.1, 2.8, $p<0.05$), density (OR=3.7, 95%CI= 2.2, 6.4, $p<0.001$), mixed land use (OR=2.5, 95%CI= 1.6, 3.8, $p<0.001$), at least one commercial use (OR=2.6, 95%CI= 1.7, 4.0, $p<0.001$), and at least one recreation/open space (OR=2.5, 95%CI= 1.7, 3.6, $p<0.001$) were significant factors. 5. For 12-15 year olds reporting that they walked ≥0.5 miles/day, number of intersections (OR=2.4, 95%CI= 1.1, 5.1, $p<0.05$), highest density (OR=4.9, 95%CI= 2.1, 11.4, $p<0.001$), mixed land use (OR=2.7, 95%CI= 1.4, 5.3, $p<0.01$), at least one commercial use (OR=2.7, 95%CI= 1.4, 5.4, $p<0.001$), and at least one recreation/open space (OR=2.4, 95%CI= 1.3, 4.2, $p<0.001$) were significant factors. 6. For the 16-20 year olds reporting that they had walked at least once over 2 days, intersection density (OR=2.0, 95%CI= 1.1, 3.6, $p<0.05$), mixed land use (OR=1.9, 95%CI=1.0, 3.2, $p<0.05$), and recreation land use (OR=1.8, 95%CI= 1.1, 2.9, $p<0.01$) were significant. 7. For those reporting that they had walked ≥ 0.5 miles per day, intersection density (OR=3.1, 95%CI= 1.3, 7.4, $p<0.01$), residential density (OR=3.2, 95%CI= 1.1, 9.1, $p<0.05$), and recreation land use (OR=2.1, 95%CI= 1.1, 3.7, $p<0.05$) were significant factors. *(continued next page)*

(Continued from previous study)						
						8. In the multivariate analyses, having no car, access to recreation and open spaces (walking ≥1 time per 2 days; OR=1.9, 95%CI= 1.3, 2.3, p<0.001; walking ≥0.5 miles/day; OR=1.7, 95%CI= 1.2, 2.4, p<0.01), and greater residential density (walking ≥1 time per 2 days; OR=1.7, 95%CI= 1.1, 2.3, p<0.01; walking ≥0.5 miles/day; OR=1.8, 95%CI= 1.0, 3.1, p<0.05) were significantly related to walking. 9. Intersection density, land use mix, commercial land usage, gender, and household size were not significant in the multivariate model. 10. For 5-8 year olds, living near recreation or open space (walking ≥1 time per 2 days; OR=2.1, 95%CI= 1.3, 3.4, p<0.001; walking ≥0.5 miles/day; OR=2.4, 95%CI= 1.2, 5.1, p<0.05) was significantly related to walking at least once over 2 days as well as walking ≥0.5 miles per day. 11. Having up to 5 acres of recreation space in a 1-km buffer was significantly related to walking (5-8 years; OR=2.2, 95%CI= 1.2, 4.1, p<0.01)(12-15 years; OR=2.2, 95%CI= 1.3, 3.7, p<0.01)(16-20 years; OR=2.6, 95%CI= 1.5, 4.6, p<0.001), however more than 6 acres of recreation or open space did not appear to be related to walking. 12. In 9-11 year olds, only four or more recreation spaces (OR=2.6, 95%CI= 1.3, 5.4, p<0.01) were associated with an increased likelihood of walking, size of park was not related to walking behavior.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Lopez (2007) Massachusetts	Neighborhood density and land-use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Supermarket and fast food restaurant density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 15,358 residents living in 327 zip code tabulation areas. **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Behavioral Risk Factor Surveillance System [BRFSS] (sociodemographic data, body mass index [BMI], home location) 2. Topographically Integrated Geographic Encoding and Referencing [TIGER] Zip Code Tabulation Areas [ZCTAs] (street network) 3. Geographic Information Systems [ArcView GIS 3.2] data (street connectivity, intersection density) 4. 2000 US Census (neighborhood ethnic composition, population density, median income) 5. 2001 County Business Pattern data (number of paid employees, number of establishments, number of fast food restaurants and supermarkets, retail density, establishment density) **DATA COLLECTION:** Individuals were surveyed between 1998 and 2002. The Census provides a set of cartographic files (TIGER) that contain the layouts of all streets across the United States. Business pattern reports and Census data were downloaded by zip codes. BRFSS data does not include respondent's street address or census tract. Zip code tabulation areas (ZCTAs) were used to examine the full range of potential neighborhood variables. **LIMITATIONS:** Data was self-reported; the study design is cross-sectional limiting causal and temporal outcomes; the Massachusetts version of the BRFSS is available in only English; there may have been a significant number of individuals without telephone access	General Population (target sample) 11% Hispanic, 8% African-American, 81% Caucasian (evaluation sample) Participants were surveyed from eastern Massachusetts, from Cape Cod to Worcester between the New Hampshire and Rhode Island state borders. The obesity rate in this sample (19.8%) is higher than that in Massachusetts as a whole (16.8% in 2000). The population density for the sample ranged from 11 to over 61,000 persons per square mile. **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the Massachusetts Department of Public Health and Boston University. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was supported by the National Institute of Environmental Health Sciences, NIH. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Using multiple regression revealed that as median income, population density, and establishment density increased, the risk of obesity declined by 0.8% (OR=0.992; 95% CI= 0.990, 0.994; p=0.01), 2% (OR=0.980; 95% CI= 0.972, 0.990; p=0.01), and 1.9% (OR=0.981; 95% CI= 0.964, 0.999; p=0.05), respectively. 2. Using multiple regression revealed that as employment density increased, obesity risk increased by 0.4% (OR=1.004; 95% CI= 1.001, 1.009; p=0.05). 3. Using bivariate analyses, neither supermarket nor fast food density variables were associated with obesity risk. 4. Multiple regression analyses revealed that having one or more supermarket in a ZCTA decreased the risk of obesity by 10.7% (OR=0.893; 95% CI= 0.815, 0.978; p=0.05); about 11% of the variation in the final model was attributable to neighborhood level factors.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kelly-Schwartz, Stockard (2004) United States	Urban sprawl: density and land-use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 9,252 respondents in 29 primary metropolitan statistical areas (PMSAs) **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. 1988-1994 National Health and Nutrition Examination Survey III (health, sociodemographic data, length of residence, walking, body mass index [BMI], chronic conditions, self-reported and physician reported health) 2. Sprawl measures (residential density, land-use mix, distance to metro-center, accessibility) 3. Behavioral Risk Factor Surveillance System (BRFSS) data (comparative data for NHANES) **DATA COLLECTION:** Data on individual health was obtained from the NHANES III collected from 1988-1994. The NHANES is a nationwide survey conducted by the National Center for Health Statistics. Primary Metropolitan Statistical Areas (PMSAs) were used to assess information on the county in which respondents live, available for areas with a population ≥ 500,000. The measures used to assess sprawl were taken from previous analysis. Individual factor scores were used for sprawl. **LIMITATIONS:** The measure for walking may not capture the casual type of exercise that is common in less sprawling areas; survey data was self-reported; the survey design was cross-sectional thus causal inferences cannot be made	Adults (target sample) 32% Non-Hispanic White, 28% Non-Hispanic Black, 33% Mexican American (evaluation sample) Mexican-Americans and African- Americans were oversampled to allow for more accurate comparisons among race/ethnic groups for the NHANES. Respondents in the interview sample, but not the examination sample, tended to be somewhat older, less healthy, more often non-Hispanic white, and living in less sprawling areas. **ELIGIBILITY:** This studylimited analysis to individuals 18 years or older. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Lead agency consisted of an urban planner from South Carolina and researchers from the University of Oregon conducted this study. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Literature suggests that people are less likely to drive, more often will use public transit, and are more likely to walk in areas that have better connected and highly accessible street networks, smaller blocks, more compact and dense land-use patterns, ample sidewalks, a rich and varied visual environment, and a strong mix of residential, commercial, and retail activities. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. The results of the NHANES data indicate that residents of less sprawling counties tend to have lower BMIs (CE= -0.00313, t=-1.93, p=0.0532). **PHYSICAL ACTIVITY:** 2. The results of the NHANES data indicate that residents of less sprawling counties tend to walk more (CE=0.0036, t=3.51, p=0.0013). **HEALTH RATINGS:** 3. When BMI and walking are included in the model, the influence of the measures of sprawl declines slightly and the significance of the influence of density (for self-rated health only (CE=0.0012 p<0.05) and streets (self-report CE= -0.0021, p<0.05; physician report CE=-0.0104) is somewhat lower. 4. When both walking and BMI are added to the model, the influence of a highly accessible street pattern remains significant for physicians' ratings of health but declines somewhat and is below traditional levels of significance for self-ratings of health (t=-1.33, p=0.18). 5. The unidimensional measure of sprawl has no significant relationship with overall health ratings (physician rating; CE= -0.0002, t=-0.10, p=0.916; self-rating; CE=0.00004, t=0.13, p=0.8959). 6. People who live in PMSAs that have highly connected street networks and are less densely populated tend to have higher rated health no matter how much they walk or how much they weigh. 7. The unidimensional measure of sprawl has no significant relationship to overall health ratings (physician rating; CE; -0.0002, t=-0.10, p=0.916; self-rating; CE=0.00004, t=0.13, p=0.8959).8. Those who frequently walk at least a mile at a time without stopping are less likely to have health rated as poor whether by themselves (CE=-0.2680) or their physician (CE= -0.0922) (p<0.001). **OTHER: (MEASURE AND MODEL FIT)** 9. The measures of density and streets are highly correlated (r=0.788, r^2=0.62), reflecting the fact that many highly gridded urban areas also tend to be relatively dense.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Ewing, Schmid (2003) United States	Urban sprawl: land-use mix and residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 382,601 respondents: 206,992 from 448 counties and 175,609 from 83 metropolitan areas **PRIMARY OUTCOME:** Overweight/ obesity and physical activity **MEASURES:** 1. Behavioral Risk Factor Surveillance System (BRFSS) data (leisure time physical activity, body mass index [BMI], hypertension, diabetes, presence of obesity and/or coronary heart disease, sociodemographic data) 2. Smart Growth index (metropolitan sprawl: land use and street network variables) 3. County level index (gross population density, percentage of the county in low and high-moderate suburban density, net density (USDA), average block size, percentage of blocks with areas < 1/100 miles squared) **DATA COLLECTION:** Data was taken from the BRFSS for 3 years 1998-2000 (high reliability and validity for demographics, behavioral, health status). Metropolitan Sprawl Index (good explanatory power) was developed for Smart Growth America and was used to measure urban form at the metropolitan level. The larger the index the more compact the metro region. A simpler county sprawl index was used to measure urban form at the county level. All factors were combined to reveal degree of county sprawl. Metropolitan Areas are defined by the US Office of Management and Budget as one or more counties having a high degree of economic and social integration with one another **LIMITATIONS:** Data was self-reported; causal assumptions cannot be made with cross-sectional data; this study did not account for BRFSS sampling; no data on diet was collected; many environmental variables were not accounted; leisure time physical activity constitutes only one of four major sources of physical activity	Adults **ELIGIBILITY:** In order to participate in the BRFSS respondents had to be non-institutionalized US civilian adults aged ≥18 years. Respondents had to live in metro areas where urban sprawl indices were available (>500,000 people). **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Rutgers University, University of Maryland, The University of North Carolina, Centers for Disease Control and Prevention, and the University of Michigan. **THEORY/ FRAMEWORK:** The research design focused on an ecological model to assess urban form measures related to physical activity and health outcomes. **EVIDENCE-BASED:** The study is evidence based since studies addressing sprawl/ built environment and physical activity have been reviewed as part of the evidence base for the guide for community prevention services. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. More compact county index was related to lower BMI at a highly significant level (coefficient=-0.00344, t= -2.84, p=0.005). 2. Residents of a more compact county, one standard deviation above the mean county index, would be expected to have BMIs 0.17 kg/ m^2 lower than residents of a more sprawling county, one standard deviation below the mean. For example, New York residents would have BMIs almost 1 kg/m^2 less than their counterparts Geauga county for the BRFSS sample this translates into 6.3 fewer lbs of body weight. 3. Living in a more compact county index was significantly related to being less obese (coefficient=-0.00212, t= -4.24, p<0.001). 4. The odds of being obese in a more compact county, one standard deviation above the mean county index, were 0.90 times the odds in a more sprawling county, one standard deviation below the mean index (95% CI= 0.86, 0.95). 5. Sprawl appears to have direct relationships with BMI and obesity, plus indirect relationships through the number of minutes walked which varies with the county sprawl index. 6. A 25 unit increase in the county index (1 SD) is associated with directly with a 0.085 kg/m^2 (25 X 0.00338) decrease in BMI. The same 25-unit increase is associated indirectly with only a 0.001 kg/m^2 (25 X 0.275 X 0.000128) decrease in BMI through its effect on leisure time walking. **PHYSICAL ACTIVITY:** 7. The likelihood of reporting any leisure time physical activity was not significantly related to the county index (coefficient=0.000552, t=1.01, p=0.313). 8. The number of minutes walked varied directly with county index, with residents of more compact places reporting more leisure time walking than residents of more sprawling places (coefficient=0.275, t=2.95, p=0.004). 9. All else being equal, residents of a county one standard deviation (25 units) above the mean county index would be expected to walk for leisure 14 minutes more each month compared to residents of a county one standard deviation below the mean (i.e., 50 units X 0.275 minutes per unit). Comparing the extremes (New York County with an index of 352 and Geauga County with an index of 63), New York residents would be expected to walk for leisure 79 minutes more each month. 10. Metropolitan level sprawl was similarly associated with minutes walked (coefficient=0.338, t=0.09, p=0.04) but not with the other variables. **OTHER:** 11. County sprawl index had significant associations with hypertension (coefficient= -0.00119, t= -2.37, p=0.018).The odds of suffering from hypertension in a more compact county, one standard deviation above the mean sprawl index, was 0.94 times the odds in a more sprawling county, one standard deviation below the mean index (95% CI= 0.90, 0.99). In most cases, the county index was more strongly associated with outcomes than was the metropolitan index.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Lopez (2004) United States	Differences in sprawl (density and compactness) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 104,084 respondents in 330 metropolitan areas **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. 2000 Behavioral Risk Factor Surveillance System (BRFSS) data (metropolitan sprawl, anthropometric data, sociodemographic data) 2. 2000 US Census (census tract level: urban sprawl, density, compactness) 3. Geographic Information System (GIS) data (land area tracts) **DATA COLLECTION:** Data from the 2000 BRFSS survey were obtained using the BRFSS Web site. Respondents were assigned sprawl index value for their metropolitan area on the basis of the metropolitan-area identifier in the survey. The 2000 US Census was used to develop an index that measured urban sprawl on the basis of density and compactness. Urban sprawl was defined as an overall pattern of development across a metro area, where large percentages of the population live in lower-density residential areas.Tracts were considered to be high density if they had a population density of 3500 or more persons per square mile and low density if they were below that threshold. Tracts were considered rural if the population density had fewer than 200 persons per square mile. **LIMITATIONS:** Data was self-reported; causal and/or temporal inferences cannot be made with cross-sectional data; this study did not account for individual or within population variation or self-selection; this study only includes non-institutionalized metropolitan-dwelling US adults who live in households with telephones and may not be generalizable to the entire adult population or children; BRFSS response rates vary by state (range was 44%-95% in 1999)	Adults, 74% Caucasian, 10% African-American, 13% Hispanic (evaluation sample) Blacks, Hispanics and males were more likely to be overweight or obese and females were less likely to be overweight or obese than the sample as a whole. **ELIGIBILITY:** Individuals were eligible if they were non-institutionalized adults, living in an identified metropolitan US area (not Puerto Rico), and had a telephone. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Boston University's School of Public Health. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Institute of Environmental Health Sciences **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. For each 1 point rise in the urban sprawl index (1-100), the risk for being overweight increased by 0.2% (Relative Risk (RR)=1.002, 95% CI=1.0006, 1.003) and the risk for being obese increased by 0.5% (RR=1.005, 95% CI=1.004, 1.006). 2. When compared individually without controls for other explanatory variables, the association between urban sprawl and the risk for being overweight was small (RR=1.0007, 95%CI=0.9995, 1.0017), however the sprawl index was associated with an increased risk for being obese (RR=1.0032, 95% CI=1.002, 1.004).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Cervero, Duncan (2003) California	Urban design, land-use diversity, and density patterns on mode choice **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Pedestrian/ bicycle friendly design *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 7,889 trip records from 15,066 households in the 9 county San Francisco Bay Area **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. 2000 Bay Area Travel Survey (BATS) data (trip mode, time, day, personal and household information) 2. Geographic Information Systems (GIS) (density, land-use) 3. 2000 Census Topologically Integrated Geographic Encoding and Referencing files (TIGER) (pedestrian friendly design [street connectivity, type and density of intersections]) 4. Association of Bay Area Governments occupation information (land-use mixture) 5. 2000 US Census (sociodemographic data, neighborhood attributes) 6. Weather data **DATA COLLECTION:** 2000 Bay Area Travel Survey data was used to assess daily activity information for 2 days. Potential walkable or bikable trips were investigated. Records for out-of-home activities like visiting friends, banking, shopping away from home, etc. (≥15 minutes in duration) were collected. Trips less than 5 miles not originating in the workplace were selected. Average slope (rise/run) was calculated based on elevations of trip origins and destinations. Time of trips was based against sunset and sunrise to determine time of day. Neighborhood quality was assessed using the proportion of households with annual incomes below $25,000 within a 1-mile radius of trip origins and destinations. Variables within 1-mile radii of trip origins and destinations were assessed the 2000 Census TIGER files. **LIMITATIONS:** Data was self-reported; not all landscape variables were accounted	Adults **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of California-Berkeley. **THEORY/ FRAMEWORK:** This work builds upon other research that has applied the "3D" framework (density, diversity, and design) to associate travel choices with built environment. **EVIDENCE-BASED:** 3-D Framework and study design **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This research was supported by a grant from the University of California Transportation Center. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Even within a 5-mile distance band, the likelihood of walking eroded steadily with the length of trip. Steep terrain (CE=-4.109, SE=2.090, p=0.049), rain (CE=-0.729, SE=0.330, p=0.027), and nightfall (CE=-0.158, SE=0.112, p=0.159) also deterred walking. 2. Mixed use environs with retail services significantly induced walking, other things being equal. Similarly, land-use diversity at the destination (CE= 0.023, SE=0.042, p= 0.590) generally encouraged walking; however, this relation was statistically weak. 3. Pedestrian/bicycle friendly designs at neither origin (CE=0.037, SE=0.048, p=0.441) nor destination (CE=0.035, SE=0.047, p=0.465) had much bearing on mode choice. 4. Among built environment features, the urban design and land-use diversity factors (origin; CE=0.156, SE=0.098, p=0.112; destination; CE=0.056, SE=0.099, p=0.570) were positively associated with the decision to ride a bicycle. 5. Land-use diversity was significant for trip origin (CE=0.098, SE=0.042, p= 0.021), which in most instances corresponded to a 1-mile radius of a person's residence. 6. Pedestrians tended to shy away from lower-income settings (CE=-0.766, SE=0.523, p= 0.143), presumably because of safety concerns.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Eid, Overman (2008) United States	Neighborhood sprawl: residential density, mixed land-use, compactness of development **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 5,190 participants (2,663 women, 2,527 men) **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Weight and height (body mass index [BMI]) 2. 1979 The National Longitudinal Survey of Youth (NLSY79) (sociodemographic data, confidential geo-code data, personal characteristics) 3. Residential sprawl index (portion of undeveloped land) 4. 1992 Land Cover Data (land-use; residential, commercial) 5. US Census Bureau Zip Code Business Pattern (level of mixed land-use) **DATA COLLECTION:** Data for this study came from the NLSY79. Individuals were interviewed annually using six waves of the cross-sectional sample of the NLSY79; 1988-1990 and 1992-1994. The Confidential Geo-code Data of the 1979 National Longitudinal Survey of Youth (NLSY79) uses latitudinal and longitudinal coordinates to match a representative pane of individuals to neighborhoods throughout the US. Average residential development was calculated around each residence to determine a neighborhood index of residential-sprawl. Residential sprawl was the share of undeveloped land surrounding an average residential development. Index was calculated with land cover data using the 1992 National Land Cover Data that describes predominant land use for continental US. **LIMITATIONS:** Sample size may have been too small	14-21 year olds The NLSY79 is a survey that follows a nationally representative sample of women and men. **ELIGIBILITY:** Individuals from the conterminous US holding residence for at least two years were eligible for the National Longitudinal Survey of Youth. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the London School of Economics, the University of Toronto, the Centre for Economic Performance, Madrid Institute for advanced Studies, and the Universidad Carloss III de Madrid. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Funding from the Social Sciences and Humanities Research Council of Canada, the Center for Urban Health Initiatives, Spain's Ministerio de Educacion y Ciencia and the Centre de Recerca en Economia Internacional, as well as the support of the Canadian Institute for Advanced Research, and CORE. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** *Partial control (age and ethnicity):* 1. For men, the correlation between obesity and both landscape variables (residential sprawl; coefficient= 0.455, standard error= 0.259, $p<0.1$) (mixed use; coefficient= -3.950, standard error= 1.073, $p<0.01$) is statistically significant. 2. An average man of 1.79 meters who lives in a 'sprawling' neighborhood one standard deviation above the mean weighs 0.82 kg more than an average individual who lives in a 'compact' neighborhood one standard deviation below the mean. For mixed usethe difference in mean weights is almost twice as much at 1.34kg in men. *Full controls (smoking, profession, age, marital status, etc.):* 3. For men there was a negative correlation between mixed-use and BMI (coefficient= -2.814, standard error= 1.072, $p<0.01$). 4. For women neither residential sprawl nor mixed-use are even close to being significant. 5. The results suggest that there is no relationship between BMI and neighborhood characteristics. **OTHER:** 6. After a robustness analysis, the authors concluded that the possibility that people may be more or less likely to move depending on how moving will affect their weight does not drive the results.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Coogan, Karash (2007) United States	Neighborhood compactness and form ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Access to transit *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 865 residents from 11 major metro-areas across the US (467 "high values"; 398 "'low values) (222 compact neighborhood; 463 non-compact) ***PRIMARY OUTCOME:*** Physical activity ***MEASURES:*** 1. Survey (walking for transportation, primary mode of transport, number of automobiles, attitudes, neighborhood compactness and form, access to transit) ***DATA COLLECTION:*** "Walking" or "walk trips" refers to trips taken to a destination, for a purpose other than exercise or pleasure. Respondents reported on nine trip purposes: work, school, shop, entertainment/dining, medical, parks, family, friends, and church. Pro-urban/environmental factors had an ICC=0.85. The sample was divided into two groups: high scores referred to as high values group and low scores referred to as the low values group. A respondent is referred to as living in a 'compact neighborhood if (1) there is some form of housing other than a single family home within 1/3 of a mile from the location, (2) there is a commercial district within walking distance of the location, and (3) there is transit service to the location. Low availability refers to fewer cars than adults. High availability refers to cars equal to or greater than the numbers of adults. ***LIMITATIONS:*** The sample was not random; causal inferences cannot be made using cross-sectional data	Adults 36% < 30 years of age, 33% 30-40 years of age, 67% Female, 81% White, 19% Minority (evaluation sample) ***ELIGIBILITY:*** Individuals considering a residential move or having moved with access to public transportation were eligible for the study. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Collaboration between the New England Transportation Institute, TranSystems Corporation, Resource Systems Group, and San Diego University occurred. ***THEORY/ FRAMEWORK:*** Theory of Planned Behavior ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Transystem Corporation conducted the project from which this data is drawn. It was undertaken in the Transit Cooperative Research Program, "Understanding How Individuals Make Travel and Location Decisions: Implications for Public Transportation." ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. Using a regression analysis, all 3 variables were associated with walking; neighborhood form; (β= -0.23, t= -6.91, p<0.001), auto availability; (β= -0.21, t=-6.22, p<0.001), urban values; (β= -0.18, t=-5.39, p<0.001). 2. For urban and environmental values, the high values group had a 16% mode share to walking, while the low values group has a 6% mode share. 3. Individuals living in a compact neighborhood have approximately a 20% walk mode share; while those not living in such a neighborhood have less than a 9% mode share. 4. Car ownership changed the amount people walked for transportation; those with one car per adult had a walk share of 19%; those from households with at least one car per adult have a walk share of 8%. 5. For individuals living in a compact neighborhood, the high values group has a 24% walk mode share, while the low values group has only 10% (p<0.01). 6. Individuals with high values in a non-compact neighborhood have a 12% walk mode share and those with low values in a non-compact neighborhood with a 6% walk mode share (p<0.01). 7. For individuals with low levels of auto availability, the high values groups had a 21% walk share, compared with the low values groups at 11% (p<0.01). 8. Individuals with high levels of auto availability in the high values group had a walk share of 12% walk compared with low values at 5% (p<0.01). 9. Individuals living in a compact neighborhood with low auto availability showed a 27% walk share compared with only 13% for those with high auto-availability (p<0.01). 10. Individuals with a high auto availability in a compact neighborhood had a 13% walk share compared with 7% living outside such a neighborhood (p<0.01). 11. When there is a combination of the three supportive conditions there is a range from 28% walk share while with three non-supportive conditions there is a 5% walk mode share (p<.01).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Vernez Moudon, Lee (2007) Washington	Land-use mix, density, and distance to commercial facilities **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Complete sidewalks and route directness 2. Access to grocery stores and restaurants *Complex:* 1. Perceptions of social supports	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 608 adults from 4 parts of urbanized areas (88 non-contiguous square miles) within the Urban Growth Boundary of King County, Washington. (105 sub-sample personal characteristics) **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Geographic Information System (GIS) data (parcel level data: urban and non-suburban environment, buffer and proximity measures) 2. Survey (walking behavior, attitude, perceptions [visual quality, social supports for walking, street amenities], demographics, household characteristics, the environment) 3. Behavioral Risk Factor Surveillance System (BRFSS) (total walking) 4. National Health Interview Survey (NHIS) (total walking) 5. International Physical Activity Questionnaire-Long (IPAQ) (total walking) 6. King County tax assessor (environmental factors [data ca. 2001]) 7. King County park and Metro data (street connectivity, land-use mix, residential density, distance to locations, presence of sidewalks, bike lanes, and trails [data ca. 2001]) 8. Puget Sound Regional Council (trails, sidewalks, street connectivity) **DATA COLLECTION:** With the exception of questions about walking behavior, attitude, and perception, the survey used validated questions from the Behavioral Risk Factor Surveillance System (BRFSS), the National Health Interview Survey (NHIS), and the International Physical Activity Questionnaire-Long (IPAQ). 3 categories for weekly walking minutes were developed; "nonwalker," "moderate walker" (<149 minutes per week), and "sufficient walker" (>150 minutes per week). Measures were taken using both airline (straight line) and network (actual street line) distances. Clustered destination areas were labeled Neighborhood Centers or NCs. **LIMITATIONS:** Objective measures were not used; the study was cross-sectional; response rate was low	Adults, General population, Urban and Suburban environments **ELIGIBILITY:** Participants had to be 18 years or older, having little or no difficulty in walking a quarter of a mile, living at the same address as listed in the database, speaking English, and being able to communicate via telephone. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of Washington, Texas A&M University, Centers for Disease Control and Prevention, and the Seattle Pacific University. **THEORY/ FRAMEWORK:** The previously developed Behavioral Model of Environment (BME) provided conceptual framework for selecting attributes for the environment. The BME used 3 spatial constructs to model the walking environment: points of origin/ destination, route, and area around origin/ destination. **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** The survey was pilot-tested on a random sample of 50 respondents drawn from the same sample frame and administered in the summer and early fall of 2002. **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was supported by a cooperative between CDC and the University of Washington Health Promotion Research Center. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Survey variables strongly associated with walking sufficiently to enhance health included using transit, perceiving social support for walking, walking outside of the neighborhood, and having a dog (p<0.01). 2. Having too many grocery stores near home was negatively associated with walking in one airline model (airline model [walking sufficiently relative to not walking] OR=0.667, 95%CI=0.454, 0.980, p<0.05). 3. Walking was negatively associated with distance to NC5 (office and mixed-use; airline model, odds of walking sufficiently relative to not walking OR=1.274, 95%CI=1.041, 1.559, p<0.05) and distance to (office only network model; odds of walking sufficiently relative to not walking, OR=1.581, 95%CI=1.146, 2.180; network model odds of walking sufficiently relative to walking moderately; OR=1.235, 95%CI=1.020, 1.495, p<0.05) as well as the size of the closest NC8 (office, airline model, odds of walking sufficiently relative to walking moderately; OR=0.779, CI=0.655, 0.927, p<0.05; odds of walking sufficiently relative to walking moderately, OR=0.801, 95%CI=0.712, 0.901, p<0.05) to home. 4. Living closer to a grocery store/market (airline model odds of walking moderately relative to not walking; OR=0.375, 95%CI=0.189, .743, p<0.01) (airline model odds of walking sufficiently relative to not walking OR=0.443, 95% CI=0.219, 0.896, p<0.05)], an eating/drinking place (airline model odds of sufficient walking relative to walking moderately OR=0.688, 95%CI=0.493, 0.959, p<0.05), a bank (network model odds of walking moderately relative to not walking OR=0.775, 95% CI=0.620, 0.968)), and a NC2 ([grocery, restaurant, retail] Network model odds of walking sufficiently relative to not walking OR=0.640, 95%CI= 0.441, 0.928, p<0.05) were correlated with increased walking. 5. Living in an area with more complete sidewalks along major streets (airline (sufficient relative to walking) OR=1.090, 95%CI=1.008, 1.179, p<0.05) was significant in the airline but not in the network models and was positively associated with the likelihood of walking sufficiently (p<0.05). 6. Two route directness (airline/network ratio) variables, showed moderately significant (all p<0.05) associations with walking to the closest grocery store/market (network; walking sufficiently relative to not walking, (OR=1.025, 95%CI=1.004, 1.047) and to the school (OR=0.987, 95%CI=0.974, 1.00). 7. The density of the respondent's parcel was also strongly associated with walking sufficiently (airline sufficient not walking, OR=1.959, 95%CI=1.148, 3.346) (network sufficient relative to not walking, OR=2.021, 95%CI=1.239, 3.294) (network sufficient to moderate, OR=1.457, 95%CI=1.118, 1.899) (p<0.01 for all) and significantly correlated with both the network and airline models. **PSYCHOSOCIAL:** 8. Perceived social support for walking in the neighborhood had the strongest association with increased odds of walking. Odds of walking moderately to not walking, (OR=1.622, 95%CI=1.216, 2.165, p<0.01) and odds of walking sufficiently relative to not walking, (OR=1.855, 95% CI=1.366, 2.520, p<0.01).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Smith, Brown (2008) Utah	Population density and land-use diversity **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity and intersection density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 453,927 individuals **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Height and weight [body mass index (BMI)] from Utah Population database [UPDB] driver license data 2. 2000 Census data (racial composition, income, median age of block residents, land-use diversity [proportion of individuals walking to work, home age], population density) 3. Salt Lake County assessor's office (pedestrian friendly street design [street network, intersection density]) **DATA COLLECTION:** License data is linked to census-block groups via Universal Transverse Mercator (UTM) coordinates by the UPDB staff. For the 2000 Census, the median age of houses is based on an item that is bottom-coded for homes built in 1939 or earlier. Pedestrian friendly design is measured as street connectivity or the number of intersections within 0.25 mile of the resident's home. The DIGIT Lab calculated intersections within buffers that extend 0.25 miles from a point that approximates the location of the home. Respondents were placed into walkability quartiles, with the highest 25% quartile having the most walkable neighborhood. **LIMITATIONS:** Data is self-reported; this study did not account for self-selection; few individual measures were not available; the sample is based on one county; causality cannot be determined through cross-sectional studies; the low percentage of individuals who walk to work may limit the utility of this predictor in small samples	25-64 year olds, Adults, General Population **ELIGIBILITY:** The age range was chosen in order to exclude young adults who have not established their post-adolescence residence and elderly adults who are increasingly less likely to hold a driver license and for whom BMI has more complex associations with health. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of Utah. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Institute of Public and International Affairs at the University of Utah. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Higher density reduces the risk of overweight among men (OR=0.997; 95%CI=0.993, 1.00; p=0.051). Higher population density increases the obesity risk for women (OR=1.06; 95%CI=1.001, 1.011; p=0.026). 2. An analysis of weight across quartiles of walkability factors, including density, reveals the expected negative relationship (p=0.039) between the top quartile of density (compared to the lowest quartile) and women's obesity odds. The unexpected overall positive relationship is attributable to the large effect of the third quartile (50th-74th percentile, p=0.002). 3. The higher the number of intersections within 0.25 miles of the home, the more reduced the risk for overweight and obesity is in men (OR=0.991, 95%CI=0.985, 0.997, p=0.004 and OR=0.988, 95%CI 0.980, 0.996; p=0.004, respectively) and the more reduced the risk is for overweight in women (OR=0.993, 95%CI=0.985, 1.0, p=0.042). 4. For men, being in the top 25% of all four walkability measures (defined as highest levels of density, pedestrian-friendly street design, neighborhood age, and walking to work) is associated with approximately a 1.28-point reduction in BMI. For women, the reduction is 0.95 points. For a hypothetical 6-foot, 200-pound man, the least walkable neighborhood would be associated with approximately 10 more pounds than the most walkable neighborhood. Using the female sample's average height and weight (5 feet, 5 inches; 149 pounds), the most walkable neighborhood would be associated with nearly 6 fewer pounds than the least walkable neighborhood. 5. As the age of the housing in the neighborhood increases, BMI declines, as do the odds of overweight and obesity (men: OR=0.922, 95%CI=0.915, 0.929, p<0.001 and OR=0.879, 95%CI=0.87, 0.889, p<0.001, respectively and women: OR=0.933, 95%CI=0.924, 0.924, p<0.001 and OR=0.925, 95%CI=0.915, 0.936, p<0.001, respectively).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Frank, Schmid (2005) Georgia	Land-use mix and residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Intersection density and street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 357 people from 13-counties in the Atlanta region **PRIMARY OUTCOME:** Moderate-intensity physical activity, meeting physical activity recommendations **MEASURES:** 1. Travel survey (travel and objective physical activity data) 2. Accelerometer and MTI software (2-day physical activity) 3. SMARTRAQ 2001 land use database (parcel-level, land-use mix) 4. Street center line files (street connectivity) 5. 2000 Census data and regional land cover data from aerial photos (net residential density) 6. Walkability index (land use mix, residential density, intersection density) **DATA COLLECTION:** Data for the present study came from the Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality (SMARTRAQ) and was collected between 2001 and 2003. A computer-aided telephone interview [CATI] was used for recruitment, at which time all sociodemographic data was gathered. A valid accelerometer hour was ≤30 consecutive minutes of 0 activity counts at any point during the hour. Eight or more hours defined a valid day (has been shown to be reliable in adults and with moderate activity). Net residential density was measured at the block group level due to a lack of consistent reporting on number of dwelling units for multifamily parcels across the 13-county region. **LIMITATIONS:** Self-selection; attitudinal pre-determinants; causation cannot be assessed with a cross-sectional design; data was self-reported; physical activity measures were limited to 2-days; the Atlanta region has limited variability in land use; accelerometers do not measure activities such as swimming and bicycling; this study did not account for the influence of sidewalks and bikeways on levels of physical activity; low-levels of vigorous intensity activities made it difficult to account for other health related variables; the people who agreed to wear monitors were more likely to be white and affluent than the region	Adults, General Population (target sample) 74.9% White, 15.9% Black, mean age= 43.8 years old (evaluation sample) Study participants were more likely to be female (55.7%), and well educated, as 66.4% had at least a bachelor's degree. Study participants were 74.9% white as compared to 53.9% in the Atlanta region and 15.9% black. (evaluation sample) **ELIGIBILITY:** Eligible participants were between the ages of 20 and 70, had a household income of <$45,000 or >$54,999, and lived in low and high density, connectivity, and commercially active environments. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of British Columbia, Centers for Disease Control and Prevention, San Diego State University, Lawrence and Frank Company, Inc., and the University of Cincinnati. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Funding for this research was provided by the Georgia Department of Transportation, the Georgia Regional Transportation Authority and Centers for Disease Control and Prevention. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. A natural log of the minutes of moderate physical activity per day was significantly correlated with land use mix ($r=0.145$, $p<0.01$), net residential density ($r=0.179$, $p<0.01$), and intersection density ($r=0.111$, $p<0.01$). 2. The walkability index was a significant correlate for meeting the ≥30-minute physical activity recommendation. Individuals were on average thirty percent more likely to record ≥30 minutes of activity with each increase in the walkability index quartile. 3. Thirty-seven percent of individuals in the highest walkability index quartile met the minimum of ≥30 minutes for physical activity, while only eighteen percent of individuals in the lowest walkability quartile met the recommendation. 4. Results demonstrate that the odds of meeting the recommended ≥30 minutes of moderate activity per day was 2.4 (OR) times greater for the fourth quartile group than the referent group (least walkable) with a reported confidence interval (CI) of 1.18 to 4.88 ($p=0.015$). However, the third quartile group approaches a significant difference from the referent group as well (OR=2.02, 95%CI=0.99, 4.12, $p=0.055$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Lee, Cubbin (2002) United States	Levels of urbanization (residential density, type of housing units, etc.) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 8,165 youths **PRIMARY OUTCOME:** Physical activity and nutrition **MEASURES:** 1. Youth Risk Behavior Survey (YRBS) (dietary consumption habits, physical activity [participation in sports and intensity], cigarette smoking [frequency of monthly smoking behavior]) 2. 1992 National Health Interview Survey (NHIS) (sociodemographic data, included 1990 census geography codes [link youth to residential characteristics = urbanization (multi-unit housing, urban space) using tract data]) 3. 1990 Census (social disorganization, neighborhood socioeconomic status, ethnic minority concentration, urbanization) **DATA COLLECTION:** Data was taken from the1990 US Census and the YRBS, which was conducted as a follow back to the 1992 NHIS. YRBS food items were scaled to create a summary value with higher values indicating healthier dietary habits. Youths were assigned neighborhood variables according to their residential census tract. **LIMITATIONS:** Neighborhood characteristics were measured in 1990 and YRBS data was collected in 1992; causal and temporal inferences cannot be obtained using cross-sectional data; most of the foods used for questions were "Americanized" choices, less common foods were not considered; data was self-reported; the category for Hispanic did not ethnically distinguish between types of Hispanics	49.5% Male, 19.1% non-Hispanic Black,12.5% Hispanic , 68.4% non-Hispanic White, 16.5 years ± 4.5 mean age (evaluation sample) Respondents whose records were missing geocodes were more likely to be Hispanic and of higher SES than respondents with geocoded records. The study used an ethnically diverse, nationally representative sample of youths. **ELIGIBILITY:** Family consent was attained. All children in the 19 schools within the preparatory grade and grades 5 and 6 were eligible. Eligible participants had to have a residence that was able to be geo-coded. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Stanford University and the University of Kansas. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This work was supported in part by a joint Association of Schools of Public Health and Centers for Disease Control and Prevention fellowship and by a grant from the National Heart, Lung, and Blood Institute. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Neighborhood characteristics were not associated with physical activity or smoking. **NUTRITION:** 2. Residence in neighborhoods with the highest proportions of multi-unit housing (a proxy for urban residence) was associated with healthier dietary habits (21.9-100% Multi-unit housing β=0.16, p<0.05). 3. Youths residing in neighborhoods with higher levels of mobility had poorer dietary habits (48.3-57.0%; β=-0.21, 57.0-64.4%; β=-0.22, p<0.01 for both) than youths residing in neighborhoods with lower levels of mobility. 4. Residence in neighborhoods characterized by low socioeconomic status and high social disorganization (results not shown) was related to poorer dietary behaviors. 5. Residence in neighborhoods with high Hispanic concentrations or urban areas was related to better dietary habits (results not shown).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Aytur, Rodriguez (2007) North Carolina	Active community environments (ACE): mixed land-use and non-motorized transportation improvements (NMTI) ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 6,694 residents from the North Carolina Behavioral Risk Factor Surveillance System (BRFSS) survey ***PRIMARY OUTCOME:*** Leisure physical activity, leisure walking/bicycling, transportation activity, and meeting physical activity recommendations ***MEASURES:*** 1. North Carolina Behavioral Risk Factor Surveillance System [BRFSS] data (individual level data: sociodemographic data, physical activity [activity over past month, leisure-time walking and biking, transportation activity over past week], recommended physical activity and walking [2000 BRFSS]) 2. 2000 US Census (county-level data: racial composition of area residents, area growth and metropolitan, income and education) 3. NCDOT Surveys (policy use and planning implementation [non-motorized transportation improvements (NMTI), mixed land-use classification, the comprehensiveness of implementation tools to guide land development], Active Community Environment [ACE] composite scores) ***DATA COLLECTION:*** Data for this study came from a variety of sources. The North Carolina Department of Transportation (NCDOT) survey was mailed in 2003 to planning directors. Higher ACE scores indicated a more mixed environmental landscape. A detailed content evaluation was conducted on a subset of 30 plans comparing planners' self-reported information to the documentation contained within the plans to assess validity. Sensitivity and specificity for attributes pertaining to the inclusion of NMTI were 83% and 73%, respectively. Self-reported variables from the BRFSS have been shown to be reliable. Reliability of the leisure physical activity measures from BRFSS have been shown to be acceptable (K range, 0.50-0.77) across race and gender groups (intraclass correlation coefficients, 0.36-0.63). ***LIMITATIONS:*** The cross-sectional design limits causal inferences; survey data was self-reported; study was not developed to distinguish how well the policies have been enforced or the extent to which they have affected land-development patterns on the ground; there was no distinction between county-level and municipal planning; analyses were restricted to North Carolina counties with land-use plans and may not be generalizable	Adults Median proportion of non-white was 28 (range, 2.8-62.5) [evaluation sample] County sociodemographic characteristics were generally representative of the state, although the sample included a higher percentage of metropolitan counties and had higher median income. ***ELIGIBILITY:*** 67 counties with land-use plans were eligible because they could be linked to the BRFSS and had a sufficient sample size. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** The North Carolina Department of Transportation and the University of North Carolina-Chapel Hill ***THEORY/ FRAMEWORK:*** Social ecological model with macrosocial, political, and economic processes. ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** This study was funded by a dissertation grant from the Robert Wood Johnson Foundation's Active Living Research Program. Support for the planning survey was provided by the North Carolina Department of Transportation ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. (Full model) After adjusting for county and individual level covariates and any significant interaction terms, those living in counties with the highest ACE scores were found to have nearly twice the odds of engaging in any leisure physical activity (prevalence odds ratio (POR)=1.54, 95%CI= 1.09, 2.19), leisure walking (POR=1.66, 95%CI= 1.05, 2.61), any transportation physical activity (POR=2.13, 95%CI=1.24, 3.65), any bicycling (POR=2.16, 95%CI=1.05, 4.43), and being in a better physical activity recommendation category (POR=1.83, 95%CI= 1.21, 2.75). 2. (Final model) After adjusting for sociodemographic data and keeping significant interaction terms, those living in counties with the highest ACE scores were found to have almost twice the odds of engaging in any leisure physical activity (POR=1.58, 95%CI=1.11, 2.23), leisure walking (POR=1.75,95%CI= 1.35, 2.36), and being in a more favorable recommended physical activity category (POR=1.94,95%CI= 1.44, 2.62), and more than twice the odds of engaging in any transportation physical activity (POR=2.24, 95%CI=1.25, 4) and any bicycling (POR=2.42, 95%CI=1.13, 5.16). 3. In stratified analyses, lower-income individuals (<$25,000) living in high scoring counties were 3 times more likely to participate in transportation physical activity compared with those living in low ACE scoring counties (POR=3.2, 95% CI= 1.4, 7.3). Those with a household income ≥$25,000 had 1.8 times the odds of engaging in transportation physical activity (95%CI= 1.1, 3.1). 4. Individuals that engaged in transportation physical activity were significantly more likely to meet public health guidelines for leisure physical activity (p<0.001; analyses not shown in article). 5. The multilevel models including ACE variables and sociodemographic covariates explained 71% of the between-county variation in transportation physical activity, 92% of the between-county variation in leisure physical activity, and 83% of the between-county variation in bicycling.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Frank, Andresen (2004) Atlanta	Land-use mix, distance to locations, and net residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Intersection density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 10,878 participants from 13 counties in the Atlanta region **PRIMARY OUTCOME:** Overweight/obesity and physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Geographic Information Systems [GIS] (household buffers, mapping, street network, actual trip distance, connectivity, land-use mix) 3. 2-day Travel Diary (distance walked, time spent in a motor vehicle, origin and destination of trips 4. 2000 US Census and land use data from Atlanta Regional Commission and parcel level data (net residential density, sociodemographic variables 5. County level tax assessor's data, aerial photography, street network data, Census data (combined identified residence urban form characteristics including connectivity, net residential density, and mixed use) 6. Atlanta Regional Commission's Regional Travel Model (expected travel times) **DATA COLLECTION:** This study used travel survey data from the Strategies for Metro Atlanta's Regional Transportation and Air Quality (SMARTRAQ) study. The shortest path between the origin and destination was found, and actual network distances were calculated for each trip. A 1-kilometer network buffer size was placed around a household within a disconnected urban environment (small buffer) and a household within connected (large buffer) urban environment. An equation of land-use mix was created using the proportion of estimated square footage attributed to land use and the number of land-uses. Land-use mix ranges from zero to one, with zero representing a single land-use environment and one representing a perfectly even distribution of square footage across all four land uses with several destinations within walking distance. Mixed land-use was organized in quartiles. **LIMITATIONS:** Causality cannot be determined with a cross-sectional design; there was a potential for item, participation, and non-response bias; the diary relied on self-reported data; Atlanta has a limited range of urban forms; the study did not consider time associated with transit use or the relationship among transit service, walking, and driving	Adults African-American Caucasian 65% White (sample) 35% African-American (sample) Higher-density locations were oversampled to ensure a sample of households within a range of different types of urban environments. **ELIGIBILITY:** Participants had to meet one of the ethnic/gender combinations (black, white, male and female) to be eligible. The ethnic combinations comprised 91% of the SMARTRAQ sample. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from the University of British Columbia, Simon Fraser University, and the Centers for Disease Control and Prevention **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not reported **IMPLEMENTATION:** Not reported **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Centers for Disease Control and Prevention, the Georgia Department of Transportation, and the Georgia Regional Transportation Authority **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. For each quartile increase in land-use mix there was a 12.2% reduction associated with the odds of being obese (OR=0.878, 95%CI= 0.839, 0.919, p<0.001). 2. The odds of obesity decline by 4.8% for each additional kilometer walked, but conversely increased by 6% for each hour spent in a car per day. 3. The change from a land use mix of zero to the average land use mix in the region (0.15) decreases the odds of obesity for the average person by 4.65%. Increasing the land use mix to 0.25, the 90th percentile in the Atlanta metropolitan area, decreases the odds of obesity by 6.85%. 4. The proportion of obese persons in the sample declined from 20.2% in the lowest to 15.5% in the highest land-use-mix quartile. 5. For white males, all three urban form variables: mixed use (r=-0.11; p<0.001), intersection density (r=-0.089; p<0.001), and net residential use (r=-0.096; p<0.001) were inversely correlated with BMI. 6. Mixed use (r=-0.086; p<0.001) and residential density (r=-0.039; p=0.02) were negatively associated with BMI for white females. 7. No linear relationships were found between BMI and urban form for blacks. **PHYSICAL ACTIVITY:** 8. Walking distance was positively associated with land use mix for white males (r=0.046, p=0.01), black females (r=0.059, p=0.01), and white females (r=0.051, p<0.001). 9. Walking distance was positively related to intersection density for black females (r=0.051, p=0.02), white males (r=0.062, p<0.001), and white females (r=0.084, p<0.001). 10. Walking distance was positively related to residential density for white males and females (r=0.050, r=0.065, respectively, p<0.001). 11. No linear relationships were found between urban form and walk distance for black males. 12. Minutes spent in the car per day was negatively associated with land-use mix for white males (r=-.107, p<0.001) and females (r=-0.108, p<0.001). 13. Minutes spent in the car per day was positively associated with land-use mix for black females (r=0.042, p=0.05). 14. Car time was negatively associated with intersection density for black females (r=-0.046, p<0.05), white males (r=-0.039, p<0.05), and white females (r=-0.046, p=0.01). 15. Car time was negatively associated for all ethnic/sex combinations for residential density: black males (r=-0.076, p<0.001), white males (r=-0.074, p<0.001), black females (r=-0.050, p<0.05), white females (r=-0.090, p<0.001).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Frank, Sallis (2006) Washington	Land-use mix, residential density, and retail floor ratio **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1,228 adults from the Neighborhood Quality of Life Study (NQLS) and 5,766 adults for the Land Use, Transportation, Air Quality and Health Study (LUTAQH) **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Walkability index/scale (built environment) 3. International Physical Activity Questionnaire [IPAQ] (7-day frequency and duration of walking and biking) 4. Travel diary (travel and activity behavior) 5. Puget Sound Regional Council's 1999 Travel and Activity Survey (walkability, travel data, vehicles miles traveled per person, demographics) 6. MOBILE model (vehicle emissions) **DATA COLLECTION:** Data for the present study came from the Neighborhood Quality of Life study (NQLS), which was collected from May 2002 through December 2003 from neighborhoods with highest and lowest walkability deciles. The walkability index used a 1-kilometer network buffer for each respondent's geo-coded residence. The IPAQ is reliable. The Puget Sound Regional Council's 1999 Travel and Activity Survey was collected as part of the King County Land Use, Transportation, Air Quality and Health Study (LUTAQH). Participants provided data for two consecutive weekdays between August and November of 1999. Daily grams of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) were estimated for each trip made by the participant. The Environmental Protection Agency's emission rate model (MOBILE) was used for estimates. Shortest time-path network distance between reported origins and destinations was used to assess vehicle miles of travel. **LIMITATIONS:** Data was self-reported; this study relied on modeled emissions rather than actual; causality cannot be inferred from cross-sectional data	Adults, General Population (target sample) The sample was well balanced by gender, education, household income, and vehicle ownership **ELIGIBILITY:** In order to be eligible for the NQLS neighborhoods had to be in the highest and lowest decile, have moderately low or high income, and have a listed telephone number or valid mailing address. In addition, block groups had to have a population of at least 1,000 households. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from University of British Columbia, San Diego State University, LFC, Inc., King County, and the Puget Sound Regional Council. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The research on which the article is based was funded by a grant from the National Institutes for Health and King County, Washington. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. When the walkability index was compared to BMI there was an expected relationship, with walkability negatively related to body mass (β= -0.113, t=-3.898, p<0.001, partial correlate -0.107). 2. Researchers found a 5% increase in walkability associated with a 0.23-point reduction in body mass index. 3. The demographic and socioeconomic covariates explained 5.6% of variance in the BMI, the walkability index explained 1.1% of additional variance, which was significant (β=-0.113, t= -3.898, p<0.001, partial correlate -0.107, R^2=0.067). **PHYSICAL ACTIVITY:** 4. When the walkability index was compared to minutes per week devoted to active transportation there was an expected relationship, with walkability positively related to active transportation (β= 0.304, t=10.659, p<0.001, partial correlate=0.289). 5. Researchers found a 5% increase in walkability associated with a per capita 32.1% increase in time spent in physically active travel, 6.5% fewer vehicle miles traveled, 5.6% fewer grams of oxides of nitrogen (NOx) emitted, and 5.5% fewer grams of volatile organic compounds (VOC) emitted. 6. All six covariates explained 1.4% of the variance in the active transportation variable, while the walkability index explained 8.3% of additional variance in active transportation (adjusted R^2 values, 0.097). 7. The walkability index explains 1.81% of the variance in the prediction of vehicle miles of travel (adjusted R^2=0.106). All of the variables in the model were significant at the 0.01 level or better. Only educational attainment explained more of the variation in vehicle miles traveled than walkability. 8. Those individuals living in a neighborhood with higher neighborhood walkability had fewer vehicle miles of travel when compared to individuals living in less walkable neighborhoods (β= -0.157, t=-10.740, p<0.001, partial correlation= -0.134). 9. The walkability index was significantly related to emissions that cause the formation of ozone (β=-0.140, t=-10.841, p<0.001, partial correlation=-0.131).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Khattak, Rodriguez (2005), Rodriguez, Khattak (2006), Brown, Khattak (2008) North Carolina	Land-use mix and residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity *Complex:* 1. Neighborhood self-selection	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 711 individuals (393 surveys, 370 travel diaries) A sub-analyses compared single-family households in the conventional neighborhood (n=122) with the same households in the neo-traditional neighborhood (n=188). **PRIMARY OUTCOME:** Overweight/obesity and physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Mail-in-mail back survey (sociodemographic data, number and type of trips per week, attitudinal data [self-selection], physical activity) 3. 1- day Travel diary ([1995 NPTS and 2001 NHTS] active travel, origin and destination, duration, time of day, purpose, mode, distance, travel expense, sociodemographic data) 4. 2001 Behavioral Risk Factor Surveillance System [BRFSS] data (moderate and vigorous physical activity [MVPA], duration of physical activity, activity recommendations) 5. 1995 Activity survey ([Triangle Transit Authority, regional comparisons] number of trips, trip length, internal trip capture rates, travel modes) **DATA COLLECTION:** This study used data collected from March through May 2003, matching a large neo-traditional/new-urbanist neighborhood (town center, mix of office, commercial, and residential space, more street connectivity) with conventional suburban neighborhoods (50% more residential buildings, twice the land). Section 1 of the survey was filled out by the head of household, while section 2 was filled out by members of the household 16 years or older. Diary design and questions were based on the 1995 National Personal Transportation Survey (NPTS) and the 2001 National Household Transportation Survey (NHTS). 2001 BRFSS items were used for physical activity questions, which are reliable. Household heads were categorized as meeting activity recommendations, active but insufficient, and physically inactive or no participation. **LIMITATIONS:** Data was self-reported; causal inferences are restricted using cross-sectional data; sites were geographically specific; participant preference was not assessed; some survey items were restricted to certain individuals limiting overall household behavior; there may be non-response errors; study had a low-response rate: binary variables can limit potential responses	Adults, General population Responding individuals compared well in terms of socioeconomic characteristics with census and the regional survey. Number of people and vehicles per household are largely consistent with the National Household Travel Survey. **ELIGIBILITY:** Eligible participants could not live in condominiums or town homes and were required to live in neighborhoods that fell into the neo-traditional or conventional category. All participants had to be 16 years of age or older and have a BMI above 18.5. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of North Carolina-Chapel Hill, the Carolina Transportation Program, and Old Dominion University. **THEORY/ FRAMEWORK:** Socioecological conceptual model/ framework **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Financial support for this study was provided in part by the North Carolina Department of Transportation. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Heads of households in the new urbanist multi-family units had an average BMI (23.8, p=0.03) lower than the BMI (24.9) of household heads in conventional neighborhoods. The difference in overweight prevalence between households from multi-family dwellings (27.9 %) and conventional suburban neighborhoods (40.3%) approached, but did not achieve significance. 2. Indirectly through the duration of MVPA, the association between both new urbanist dwelling types and BMI was not significantly associated with a reduction in BMI. 3. Indirectly through the number of utilitarian physical activity trips the association between the new urbanist neighborhood and BMI shows a significant 0.119 reduction in BMI (0.390 [main effect] * -0.304 [coefficient] =-0.119) for household heads from the single-family dwellings compared with household heads from the conventional suburban neighborhood. 4. Indirectly, through utilitarian physical activity trips for the household heads residing in the new urbanist multi-family dwellings, the association between the neighborhood and BMI was not significant. **PHYSICAL ACTIVITY:** 5. Residents of the new urbanist neighborhoods (mean=2.03) spend more time being physically active in their neighborhood than did residents of the conventional neighborhoods (mean=1.20) (moderate or vigorous physical activity t=2.890, p<0.001). 6. Households in neo-traditional neighborhoods generate 22.1% (e(0.20)-1) fewer auto trips and 23.4% fewer external trips than households in the conventional neighborhood (after controlling for other factors and accounting for self-selection). The walk trips show a dramatic 305.5% increase in neo-traditional developments. 7. The marginal effect corresponding to the new urbanist single-family dwelling indicates that heads of household make 0.39 (p=0.02) more utilitarian physical activity trips than their counterparts residing in the conventional suburban neighborhoods.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Frank, Saelens (2007) Georgia	Land-use mix, density, retail floor ratio, and distance to locations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 3,511 individuals from 2 sub-samples (Neighborhood selection = 2,056 individuals and Neighborhood preference = 1,455 individuals) of the 2001-02 SMARTRAQ from 13 counties near Atlanta **PRIMARY OUTCOME:** Overweight/obesity and physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality [SMARTRAQ] survey (2-day travel diary [destinations, mode, time of day, day of week, duration, distance], walkability index (land-use mix, residential density, retail floor area ratio, street connectivity], Neighborhood Selection Questionnaire [reasons for moving], Stated Preference survey [preferences for travel convenience and neighborhood design], and sociodemographic characteristics) 3. Geographic Information System ([GIS] number of vehicle miles traveled, urban form characteristics [street network], immediate neighborhood buffer around residence) 4. County level tax assessor's data (urban form characteristics) **DATA COLLECTION:** Neighborhood selection items included 10 questions assessing reasons for moving to one's neighborhood using a 5-point Likert scale. The items "ease of walking," "low transportation costs," and "near to public transit" loaded most highly on this factor labeled "non-motorized selection." Individuals' composite scores were averaged for their responses and placed into quartiles. The stated preference survey for SMARTRAQ used for this study used an 11-point Likert type response and gauged the extent of demand for aspects of travel convenience and neighborhood design. Respondents were placed into quartiles based on walkability score, the higher the quartile indicated better neighborhood walkability. **LIMITATIONS:** Observed neighborhood-associated differences may be spurious and merely reflect shared underlying lifestyle preferences that impact both location and travel choice; longer and more complete assessments of walking (walking duration) are necessary to better specify the health impact; the models were incomplete, accounting for only a modest proportion of the variance; there are likely many factors that influence neighborhood selection and preference that were not measured, including availability, cost, and other neighborhood characteristics	General population The sample was not weighted to be representative of regional demographic or urban form characteristics. Both samples were representative of the regional distribution across gender and household size. The selection sample was closer to the regional distribution in terms of ethnicity and income. The neighborhood preference sample was derived from a representative sample of the larger SMARTRAQ survey across income and net residential density. **ELIGIBILITY:** Eligibility for the SMARTRAQ neighborhood selection sub-sample required participants to be 18 years or older, the head of household, a home renter or owner, and having residentially moved within the past 3 years. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The University of British Columbia, Children's Hospital and Regional Medical Center and the University of Washington, Public Health and Epidemiology Consultant in Atlanta, and Lawrence Frank and Company. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Georgia Department of Transportation funded this cross-sectional study. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Individuals in both the third and fourth quartiles for the non-motorized selection factor and walkability had significantly higher odds of any walk trips (3rd; OR=1.52, 95%CI=1.06, 2.15, 4th; OR=2.49, 95%CI=1.80, 3.36) and non-discretionary walk trips (3rd; OR=1.52, 95%CI=1.04, 2.19, 4th; OR=2.43, 95% CI=1.71, 3.36) than first quartile individuals for the selection and walkability factors (p-values not reported). 2. Only the fourth quartile on walkability showed significantly greater odds of a discretionary walk trip (OR=3.3, 95%CI=2.93, 7.10, p-value not reported). 3. Overall model fit for obesity was lower than for the walking outcomes (R^2=0.08). 4. Lower age, fewer motorized vehicles, lower proportion of licensed drivers, increased importance of non-motorized selection, and increased walkability were all significant predictors of increased likelihood of any walk trips (pseudo R^2=0.15). Being younger, having access to fewer vehicles, greater preference for pedestrian oriented neighborhoods, and greater walkability (significant for the 4th quartile, p=0.07) where one lives were associated with an increased likelihood of any walk trips (pseudo R^2=0.20).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kerr, Rosenberg (2006) Washington	Diverse land use mix ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Perceptions of neighborhood safety (crime) 2. Perceptions of neighborhood traffic 3. Street connectivity and perceptions of neighborhood aesthetics 4. Perceived access to local shops and facilities *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 259 parents in neighborhoods of King County, WA ***PRIMARY OUTCOME:*** Physical activity ***MEASURES:*** 1. Survey (physical activity [number of days per week their child walked or biked, rode in a car or school bus, or took public transportation to and from school], self-reported sociodemographic variables and perception of the local environment) 2. The Neighborhood Environment Walkability Scale [NEWS] (participant address [geo-coded], 1 km buffer around residence, residential density, proximity and ease of access to nonresidential land uses [e.g., restaurants], street connectivity, walking or cycling facilities, aesthetics, pedestrian traffic safety, and crime safety) ***DATA COLLECTION:*** Data for this study used information from the Neighborhood Quality of Life Study (NQLS), which combines Geographic Information Systems (GIS) data and Census data. Parents answered supplemental questions with regard to the youngest or only child in the household between 4-16 years of age. Data was collected throughout an entire year, to allow for variations in activity because of weather. The NEWS is a GIS based index combining net residential density, retail floor area ratio, intersection density, and land use mix. ***LIMITATIONS:*** The small sample size and cross-sectional data limit the ability to infer causal relationships	Parents; 20-65 years old, 83.3% White, 16.7% Minority Children; 45.9% >12 years old (evaluation sample) ***ELIGIBILITY:*** Eligible participants had children 4 to 18 years old, provided consent, had a working telephone, and lived within the neighborhood study areas. Parents of children with disabilities were not included in the study. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** The research team was from San Diego State University, Cincinnati Children's Hospital and Health Center and the University of British Columbia. ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** National Heart Lung, Blood, and Blood Institute of the National Institutes of Health ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. In high-income neighborhoods, more children actively commuted in high-walkable (34%) than low-walkable neighborhoods (23%) (OR= 2.1, 95% CI= 1.12, 3.97, $p<0.05$), but no differences were noted in low-income neighborhoods. 2. Parent concerns, neighborhoods aesthetics, and stores within a 20-minute walk were independently associated with active commuting (parent aesthetics; OR= 5.2, 95%CI =2.71, 9.96, $p<0.05$, aesthetics; OR=2.5, 95% CI=1.33, 4.80, $p<0.05$, store distance; OR= 3.2, 95%CI= 1.68, 6.01, $p<0.05$). 3. Perceived access to local stores and biking or walking facilities accounted for some of the effect of walkability on active commuting (OR=2.0, 95% CI=1.03, 4.00, $p<0.05$). 4. In high-income neighborhoods, more children actively commute in high-walkable (34%) than in low-walkable neighborhoods (23%), but no differences are noted in low-income neighborhoods. 5. Parent concerns and neighborhood aesthetics were independently associated with active commuting (parent concerns; OR=4.9, 95% CI=2.54, 9.40, $p<0.05$, aesthetics; OR=2.4, 95% CI=1.23, 4.56, $p<0.05$). 6. Parent concerns about their child walking or biking to school were significantly inversely associated with residential density and neighborhood-level walkability (OR=2.0, 95%CI=1.08, 3.84, $p<0.05$ and OR=1.7, 95%CI=1.00, 2.85, $p<0.05$, respectively). 7. Parents of children aged 12-18 had significantly fewer concerns about active commuting ($p=0.004$) than parents of children 5-11 years old, but child gender and parent education or gender were not significantly related to parent concerns. 8. A parental concerns scale was most strongly associated with child active commuting (OR=5.2, 95% CI= 2.71, 9.96, $p<0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Ewing, Brownson (2006) United States	Residential density ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** (N=8,984) youth from the National Longitudinal Survey of Youth 1997 (NLSY97) from 1,862 households in 954 counties and independent cities. ***PRIMARY OUTCOME:*** Overweight/obesity ***MEASURES:*** 1. Height and weight (body mass index [BMI]), NLSY97 N=8,531; NLSY97-2002 N=7,240; NLSY97-2003 N=6,677 2. County Sprawl Index (residential density, street accessibility) NLSY97 N=6,760; NLSY97-2002 Sprawl N=5,815; NLSY97-2003 N=3,667; Complete continuous sprawl measures= N=3567 3. 1997-2003 National Longitudinal Survey of Youth [NLSY] (exercise, diet, sociodemographic data) 4. Geographic Information Systems [GIS] files (participant address, link respondent to county of residence) 5. FBI crime rate (violent and property crimes) ***DATA COLLECTION:*** The data were drawn from five consecutive cross-sectional rounds of the NLSY97 from 1997 through 2003. Sociodemographic variables were extracted from the original sample using the NLSY97. Two longitudinal analyses were conducted to follow up on positive findings in the cross-sectional analyses. TV watched and questions on exercise and diet were provided by a sub-sample from the 1997 data and by all in the 2002 NLYS. Ewing, et al. county sprawl index was used, which has been validated. The more compact the county, the higher the value of the county sprawl. Average annual heating-degree days and cooling-degree days for the period 1971 to 2000, relative to a base temperature of 65 ºF were the chosen measures of climate. ***LIMITATIONS:*** The sample of movers was small; the cross-sectional and longitudinal designs give such different results; the cross-sectional study examined those who were already overweight/ obese whereas the longitudinal study looked at changes in overweight/obesity; the study relied on self-reported data	12-23 year olds (mean age=14.9 years), 26.0% Black non-Hispanic, 21.2% Hispanic, 3.5% other race, 51.2% Male (evaluation sample) A supplemental sample of Black or Hispanic youth was included to permit analysis across race or ethnicity. ***ELIGIBILITY:*** Eligible participants for the NLSY97 lived in metropolitan areas, had a BMI of between 11 and 59. City and county area data were merged into the Natural Resources Inventory [NRI] and required to meet density and area thresholds in order to be incorporated. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers were from the National Center for Smart Growth Education and Research at the University of Maryland, St Louis University's School of Public Health, and the National Cancer Institute. ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** Funding for this study was provided by the National Cancer Institute, National Institutes of Health. ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** *Data from the NLSY97:* 1. The county sprawl index was related to overweight or risk of overweight in the expected direction at a significant level (β= -0.0030, t=-2.30, p=0.022). 2. The odds of being overweight or at risk of overweight, one standard deviation below the mean county index, were 1.16 times the odds in a more compact county, one standard deviation above the mean index (95% CI= 1.02, 1.31 [no p-value]). *Data from 2002:* 3. The more compact the environment the less likely respondents were to be obese β= -0.0026, t=-1.98, p=0.048). 4. Crime and climatic variables were not significant in combination with county sprawl and individual characteristics. *Data available from NLSY97-2003:* 5. The more compact the environment, BMI at mean age and BMI growth decreased but not significantly (BMI mean age and county sprawl: coefficient=-0.00014, t=-0.37, p=0.71; county sprawl and BMI: coefficient= -0.00082, t= -0.28, p=0.78, respectively). *Data from NLSY97 from 1997-2003 consecutively:* 6. A youth's BMI after a move was most strongly associated with his or her BMI before the move. (coefficient= 0.917, t=51.6, p<.001). ***OTHER:*** 7. Data from a subsample from the NLSY97 showed that county sprawl was more significant with the TV variable in the model (β= -0.045, t= -2.47, p=.014), thus adolescents in compact areas watch slightly more TV than those in sprawling areas. 8. The relationship between sprawl and overweight for US youth actually proved stronger than between sprawl and obesity for adults in the original study by Ewing et al (2003). The coefficient of sprawl was .0030 for adolescents, 0.0026 for young adults and 0.0021 for older adults. Significance was lower in this study only because the sample of individuals and the sample of counties represented were smaller in this study than in the original study.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Atkinson, Sallis (2005); Saelens, Sallis, Black (2003) California	Land-use mix and residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to equipment and places to be physically active 2. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 107 adults from 2 nonadjacent neighborhoods (high walkability; n=54 and low walkability; n=53). **PRIMARY OUTCOME:** Physical activity and walking **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Survey (duration [minutes] of walking to and from school in past week, duration of walking during breaks and lunch, duration of walking for errands, exercise, and to and from transit stops, demographic questions, anthropometric data, recreational variables, availability of home sports equipment, convenience to recreational/exercise facilities within a 5 minute or 10 minute walk) 3. Neighborhood Environment Walkability Survey [NEWS] (perceptions of neighborhood residential density, mixed land use, accessibility, connectivity, infrastructure, aesthetics, traffic safety, and crime within a 10-15 minute walk) 4. Godin-Shephard Leisure Time Exercise Questionnaire (leisure time physical activity, frequency and intensity of physical activity over a 7-day period) 5. Accelerometers (physical activity) **DATA COLLECTION:** This study assessed data taken from adults in two neighborhoods with different walkability scores. Participants wore an accelerometer on their hips for 7 consecutive days during all waking hours except water related activities. A survey was mailed to respondents 4-5 days after receiving accelerometers. This survey contained the NEWS instrument, the Godin-Shephard Questionnaire, as well as other measures from previous surveys and developed specifically for this survey. NEWS scales used a four-point Likert-type scale and had test-retest interclass correlations >0.58 with six of the eight scales being >0.75. Test-retest reliability for the Godin-Shephard Leisure Time Exercise Questionnaire for adults was previously found to be 0.24-0.94. Test-retest reliability correlations for items added to the survey related to home environment and convenience were 0.89 and 0.80 respectively. One week after receiving completed surveys a second survey was sent to respondents, which contained only the environmental perception subscales. **LIMITATIONS:** Small sample with only two neighborhoods recruited; recruitment rate was low; neighborhoods may not have been heterogeneous enough to observe differences; neighborhood self-selection may have been a problem; cross-sectional study design limits causal interpretations; accelerometers are not sensitive to all activities and not usable in aquatic environments and do not distinguish type, location, or purpose of activity	Adults 81% White, 9% Hispanic/Latino, 5% Asian/Pacific Islander, 1% African-American, 34% Multiple ethnicities; 52% Female; >90% With some college/ vocational training; mean age=48.2 years (SD=11.6) (evaluation sample) The neighborhoods differed in respect to mean age (p=0.008) and percentage of residents completing college differed significantly (p=0.026). **ELIGIBILITY:** Participants were eligible if they lived within the identified neighborhoods (based on walkability), were aged between 18-65 years, did not have a disability precluding walking, and were able to complete surveys in English. Participants gave written consent to participate **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from San Diego State University and the Cincinnati Children's Hospital Medical Center. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Two of the authors and a community group composed of transportation, environmental protection, and urban planning professionals created the survey, which was based on literature. **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Institutes of Health grant **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Residents in the high-walkability neighborhood engaged in almost 60 more minutes of moderate-intensity physical activity during the past 7 days than did low-walkability residents (194.8 min vs. 130.7 min, F(1,105)=6.02, p=0.016). This was the primary contributor to greater overall objectively measured physical activity among high- vs. low-walkability neighborhood residents (F1,105=6.8, p=0.01). 2. Percentage of residents walking for errands was higher in the high-walkability neighborhood than in the low-walkability neighborhood (85.2% vs. 59.6%; χ^2 [1]=8.72, p=0.003). 3. Self-reported vigorous physical activity (VPA) was significantly and positively correlated with residential density at a moderate level (r=0.35, p<0.01), with more modest, but significant, positive correlations with home equipment availability (r=0.27, p=0.01) and the total environment index (r=0.28, p<0.01). 4. Self-reported total physical activity was positively correlated with home equipment availability at a moderate level (r=0.34, p<0.01). 5. Accelerometer-derived VPA was significantly and positively correlated with the residential density at a moderate level (r=0.39, p=0.00), having more modest correlations with connectivity (r=0.25, p=0.01) and the environmental index (r=0.23, p=0.02). 6. Accelerometer-derived total physical activity was positively correlated with connectivity at a modest level (r=0.21, p=0.04).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Wen, Zhang (2009) Illinois	Residential density, land-use mix, neighborhood amenities (access to health and human services) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to restaurants and bars *Complex:* 1. Social environment (trust, social capital, norms of reciprocity)	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 3,530 respondents from the MCIS-MS in 266 Chicago neighborhoods **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. Metropolitan Chicago Information Center-Metro Survey [MCIC-MS] (physical activity; weekly work-out and exercise [1996 data included exercise for the year]) 2. 2000 community indices from Metropolitan Chicago Information Center [MCIC] (built environment), 2000 City of Chicago Public Data/2003 Chicago Area Transportation data (pedestrian injury rate, residential density, distance to subway and parks, land-use mix, access to neighborhood amenities, neighborhood buffers) 3. 1995 Project on Human Development in Chicago Neighborhoods-Community Survey [PHDCN-CS] (social capital; neighborhood trust, norms of reciprocity, perceived violence) 4. 1990 US Census Data (neighborhood socioeconomic status; affluence, poverty, education, % female head of household, % of households using public assistance) **DATA COLLECTION:** Results presented were from secondary data analyses of existing survey data that was merged with publicly accessible administrative data and Census data on individual and neighborhood characteristics. On 8 SES and social capital variables, a composite scale of neighborhood social environment was constructed with excellent internal reliability (α=0.92). Neighborhood clusters were used as the unit of analysis and were composed of geographically contiguous census tracts (typically 2 or 3) and should have been homogeneous on key census indicators. During the 1996 MCIC-MS respondents were asked if during the past year individuals improved their fitness and exercised regularly. Questions from the self-reported measures have been validated. **LIMITATIONS:** Data was self-reported; exercise measures do not distinguish purpose; the sample is geographically limited; causal inferences cannot be made using cross-sectional studies; environmental measures were objective; both of the exercise measures were not subjected to psychometric testing; this research does not look at spatial dependency between adjacent neighborhoods; there was a time lag between individual-level data used and social and environmental data	Adults, General Population, 56.29% non-White respondents (MCIC-MS 1995, 1996, 1997, 1999) [evaluation sample] **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from University of Utah and the Academy of Family Physicians, Washington DC. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This work was supported by a grant from the National Institute of Child Health and Human Development (NICHD). **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Respondents who lived in neighborhoods that had more access to restaurants and bars were more likely to report one to three times of weekly workout/ exercise (OR=1.08; 95% CI= 0.99, 1.19; $p<0.01$) and four times or more weekly workout/exercise (OR=1.14; 95% CI= 1.03, 1.26; $p<0.05$) compared with those who lived in neighborhoods that had less access to restaurants and bars. 2. Access to restaurants and bars (OR=1.24; 95% CI= 1.05, 1.46; $p<0.01$) and neighborhood social environment (OR=1.37; 95% CI= 1.11, 1.69; $p<0.05$) both were significantly associated with the likelihood of reporting regular exercise in the past year. **ENVIRONMENT:** 3. Correlation analyses (data not shown) suggested that an advantaged neighborhood social environment was positively correlated with access to neighborhood amenities, such as restaurants, bars, libraries, and museums, and to lower pedestrian injury rates, whereas it was negatively correlated with mixed land use, access to subway stations and parks, and access to services. Meanwhile, neighborhoods with more mixed land use had better access to subway and amenities but also had higher pedestrian injury rates. **OTHER:** 4. The beneficial effect of neighborhood social environment was significantly stronger for women (data not shown).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Forsyth, Hearst (2008), Forsyth, Oakes (2007), Oakes, Forsyth (2007) Minnesota	Residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood safety from crime 2. Access to places for physical activity 3. Access to transit 4. Street connectivity *Complex:* 1. Social environment	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 716 individuals from 36 neighborhoods **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. International Physical Activity Questionnaire (IPAQ: n=716) (physical activity, metabolic equivalent times scale [METs]) 3. 7-day travel and walking diary (n=709) (modified version of National Household Travel Survey) (mean miles walked) 4. Geographic Information Systems (GIS) (focus areas, street pattern, residential density) 5. Accelerometers (n=712) (physical activity [activity counts]) 6. US Census (density, street connectivity) **DATA COLLECTION:** The data reported is from the Twin Cities Walking Study, which was collected from April to November. The IPAQ and Travel diary, modified National Household Travel Survey, were used to assess walking behavior and overall physical activity. Accelerometer data were processed as mean total activity counts per 24-hour day and were calculated by summing counts within all valid days then dividing by the number of valid days. Accelerometer reliability in children and adolescents is ICC=0.76, and is reliable in adults as well. High density was defined as greater than 24.7 persons per gross hectare excluding water bodies only; low density was defined as less than 12.4 persons/hectare (ha). Small median block size was defined as below 2 ha, which was related to standard block sizes in the area. Large blocks were larger than 3.2 ha. Twenty per cent of participants, or 147 people, completed repeated measures for a reliability assessment **LIMITATIONS:** Only the first 20 volunteers from each area were taken for the study; all potential confounders were not controlled; the threat of residual confounding was severe; self-selection was not controlled; cross-sectional study design restricts temporal and causal inferences; data was self-reported	Adults 65% Female 81% Caucasian (evaluation sample) 51% Female 76% Caucasian (2000 Census) Study participants appear relatively homogenous with respect to SES but heterogeneous with respect to density and street connectivity. The northern sector of the Minneapolis-St. Paul metropolitan area was chosen for its environmental diversity. **ELIGIBILITY:** Participants were ≥25 years of age, had primary residence in one of the 36 neighborhoods, and were able to walk for 20 minutes unaided. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from the University of Minnesota, Cornell University, University of Pennsylvania **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not reported **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was supported by a grant from the Robert Wood Johnson Foundation through the Active Living Research program. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. High density areas have twice the odds of increased travel walking as low density areas (OR=1.99; 95%CI= 1.29, 3.06), but block size has no similar effect. For the negative binomial model the odds ratio was 1.47 ($p<0.10$). 2. Larger blocks seem to increase odds ratios for leisure walking by about 40% (OR=1.40; 95%CI= 0.96, 2.05, p-value not reported). 3. There are small positive correlations between mean and median accelerometer counts of total physical activity with straight-line and network distances to the nearest video store, hardware store, and pharmacy, although not to other destinations. Park distance was negatively correlated with accelerometer readings, however while the values were significant they were low (results not shown). 4. Using Spearman's correlations there was significant positive association with accelerometry physical activity and whether people spoke to others in their neighborhood, perceptions of crime, having places to go in walking distance from their home, hills, nearness to book stores and participant's job, and access to bicycle and pedestrian paths (although significant, r values were low with the highest being r=0.13 for closeness to job or school) (results not shown). 5. Regression models reveal high density areas are marginally associated with an increase in total walking and, in some cases, total physical activity for racial minorities, those without college degrees, the less healthy, and the obese (results not shown). 6. There are very few correlations with the 3 measures of total physical activity and these are all negative correlations with measures of retail (accelerometer mean; CE= -0.3488) and commercial uses (accelerometer mean; CE= -0.3473) ($p<0.05$). 7. Total walking in mean miles per day is positively correlated with sidewalks (length per unit area; CE= 0.4510; length divided by road length; CE= 0.3449), street lights (CE= 0.4874), traffic calming (CE= 0.3629), and several of our many measures of connected street patterns (signs vary) ($p<0.05$). 8. Notably absent were any positive correlations with mixed use-apart from a modest one with miscellaneous retail (CE= 0.3505, $p<0.05$). *(continued next page)*

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						9. Travel walking measured both by survey and diary was positively correlated with social land uses (IPAQ; CE= 0.4166; Diary; CE= 0.3379), sidewalks (length per unit (lpu)/IPAQ; CE= 0.4866; lpu Diary; CE= 0.6224; length/road(l/r) IPAQ; CE= 0.5282; l/r Diary; CE= 0.5945), transit (IPAQ; CE= 0.3716, Diary; CE= 0.4652), litter/graffiti (IPAQ; CE= 0.3325; Diary; CE= 0.5238) and connected street patterns (# access pts./ IPAQ; CE= 0.5176, # pts/Diary; CE= 0.5384; intersections IPAQ; CE= 0.4052, int. Diary; CE= 0.5279; 4-way IPAQ; CE= 0.4602; 4-way Diary; CE= 0.5782; nodes IPAQ; CE= 0.4284, nodes Diary; CE= 0.4673; ratio 4-way IPAQ; CE= 0.4164, 4-way Diary; CE= 0.4698) (all $p<0.05$). 10. Leisure walking was negatively correlated with some of the same features; transit (IPAQ CE= -0.4882; Diary CE= -0.3360), sidewalks (length/road IPAQ CE= -0.3318), street lights, connected street patterns (IPAQ # access points CE= -0.3349; IPAQ connected nodes CE= -0.3643), social land uses (IPAQ CE= -0.5067), as well as tax exempt land uses (IPAQ CE= -0.4214) (all $p<0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Handy, Cao (2008); Handy, Cao (2006) California	Land-use mix and distance to destinations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to places to be active 2. Perceptions of safety (crime) 3. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1,682 adult "movers" and "non-movers" from 8 neighborhoods **PRIMARY OUTCOME:** Walking and biking **MEASURES:** 1. 12-page survey (sociodemographic data, mobility constraints, residential tenure, frequency of transport and leisure walking and walking to specific destinations in the past 30 days, change in walking and biking before the move [for movers] or from one year ago [for non-movers], perceptions and preferences for accessibility, activity and socializing opportunities, attractiveness, presence of outdoor spaces, and safety [crime, lighting], travel attitudes [pro-bike/ walk, pro-transit, pro-travel, travel minimizing, safety of car, car dependency], frequency and intensity of activity in past week) 2. Geographic Information Systems [GIS] data (geo-coded residential address, street network distance from residence to destination) 3. New Neighborhoods Contact service (2 residential databases for names of "movers" and "non-movers") 4. Yellow pages (commercial destinations; institutional [e.g., church], maintenance [e.g., grocery store], eating out [e.g., bakery], and leisure [e.g., health club]) **DATA COLLECTION:** The New Neighbors Contact Service databases identified "movers" and "non-movers" to traditional neighborhoods (built in pre-World War II, more connectivity) and suburban (built more recently, less connectivity) neighborhoods. Database contacts were mailed 2 rounds of questionnaires at the end of September 2003. In November, a second copy of the survey was sent to non-responders. Surveys questions were developed using previous research projects and items from the International Physical Activity Questionnaire, which was then pretested with UC Davis students, staff, and area residents. A reliability test for frequency of neighborhood physical activity (NPA) produced an intra-class correlation coefficient (ICC) of 0.20 (n=23). Reliability testing for the change in physical activity over the last year produced an ICC of 0.89 (n=16). *(continued next page)*	Adults, General population, Urban, Suburban (target sample) According to the 2000 US Census the evaluation sample tended to be older on average than neighborhood residents and the percent of households with children is lower among the evaluation sample for most neighborhoods. Median household income for the evaluation sample was higher than the census median for all but one neighborhood. **ELIGIBILITY:** Eligible participants had to have addresses that could be geo-coded. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of California-Davis. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** University of California, Davis-Caltrans Air Quality Project, Robert Wood Johnson Foundation, and the University of California Transportation Center. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Objective measures for minimum distance to a bank (coefficient=0.082, p=0.035), number of banks within 800m (coefficient=0.091, p=0.005), and number of types of businesses within 1600m (coefficient=0.073, p=0.040) were positively associated with increased walking. 2. Individuals living in mixed-use neighborhoods (coefficient=0.0471, p=0.017) and living farther from health clubs (coefficient=0.0561, p=0.004) had higher neighborhood physical activity. 3. Individuals with higher perceptions of physical activity options (coefficient=0.0395, p=0.083), the social environment (coefficient=0.0447, p=0.026), attractiveness (coefficient=0.0866, p<0.001), and stores within walking distance (coefficient=0.0549, p=0.004) engaged in neighborhood physical activity more frequently. 4. Respondents who preferred to be physically active (coefficient=0.118, p=0.004) and had stores within walking distance (coefficient=0.168, p<0.001) walked to the store more frequently. Respondents who preferred to be safe (coefficient=-0.102, p=0.008) and have cul-de-sacs (coefficient=-0.065, p=0.084) walked less frequently, suggesting a self-selection effect. After controlling for these effects, distance to potential destinations, both objective (coefficient=-0.144, p<0.001) and perceived (coefficient=0.268, p<0.001) remained positively associated with neighborhood walking. Perceived safety (coefficient =-0.071, p=0.029) remained negatively associated with walking and attractiveness (coefficient=0.078, p=0.038) remained positively associated. 5. A significantly higher share of residents in traditional neighborhoods reported walking to a store at least once in the last 30 days compared to suburban neighborhoods (data not shown). Over 86% of residents in traditional neighborhoods strolled at least once in the last 30 days versus 79% of residents in suburban neighborhoods, with an average frequency of 10.1 strolls compared to 7.7 strolls. 6. Compared to suburban residents, residents in traditional neighborhoods perceived their neighborhoods on average as having higher accessibility (mean=0.15 vs. mean=-0.18, p<0.01), opportunities for socializing (mean=0.09 vs. mean=-0.12, p<0.01), and attractiveness (mean=0.28 vs. mean=-0.33, p<0.01). Residents in suburban neighborhoods on average perceived their neighborhoods as having greater safety (mean=0.16 vs. mean=-0.14, p<0.01) and outdoor spaciousness (mean=0.06 vs. mean=-0.05, p=0.02). *(continued next page)*

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		LIMITATIONS: Data was self reported; causality cannot be determined using cross-sectional data; total activity perceptions, and duration and intensity of activity were not assessed; neighborhood preference was measured retrospectively; there was temporal inconsistency between the two groups; there was no differentiation between home and neighborhood exercise; biking and walking substitute for one another; may have been response bias; there is a need to separate direct and indirect effects of attitudes on physical activity behavior; this analysis did not account for individual qualities or subsets of qualities of the built environment				7. Changes in perceptions of physical activity options (NPA coefficient=0.0586, p=0.046; walking coefficient=0.103, p<0.001), attractiveness (NPA coefficient=0.151, p<0.01), accessibility (walking coefficient=0.103, p<0.001), socializing (NPA coefficient=0.0549, p=0.052; walking coefficient=0.14, p<0.001), and current safety (NPA coefficient=0.0672, p=0.025; walking coefficient=0.15, p<0.001) were associated with increased neighborhood physical activity and walking. 8. Travel-minimizing attitude (coefficient=-0.077, p=0.014), pro-transit attitude (coefficient=-0.121, p<0.001), and preference for spaciousness (coefficient=-0.111, p=0.002) were all negatively associated with changes in biking, while attractiveness preference (coefficient=0.074, p=0.019) was positively associated. 9. The current number of household maintenance businesses within 1600m (coefficient=0.090, p=0.012) and the minimum distance to a health club had (coefficient=0.071, p=0.045) positive effects on changes in biking.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
King, Toobert (2006) California, Oregon, Georgia, Rhode Island, Tennessee	Land-use mix and distance to locations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood traffic safety 2. Perceptions of neighborhood safety from crime 3. Street connectivity *Complex:* 1. Perceptions of social support	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 639 individuals from 5 Behavior Change Consortium (BCC) sites; California (n=94 men and women); Oregon (n=122 post-menopausal women with type 2 diabetes); Georgia (n=255 men and women, African-American); Rhode Island (n=109 participants); Tennessee (n=64 obese, sedentary, lower-income, minority participants). **PRIMARY OUTCOME:** Physical activity **MEASURES:** 1. Neighborhood Environment Walkability Scale [NEWS] (perceived environment; residential density, land use mix, access to restaurants and retail stores, street connectivity, walking and cycling facilities, aesthetics, traffic safety, and safety from crime) 2. Community Health Activities Model Program for Seniors (CHAMPS) questionnaire (frequency, intensity, duration of physical activity over past month, meeting national recommendations, walking for errands and leisure, demographic characteristics) **DATA COLLECTION:** Data from 5 BCC sites used for the current investigation contributed cross-sectional data on physical activity (3 sites) and the perceived neighborhood environments (all 5 sites). Each site conducted a randomized, controlled trial evaluating one or more interventions aimed at changing single or multiple health behaviors. The NEWS was collected at 6 months post-baseline for Stanford, 12 months post-baseline for Atlanta, and 24-36 months post-baseline for Memphis, Rhode Island, and Oregon (ICC≥0.75). The NEWS has been shown to significantly discriminate among neighborhoods varying in objectively defined levels of walkability. All subscales were calculated as mean across items. The CHAMPS questionnaire is concurrent with the NEW and has been shown to discriminate among groups varying in physical activity levels (ICC 0.62-0.76). **LIMITATIONS:** Time point across studies for data collection could not be standardized; the number of variables tested was large; data for questionnaires was self-reported	Adults, Elderly, African-American, Lower-income (target sample) 55 years and older (Stanford); 18-72 years old (Atlanta); 65 years and older (Rhode Island) 10.6% minorities (California); 3.3% minorities (Oregon); 97.7% minority (Georgia); 1.9% minority (Rhode Island); 100% minority (Tennessee) (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Stanford University, Oregon Research Institute, Northeastern University, San Diego University, and the Universities of Michigan, Tennessee, and Rhode Island. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** The National Institutes of Health Behavior Change Consortium (BCC) Initiative, funded health behavior intervention studies between 1999 and 2002, provided data for this study. **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The current investigation was funded by the Robert Wood Johnson Foundation Active Living Research Program grant. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Stores within easy walking distance of home were positively associated with minutes per week of walking for errands at the Stanford site (parameter estimate=0.34(93), p=0.048, total R^2=15.6) and minutes per week of leisurely walking at the Atlanta site (parameter estimate=0.25(251), p=0.03, total R^2=6.3). 2. Having many alternative routes when going from place to place was positively associated with minutes per week of walking for errands at the Oregon site (parameter estimate=0.35(121), p=0.02, total R^2=6.6). 3. Living in a neighborhood of mostly detached, single-family homes was positively associated with minutes per week of moderate-and/or-vigorous intensity physical activity at the Oregon site (parameter estimate=139.0(121), p=0.02, total R^2=7.7) and negatively associated with minutes per week of leisurely walking at the Rhode Island site (parameter estimate= -1.1(94), p=0.05, total R^2=11.2). 4. Seeing stray or loose dogs in one's neighborhood was negatively associated with minutes per week of moderate-intensity or more vigorous physical activity in the Atlanta sample (parameter estimate=-63.2(218), p=0.006, total R^2=6.7) and was negatively associated with hours per week walking for errands at the Memphis site (parameter estimate = -0.27(73), p=0.04, total R^2=26.0).Seeing stray or loose dogs in one's neighborhood was negatively associated with minutes per week of leisurely walking at the Memphis (parameter estimate=-0.45(73), p=0.03, total R^2=13.9) and Atlanta sites (parameter estimate=-0.30(251), p=0.017, total R^2=6.3). 5. Seeing or speaking with others when walking in one's neighborhood was positively associated with minutes per week of moderate-and/or-vigorous intensity physical activity at the Stanford (parameter estimate=70.4(93), p=0.009, R^2=13.3) and Atlanta sites (parameter estimate=59.3(218), p=0.029, total R^2=6.7). While seeing or speaking with others when walking in the neighborhood was positively associated with minutes per week of walking for errands at the Stanford (parameter estimate=0.46(93), p=0.02, total R^2=15.6) and Memphis sites (parameter estimate=0.25(73), p=0.05, total R^2=26.0). *CHAMPS baseline and intervention;* 6. In Stanford, participants who strongly agreed with "most drivers exceed the posted speed limits while driving in the neighborhood" showed fewer minutes per week of 6-month moderate-intensity or more vigorous physical activity (by approximately 90 minutes or more per week) relative to intervention participants reporting speeding drivers to be less of an issue this interaction effect reached significance (F for interaction term= 3.8, [1,89], p=0.05). *(continued next page)*

(Continued from previous study)						
						7. In Oregon, participants who strongly agreed that their neighborhood was generally safe showed more minutes per week of 24-month moderate-intensity or more vigorous physical activity (by approximately 150 minutes or more per week) relative to intervention participants reporting their neighborhoods as being less safe. 8. In Oregon, the interaction term involving the item that states "the crosswalks in my neighborhood help walkers feel safe crossing busy streets" reached significance [F for interaction term (1,1170)=5.2, p=0.02]. Participants who strongly agreed with this item showed more minutes per week of 24-month moderate-intensity or more vigorous physical activity (by approximately 100 minutes/week) relative to intervention participants endorsing lower levels of this item. 9. In Oregon, the neighborhood traffic and crime-related safety subscale reached statistical significance (F for interaction term (1,117)= 5.9, p=0.016). Participants who strongly agreed that "my neighborhood is safe enough that I would let a 10-year old boy walk around my block alone in the daytime" showed more minutes per week of 24-month moderate-intensity or more vigorous physical activity (by approximately 150 minutes per week) relative to intervention participants reporting lower levels of this item. 10. In Atlanta, the interaction involving a variable of perceived neighborhood safety-the presence of crosswalks in the neighborhood that helped walkers feel safe crossing busy streets-reached statistical significance (F for interaction term (2,197)=3.1, p=0.048). Participants randomized to the physical activity intervention involving tailored messages plus telephone follow-up who strongly agreed that "the crosswalks in my neighborhood help walkers feel safe crossing busy streets" showed more minutes per week of 12-month moderate-intensity or more vigorous physical activity (by more than 100 minutes/week) relative to intervention participants reporting lower values on this item.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kerr, Frank (2007) Georgia	Density and land-use mix ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Access to recreation spaces 2. Intersection density and street connectivity *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 3161 youth from the Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality (SMARTRAQ) household travel survey ***PRIMARY OUTCOME:*** Walking behavior ***MEASURES:*** 1. Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality (SMARTRAQ) household travel survey (destinations visited, travel mode and purpose, time of day). 2. Tax assessor's parcel data (land-use density and mixing of uses, street network files) 3. Census data (residential density, mixed-land use, street connectivity) 4. ArcView (network buffer) 5. Computer aided telephone interview [CATI] (sociodemographic [age, gender, ethnicity, income, house-hold size, and car ownership] and attitudinal information) ***DATA COLLECTION:*** Self-reported travel data were captured over a 2 day period in a structured diary for youth between 5 and 18 years of age, a legal guardian filled out diaries for those less than 14 years old. A head of household provided socio-demographic information through use of a CATI protocol. ArcView enabled a one kilometer buffer to be developed for each respondent's place of residence based on street network distances. A combination of county-level Tax Assessors parcel data and census data was used to measure residential density and mixing of land uses, and street network files were used to measure street connectivity based on the number of intersections per square kilometer. Within the land use codes, parks, open spaces, and commercial use were also available. Intersection density and residential density scores were categorized in tertiles. Only the relationship between the highest and lowest tertiles was represented in the results. ***LIMITATIONS:*** Data was self-reported; the study design was cross-sectional, which restricts causal and temporal inferences	5-18 year olds ~33% non-White, 50% Male, 50% with annual household income >$60,000 (evaluation sample) ***ELIGIBILITY:*** Participants were required to give informed consent. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers from San Diego State University, the University of British Columbia, and Lawrence Frank & Company. SMARTRAQ data was collected by the Georgia Department of Transportation and the Georgia Regional Transportation Authority. ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Robert Wood Johnson Foundation Active Living Research program. ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. Residential density, intersection density, and mixed land use were all significantly related to walking in both males and females. The relationship between urban form and walking appeared to be stronger in females for the variables intersection density (OR=1.8, 95%CI= 1.2, 2.7, p<0.01), land use mix (OR=2.2, 95%CI= 1.5, 3.1, p<0.001), and commercial land use (OR=2.1, 95%CI= 1.5, 3.1, p<0.001) than males (intersection density: OR=1.5, 95%CI= 1.1* [sic], p<0.05; land use mix: OR=1.5, 95%CI= 1.1, 2.1, p<0.01; commercial land use: OR=1.6, 95%CI= 1.1, 2.2, p<0.01). 2. Access to recreation space (OR=2.3, 95%CI= 1.7, 3.2, p<0.001) and high residential density (OR=2.5, 95%CI= 1.6, 3.8, p<0.001) appeared to have a stronger association among males than with females (access to recreation: OR=1.7, 95%CI= 1.2, 2.4, p<0.001; residential density: OR=2.3, 95%CI= 1.5, 3.5, p<0.001). 3. All five urban form variables were strongly and significantly related to walking in white participants in the expected direction at the p<0.001 level (intersection density (OR=1.9, 95% CI= 1.4, 2.8); residential land use (OR=3.2, 95% CI= 2.2, 4.5); mixed land use (OR=1.8, 95% CI= 1.4, 2.5); at least 1 commercial land use (OR=2.0, 95% CI= 1.5, 2.7); at least 1 recreation/open space land use (OR=2.7, 95% CI: 2.0, 3.6), all p<0.001). 4. Only land use mix (OR=1.7; 95% CI= 1.1, 2.7; p<0.05) and access to recreation spaces (OR=1.4; 95% CI= 1.0, 2.0, p<0.05) were significantly related to walking in non-whites 5. Participants were significantly more likely to walk if they had fewer than 3 cars; 25% as opposed to 8.9% walked at least once over the 2 days. 6. In households with 1 car, only land use mix (OR=2, 95%CI= 1.1, 3.5, p<0.05) and commercial land use (OR=2, 95%CI= 1.2, 3.6, p<0.05) were significantly related to walking. 7. Participants with more than 2 cars in the household were almost 3 times as likely to walk if they had access to recreation space (95%CI= 1.6, 4.2, p<0.001) or lived in an area of high residential density (95%CI= 1.6, 5.1, p<0.001).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Hoehner, Brennan (2005) Missouri and Georgia	Land-use and access to locations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to recreational areas 2. Presence and absence of sidewalks 3. Physical disorder 4. Presence of bus stops *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1053 adults (Savannah [n=600] and St. Louis [n=473]) in 1158 street segments **PRIMARY OUTCOME:** Recreation and transportation physical activity and meeting recommendations **MEASURES:** 1. ArcView Geographic Information [GIS] (street segment attributes [sums, counts, frequencies, means, buffers]) 2. Global Positioning System[GPS] (street location, attribute data, neighborhood features [walking trails]) 3. Audit (data on each street segment). Audits were constructed from a review of >30 existing tools. 4. Telephone survey (perceived environmental measures, access to recreational facilities, presence/absence of facilities, minutes walked, land-use, street segments, access to destinations, sidewalks). 5. 2000 US Census/TIGER line road files (tract data, line segment data) **DATA COLLECTION:** From February to June 2003 telephone survey data was collected. Most questions used Likert- or ordinal-type response categories. Audits were conducted during daylight hours from March to May 2003. The telephone survey contained the long version of the International Physical Activity Questionnaire [IPAQ] (7-day physical activity over 4 domains [occupation, transportation, house/yard work, recreation/leisure]). Extensive reliability and validity testing of the IPAQ has been conducted by the International Consensus Group on Physical Activity Measurements across 12 countries; it has a test-retest reliability coefficient of ~0.80. Physical and social environmental variables were chosen from an expert consensus development process carried out between October 2001 and June 2002 to be measured in parallel by the telephone survey and audit. Cut-points for objective environmental measures were based on quartiles; individuals in higher quartiles had increased scores. Mapping survey respondents (as points) and the environmental audit data (as vectors) with GIS software provided a linkage between survey and audit data. *(continued next page)*	Adults, 18 to 96 years old 63.6% White, 32.6% Black, 3.8% other minority (evaluation sample) The sample was diverse with respect to age, ethnicity, and educational attainment, and slightly under-represented men. **ELIGIBILITY:** Adults were eligible if their residence could be geocoded and they were physically able to perform tasks. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the Saint Louis University Prevention Research Center and the University of California at Davis. **THEORY/ FRAMEWORK:** Not applicable **EVIDENCE-BASED:** Not applicable **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Robert Wood Johnson Foundation and the Centers for Disease Control and Prevention. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. People in the highest quartile for the total number of nonresidential destinations were two to three times more likely to engage in any transportation activity (OR=3.5, 95%CI= 2.3, 5.5) or meet recommendations (OR=3.3, 95%CI= 2.0, 5.4) through transportation activity than respondents in the lowest quartile ($p<0.05$ for trend). 2. Those in the highest quartile for segments with minimal garbage, litter, or broken glass were 0.4 times less likely (95%CI= 0.3, 0.7) to engage in transportation activity and 0.4 times less likely (95%CI= 0.2, 0.7) to meet recommendations through transportation activity than those in the lowest quartile ($p<0.05$ for trend). Similarly, those in the highest quartile of physical disorder were 0.5 (95%CI= 0.3, 0.8) and 0.4 (95%CI= 0.2, 0.7) times less likely to engage in transportation activity or meet recommendations through transportation activity, respectively ($p<0.05$ for trend). 3. Those who agreed that they had many places to exercise in their community and who reported more facilities within a 5-minute walk were slightly more likely to meet recommendations, but the direction of the trends and significance of the associations at different levels of these measures were inconsistent (data not shown). 4. Compared with never using the park in the last 30 days, the odds of meeting recommendations through recreational activity individuals were 1.2 (95%CI= 0.8, 1.7) for using it 1 to 5 days; 2.1 (95%CI= 1.3, 3.4) for using it 6 to 10 days; and 4.3 (95%CI= 2.9, 6.2) for using it >10 days ($p<0.05$ for trend). 5. Compared to never using the nearest trail in the past 30 days, the odds of meeting recommendations through recreational activity were 1.4 (95%CI= 0.97, 2.0) for 1 to 5 days; 2.4 (95%CI= 1.4, 4.1) for 6 to 10 days; and 3.4(95%CI= 2.2, 5.1) for >10 days ($p<0.05$ for trend). For use of the nearest private fitness facility, individuals were 1.3 times more likely (95%CI= 0.8, 1.9) for 1 to 5 days; 2.3 times more likely (95%CI= 1.3, 4.0) for 6 to 10 days; and 5.3 times more likely (95%CI= 3.3, 8.6) for > 10 days ($p<0.05$ for trend) to meet recommendations through recreational activity. 6. Levelness of sidewalks as assessed by the audit showed a significant negative association (OR=0.6, 95%CI= 0.4, 0.9) for engaging in any transportation activity and with meeting recommendations (OR=0.5, 95%CI= 0.3, 0.8) through transportation activity ($p<0.05$ for trend). 7. Those in the top quartile for street segments of bus stops were 1.5 times more likely to engage in transportation activity (95%CI= 1.0, 2.3) and 1.6 times more likely to meet recommendations through transportation activity (95%CI= 0.99, 2.6) compared to those in the lowest quartile as assessed by the audit ($p<0.05$ for trend). *(continued next page)*

(Continued from previous study)						
		LIMITATIONS: Audit instrument provided limited variation and was not systematic; not all crime and income variables were accounted for; not all street network characteristics and distances within the fringe area were examined; the IPAQ-long form is long, repetitious, and associated with over-estimation; there may have been measurement error, low statistical power, and/or a limited direct effect related to features measured				8. Respondents with >92 active people observed within 400 m of their home (highest quartile) were about two to three times more likely to engage in any (OR=2.1, 95%CI= 1.4, 3.2) or recommended levels of activity (OR=2.7, 95%CI= 1.7, 4.3) through transportation compared to those with <47 active people.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Krizek, Johnson (2006) Minnesota	Distance to locations and land-use mix ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Access to neighborhood facilities for physical activity including on-and-off-road bicycle paths *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 1653 participants in Minneapolis and St. Paul, Minnesota ***PRIMARY OUTCOME:*** Bicycle and walking behavior ***MEASURES:*** 1. 2000 Twin Cities Metropolitan Area Travel Behavior Inventory (TBI) 24-hour diary (origins and destinations, modes of travel, duration of trips, primary activities, socioeconomic and demographic data) 2. Geographic Information Systems map (distance from residence to destination on-street bicycle lanes and off-street bicycle paths and facilities, location of retail establishments and proximity using network distance to neighborhoods) ***DATA COLLECTION:*** The 2000 Twin Cities Metropolitan Area Travel Behavior Inventory (TBI) database, administered by the regional planning agency, was used for the present analysis. Each household kept a 24-hour diary of travel for all household members 5 years or older on a particular day. Using GIS data, individuals were grouped into categories according to distance from their homes to the nearest bicycle trail ranging from less than 400 meters to 1600 meters or more.Distance from home to the nearest neighborhood retail establishment was divided into four categories ranging from less than 200 meters to greater than 600 meters. ***LIMITATIONS:*** Causal inferences cannot be made using cross-sectional data; no pre-existing attitudes preference or other motivations for walking/biking were requested; neighborhood and amenity self-selection was not explored; children, rural, and suburban residents were not recruited for this study limiting generalizability	Adults, Urban 48% male, 36% <$50,000 annual household income (evaluation sample) 5.2% of the sample reported at least one bike trip during the survey, which is a higher rate of cycling than the larger TBI sample and the nation, for which approximately 2% ride a bike on any given day. ***ELIGIBILITY:*** Eligible participants were in the TBI diary database, residing in Minneapolis or St. Paul, and were 20 years of age or older. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers were from the University of Minnesota (evaluation) ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Funding from the National Cooperative Highway Research Program and the Minnesota Department of Transportation. ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. Using a logistic regression model, for walking behavior found those living within 200 meters of retail establishments had statistically significantly increased odds of walking compared to those in the most distant category (OR=2.51, $p<0.05$). 2. The odds of bicycle use did not differ significantly by proximity to any bicycle facility suggesting proximity to these facilities generally has no effect on bicycle use. 3. Using a logistic regression model, subjects living closest to an on-street bicycle facility (less than 400 meters away) had statistically significantly increased odds of bicycle use compared with subjects living more than 1600 meters from an on-street facility (OR=2.23, $p<0.05$). 4. Proximity to off-street bicycle trails had no effect on bicycle use ($p>0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Grow, Saelens (2008) Massachusetts, Ohio, California	Land-use mix OTHER INTERVENTION COMPONENTS: *Multi-component:* 1. Neighborhood traffic safety 2. Access to recreational facilities 3. Street connectivity and pedestrian infrastructure 4. Safety from crime *Complex:* Not reported	DESIGN: Cross-sectional study DURATION: Not applicable SAMPLE SIZE: 87 parents of children (ages 5-18) and 124 matched parents and their adolescents (ages 11-18) from Boston, Cincinnati, and San Diego areas. PRIMARY OUTCOME: Bicycling/ walking behavior and physical activity (PA) MEASURES: 1. Survey (demographics, frequency and use of physical activity resources [e.g., exercise facility, swimming pool], proximity to sites [≤or≥10 min walk], active transport to each site). 2. Neighborhood Environment Walkability Scale [NEWS] (perceived land-use mix, street connectivity, pedestrian infrastructure, neighborhood aesthetics, traffic safety, crime threat) DATA COLLECTION: A test-retest study design was used to evaluate the reliability of all measures except demographic information. Average time between completing the 2 surveys was 27 days. Parents, children, and adolescents completed the surveys. Only responses from the first survey were used in the analyses. Site types for the survey were based on formative research using qualitative interviews and prior research. Test-retest reliability for active use of, proximity to, and active transport to/ from recreation sites range from fair to good for parents (ICC=0.32-0.75) and adolescents (ICC=0.25-0.77). LIMITATIONS: Causal inferences cannot be drawn from cross-sectional study design; data was self-reported; the study was not designed to be nationally representative; potentially ambiguous survey phrases may have led to confusion; particular sites were not specified by the respondents	11-18 year old adolescents PARENTS: 80.5% White, 9.2% Black, and 5.7% Other (evaluation sample) ADOLESCENTS: 75.0% White, 18.8% Black, 2.7% Asian/ Pacific Islander, and 3.6% Other (evaluation sample) ELIGIBILITY: Parental written consent and participant assent were required. Parents of 5-18 year-old children were eligible; the 11-18 year-old adolescents of these parents were also eligible EXPOSURE/ PARTICIPATION: Not applicable	LEAD AGENCY: The research team was from the University of Washington, San Diego State University, the University of Alabama, and the University of California, San Diego. THEORY/ FRAMEWORK: Not reported EVIDENCE-BASED: Not reported REPLICATION/ ADAPTATION: Not applicable ADOPTION: Not applicable IMPLEMENTATION: Not applicable FORMATIVE EVALUATION: Not reported PROCESS EVALUATION: Not reported	RESOURCES: Not applicable FUNDING: Robert Wood Johnson Active Living Research program STRATEGIES: Not applicable	PHYSICAL ACTIVITY: 1. Parents and adolescents who usually walked/biked to at least 5 sites reported higher perceptions for pedestrian infrastructure and traffic safety. Only adolescents reported higher land-use mix and street connectivity (no statistics reported). 2. Adolescent and parent report multivariate regression models revealed that positive estimates were found for street connectivity, pedestrian infrastructure, and traffic safety and a negative estimate was found for crime threat in relation to the number of sites to which adolescents walked/biked. After adding proximity to the model, only traffic safety remained highly significantly associated with usual walking/ biking to sites for both parent (β=0.55, $p<0.01$) and adolescent (β=0.3, $p<0.01$) reports. 3. Living within a 10-min walk of large parks (Report for children; 69.2% active, $p<0.05$, Report for adolescents; 55.9% active, $p<0.01$, Adolescent report; 47.6% active; $p<0.01$) and public open spaces (Report for children; 59.5% active, $p<0.01$, Report for Adolescents; 30.4% active, $p<0.05$, Adolescent report; 36% adolescents active, $p<0.01$) was associated with increased likelihood of being active at those sites. 4. Multivariate analysis revealed that walking/biking was the most frequently reported transport for 9 of 12 sites (swimming pools: RR=1.9, $p<0.05$; basketball courts, RR=2.1, $p<0.05$; walking/running tracks: RR=3.3, $p<0.01$; school recreation sites: RR=2.3, $p<0.05$; small parks: RR=6.9, $p<0.01$; large parks: RR=2.9, $p<0.05$; playgrounds: RR=5.1, $p<0.05$; bike/hike/walk trails: RR=4.7, $p<0.01$; open spaces: RR=9.8, $p<0.01$) and also 8 of 12 sites from parent reports (basketball courts: RR=4.5, $p<0.01$; walking/running tracks: RR=4.6, $p<0.01$; school recreation sites: RR=4.4, $p<0.01$; small parks: RR=6, $p<0.01$; large parks: RR=4.1, $p<0.01$; playgrounds: RR=5, $p<0.01$; bike/hike/walk trails: RR=3.7, $p<0.01$; open spaces: RR=7.3, $p<0.01$). 5. For adolescents, walking/biking to sites was associated with the use of play fields and courts (parental report only: 54.5% active, $p<0.05$), swimming pools (self-report only: 58.5% active, $p<0.01$), beach/lack/river/creek (parent report: 42.9% active, $p<0.01$; self-report: 48.5% active, $p<0.01$), and bike/hike/walk trail (parent report: 52% active, $p<0.01$; self-report: 49.1%, $p<0.01$). 6. Multivariate analysis of parent report revealed that site proximity was only associated with adolescents' swimming pool use (RR=2.1, $p<0.05$). 7. Adolescents who usually walked/biked to at least 5 sites (site median) had higher scores on perceived pedestrian infrastructure and on traffic safety both by parent report and self-report and had higher land use mix and street connectivity for adolescent report only (no statistics). 8. Parents reported that children walking/biking to the site was significantly associated with active use of most recreation sites: indoor recreation sites (72.7% active, $p<0.05$), basketball courts (45.5% active, $p<0.01$), walking/running tracks (68.8% active, $p<0.01$), school recreation site (70.8% active, $p<0.01$), small (73.7% active, $p<0.01$) and large public parks (68.8% active, $p<0.05$), public playgrounds (71.1% active, $p<0.05$), and open space (63% active, $p<0.01$). The same trend was found for parental report for adolescents (indoor recreation facilities: 54.5% active, $p<0.05$; basketball courts: 57.5% active, $p<0.01$; walking/running tracks: 62.5% active, $p<0.01$; school recreation site: 56.7% active, $p<0.01$; small parks: 52.4% active, $p<0.01$; large parks: 59% active, $p<0.01$; playgrounds: 43.1% active, $p<0.01$; open spaces: 45.5% active, $p<0.01$) and adolescent self-report (indoor recreation facilities: 53.8% active, $p<0.05$; basketball courts: 43.4% active, $p<0.01$; walking/ running tracks: 56.8% active, $p<0.01$; school recreation sites: 44.4% active, $p<0.01$; small parks: 50% active, $p<0.01$; large parks: 48.1% active, $p<0.01$; playgrounds: 37.3% active, $p<0.01$; open spaces: 50% active, $p<0.01$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Bell, Wilson (2008) Indiana	Residential density ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Green space near the residence *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 3831 youth from Marion County Indianapolis, Indiana ***PRIMARY OUTCOME:*** Overweight/obesity ***MEASURES:*** 1. Survey of medical records (height and weight [body mass index=BMI], racial/ethnic composition, gender, and health insurance status) 2. Normalized Difference Vegetation Index [NDVI] (urban form and greenness) 3. Geographic Information System [GIS] data (geo-coded address, urban form and residential density defined as the number of housing units per acre devoted to residential land use within a child's census block-group or residence) ***DATA COLLECTION:*** Data for this study was taken from records collected at a medical facility from 1996 through 2000. The analysis was conducted in 2007 and 2008. A primary care clinic network in Indianapolis, IN provided researchers with electronic medical records. Time 1 data was collected in the beginning of the 1996 period from patients and Time 2 data was any follow-up data taken during that same four year period. Greenness was measured using the normalized difference vegetation index (NDVI), derived by converting pixel values in satellite images encompassing 30x30 meter areas to continuous measurements that can range from -1(usually water) to +1 (dense, healthy green vegetations). Because of weather changes specific dates were not always surveyed, rather a summer measurement was chosen that corresponds to high green biomass in residential environments. Mean NDVI was calculated within a 1-kilometer straight line circular and a road-based network buffer surrounding each child's residence. Network buffers varied in size, based on level of street connectivity. A dichotomous variable was developed to categorize BMI z-scores as increasing between Time 1 and Time 2 or remaining constant or declining between the two time frames. ***LIMITATIONS:*** The study region, geographic scale, and sample limit generalizability; results may reflect selection bias; omitted variables, including more-robust measures of SES and neighborhood attributes such as crime and the presence of resources and amenities, may also influence the findings; physical activity is not available in medical records	3-16 year olds, 64% Minority, 58% Black, 83% Lower-income(evaluation sample) The average block group median family income was lower than in the county as a whole ($36,917/year vs. $49,387/year). ***ELIGIBILITY:*** Children aged 3-16 years of age, residing in Marion County at the same address for 24 consecutive months, receiving well-child care from the network during 1996-2002, and having same-day clinical measurements for height and weight recorded 2 years apart were eligible for the study. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers from University of Washington and Indiana University-Purdue University ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** The Agency for Healthcare Research and Quality and the Department of Health and Human Services ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. Residential density was not significantly associated with BMI at Time 2 when modeled without the greenness (NDVI). 2. A 0.01-unit increase in greenness (NDVI) was associated with lower BMI at Time 2 (β= -0.06 SD, 95% CI= -0.09, -0.02, p<0.01). 3. A higher greenness (NDVI) was associated with lower Time 2 BMI (β= -0.07 SD, 95% CI=-0.11, -0.03, p<0.01), and residential density was marginally associated with lower Time 2 BMI (β= -0.01, 95%CI; -0.01, 0.01, p<0.06) when greenness and density were modeled together. 4. Relationships between greenness (NDVI) and Time 2 BMI were significantly modified by insurance status (F-test, p<0.01), with results of greater magnitude for children and youth with private/other insurance (β=-0.13, SD, 95% CI=-0.21, -0.04, p<0.01) versus Medicaid (β=-0.06 SD, 95% CI=-0.10, -0.01, p=0.01; not shown in tables). 5. Associations between greenness (NDVI) and Time 2 BMI were similar with radial and network buffers (β=-0.07 SSD, 95% CI=-0.11, -0.03; not shown in tables), and the model fits were identical (adjusted r^2=0.53). 6. Higher greenness was associated with lower odds of increasing BMI (OR=0.87; 95% CI=0.79, 0.97; not shown in tables, for the logistic regression model).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Norman, Nutter (2006) California	Land-use, residential density, and retail floor area ratio **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to neighborhood parks and size of parks 2. Street connectivity/ network and intersection density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 799 adolescents (11-15 years) recruited for a health promotion intervention trial from 45 primary care providers at 6 clinic sites in San Diego County **PRIMARY OUTCOME:** Overweight/obesity and physical activity (PA) **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Accelerometers (physical activity) 3. Geographic information systems [GIS] (geocode participant address, street network including land-use mix, retail floor area ratio, intersection density, and buffers) 4. Walkability index (intersection and residential density, retail floor area ratio, land-use mix) 5. San Diego Association of Governments database files [SANDAG] (land cover data, location of parks and schools) 6. 2000 Census (density/number of residential units) **DATA COLLECTION:** Over a 13-month period researchers recruited and collected information on households. Physical activity was measured for 7 days in 1-minute intervals. Age-specific cut-points were used to estimate intensity levels of activity. Intensity scores were summed and average across the valid days. Each measure was taken twice and the averages of the 2 readings were used. GIS variables were calculated for the 1-mile network buffer around each participant's residence using SANDAG and other data (SanGIS and DataQuick). The walkability index was derived by taking the sum of the z-scores for all 4 community design variables. Adolescents received $10 for completing all measurements and were entered in to a lottery drawing for one of 10 cash prizes ranging between $10 and $50. **LIMITATIONS:** Overall physical activity measures may have obscured associations between specific subsets of variables; accelerometers may underestimate common adolescent activities; measures of access to facilities assessed only proximity; many hypothesized built environment correlates were not measured in the present study; generalizability is limited to communities similar to those found in San Diego County (predominantly suburban with low walkability and few areas with high land use mix); For many of the participants geocoding for their address was not possible	Suburban 11-18 year olds 3.6% Asian/Pacific Islander, 6.4% African American, 0.8% Native American, 13.1% Hispanic, 56.8% White, 19.3% Other (evaluation sample) **ELIGIBILITY:** Adolescents were ineligible if they were unable to read English at a minimum of 6th-grade reading level, any disability that would make exercise or nutrition counseling contraindicated. Verbal consent and child assent was obtained from each participant and parent. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from San Diego University and the University of California-San Diego. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not reported **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The National Cancer Institute; the National Heart, Lung, and Blood Institute; and The Active Living Research program of The Robert Wood Johnson Foundation **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. No statistically significant correlations were found between environmental variables and BMI percentile for girls or boys. 2. BMI percentile was marginally correlated with number of recreation facilities for boys ($r=0.08$, $p<0.11$). **PHYSICAL ACTIVITY:** 3. For boys, total minutes/day of physical activity was correlated only with retail floor area ratio ($r=0.12$, $p<0.05$). Retail floor area ratio remained a significant contributor after multiple linear regression ($R^2=0.23$, $\beta=0.135$, $p=0.007$). 4. For girls, significant correlations were found for total minutes/day of moderate-to-vigorous physical activity with number of recreation facilities ($r=0.11$, $p<0.05$), number of parks ($r=0.14$, $p<0.01$), and intersection density ($r=-0.14$, $p<0.01$). 5. The number of recreation facilities (adjusted $R^2=0.25$, $\beta=0.11$, $p=0.016$) and intersection density ($R^2=0.25$, $\beta=-0.127$, $p=0.006$) remained significant after multiple linear regression, but the number of parks became non-significant.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Rutt, Coleman (2005) Texas	Land-use mix and population density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Availability of physical activity facilities *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 953 adults living in El Paso, Texas **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Height and weight (Body Mass Index [BMI]) 2. Survey (frequency and duration of walking [past month], frequency of fruit and vegetable consumption, overall health, number of diseases, social support for walking, acculturation, socioeconomic status [Hollingshead Four Factor Index of Social Status] and sociodemographic data [e.g., number of children], frequency and duration of screen time, perceived benefits of walking and barriers to exercise) 3. ArcView Geographic Information Systems [GIS]software (neighborhood level-sidewalk availability within a 0.25 mile radius of participant's home [photographs 1 foot resolution], bought by Public Senate Board, free to public; number of physical activity facilities, shortest distance from residence to activity facilities, intersection density [% of cul de sacs and 4-way intersections], geocoding of participant's residence) 4. Online Yellow Pages (location and number of gyms) 5. Topo Depot slope data (neighborhood average change in elevation) 6. City of El Paso Planning, Research, and Development Department working draft (land-use [non-residential buildings]) 7. US Census (population density) **DATA COLLECTION:** Participants were surveyed in English or Spanish by researchers from February to March 2001. Residential addresses were obtained through phone number matches in existing databases or reverse look-ups. For the survey, total minutes spent walking was calculated by multiplying frequency of walking by duration. Likert-type scales were used to rate specific items to provide participants with a range of answers. Total minutes watching TV or videos were calculated by multiplying frequency by average time. Finding shortest distance using ArcView software yielded an ICC of r>0.90. **LIMITATIONS:** No additional information was analyzed on park size or quality; examination of aerial photos used to determine sidewalk availability encountered several problems (e.g., trees obscure view); telephone surveys can lead to an under-representation of low SES individuals; participants were not contacted to determine if the correct address was found	Adults 71% female; age 42±17 years; 79% Hispanic (evaluation sample) Socioeconomic status score 27.5±16.5; acculturation score 3.08±1.19 (evaluation sample) **ELIGIBILITY:** Eligible participants required a home address that could be geocoded. Consent was obtained from each subject. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Texas at El Paso, San Diego State University. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Dodson Fellowship from the University of Texas at El Paso **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. For the entire sample, total time spent walking for exercise was related to higher socio-economic status, walking frequency was related to fewer perceived barriers (β= -0.11, p=0.03, R^2=0.07), and walking duration was related to higher socio-economic status, better overall health (β= -0.12, p=0.40), fewer perceived barriers to physical activity (β= -0.11, p=0.02), and living in a more residential area (β= -0.11, p=0.04) (R^2=0.08). 2. Among the subsample of subjects who reported walking for exercise in the past month, walking frequency was related to older age, fewer physical activity facilities (β=-0.24, p=0.05), and living in a more commercial neighborhood (β=0.19 p=0.02) (R^2=0.11). None of the variables were significantly related to walking duration (R^2=0.09). 3. Among the subsample of subjects who reported walking for exercise in the past month, total time spent walking was related to older age and having fewer physical activity facilities in their neighborhood (β=-0.24, p=0.05) (R^2=0.11). 4. For all participants, no environmental variables were statistically significantly related to total time walking or walking frequency.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kligerman, Sallis (2007) California	Land-use mix, residential density, and retail floor area ratio **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to parks and recreational facilities 2. Intersection density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 98 adolescents from San Diego County. These individuals came from a larger cohort study that used participant data from preschools throughout San Diego County, California conducted in the mid-1980s (at age 4). These children were followed periodically until the final measurements at a mean age of 16.2 years. **PRIMARY OUTCOME:** Overweight/obesity and moderate-to-vigorous physical activity (MVPA) **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Accelerometers (physical activity) 3. ArcView Geographic Information Systems [GIS] (land-use patterns, buffered areas around participant's residence) 4. Walkability index (land-use mix, retail, intersection, and residential density) **DATA COLLECTION:** Data was collected from children until they were 16.2 years (mean age). Accelerometery data was taken for at least four of the seven days the device was worn. Anthropometric data was calculated for each participant. Environmental variables were created GIS. Three buffer sizes were used for each participant's home 0.25 mile, 0.5 mile, and 1 mile. Land-use mix, net residential and intersection density, retail floor area ratio, number of schools, number of parks, acres of parks, number of private recreation facilities, nearest park, nearest private recreation facility, and nearest beach were all assessed through GIS. A walkability index was created using measures from four of the built environment variables. Telephone books were used to identify private recreation facilities. **LIMITATIONS:** The small sample size and large attrition from cohort data limit generalizability; this study was restricted by age range and geographic area; GIS was not used initially thus environmental attributes may have changed and altered behavior without having been documented; location of participant physical activity was not recorded;because the study was cross-sectional there may have been self-selection bias; proximity to recreation facilities is too limited an evaluation and it is necessary to assess characteristics such as fees and quality of parks, walking trails, and recreation centers	14-18 year olds (mean age 16.2 years) 61.2% Mexican-American (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from San Diego State University, the University of British Columbia, and the University of California-San Diego. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not reported **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. All correlations between environmental variables and BMI were low and non-significant (no statistics). **PHYSICAL ACTIVITY:** 2. Land-use mix ($r=0.285$, $p<0.004$) and the walkability index ($r=0.168$, $p<0.098$) for the 0.5-mile buffer were the only measures to yield significant or marginal bivariate correlations with moderate-to-vigorous physical activity. 3. In a linear regression, the walkability index was related to minutes of moderate to vigorous physical activity within 0.5 mile of homes, explaining approximately 4% of variance. 4. None of the recreation facilities variables were related to moderate-to-vigorous physical activity (no statistics).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Troped, Saunders (2001) Massachusetts	Land use diversity and the distance to resources **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to a community rail-trail (Minuteman Bikeway) 2. Busy street barrier *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 413 adults **PRIMARY OUTCOME:** Trail use **MEASURES:** 1. Arlington Physical Activity and Bikeway Survey (duration, frequency and locations for recreational physical activity; use of the trail; participation in recreational and transportation-related physical activity; neighborhood environment scale including presence of sidewalks, perceived safety, land-use, perceived steep hill and busy street barrier; distance to bikeway; socio-demographics; physical activity limitations). 2. Geographic Information Systems [GIS] data (road network, [functional] distance/access to the Bikeway from residence, busy street and steep hill barriers, road network) 3. 1994 Topologically Integrated Geographic Encoding and Referencing [TIGER] system data (street addresses for Arlington) **DATA COLLECTION:** This cross-sectional study mailed the Arlington Physical Activity and Bikeway Survey to adults at the beginning of September 1998. The authors sent an alert postcard prior to the survey mail-out and up to three follow-up mailings to non-respondents, in addition to a raffle of inexpensive gift certificates to increase response. Prior to calculating GIS environmental variables all survey respondents were address matched using Arlington census and TIGER data. GIS was used to measure the functional distance from homes of respondents to an access point on the Bikeway, and whether or not this route intersected a busy street or a steep hill. A steep hill barrier was defined as a route that crossed a steep slope grid of ≥10% for a continuous distance of at least 100m. Reliability for neighborhood environment scale was 0.68 for 110 college students. **LIMITATIONS:** Cross-sectional study, self-reported and objective measures of the busy street barrier were defined differently; may have been response bias in regard to Bikeway use	Adults, 6% Minority A higher percentage of respondents were women (60% vs. 54%) and had a college degree (60% vs. 40%). [evaluation sample] The racial/ethnic composition of the study was consistent with that of the general Arlington population. **ELIGIBILITY:** A conservative sample size estimate of 380 was chosen as a target based on an estimated Minuteman Bikeway use frequency of 50%. Individuals were eligible if they maintained residence in Arlington, MA throughout the study. **EXPOSURE/ PARTICIPATION:** The 1997 Arlington town census included 34,463 adult residents all of whom were exposed to the Minuteman Bikeway.	**LEAD AGENCY:** Researchers were from the Department of Health Promotion and Education, Department of Exercise Science, and Department of Epidemiology and Biostatistics, School of Public Health, University of South Carolina. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Massachusetts Governor's Committee on Physical Fitness and Sports provided funding, and the Arlington Planning and Community Development Department and the Massachusetts Department of Public Health provided in-kind support. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Self-reported distance was also inversely associated with use of the Bikeway. Survey participants were 0.65 times as likely to use the Minuteman Bikeway for every 0.25-mile increase in self-reported distance from the trail (95%CI= 0.54, 0.79). 2. Survey participants located further from the trail as measured by GIS road network distance in the GIS multivariate model were less likely to use the Bikeway (OR=0.58, 95%CI=0.45, 0.73). 3. Based on survey data, respondents who reported that they did not have to cross a busy street to access the Bikeway were about 2 times more likely to be Bikeway users than those who reported this barrier (OR=2.01, 95%CI= 1.11, 3.63). 4. In the GIS multivariate model, respondents who did not have to traverse a steep hill were almost twice as likely to be Bikeway users compared to those who had to cross a steep hill (OR=1.90, 95%CI= 1.09, 3.32). 5. Physical activity limitation and the busy street barrier, both of which showed a statistically significant association with Bikeway use in the model based on self-reported data only (and in unadjusted analyses), were not retained in the GIS predictive model. (Note: p-values not reported.)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Roemmich, Epstein (2007) New York	Area of park land **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to parks and recreation areas 2. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 88 children **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Accelerometers (objective daily physical activity) 3. Geographic Information System [GIS] (geo-coded participant residence and measured neighborhood environmental characteristics [housing density, street connectivity, street width, percentage of park area, park area, etc.]) 4. Parent Questionnaire (family socio-economic status, child's ethnic composition) 5. Habit Book (start/end time of wear for accelerometer, duration of sedentary behaviors) **DATA COLLECTION:** This study was based on a cross-sectional analysis of the screening data from a longitudinal study. Four cohorts were recruited over a 2-year period. Two cohorts were completed during the spring season and two during the fall season. Children were instructed to wear the accelerometer for at least 4 of 6 days, including 4 hr on weekdays before or after school hours and at least 6 hours on weekends. Children recorded the time, each occasion they put the monitor on, and when it was taken off for the day. Each child recorded in the habit book for 6 days, dividing the day into half hour increments with the help of a parent. Researchers compared activity level reported in the book with accelerometry data to determine an accurate activity count. The neighborhood environment data was measured in 2004. The activity data were collected over a two year period between 2003 and 2005. **LIMITATIONS:** The lack of concurrent measures of where the activity occurred is problematic; data was self-reported; accelerometers cannot measure all types of activity	8-12 year olds (10.5±1.4); 9% Black; 2% Other; 89% White (evaluation sample) **ELIGIBILITY:** Eligible participants had a BMI <90th percentile, had no physical conditions limiting mobility, were willing to attend an orientation session, lived in areas that could be geo-coded, and watched 15 or more hours of TV per week including VCR use and video game playing. Parental consent was obtained from the parents of all participants. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University at Buffalo **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** University at Buffalo Interdisciplinary Research and Creative Activities Fund **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. For boys, neighborhood street connectivity (coefficient=0.30), percentage park area (coefficient=0.34), and percentage park and recreation area (coefficient=0.32) were positively correlated to total physical activity (p≤0.05 for all). 2. For boys, street connectivity (0.34) was positively correlated with moderate-to-vigorous physical activity (p≤ 0.05). 3. When combining the boys and girls into a single group, total physical activity was correlated to street connectivity (r=0.25, p≤ 0.05) and percentage park area (r=0.22, p≤0.04). 4. Street connectivity was correlated with MVPA (r=0.26, p≤0.05). 5. Percentage park area + recreation were inversely correlated with television watching in boys but not girls (p≤0.05). 6. Home environment variables, rather than neighborhood environment variables were correlated with sedentary behaviors in that the number of televisions in the home was related to television watching time (r=0.31, p≤0.01).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Suminski, Poston (2005) Midwestern United States	Access to shops **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood traffic safety 2. Access to parks 3. Perceptions of neighborhood safety from crime 4. Street design and aesthetics *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 474 participants from a large, Midwestern metropolitan area **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Questionnaire (frequency and duration of walking behavior, forms of physical activity, physical environment [construction/integrity of sidewalks and streets, neighborhood traffic volume and speed, lighting, crime, aesthetics, availability of shops, parks, work, and schools], demographic data, dog ownership) 2. County Auditor Records (list of participants and locations) **DATA COLLECTION:** Door-to-door interviews were conducted by trained interviewers in 2003 over a 13-day period in July. An analysis was conducted in 2004. Men and women were analyzed separately. For the interview, intra-class correlations for the physical environment questionnaire ranged from 0.85 to 0.94, and the Cronbach's alpha coefficient of internal consistency was 0.83. The scores from each of the items were summed and divided by the number of items per feature to yield an average score. The average feature scores were transformed into categorical variables with three levels - the lowest, middle, and highest tertiles. The questionnaire used was reliable (correlation coefficient r=0.58) and valid (relationship with physical activity log; correlation coefficient r=0.71) for assessing walking behavior and other forms of physical activity. **LIMITATIONS:** Questionnaire data was self-reported; environment data was based on perception rather than objective measures; cross-sectional study design does not allow for causal inferences to be made	Adults 89.7% White, 1.7% Hispanic, 1.5% African American, and 1.3% Asian American (evaluation sample) **ELIGIBILITY:** Eligible participants resided in the interview neighborhood, were 18 years of age and older, and were not physically limited because of a health condition. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Ohio State University, University of Missouri-Kansas City, and the Mid-America Heart Institute **THEORY/ FRAMEWORK:** Social ecologic models **EVIDENCE-BASED:** Findings from cross-sectional and longitudinal investigations suggest that features of the physical environment are related to walking (multiple references). **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Funding for this study was provided by the Centers for Disease Control and Prevention. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Women were 5.7 times more likely to walk for transportation if they indicated having an average number of available places in and around their neighborhood to which they could walk (95%CI=1.63, 19.73; $p<0.01$). 2. For men, environmental features were not associated with walking the dog or for exercise. However, inverse relationships between walking for transportation and environmental features were noted in men (data not shown). 3. Men were less likely to walk for transportation in the neighborhood if the functional (OR=0.22, 95%CI=0.06, 0.89) or aesthetic (OR=0.17, 95%CI=0.03, 0.89) features of the neighborhood were average versus below average ($p<0.05$). 4. Women with an average number of neighborhood destinations were more likely to walk for transportation in the neighborhood (OR=5.7, 95%CI=1.63, 19.73) than women with a below average number of neighborhood destinations ($p<0.01$). 5. Women were 4.5 times more likely to walk for exercise in their neighborhood if neighborhood safety was average compared to below average (95%CI=1.01, 20.72; $p<0.05$). 6. Women were more likely (threefold) to walk their dog if neighborhood safety was average versus below average (95% CI=1.01, 11.08; $p<0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Samimi, Mohammadian (2008) United States	Population density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Intersection density, block size, and road density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** >300,000 individuals **PRIMARY OUTCOME:** Overweight/obesity (body mass index [BMI]) **MEASURES:** 1. Behavioral Risk Factor Surveillance System [BRFSS] data (body mass index [weight and height], demographic and socio-economic data, general health) 2. 2001 National Household Travel Survey [NHTS] from the US Highway Administration (land-use, transportation, built environment) 3. 2000 Census Transportation Planning Package [CTPP 2000] data (land-use, transportation, built environment) 4. Census 2000 Topologically Integrated Geographic Encoding and Referencing [TIGER] database/Line Geographic Information Systems [GIS] database (county level land-use, transportation, built environment) 5. Transit-friendly measure (proportion of transit-users to the population) 6. Neighborhood Pedestrian Friendliness measure (auto use, intersection density, road density, block size) **DATA COLLECTION:** Researchers used multiple data sources. This study used BRFSS data, prepared by the National Center for Chronic Disease Prevention and Health Promotion, from 2005 from over 300,000 individuals. Transportation, land-use, and built environment variables were examined at the county-level. Since the zip code for each individual was not accessible, the lowest level of geography (county of residence) available was used. A measure estimating the proportion of transit-users to the number of workers using CTPP 2000 data was used to determine if each census tract is transit-friendly. Measures for auto-use and intersection density, road density, and block size werecombined to determine pedestrian friendliness of a neighborhood. **LIMITATIONS:** Cross-sectional study design does not allow for causal inferences to be made	Adults General Population **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of Illinois at Chicago and the University of Chicago. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not reported **FUNDING:** Not reported **STRATEGIES:** Not reported	**OVERWEIGHT/OBESITY:** 1. Using forward selection, positive correlations for auto-use (coefficient [C]; 0.41, standard error [SE]; 0.03, p<0.001) and block size (CE; 0.28, SE; 0.03, p<0.001) are seen for obesity. 2. Using forward selection, negative coefficients for road density (CE; -0.45 E-02, SE; 0.64E-03), intersection density (CE; -0.46E-03, SE; 0.56E-04), and population density (CE; -0.61E-05, SE; 0.75E-06) were found, suggesting that people living in urbanized areas are less likely to be obese (p<0.001). 3. Using backward selection methods, positive correlations for auto-use (marginal effects=0.120; elasticity=0.425; and p<0.001) and block-size (marginal effects; 0.074; elasticity=0.055; and p<0.001) were seen for obesity. 4. A one percent decrease in the use of automobiles can decrease obesity by 0.4%. **GENERAL HEALTH:** 5. Using backward selection methods, positive correlations for transit-use (marginal effects; 0.092, elasticity; 0.002, p<0.001) and block size (marginal effects; 0.026, elasticity; 0.006, p=0.001) were seen for general health.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Cervero (2002) Maryland	Land-use mix and population density ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Sidewalk infrastructure *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 5167 trip records from Montgomery County, Maryland residents (multiple trips for multiple purposes, among respondents) ***PRIMARY OUTCOME:*** Transit use (active transportation) ***MEASURES:*** 1. 1994 Household Travel Survey (trip behavior) 2. Calibration files used for developing Version 2 Model of the Metropolitan Washington Council of Government [MWCOG] (comparative travel times and travel costs of competing modes of travel, socio-demographic characteristics of trip-makers, origin and destination) ***DATA COLLECTION:*** Trip records were drawn from the 1994 Household Travel Survey compiled for the Metropolitan Washington Council of Government (MWCOG) region. For land use measures the 318 Montgomery County traffic analysis zones (TAZs) were used. Land-use, activity location, urban design, and accessibility measures associated with the TAZs of the origin and the destination of each trip record were added to the calibration files. A number of additional variables (e.g., land-use diversity, gross densities) were created using input variables of each TAZ. "Total Activity Density" of a TAZ for a trip end was used, expressed as the total of population and employment divided by total square miles of the TAZ. Diversity compared the degree of jobs to the population balance of a TAZ relative to the county wide average and ones that relied on entropy measures of mixtures across activity categories. The ratio of sidewalk miles to centerline miles of roadway (serving as an index of sidewalk provisions) was used to predict mode choice. ***LIMITATIONS:*** Causal inferences cannot be made using cross-sectional data; data was self-reported from the survey; study design did not account for self-selection; the sample size was limited	General Population Residents enjoy a wide array of mobility options that are available in the Washington metropolitan area, providing a good setting to study variations in mode choice behavior. ***ELIGIBILITY:*** Montgomery County was selected because it maintains fairly rich data on land-use characteristics of its traffic analysis zones (TAZs). ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Researchers from the University of California, Berkeley ***THEORY/ FRAMEWORK:*** The built-environment is defined in terms of 3 core dimensions, or the "3-Ds": density, diversity, and design. ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Not reported ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. Neighborhoods with fairly well developed sidewalk infrastructure appear to have influenced mode choice to some degree, ostensibly by providing more attractive settings for taking a bus or joining a vanpool (ratio of sidewalk miles to road miles; origin TAZ; coefficient; -0.7282, standard error= 0.2628, p=0.0056; destination TAZ; coefficient; -0.8371, standard error= 0.2664, p=0.0017). 2. Having high shares of apartments and condominiums near one's place of residence lowered the odds of driving alone or ride-sharing relative to transit riding (coefficient; -1.64, standard error= 0.814, p=0.151). 3. Having relatively complete sidewalk networks at the trip destination promoted transit usage (coefficient estimate=0.4701, p=0.2935). 4. Land-use mixtures at both trip ends lowered the probability of driving alone or ride-sharing versus taking a bus or train (origin: coefficient estimate= -2.488, p=0.016 for drive-alone and coefficient estimate= -2.679; p=0.011 for group ride and destination: coefficient estimate= -1.984: p=0.048 for drive alone and coefficient estimate= -2.222; p=0.027 for group-ride). ***OTHER:*** 5. A longer (in-vehicle and out of vehicle) travel time aboard transit relative to the private automobile lowered the odds of taking transit (coefficient; -0.0150, standard error= 0.0044, p=0.0009). And where transit fares exceeded the direct cost of motoring (including tolls and parking fees), residents tended to travel by car (coefficient; -0.0100, standard error= 0.0027, p<0.0001). 6. Activity density at both the trip origin and destination significantly increased the odds of transit usage (coefficient estimate=0.0386, p<0.0001 and coefficient estimate=0.0258, p=0.0265, respectively).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Moudon, Lee (2005) Washington	Perceptions of distance and land-use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to recreational amenities (bicycle lanes and trails) *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 608 able-bodied adults **PRIMARY OUTCOME:** Cycling behavior **MEASURES:** 1. Telephone survey [Walkable and Bikeable Community Project (WBC)] data (socio-demographic data, transit use, physical activity [frequency of bicycle use per week], attitude toward environment and transportation, household characteristics and transportation, neighborhood perceptions of distance and barriers) 2. Geographic Information Systems [GIS] data (King County assessor's offices; land-use, parcel data; Puget Sound Regional Council data [park layer and bus ridership, traffic volume, posted speed, number of traffic and bicycle lanes] agglomerations of destinations [grocery, retail, restaurants, convenience store, office, mixed use, sports facility, school, bank, fast food, post office, church]) 3. Walkable and Bikeable Communities [WBC] Analyst (ArcView 3.2 extension; uses buffers to find environmental measures of walkability/ bikeability) **DATA COLLECTION:** Data are from the Walkable and Bikeable Communities (WBC) project. The survey was administered in the summer and early fall of 2002. Respondents are dichotomized into cyclists (bicycled at least once per week) and non-cyclists. The telephone survey used items from validated questionnaires. Survey reliability was examined during the project pilot testing phase. Objective built environment measures specially created for this study include 24 individual destination-based land uses that may attract or hinder cycling. Three sets of specified GIS measurement types were gathered using the WBC Analyst including: (a) home-based proximity measures (up to 3 km from home), (b) home-based buffer measures, and (c) neighborhood center-based measures. Airline and Network models were created. **LIMITATIONS:** Survey data was self-reported; causal inferences cannot be assessed using cross-sectional data; neighborhood self-selection was not considered; generalizability is limited to a particular sample frame	Adults (18+ years), General population, Urban (target population) The survey respondents are shown to be fairly representative of the sample frame. **ELIGIBILITY:** Participants were eligible if they had a telephone, were able-bodied, and were 18 years and older. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of Washington, Texas A&M, Seattle Pacific University, and the Centers for Disease Control and Prevention. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was supported by the Centers of Disease Control and Prevention through the University of Washington Health Promotion Research Center. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Perceived presence of destinations (grocery stores and schools) is negatively associated with the odds of cycling (Airline OR=0.702; $p<0.10$ and Network OR=0.718; $p<0.10$). 2. Summed area of convenience store parcels (Airline; OR= 0.822, Network; OR= 0.784, $p<0.01$), number of parcels within the closest NC10 [office, fast food, and hospital] (Airline; OR= 1.160, Network; OR= 1.238, $p<0.01$, $p<0.05$, respectively), and distance to the closest trail (Airline; OR= 0.801, Network; OR=0.728, $p<0.01$) were significantly positively associated with the odds of cycling. 3. Most parcels in the closest NC10 (office+fast food+hospital) from home are moderately related to the increased odds of cycling (Airline OR= 1.160, $p<0.1$, Network OR= 1.238, $p<0.05$). 4. Perceived presence of recreational amenities (bicycle lanes/ trails) is positively associated with the odds of cycling (Airline OR=1.704; $p<0.01$ and Network OR=1.729; $p<0.01$). 5. Variables that capture the perception of problems related to automobiles (such as traffic congestion) and the perceived presence of auto-oriented facilities (such as large parking lots in the neighborhood) show a curvilinear relationship with cycling for both Airline and Network models ($p<0.10$ and $p<0.05$, respectively). Those who responded neutrally to these factors had the highest likelihood of cycling, compared to those who disagreed or agreed.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Franzini, Elliot (2009) United States	Differences in residential density ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Perceptions of neighborhood traffic 2. Physical disorder in the neighborhood *Complex:* 1. Social support	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 544 Fifth grade students and their primary caregivers from the metropolitan area of 3 cities (Birmingham, Los Angeles, Houston) ***PRIMARY OUTCOME:*** Physical activity (PA) ***MEASURES:*** 1. Height and weight (body mass index [BMI]) 2. Youth Behavior Survey compiled by the Centers for Disease Control and Prevention (frequency, duration, and intensity of physical activity) 3. Direct observation (neighborhood traffic, physical disorder, residential density) 4. Face-to-face interview with parents (sociodemographic data, neighborhood perceptions of social processes [social cohesion, informal social control, socialization of children, social ties] neighborhood safety) ***DATA COLLECTION:*** Data was collected as part of phase 1 of Healthy Passages, a multisite, community-based study on children's health between May and September of 2003. The child and parent each completed (in English or Spanish) a face to face computer assisted personal interview and an audio computer self-interview with and without the interviewer. Neighborhood data combined physical observations collected by trained observers and parents' neighborhood perceptions. ***LIMITATIONS:*** The study design was cross-sectional which does not allow for causal inferences to be made	5-10 year olds, 76% Minority, 30% Hispanic, 38% Black, 55% Female, 41% Overweight, most lived in urban areas (evaluation sample) ***ELIGIBILITY:*** All 5th grade students enrolled in public schools with at least 25 students in the class, in the 3 cities were included in the study. Written parental consent was required. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers from the University of Texas, University of California- Los Angeles, RAND Corporation, Children's Hospital Boston, Harvard Medical School, University of Alabama and Centers for Disease Control and Prevention. ***THEORY/ FRAMEWORK:*** Social Determinants of Health and Environmental Health Promotion model ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Research was supported by Centers for Disease Control and Prevention cooperative agreements ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. The structural model for the ordinal measure of child obesity (underweight or normal weight, overweight, obese) suggested that neighborhood physical environment had no significant association with activity levels. 2. The structural model for ordinal measures of child obesity suggested that a favorable social environment was positively associated with physical activity (standardized regression coefficient = 0.13, $p<0.05$), which was negatively associated with child obesity (standardized regression coefficient = -0.24, $p<0.05$). 3. A favorable neighborhood social environment was positively associated with overall physical activity ($\beta=0.15$, $t=2.35$), days of vigorous exercise ($\beta= 0.57$, $t=2.90$), days with physical education in school ($\beta=0.39$, $t=4.18$), and favoring free-time movement activities ($\beta= 0.19$, $t=3.16$) (all $p<0.05$). (Note: Neighborhood physical environment was comprised of variables for traffic, density, land-use mix, and physical disorder.)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Boehmer, Lovegreen (2006) Arkansas, Missouri, Tennessee	Land-use mix and distance to grocery stores **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to recreational facilities 2. Perceptions of neighborhood traffic safety 3. Perceptions of safety from crime 4. Access to fruits and vegetables, distance to grocery stores 5. Presence and absence of sidewalks and shoulders on the street and aesthetic quality of the environment *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 2210 adults from 13 rural communities in Arkansas, Missouri, and Tennessee **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Weight and height (body mass index [BMI]) 2. Survey (moderate-to-vigorous physical activity [MVPA], walking behavior, sedentary leisure-time activity, perceived recreational facilities, land use, barriers related to traffic safety and crime, aesthetics, food environment, demographic characteristics, presence of quality sidewalks and shoulders on streets, availability of fruits and vegetables) **DATA COLLECTION:** The present study used data from a previously administered survey that used a modified version of the BRFSS and was collected between July and September 2003. Demographic characteristics and moderate and vigorous physical activity were measured using standard BRFSS questions with established psychometric properties. Open-ended environmental perception items were calculated using a four-level, ordinal response scale, with most items having been tested for reliability. MVPA was stratified into 3 categories; meeting recommendations, insufficient activity, and not active. BMI and MVPA were combined to create risk categories. The lowest risk group was defined as normal weight and active (recommended MVPA) and the highest risk group was defined as obese and inactive (insufficient and not active). **LIMITATIONS:** Causal inferences cannot be achieved using cross-sectional data; the study did not account for selection bias or response bias; social, intrapersonal, and biological factors that interact with environmental factors were not accounted for; non-response bias may limit the representativeness of the sample; the sample over-represented women and older individuals and cannot accurately estimate the prevalence of obesity in the study population; there was a small sample size for some subgroups	Adults, 74.4% Female, 93.4% White, 36.8% income <$25,000, 59.1% income >$25,000; 27% obese; 31% overweight (evaluation sample) 8 communities met the US Census definition of rural; 12 were located within a nonmetropolitan county. The communities in TN and AR were selected to match the MO sites on size, race/ethnicity, and proportion of the population living below the poverty level. **ELIGIBILITY:** Communities with established walking trails were eligible for participation. Households within those communities within a 2-mile radius of the existing walking trails were eligible. English speaking adults were eligible to participate. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Saint Louis University (evaluation) **THEORY/ FRAMEWORK:** Ecological framework **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Institutes of Health **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** *Stratified Analysis:* 1. Neighborhood perceptions of having no or a few destinations within close proximity (3-6 destinations: OR=2.03, 95%CI= 1.33, 3.09; 1-2 destinations: OR=1.72,95%CI= 1.13, 2.62; none: OR=1.63, 95%CI= 1.07, 2.5), feeling unsafe from crime (OR=2.91, 95%CI= 1.86, 2.55, p<0.05), feeling unsafe from traffic (OR=2.46, 95%CI= 1.63, 3.71, p<0.05), and finding the community somewhat pleasant (OR=1.73, 95%CI= 1.28, 2.34) or not pleasant (OR=2.02, 95% CI= 1.29, 3.15, p<0.05) were all associated with being obese/inactive. 2. Having no sidewalks or shoulders on most streets was not significantly associated with obesity nor was the availability and quality of fresh fruits and vegetables. Further distance to the nearest supermarket was associated with increased odds of obesity (OR: 1.8, 95% CI= 1.3, 2.4). 3. Neighborhood perceptions of a lack of places to be physically active (OR=1.46, 95%CI= 1.1, 1.94), no available equipment (OR=1.55, 95%CI=1.19, 2.02), few or moderate number of destinations within close proximity (3-6 destinations: OR=1.49, 95%CI= 1.08, 2.06; 1-2 destinations: OR=1.42,95%CI= 1.03, 1.97), feeling unsafe from crime (OR=2.09, 95%CI= 1.5, 2.92, p<0.05), feeling unsafe from traffic (OR=1.65, 95%CI=1.2, 2.27, p<0.05), finding the community somewhat pleasant (OR=1.44, 95%CI= 1.13, 1.92) or not pleasant (OR=1.85; 95%CI=1.31, 2.59, p<0.05), and having an unmaintained community (OR=1.48, 95%CI=1.09, 1.99) were all associated with being obese. 4. Perceived lack of equipment for physical activity was associated with being obese (OR= 1.8, 95% CI= 1.3, 2.4) and obese/inactive (OR= 1.8, 95% CI= 1.2, 2.7) among only women. 5. Women had stronger associations between obesity and indicators of poor aesthetics (OR= 1.3, 95% CI= 1.0, 1.7 for interesting things; OR= 1.7, 95% CI= 1.2, 2.3 for well-maintained) and feeling slightly/not at all safe from crime (OR= 2.4; 95% CI= 1.6, 3.5). *Multivariate Analysis:* 6. Furthest distance (>20 minutes) to the nearest recreational facility (OR=2.74, 95% CI= 1.68, 4.48), having 3-6 destination types near home (OR=1.76, 95%CI= 1.09, 2.84), and feeling unsafe from crime (OR=2.59, 95% CI= 1.56, 4.28) were neighborhood environmental perceptions associated with being obese. 7. Furthest distance (>20 minutes) to the nearest recreational facility (OR=1.53, 95% CI= 1.1, 2.11) and feeling un, afe from crime (OR=1.71, 95% CI= 1.19-2.46) were neighborhood environmental perceptions associated with being obese.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Sallis, Saelens (2009) Washington and Maryland	Net residential density, mixed land use, and retail floor area ratio **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity and intersection density *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 2199 participants from 32 neighborhoods in Seattle and Baltimore **PRIMARY OUTCOME:** Overweight/obesity and walking behavior **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Walkability index (density, mixed land use, street connectivity, retail floor area ratio) 3. Accelerometer (physical activity) 4. International Physical Activity Questionnaire (physical activity (general and moderate-to-vigorous physical activity [MVPA]), psychosocial measures, frequency and duration of walking past week) 5. US Census (neighborhood selection, walkability [net residential density, retail floor area ratio, land-use mix, intersection density]) 6. Neighborhood satisfaction items (social interaction, traffic and crime safety, school quality) 7. 12-item Short-Form (SF-12) Health Survey (quality of life, mental quality of life) 8. Depression scale (depressive symptoms [Center for Epidemiologic Studies]) **DATA COLLECTION:** Data for this study was collected from the neighborhood quality of life study (NQLS), conducted from 2001 to 2005. A higher retail floor ratio indicated a more pedestrian oriented design and lower ratios suggesting more land area devoted to parking. A five point Likert scale was used for neighborhood social cohesion and satisfaction ranging from strongly dissatisfied (1) to strongly satisfied (5). To control for walkability-related to self-selection of neighborhoods, a scale (internal consistency alpha=0.76) of "reasons for moving" to the current home was computed by averaging ratings of importance of three items; "desire for nearby shops and services," "ease of walking," and "closeness to recreational facilities". **LIMITATIONS:** Data was self-reported; recruitment and participation were low; cross-sectional design does not allow for causal inferences to be made; the specific tools had limited capabilities of measuring certain variables	Adults, General population, 20-65 years (age range), 26% Minority (evaluation sample) **ELIGIBILITY:** Eligibility was defined as being between 20 and 65 years, not residing in a group living establishment, ability to complete written surveys in English, and absence of a medical condition that interfered with the ability to walk. Participants gave written informed consent. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from San Diego State University, University of Washington and Children's Hospital in Seattle, University of British Columbia, and the Lawrence and Frank Company. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was supported by a grant from the National Heart, Lung, and Blood Institute. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. The walkability main effect was significant (p=0.007), with the odds of being overweight or obese 35% higher for participants living in low vs. high-walkability neighborhoods (OR=1.35, 95% CI; 1.09, 1.69). **PHYSICAL ACTIVITY:** 2. Overall, the significant walkability main effect indicated a higher average of number of minutes per week of walking for transportation in high-walkability neighborhoods 44.3 min per week, compared to low-walkability neighborhoods 12.8 min per week (walkability main effect p<0.0001). 3. Walking for transportation was significantly higher in high-walkability neighborhoods compared to low-walkability neighborhoods for both high- and low-income neighborhoods; however, the differential was larger in high-income neighborhoods at 5.1 minutes compared to low-income neighborhoods at 2.3 minutes (walkability-by-income interaction p=0.027). 4. The leisure walking main effect was significant (p=0.012), with people living in high-walkability neighborhoods averaging 18.5 minutes per week of leisure walking compared to 14.2 minutes per week in low-walkability neighborhoods. 5. On average, participants in high-walkability neighborhoods had 5.8 more minutes per day of objectively measured MVPA than those in low-walkability (main effect p=0.0002). 6. When the "reasons for moving here" score was added to control for preferences related to "activity-friendly" environments, the walkability main effect was still significant (p<0.0001). For minutes of leisure walking, the walkability main effect was no longer significant (p=0.36).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Lee, Vernez Moudon (2006) Washington	Distance to grocery stores, restaurants, parks and trails and area based density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Traffic volume 2. Length of sidewalks, and street vegetation (trees), and block size *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 438 Seattle adult residents (final sample was a subset from the Walkable and Bikeable communities) **OUTCOME:** Walking behavior **MEASURES:** 1. Survey (demographic data, transit use, weekly walking and biking, difficulty walking or biking, vehicle miles traveled per month, frequency of walking for transport and recreation, number of cars in household, dogs in household, awareness of the importance of physical activity, the need to walk/bike, knowledge of congestion and air problems, neighborhood perceptions [type of neighborhood, architecture, awareness of neighbors, traffic problems, air pollution]) 2. Geographic Information System (GIS) data (buffer measures [type and intensity of land use/pedestrian and other transportation infrastructure conditions], distance to individual and agglomerations of destinations, and topography) **DATA COLLECTION:** Survey data came from a telephone survey conducted as part of the Walkable and Bikeable Communities (WBC) project. The survey was administered in fall of 2002 by a professional survey company. The instrument was developed using validated questions from existing surveys. The raw data used for the GIS analysis came from the county's parcel-level and building level assessor's data, park layer, METRO bus ridership data, and the Puget Sound Regional Council's regional transportation network data (including trails).Environmental variables were measured using a custom-made GIS tool, called Walkable and Bikeable Communities Analyst, developed as part of the WBC project. 11 types of distance agglomerations were included, called Neighborhood Centers (NCs). Variables were measured and ranked by importance VIP (very important) and Non-VIP (not very important). **LIMITATIONS:** Cross sectional study design does not allow for causal inferences; self-reported data possibly leads to bias; some variables were excluded because of problems with interpretation	Adults 10% Minority, 90% White, 54% Female,16% age 66 years or older (evaluation sample) **ELIGIBILITY:** Eligible participants of the Walkable and Bikable Communities were at least 18 years of age, had little or no difficulty walking three city blocks, English speaking, and lived at the same address as the database showed and had a working telephone. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Washington Health Promotion Research Center. **THEORY/ FRAMEWORK:** A multi-or trans-disciplinary approach to active living research; the social ecological model; and the Behavioral Model of Environment **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** The survey instrument was pilot tested on 50 random samples drawn from the same sample frame. Interview protocols followed the methods used by Behavioral Risk Factor Surveillance System. **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Robert Wood Johnson Foundation through the Active Living Research program and the WBC project, funded by Centers for Disease Control and Prevention through the University of Washington Health Promotion Research Center. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** *Objective Correlates of Walking* 1. Distance to the closest office and mixed use neighborhood centers for both-walkers (OR=2.591, 95% CI= 1.463, 4.587, p<0.01), the recreation walker (OR=2.233, 95% CI= 1.198, 4.161, p<0.05), and the transportation walker (OR=2.503, 95% CI= 1.314, 4.768, p<0.01) was significant in all models. 2. Area level residential density was found significant in all models for both recreational and transport walkers (OR= 0.135, 95% CI= 0.036, 0.511, p<0.01), and independently for the recreation walkers (OR= 0.101, 95% CI= 0.024, 0.421, p<0.05), and the transportation walker (OR= 0.186, 95% CI= 0.043, 0.798, p<0.05). 3. Parcel-level density (OR=2.740, 95% CI= 1.239, 6.056, p<0.05) showed a positive association with the likelihood of walking for both purposes relative to not walking at all. 4. Area based density (OR=0.135, 95% CI= 0.036, 0.511, p<0.001) showed a negative association with the likelihood of walking for both purposes relative to not walking at all. 5. Frequent walkers have a 17% decreased odds of walking (OR=0.825, 95% CI= 0.688, 0.989, p<0.05) for transportation compared to non-walkers in a sloped environment. 6. Frequent walkers have a 15% increased odds of walking for recreation compared to non-walkers in a sloped environment. 7. Route related variables, such as block size, traffic volume, sidewalk, and street trees, did not show a statically significant association with transportation walking; but longer sidewalks was positively associated with recreation walking (frequent walking; OR=1.117, 95% CI= 1.001, 1.245, p<0.05). 8. Moderate walkers had a 56% decreased odds of perceiving their neighborhood as having a mix or only commercial atmosphere when (OR=0.441, 95% CI= 0.200, 0.972, p<0.05) compared to non-walkers. 9. Both socio-demographic and physical environmental variables had a stronger association with transportation walking than with recreation walking. The Frequency Models showed the fit of the recreational model (pseudo R^2=0.349) to be much poorer than that of the transportation model (pseudo R^2=0.641). **OTHER:** 10. The odds of transportation walking were 1.7 times higher for moderate walkers (OR=1.765, 95% CI= 1.247, 2.494, p<0.01) and 2.7 times higher for frequent walkers when compared to non-walkers with increased social support (OR=2.652, 95%CI= 1.673, 4.203, p<0.01). **ENVIRONMENT:** 11. The objectively measured environmental variables captured up to 20% of the variation in the models, whereas the socio-demographic variables including perceived environmental variables, captured about 10% to 40% of the variation depending on the model.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Joshu, Boehmer (2008), Brownson, Baker (2001) United States	Community sprawl **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to places to exercise (e.g., shopping malls, parks, trails) 2. Presence of sidewalks 3. Perceptions of traffic barriers (safety) *Complex:* 1. Social and personal barriers	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1818 United States adults of diverse ethnicity and income level **PRIMARY OUTCOME:** Overweight/obesity and physical activity and walking behavior **MEASURES:** 1. Height and weight (calculated body mass index [BMI]) 2. County Sprawl Index (metropolitan counties gross population density, percentage of county population living in suburban and urban densities, net density, block size, percentage of blocks with less than 1/100 square miles) 3. Survey (perceived barriers to physical activity including hills, lack of sidewalk, personal barriers including fear of injury, limited time, and intensity and frequency of physical activity) **DATA COLLECTION:** Data used for this study was collected by researchers who conducted interviews between September 1999 and January 2000. Respondent zip codes were matched to county of residence on the basis of Federal Information Processing Standard (FIPS) codes and a level of urbanization (e.g., large metropolitan, rural) was assigned to each respondent.The survey instrument was developed using a combination of questions from the Behavioral Risk Factor Surveillance System (BRFSS), the National Health Interview Survey and other surveys. Personal barrier scores were totaled to create a summary score. Larger values of the sprawl index indicate more compact counties whereas smaller values indicate more sprawling counties. **LIMITATIONS:** Data was self-reported; some BRFSS items have not been systematically examined; study design is cross-sectional restricting causal inferences; perceived measures of neighborhood barriers were used rather than observed measures	Adults, 45.7% Minority: 54.3% White, 29.4% Black,2.1% Asian/ Pacific Islander, 2.7% Indian/ Alaskan native, 11% Other, 0.4% missing/unknown, 39.3% Lower-income 67.1% Female (evaluation sample) To obtain a representative sample of lower income individuals, zip codes were over sampled in which 32% or more of residents were below the federal poverty level. The sample tended to under-represent Whites, men, and higher income groups (in comparison with data from the US census). **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from Saint Louis University Prevention Research Center **THEORY/ FRAMEWORK:** Ecological framework **EVIDENCE-BASED:** Previous investigation of the macro-environment has shown that communities differ in demographic, physical, social and economic factors depending of level of urbanization. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was funded through the Centers for Disease Control and Prevention including support from the Community Prevention Study of the National Institutes of Health Women's Health Initiative. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. An increase in the number of perceived neighborhood barriers increased the odds of being obese (chi-square for linear trend, $p<0.05$). 2. Heavy traffic was associated with obesity within large metropolitan (adjusted OR= 1.9, 95% CI= 1.3, 2.9), micropolitan (adjusted OR= 2.2, 95% CI= 1.03, 4.5) and rural areas (adjusted OR= 1.7, 95% CI= 0.8, 3.3). 3. Hierarchical linear modeling found that the effect of sprawl on BMI is greater for individuals who report a greater number of personal barriers. The effect of sprawl on BMI increased by -0.006 with each additional personal barrier. **PHYSICAL ACTIVITY:** 4. Neighborhood characteristics, including the presence of sidewalks (OR=1.28, 95% CI=1.02, 1.59), enjoyable scenery (OR=1.46, 95% CI=1.13, 1.88), heavy traffic (OR=1.28, 95% CI=1.04, 1.58), and hills (OR=1.28, 95% CI=1.04, 1.58), were positively associated with physical activity. 5. Among those with lower incomes, the most important neighborhood variable was enjoyable scenery (OR = 1.53, 95% CI = 1.07, 2.18). 6. Access to parks (adjusted OR=1.95, 95% CI=1.52, 2.52), indoor gyms (adjusted OR=1.94, 95% CI=1.45, 2.60), and treadmills (adjusted OR=1.48, 95% CI=1.13, 1.93) were positively associated with physical activity. 7. Two policy variables were positively associated with physical activity: believing that employers should provide time for exercise (adjusted OR=1.27, 95% CI=1.01, 2.01), and support for the use of local government funds for walking or jogging trails (adjusted OR=1.42, 95% CI=1.00, 2.01). 8. Among individuals indicating some degree of physical activity, the following environmental supports were associated with reports of increases in activity: neighborhood streets (22.6% of respondents), shopping malls (25.9%), parks (28.5%), walking and jogging trails (29.9%), treadmills (30.6%), and indoor gyms (33.7%). 9. The presence of sidewalks was the most important neighborhood variable among those with higher incomes (OR = 1.46, 95% CI = 1.08, 1.97). **OTHER:** 10. An increase in the number of personal barriers increased the odds of being obese (chi-square for linear trend, $p<0.001$). 11. Obese individuals in small metropolitan (adjusted OR= 2.3, 95% CI= 1.05, 5.2) and micropolitan areas (adjusted OR= 4.8, 95% CI=1.6, 14.2) were more likely to report being self-conscious about the appearance while active. 12. Obesity residents of micropolitan areas were more likely to report no time for activity (adjusted OR= 2.6, 95% CI= 1.1, 6.1), and fear of injury (adjusted OR= 4.1, 95% CI= 1.2, 14.1) and dislike of exercise (adjusted OR= 3.9, 95% CI= 1.3, 11.7) were strongly associated with obesity in rural areas compared with other areas.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Rutt, Coleman (2004) Texas	Land-use diversity **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to places to be active *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 452 adults from El Paso County **PRIMARY OUTCOME:** Body Mass Index [BMI] and light, moderate, and vigorous physical activity **MEASURES:** 1. Behavioral Risk Factor Surveillance System Survey –[BRFSS] (BMI, walking information, fruit and vegetable intake, number and type of morbidities, age, number of children, Environmental characteristic [slope, land-use, street connectivity, distance to physical activity facilities, sidewalk availability, safety to exercise]) 2. San Diego Health and Exercise Survey (light, moderate, and vigorous physical activities and sedentary activities) 3. Los Angeles Epidemiologic Catchment Area study (acculturation, ethnicity, the Hollingshead Four-Factor Index of Social Status and the Compendium of Physical Activities survey) 4. Arc View aerial photographs (sidewalk availability) 5. US Census 2000 (population density, intersection density) **DATA COLLECTION:** Data was collected from the El Paso City Parks and Recreation Department; the Center for Environmental Resource Management; and the Planning, Research, and Development Dept. of El Paso City Hall. Characteristics of a neighborhood were determined within a 0.25 mile radius around each respondents home. Environmental variables were evaluated using Geographic Information Systems (GIS) software. Survey data was matched with environmental data, first by matching telephone numbers to existing database (El Paso community walking initiative), then using a reverse people finder website. Structural Equation Modeling (SEM) was used to model the relationships between built environment variables, physical activity, and BMI. **LIMITATIONS:** Only 38% of those contacted agreed to participate in survey, and only 48% of them could be geo-coded and included in analysis; physical activity, height, and weight were self-reported; use of telephone survey could underestimate individuals in lowest income brackets; trees, missing aerial photographs, use of 5 year old photos, and lack of data on sidewalk quality limited the sidewalk availability variable; no information about the perceived environment was collected	Adults 73% Hispanic, 29% Caucasian (evaluation sample) Participants with geo-coded addresses were significantly older than participants who did not have geo-coded addresses (44 vs. 39 years old). **ELIGIBILITY:** Participants were excluded if they were not a resident of El Paso county, did not have a telephone, or if it was disconnected. 7,234 calls were made, 4,544 of which were excluded (63%). From the remaining 2,690 residences, 1,665 were contacted and refused to complete the survey (62% refusal rate). 943 adults had complete surveys and only 452 had addresses that could be geo-coded. **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** Researchers from University Of Texas - El Paso and San Diego State University **THEORY/ FRAMEWORK:** State the theory and/or framework used to guide or develop the intervention **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not reported **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Significant direct predictors of BMI were moderate intensity physical activity (p=0.05), overall health (p=0.0004), SES (p=0.0003), and living in an area with more mixed land use (p=0.03). 2. A mediating relationship was found for poorer overall health (p=0.004) predicting more perceived barriers to physical activity (R^2=0.05), which in turn predicted less self-reported moderate physical activity (p=0.04) and then higher BMI (R^2= -0.20). 3. The proposed model explained variance in BMI for a random sample of El Paso residents (R^2=0.20). **PHYSICAL ACTIVITY:** 4. Time spent in vigorous physical activity was predicted by fruit and vegetable intake (p=0.04), younger age (p=0.0002) and increased distance to physical activity facilities (p=0.04, R^2=0.14). 5. The only significant predictor of time spent in light physical activity was number of co-morbidities (p=0.02, R^2=0.06). 6. Other findings included increased fruit and vegetable consumption (p=0.04) and younger age (p=0.02) as predictors of time spent in moderate physical activity (R^2=0.10).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Greenwald, Boarnet (2001) Oregon	Land-use mix and population density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street griddedness, sidewalk continuity, and street connectivity *Complex:* Not reported	**DESIGN:**Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 3 counties surrounding Portland, Oregon **PRIMARY OUTCOME:** Non-work walking behavior **MEASURES:** 1. Geographic Information Systems [GIS] (percentage ¼ mile buffer zone covered by a grid street pattern) 2. 1994 Portland Travel Diary (sociodemographic data, trip speeds, distances, nature or related activities) 3. 1990 US Census (block-level data; income, educational attainment, racial composition, type of home [rural, farm, urban]) 4. Pedestrian Environment Factor [PEF] (ease of street crossing, sidewalk continuity, street connectivity, topography) **DATA COLLECTION:** Researchers used data from the 2-day Portland Travel Diary for 1994. GIS software was used to create a buffer within one quarter mile of the home location of each individual respondent. The land area of all street sections within that buffer that were of a quadrilateral naturewas summed. That sum was then divided by the area of the quarter mile radius circle to get a proportion of the buffer area covered by a grid street pattern. All the attributes for PEF were scored on a scale ranging from a maximum of 12 to a minimum of four. **LIMITATIONS:** Data was self-reported; the sample was limited to individuals sharing the same travel costs and those in the Portland area	General Population **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** Researchers from the University of Wisconsin and the University of California-Irvine **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Using an ordered probit model for non-work walking trips at the census block group level, population density positively affects the likelihood of non-work travel being completed by walking trips (coefficient= 0.0000282, Z=2.985; $p<0.05$). 2. Using an ordered probit model for non-work walking trips at the census block group level, as trip cost variables (median walking distance and speeds for individuals) are added, block group density becomes an even stronger predictor for walking (coefficient= 0.0000291, Z= 3.061; $p<0.05$). 3. Using an ordered probit model for non-work walking trips at the zip code level, regional densities are not as important in determining individual walking behavior, as indicated by the insignificance of the population and retail density variables. Additionally, individual trip costs become insignificant when analyzed in the context of regional variables, lending further support to the idea that land use impacts on pedestrian travel have highly localized impacts. 4. Using ordinary least squares and instrumental variable regressions, block group population density and PEF score show support for non-work walking travel. Block group population density and PEF score are both individually significant in the ordinary least squares (coefficient= 0.0000569, T= 6.122; $p<0.05$; and coefficient; 0.0606048, T=3.649; $p<0.05$, respectively) and the instrumented variable regressions (coefficient= 0.0000596, T= 2.292, $p<0.05$; and coefficient= 0.0792254, T=2.38, $p<0.05$, respectively). 5. The percentage of area in a ¼ mile buffer zone of the residence that is covered by a street grid format was significantly associated with non-work walking travel in the ordinary least squares model (coefficient= 0.9931173, T=2.774, $p<0.05$), but became insignificant when instrumented.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Zhu, Arch (2008) Texas	Distance to school and land-use mix (convenience stores, office buildings, etc.) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of sidewalk quality 2. Presence of highway or freeway and busy roads as barriers (traffic safety) 3. Perceptions of safety (interpersonal) *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1281 students in 8 elementary schools from the Austin Independent School District (AISD) classified into 3 groups: Group 1 (small attendance, grid-like street networks, small street block/ land parcels), Group 2 (cul-de-sac street networks, larger attendance, larger street blocks/land parcels), Group 3 (schools farther north and west of the interstate, combination cul-de-sac and superblock, grid-like street networks). **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Geographic information systems [GIS] (neighborhood walkability and safety) 2. Field audits (street-level walkability) 3. Survey (child's school travel mode; personal, social, and physical environmental correlates of travel mode for parent and students; ethnicity; parents' education level; household's car ownership). The survey was developed based on previously validated instruments including the questionnaire from the University of California at Irvine's Safe Routes to School study, the Parent-Adolescent Survey, the PedsQL Family Information Form. **DATA COLLECTION:** In April 2007 the survey was administered in Spanish and English in collaboration with the city's Child Safety Program and the AISD, as part of the city's efforts to create a Safe Routes to School Plan. The variables were measured on a 5-point Likert scale or through binary measures. GISand field audit data was obtained from a previous study. **LIMITATIONS:** Self-reported data	Hispanic Lower-Income 5-10 year olds 55.4% Hispanic (in AISD) 60.3% free/ reduced lunch (in AISD) With-in groups, schools shared relatively similar socio-demographic and physical environmental characteristics. In group 2, Hispanics were slightly over-represented and African Americans were somewhat under-represented. 5th-grade students were slightly under-represented in the sample. **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Texas A&M University **THEORY/ FRAMEWORK:** Socio-ecological theory **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not reported **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** The final 3-page survey was developed from cognitive interviews and revisions. **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. The sidewalk quality factor and overall walking environment factor did not show significant associations with walking. 2. Distance to school was the strongest predictor of walking, where the child was about 4 times more likely to walk if the parent perceived the distance to be close enough for their child to walk (OR=4.918, β =1.593, p<0.01). 3. The presence of convenience stores (OR=0.588, β =-0.531, p<0.01) and office buildings (OR=0.52, β =-0.654, p<0.05) was associated with decreased likelihood of walking after controlling for other variables. 4. In the analysis using 8 separate models for individual schools, the distance to school was the most significant predictor in 6 of the 8 schools (Group 1: Zavala [n=106, OR=7.467, p<0.05)], Sanchez [n=150, OR=11.735, p<0.01], Metz [n=153, OR=9.177, p<0.01]; Group 2: Blanton [n=114, OR=10.384, p<0.01], Andrews [n=215, OR=11.68, p<0.01]; Group 3: Wooten [n=193, OR=9.441, p<0.01]). 5. Four insignificant variables from the pooled model became significant in the individual models. Among personal variables, age became positively associated with increased odds of walking in the Zavala model (data not shown). Single-parent status decreased the likelihood of walking (data not shown). The busy road barrier (Blanton; n=114, OR=0.203, p<0.05) and sidewalk quality (Harris: n=117, OR=0.477, p<0.05) decreased the likelihood of walking. 6. Having school bus services lowered the odds of walking by 67% (OR=0.333, β =-1.100, p<0.01). 7. Positive peer influences increased the odds of walking by 19% (data not shown). 8. A 1-unit increase in the safety concern factor (range: -2.6 to 1.9) reduced the odds of walking by 22% (OR=0.776, β =-0.253, p<0.01). 9. The presence of highway or freeway barrier decreased the likelihood of walking by 52% (OR=0.483, β =-0.727, p<0.01). 10. This analysis model showed that parental barriers were the second most important correlate for schools independently and was significant in 5 of the schools (Group 1: Zavala [n=106, OR=0.183, p<0.01], Metz [n=153, OR=0.453, p<0.05]; Group 2: Harris [n=117, OR=0.593, p<0.05], Andrews [n=215, OR=0.436, p<0.01]; Group 3: McBee [n=137, OR=0.354, p<0.01]). **OTHER:** 11. Analysis using a regression model of the pooled data from all 8 schools indicated that of the socio-demographic variables, only parents' highest education level was negatively correlated with walking to or from school. Every 1-unit increase in education level was associated with a 19% decreased likelihood of a child walking to or from school. A similar relationship was found for car ownership (data not shown). 12. Parents' personal barriers were negatively associated with walking (OR=0.566, β= -0.569, p<0.01), while the factor capturing children's and parents' positive walking behaviors/attitudes was positively associated with walking (OR=1.461, β=-0.379, p<0.01). 13. Among social factors, students attending Blanton elementary school were less likely to walk than students from the other 7 schools (β=-1.127, OR=0.324, p<0.01).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Fulton, Shisler (2003) United States	Levels of urbanicity (urban, suburban, and rural) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Presence of sidewalks and accessibility in the community *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1,395 parent-child pairs residing in the United States. **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Interview/Survey (physical activity, neighborhood characteristics, transport mode to school, demographic data, behavioral/attitudinal, psychosocial, perceptions of safety, presence of neighborhood sidewalks, opportunities for participation in sports teams) **DATA COLLECTION:** From September to October 1996, trained staff completed interviews. Active transportation to school (ATS) was used as the dependent variable. **LIMITATIONS:** Causal and temporal inferences cannot be determined because the study was cross-sectional; the validity of ATS is not known; researchers did not examine why girls and older youth are less likely to use ATS; distance to school was not used as a measure; the response rate limits generalizability	5-18 year olds, 7% African-American, 8% Hispanic , 4% Other, 80% White (evaluation sample) **ELIGIBILITY:** Parental consent and youth assent were obtained. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the Centers for Disease Control and Prevention. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Compared to children in rural areas, children in central cities, suburbs, or small cities/towns were more likely to walk (OR=2.2, 95%CI= 1.0, 4.6; OR=2.4, 95%CI= 1.3, 4.5, and OR=2.3, 95%CI=1.3, 4.2, respectively). 2. Children who had sidewalks in the neighborhood were more likely to walk than those without sidewalks (OR=3.4; 95%CI= 2.3, 5.1).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Nelson, Gordon-Larsen (2006) United States	Neighborhood design and development of housing OTHER INTERVENTION COMPONENTS: *Multi-component:* Not reported *Complex:* Not reported	DESIGN: Cross-sectional study DURATION: Not applicable SAMPLE SIZE: 20,745 adolescents in grades 7-12 from 80 high schools and 52 junior high schools nationwide [National Longitudinal Study of Adolescent Health (Add Health) 1994-95 data] PRIMARY OUTCOME: Overweight/obesity, physical activity (PA), and recreation center use MEASURES: 1. 7-day Recall(physical activity, sedentary behaviors, use of recreation centers, parental involvement in sports) 2. Add Health Survey(height, weight, body mass index [BMI], sociodemographic data, residential street address) 3. U.S. Census data [block group] (sociodemographic data, housing unit characteristics, mobility characteristics, metropolitan statistical area [MSA], rural/suburban/urban status) 4. 8-digit Standard Industrial Classification codes [Yellow Pages](physical activity facilities, resources, and parkswithin 3 km of participants' home) 5. U.S. Census TIGER line files (road types, number (i.e., proportion of total roadways and the absolute total length) within 3 km of participants' residential locations 6. Geographic Information System [GIS] and Global Positioning System [GPS] (geo-coded locations, intersection density, alpha index [ratio of observed to maximum route alternatives between nodes], gamma index) (ratio of node linkages to maximum network links), and cyclomatic index (# route alternatives between nodes) 7. Aerial photography (digital photos from U.S. Geological Survey to verify park locations) 8. National Archive of Criminal Justice Data [county-level] (reported crimes per 100,000 people) DATA COLLECTION: This study utilized Wave I in-home survey material (1994-1995) taken from the Add Health study. Material was analyzed in 2005-2006. LIMITATIONS: Use of data characterizing multiple sites nationwide may limit the ability to characterize neighborhood environments; self-reported measures; cross-sectional study design; no consensus on defining a neighborhood or on appropriate buffer sizes; difficult to assess the validity of the cluster method, given that cluster analysis will detect underlying patterns in data, regardless of meaning or utility	13-18 year olds 68.5% White, 15.2% Black, 11.4% Hispanic, and 4.0% Asian students; 14.7% of parents had less than high school education, 25% of parents had a college degree (evaluation sample) Designed to be nationally representative of youth ELIGIBILITY: Not reported EXPOSURE/ PARTICIPATION: Not application	LEAD AGENCY: The research team from the Add Health study and the research team from the current study THEORY/ FRAMEWORK: Not reported EVIDENCE-BASED: Not reported REPLICATION/ ADAPTATION: Not applicable ADOPTION: Not applicable IMPLEMENTATION: Not applicable FORMATIVE EVALUATION: Not reported PROCESS EVALUATION: Not reported	RESOURCES: Not applicable FUNDING: National Institutes of Health; the Centers for Disease Control and Prevention, Active Living Research Program STRATEGIES: Not applicable	OVERWEIGHT/OBESITY: 1. When examining neighborhood clusters, those who lived in rural working class (adjusted risk ratio=1.38, 95%CI=1.13, 1.69), exurban (adjusted risk ratio=1.30, 95%CI=1.04, 1.64), and mixed-race urban neighborhoods (adjusted risk ratio=1.31, 95%CI= 1.05, 1.64) were 30-40% more likely to have a BMI ≥ 95th percentile of age and gender-specific growth curves than adolescents living in newer suburban developments. 2. When examining relationships at the metropolitan statistical area there is a lower likelihood of overweight in adolescents in urban areas (adjusted risk ratio=0.85, 95%CI= 0.75, 0.96) compared to rural (adjusted risk ratio=1.9, 95%CI= 0.94, 1.27) [sic]and suburban (adjusted risk ratio=1 [ref]) areas. PHYSICAL ACTIVITY: 3. Adolescents living in older suburban developments were 11% more likely to be physically active than those living in newer suburban areas (adjusted risk ratio=1.11, 95%CI=1.04, 1.18), and those living in low-SES inner-city areas were more likely to be active compared to those in mixed-race urban neighborhoods (risk ratio=1.09, 95%CI=1.00, 1.18). 4. Those living in older suburban areas (adjusted risk ratio=1.41, 95%CI=1.21, 1.63), in mixed-race urban areas and in low-SES inner city areas were all more likely to use a neighborhood recreation center. (Note: Exurban is defined as urban/suburban outgrowth.)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Mowen, Confer (2003) Ohio	Distance to a newly constructed brownfield park in-fill **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of access for places to be active *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 505 visitors to the Ohio and Erie Canal Reservation,a new park in-fill **PRIMARY OUTCOME:** Intention to visit the park **MEASURES:** 1. Questionnaire (short term and long term behavioral intentions related to the park [use and adoption], participant address, age, gender, income level, education level, and race) 2. Geographical Information System [GIS] data (straight line distance to new urban park in-fill from respondents address) **DATA COLLECTION:**The park assessed was a 283 acre in-fill, built on a former brownfield and was opened as a public park and conservation area in August, 1999. Visitors were contacted during the Fall of 1999 and the Spring and Summer of 2000. Data was collected via a mail survey utilizing a modified Dillman (postcard) reminder procedure in combination with an initial personal contact. A questionnaire was distributed to park visitors who came to this park during its first year of operation. Items representing Rogers' five innovation characteristics were developed to assess use and adoption of the park. **LIMITATIONS:** Causal inferences cannot be made using cross sectional data; questionnaire data is self-reported	General population 4% Minority 2% African American 2% Other (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** All individuals with access to the new park in-fill	**LEAD AGENCY:** Researchers were from Pennsylvania State University and the University of Florida. **THEORY/ FRAMEWORK:** Theory of Innovation Diffusion provides a framework from which to understand how citizen perceptions can foster the acceptance and use of urban in-fill parks. **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. The shorter the distance between the park and nearby neighborhoods, the more likely early adopters were to indicate regular visitation intentions (β= -0.208, p=0.002). 2. None of the demographic characteristics included in the model were significant predictors of future visitation at this urban park infill. 3. The more the park in-fill was perceived as accessible, convenient, and superior to other traditional neighborhood parks, the more likely visitors intended on visiting regularly (accessibility; β=0.205, p=0.002, convenience; β=0.206, p=0.009, superiority; β=0.145, p=0.038,). 4. The less individuals perceived the park as compatible with surrounding communities, the more likely respondents intended to re-visit in the future (compatibility; β= -0.211, p=0.014).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Brownson, Housemann (2000) Missouri	Travel distance to trails **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Availability of places to walk and be physically active, and barriers and enablers for trails and use of trails 2. Perceptions of safety (interpersonal) *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1269 individuals (≥ 18 years) from 17 rural communities in 12 counties in southeast Missouri **PRIMARY OUTCOME:** Walking behavior and trail use **MEASURES:** 1. Risk Factor Survey (walking behavior in the past month, frequency and duration of weekly walking, access to and use of walking trails and indoor exercise facilities, behavioral changes in exercise because of trail use, perceptions of safety when using trails, knowledge and awareness of the trails, preferred aspects of the trails, demographic data) **DATA COLLECTION:** From April through December 1998, the research team conducted a two-staged, random-digit-dialedset of telephone interviews. The survey was constructed using methods from the Missouri Behavioral Risk Factor Surveillance System (BRFSS), other surveys, and items developed specifically for this project. **LIMITATIONS:** Data was self-reported; items other than the physical activity questions on the BRFSS have not been tested for reliability; the information on access to walking trails is general and does not include data on why people who had access did not use the trails; cross-sectional study design	Adults 90.8% Caucasian, 7.8% African American, 1.4% other; 34.5% male(evaluation sample) Rural, high rates of poverty, medically underserved, lower educational levels (targeted sample) **ELIGIBILITY:** Eight communities were chosen specifically because of the existence of a walking trail in the local area. All communities were part of ongoing community-based interventions (including policy and environment change) **EXPOSURE/ PARTICIPATION:** 280,000 residents in 12 counties	**LEAD AGENCY:** Research team was from the Missouri Department of Health and Senior Services, the Prevention Research Center at Saint Louis University, Centers for Disease Control and Prevention, Stanford University, and San Diego State University (evaluation) **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Centers for Disease Control and Prevention (Centers for Research and Demonstration of Health Promotion and Disease Prevention), the Community Prevention Study of the National Institutes of Health Women's Health Initiative, the Cardiovascular Risk Reduction Targeted Health Initiative of the Missouri Department of Health and Senior Services **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Persons who were regular walkers were more likely to have access to indoor exercise facilities (prevalence odds ratio=1.3, 95%CI=1.0, 1.7). 2. Persons using longer trails (>0.25 miles) were more likely to report an increase in physical activity (0.25 to 0.50 miles in length: prevalence odds ratio= 2.8, 95%CI=1.1, 7.2; >0.50 miles in length: prevalence odds ratio=13.2, 95%CI= 1.4, 124.6). 3. Travel distance to walking trails appeared to have a slight perceived effect on walking. Those travelling 5-10 miles (prevalence odds ratio= 0.8, 95%CI= 0.4, 1.9), 11-29 miles (prevalence odds ratio=0.8, 95%CI=0.3, 2.1), or >30 miles to a trail (prevalence odds ratio=0.7, 95%CI=0.3, 1.8) had a reduced likelihood of increasing their walking. 4. Among persons who had used the trails, 55.2% reported that they had increased their amount of walking since they began using the trail. 5. Women were more than twice as likely (prevalence odds ratio= 2.1, 95%CI=1, 4.4) as men to report that they had increased the amount of walking since they began using the trails. 6. Lower-income groups were more likely to have increased walking due to trail use than were higher income persons ($15-35K: prevalence odds ratio=0.9, 95%CI=0.4, 2; ≥ $35K: prevalence odds ratio= 0.4, 95%CI= 0.2, 1) 7. African Americans were more likely to have increased walking due to trail use (prevalence odds ratio= 1.9, 95%CI= 0.5, 7.7) than were Caucasians. 8. Among persons with access to walking trails, 38.8% had used the trails. 9. Concerns about safety did not appear to be a barrier to use, as 86.9% of trail users felt very safe when using trails.

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Cohen, Ashwood (2006) Washington DC, Maryland, South Carolina	Distance to neighborhood parks **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to parks and amenities 2. Presence of street lights 3. Presence of shaded areas *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1556 sixth-grade girls in 6 middle schools **PRIMARY OUTCOME:** Moderate-to-vigorous physical activity **MEASURES:** 1. Accelerometer (non-school moderate to vigorous physical activity [moderate-to-vigorous physical activity [MVPA]) 2. Geographic Information Systems [ArcView GIS] (geo-coded participant address) 3. US Census Bureau's Topologically IntegratedGeographic Encoding and Referencing/ Line street centerline data [TIGER] (street network [connectivity and segment]) 4. Direct observations with checklist (presence or absence of amenities at the park [lighting, restroom, shaded areas, fountains, fencing, open spaces, playing fields, courts]) 5. 2000 US Census data (block-level demographic data within 1 mile of residence) 6. School database (percentage of participants receiving free or reduced lunches at school [socioeconomic status]) 7. Departments of Recreation and Parks and local maps (locate and identify parks within 1 mile of participant address) **DATA COLLECTION:** Baseline data collected for the Trial of Activity for Adolescent Girls (TAAG) were used for this study. Girls wore accelerometers for 6 consecutive days during the winter and spring of 2003. MVPA was calculated for the hours outside school time. A secondary analysis used half-minute counts and 2 different cut-points; MVPA equivalent to slow walking (2.5 mph) and activities that are at or above a brisk walk (3.5 mph). Data were analyzed by summing counts from 5am to midnight. Trained staff documented park facilitieswithin one mile of each participant's house. In Tucson, a comprehensive database of local park facilities was used, and data was verified by visiting only 10% of the parks. Parks were classified using the National Recreation and Parks Association definitions. **LIMITATIONS:** The study did not account for neighborhood self-selection; study design did not connect girl's activity to a particular location; degree of importance was not established between features; there was no differentiation between travel to the park and activity at the park	11-13 year old females White 45%, Hispanic 22%, Black 21%, Asian 4%, and Native American/ mixed 8% (evaluation sample) 20% Black and 6% Hispanic, and 10% of households were below poverty level (neighborhood average; ½ mile radius) **ELIGIBILITY:** Eligible participants for TAAG could not be planning on transferring to another school. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** For the TAAG study researchers from universities in each of the six study areas managed data collection. The study was coordinated by the University of North Carolina and the National Heart, Lung, and Blood Institute Program Office. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Institutes of Health; National Heart, Lung, and Blood Institute **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. For the average girl having 3.5 parks within a 1-mile radius of home accounted for an additional 68 minutes of non-school 3.0 MET MVPA and an additional 36.5 minutes of non-school 4.6 MET MVPA per 6 days. 2. For every park, regardless of type, within a half mile radius from home there was an increase in non-school MVPA by 33 minutes for 3.0 METs (coefficient estimate=0.02, $p<0.005$) and 17.2 minutes for 4.6 METs (coefficient estimate=0.03, $p=0.04$) per 6 days. Each additional park past the half-mile increased non-school MVPA by 12 minutes for 3.0 METs (coefficient estimate=0.01, $p<0.009$) and 6.7 minutes for 4.6 METs (coefficient estimate=0.01, $p=0.09$) per 6 days. 3. For the linear model, having either a neighborhood or community park within a half-mile of home was associated with 45.5 more 3.0 MET minutes (coefficient estimate=0.03, $p<0.05$) and 24.2 more 4.6 MET minutes (coefficient estimate=0.04; $p<0.05$)per 6 days. In the half-mile to 1-mile distance, MVPA increased by 29.6, 3.0 MET minutes (coefficient estimate=0.02, $p<0.05$) and 18.6, 4.6 MET minutes (coefficient estimate=0.03; $p<0.05$) per 6 days. 4. Additional non-school MVPA minutes increased when girls had neighborhood/community parks (3.0 MET 42 min, $p<0.05$; 4.6 MET 22 min, $p<0.05$), mini-parks (3.0 MET 92 min, $p<0.05$; 4.6 MET 40 min; $p<0.10$), natural resource areas (3.0 MET 36 min, $p<0.05$), walking paths (3.0 MET 59 min, $p<0.05$; 4.6 MET 13 min; $p<0.05$), and running tracks (3.0 MET 208 min, $p<0.05$; 4.6 MET 82 min; $p<0.05$) within a half mile of their homes. 5. Playgrounds (39 min for 3.0 MET; 28 min for 4.6 MET, $p<0.05$ for both), shaded areas (20 min for 3.0 MET; 14 min for 4.6 MET, $p<0.10$ for both), drinking fountains (24 min for 3.0 MET, $p<0.05$; 14 min for 4.6 MET, $p<0.10$), streetlights (28 min for 3.0 MET; 18 min for 4.6 MET, $p<0.05$ for both), basketball courts (37 min for 3.0 MET, $p<0.10$; 30 min for 4.6 MET, $p<0.05$), multipurpose rooms (13 min for 3.0 MET and 4.6 MET, $p<0.05$ for both), park offices (14 min for 3.0 MET, $p<0.10$), an ice rink (28 min for 3.0 MET, $p<0.10$), a running track (208 min for 3.0 MET, $p<0.05$), a swimming area (32 min for 4.6 MET, $p<0.05$), and an amphitheater (16 min for 3.0 MET, $p<0.10$) were associated with increased MVPA. 6. Lawn games (-161 min for 3.0 MET, $p<0.05$; -55 min for 4.6 MET, $p<0.10$) and skateboard areas (-94 min for 3.0 MET; -48 min for 4.6 MET, $p<0.05$ for both) were negatively associated with increased MVPA. 7. Special use parks were negatively associated with both 3.0 MET and 4.6 MET MVPA (each $p<0.05$). (Note: Metabolic equivalent–weighted moderate-to-vigorousphysical activity [MET MVPA] was calculated for the hours outside of school time using two different cutpoints: activity levels ≥3.0 metabolic equivalents and ≥4.6 metabolic equivalents, the latter indicating activity at the intensity of a brisk walk or higher

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Jilcott, Evenson, (2007) North Carolina	Proximity to neighborhood locations including public parks, gyms and recreation centers, and public schools **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Availability of places to be active	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 199 under-insured women from three southeastern North Carolina counties (New Hanover, Brunswick, and Pender) in one community health center in Wilmington, North Carolina. (147 urban participants and 52 rural participants) **PRIMARY OUTCOME:** Physical activity (PA) and moderate to vigorous physical activity (MVPA) **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Geographical Information System [n=199] (GIS) data (participant address, locations of parks, gyms, recreation centers, and public schools open for public use, distance from home to activity resources) 3. Survey [n=180] (perceived proximity to physical activity resources) 4. ActiGraph Accelerometer [n=184] (physical activity) 5. Baseline Questionnaire (age, self-reported birth date, education, household income, race, smoking status) 6. Internet search/County Parks and Recreation Department/New Hanover County Department of Aging (physical activity facility address information) **DATA COLLECTION:** This study used data from a randomized trial called WISEWOMAN, conducted from May 2003 through December 2004. Buffers, 1- and 2-mile, surrounding participants' homes were created using GIS. The number of each type of PA resource in the 1- and 2-mile Euclidean ("as the crow flies") buffers was calculated using the Network Analyst intersect tool. Participants were instructed to wear the accelerometer for 7 consecutive days during all waking hours. The minimum criterion for days worn was 4 days, with a minimum of 6 valid hours to complete a valid day. All perceived proximity and accelerometer data were collected at participants' 12-month follow-up visits. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; questionnaire data was self-reported	Adult Females **ELIGIBILITY:** Uninsured, midlife women that were participants of the North Carolina WISEWOMAN program. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of North Carolina at Chapel Hill. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Center for Disease Control and Prevention and the University of North Carolina Health Promotion Disease Prevention Nutrition Activities Trust Fund **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. No statistically significant relationships were found between activity and perceived or objectively measured proximity to parks. 2. There was a statistically significant association between the number of schools within the 1-mile buffer and minutes of MVPA (objective model: n=155, adjusted standardized parameter estimate=-0.16, p=0.04, adjusted R^2=0.11; objective and perceived model: n=155, adjusted standardized parameter estimate = -0.17, p=0.03, adjusted R^2=0.10). For example, if examining two women with the same age (53 years) and BMI (31 kg/m^2), the woman with no school within her 1-mile buffer averaged 105.3 minutes of MVPA per day while the other woman with two schools within her 1-mile buffer averaged 83.2 minutes of MVPA per day (p=0.04). 3. There was no association between distance to resources identified through qualitative interviews and MVPA minutes, adjusting for age and BMI (standardized parameter estimate for GIS network distance = 0.06, p= 0.45). 4. Women who wore the accelerometer all 7 days had a lower average BMI than women who wore it 4 to 6 days (p = 0.006, data not shown). 5. The association between number of schools within the 1-mile buffer and MVPA minutes was stronger and statistically significant for women who wore the accelerometer for 7 days (adjusted standardized parameter estimate = –0.38, p≤0.01, n = 44) compared with women who wore it 4 to 6 days (standardized parameter estimate = –0.08, p = 0.36, n = 111).

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Sanderson, Foushee (2003) Alabama	Access to neighborhood places within walking distance **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Presence or absence of sidewalks and lighting 2. Perceptions of safety from crime and presence of lighting 3. Perceptions of traffic safety 4. Availability of places to walk *Complex:* 1. Neighborhood social support and self-efficacy	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 567 respondents in Greene, Lowndes, and Wilcox counties in Alabama. **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. Survey (sociodemographic information, general health, physical activity, and personal, social environment, safety [traffic, crime, dogs, lighting], lack of sidewalks, places within walking distance, places for physical activity) **DATA COLLECTION:** The University of Alabama at Birmingham's Survey Research Unit within the Center for Health Promotion conducted the telephone surveys. The study used a questionnaire developed and pilot tested through the Women's Cardiovascular Health Network Project. A higher social score indicated less negative factors influencing participation in physical activity. Open-ended questions were included to identify potential strategies for promoting physical activity within the target community. Women were grouped into three categories that described their physical activity pattern: (1) inactive (not engaging in any activities); (2) insufficient (not meeting recommendations for activities); and (3) meeting recommendations (engaging in moderate physical activity for at least 30 minutes for five times per week or vigorous activity for at least 20 minute for three times per week). Interclass correlation coefficients (ICCs) for social issue scale ranged from 0.46 to 0.75, indicating a moderate agreement comparable to the range across all sites (0.42–0.68). Environmental variables include a composite score of distance to places to walk, safety from crime, street lighting, unattended dogs, presence of sidewalks, and traffic safety. **LIMITATIONS:** Causal inferences cannot be made by using a cross-sectional study; survey data was self-reported; the sample was limited to a very specific location as well as individual type and results may not be generalizable; walking was not distinguished from other types of physical activity	Rural, Female, Adults, 20-50 years old, 75-77% African American (evaluation sample) The data was collected from a predominately impoverished rural area. Education level from the evaluation sample was similar to the Alabama BRFSS demographic data for African American women, however, income level was somewhat lower. **ELIGIBILITY:** Females 20-50 years old were eligible to participate. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Alabama at Birmingham. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** The test-retest reliability, specific to this study population was only examined on the social issue scale with 47 respondents. **PROCESS EVALUATION:** Not applicable	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Researchers found no physical environmental variables that were significantly associated with comparison of either activity-level group. 2. Women reporting good lighting at night were less likely (OR=0.48, 95% CI= 0.27, 0.88) to report any physical activity. 3. Women meeting recommendations (n=221) compared to women who did not (n=346) were more than twice as likely to see people exercising in the neighborhood (87.2%, OR=2.02, 95% CI=1.08, 3.77) and to attend religious services (84.9%, OR=2.10, 95%CI=1.21, 3.65). 4. Women who reported any activity (n=481) compared with inactive women (n=86) were more likely to know people who exercise (OR=1.82, 95% CI=1.06, 3.15), have higher social issue scores (OR=1.29, 95% CI=1.11, 1.49), and were more than 3 times as likely to report attending religious services (OR=3.82, 95% CI=2.16, 6.75).

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Burdette, Whitaker (2004) Ohio	Proximity to nearest playground **OTHER INTERVENTION COMPONENT:** *Multi-component:* 1. Perceptions of neighborhood safety 2. Distance to fast food restaurants 3. Access to playgrounds *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 7,020 3-4 year-old children enrolled in the WIC program and residing in one of the 46 (of 52) Cincinnati neighborhoods for which crime statistics were available from the city police department. **PRIMARY OUTCOME:** Weight status (body mass index [BMI]) **MEASURES:** 1. Ohio WIC Program database (height, weight [body mass index (BMI)], sociodemographic data, poverty ratio) 2. ArcView Geographic Information Systems (GIS) data (spatial location of residence, playground, and fast food, street travel distances) 3. Hamilton County Health Department database (distance from child's home to nearest playground) 4. Cincinnati Police Department's website [proxy for safety] (number of serious crimes [murder, rape, robbery, burglary, aggravated assault, larceny, and auto theft] and number of 911 police calls) 5. Yellow pages (distance from child's home to nearest fast food location) **DATA COLLECTION:** The research team used the Ohio WIC database for child demographics and used most recent WIC visit to calculate BMI. Data from the Hamilton County Health Department playground inventory database, containing 394 playgrounds, were collected for the city and surrounding county. Researchers identified 8 fast food chains using criteria: a) had franchises nationwide or multiple states, b) had more than one franchise in Cincinnati, c) served complete meals ordered without the assistance of waiters or waitresses, and d) provided facilities for consumption of meals on site. Using yellow pages from the internet and phone book (spring 2001) the research team identified the addresses for 151 fast food franchises. **LIMITATIONS:** Study did not account for any variation in playground quality or yard space at the child's residence; there is no consensus definition for a fast food restaurant that has been applied in research; the study didn't use parental perception of safety; there was a lack of variation in environmental exposure variables; categorizing exposures at the neighborhood level might not lead to the most accurate classification of the exposure; the mobility of the study population may have limited the accurate assessment of all 3 of the environmental exposures used in this study	3-4 year-olds 100% lower-income 76% Black, 24% White (evaluation sample) **ELIGIBILITY:** Eligible children made at least one WIC clinic visit between 1/1/98 and 6/30/01, resided in the city of Cincinnati, and were between 36 and 59 months of age at their visit. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** University of Cincinnati College of Medicine and Cincinnati Children's Hospital Medical Center, Cincinnati, OH **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The evaluation was funded by the US Department of Agriculture, Economic Research Service. **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. There was no difference in mean distance to the nearest playground or fast food restaurant when comparing children with a BMI ≥95th percentile to those with a BMI<95th percentile (playground: t=0.31 both, p=0.77; fast food: t=0.70 and 0.69, respectively, p=0.91) and when comparing children with a BMI ≥ 85th % to those with a BMI < 85th % (playground: t=0.31 both, p=0.32, fast food: t=0.69 and 0.70, respectively, p=0.43). 2. There was no significant correlation between childrens' BMI z scores and distance to the nearest playground or fast food restaurant. 3. When comparing overweight and non-overweight children, there was no difference in the percentage living in neighborhoods without playgrounds (3.3% vs. 4.1%, p=0.29) nor in the percentage living in neighborhoods without fast food restaurants (44.0% vs. 44.5%, p=0.84). 4. The prevalence of children with BMI ≥ 95th percentile and BMI ≥ 85th percentile did not differ statistically across the quintiles of neighborhood crime rate, but did differ significantly for 911 call rate. The percentage of children with BMI ≥95th percentile ranged from 10.7% in the lowest quintile to 9.4% in the highest quintile (p=0.04). The percentage of children with BMI ≥85th percentile ranged from 22.7% in the lowest quintile of call rate to 22.1% in the highest quintile (p=0.02). There was no clear trend suggesting that lower levels of neighborhood safety were associated with a higher prevalence of overweight. 5. After controlling for poverty ratio (as a measure of SES), child race, and child sex, the 3 environmental predictor variables (playground proximity, fast food restaurant proximity and neighborhood safety) were still not significantly associated with childhood overweight.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Voorhees, Young (2003) Virginia	Access to neighborhood destinations within walking distance **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood traffic safety 2. Perceptions of neighborhood safety from crime 3. Distance to neighborhood locations *Complex:* 1. Neighborhood social support	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 285 respondents in Fairfax and Arlington counties, and the city of Alexandria, Virginia. **PRIMARY OUTCOME:** Physical activity and meeting physical activity recommendations **MEASURES:** 1. Women and Physical Activity Survey (social roles and issues, sense of community, physical activity, sociodemographic data, general health, lack of lighting and sidewalks, neighborhood safety [traffic, dogs, crime], distance to locations, access to places for physical activity) 2. Behavioral Risk Factor Surveillance System (BRFSS) survey items (intensity of physical activity) **DATA COLLECTION:** The Women and Physical Activity Survey used for this study was developed through focus groups and collected as part of the Women's Cardiovascular Health Network Project Sites. Participants were interviewed by trained, bilingual, females of a similar age range as the interviewees in April 2002 through September 2002. The BRFSS physical activity measure had an ICC of 0.7 (95% CI= 0.4, 0.9). Respondents were categorized as inactive, insufficiently active, and meeting recommendations. Respondents met recommended activity levels if they engaged in moderate activity at least 5 days per week for at least 30 minutes or they engaged in vigorous activity at least 3 days per week for at least 20 minutes. Translation of the English version into Spanish was done by the University of North Carolina (UNC) site. Adaptations were made to account for local variations in language. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; sample size was small; survey data was self-reported; the sample was a convenience sample	Urban, Female, Hispanic, Adults (target sample) 31.9 years old [mean age], 44.0% Spanish speaking only (evaluation sample) 11.4% Hispanic/ Latino (Fairfax County), 19.5% Hispanic/Latino (Arlington County), 14.7% Hispanic/ Latino (Alexandria) **ELIGIBILITY:** Urban Latina females between the ages of 20 and 50 years were eligible. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Maryland. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** A small convenience sample (n=12) was administered the survey after 2 weeks to assess test-retest reliability (ICC for environment questions ranged from 0.30-0.94: for physical activity ICC=0.95, 95% CI=0.84, 0.98. **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Supported by the Centers for Disease Control and Prevention Special Interest Project and by a grant from The Robert Wood Johnson Foundation. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Women were more likely to be active (OR=1.36, 95% CI= 0.50, 3.66) and meet recommendations (OR=1.66, 95% CI= 0.70, 3.94) if vehicular traffic was light in the neighborhood. 2. Neighborhoods in which women reported that unattended dogs were not a problem were less likely to be active (OR=0.91, 95% CI=0.54, 1.54) and meet recommendations (OR=0.79; 95% CI= 0.44, 1.41). 3. Women who perceived their neighborhood as safe from crime (either extremely or somewhat safe) were also more likely to be active (OR=1.34, 95% CI=0.81, 2.20) and meet recommendations (OR=1.69; 95% CI= 0.82, 3.47). 4. Women (n=216) who reported having places within walking distance were less likely to be active (OR=0.87; 95% CI= 0.31, 2.44) and meet activity recommendations (OR=1.58, 95% CI= 0.64, 3.90). 5. Women who reported having places to exercise in their neighborhood were less likely to meet activity recommendations (OR=0.56, 95% CI= 0.27, 1.17) and be active (OR=0.54; 95% CI= 0.26, 1.11). 6. Women were significantly less likely to be active if they reported knowing people who exercised (meets recommendations; OR=0.49, 95% CI=0.27, 0.89, any activity; OR=0.42; 95% CI= 0.23, 0.76), if they reported people in their neighborhood exercised (meets recommendations: OR=0.16, 95% CI=0.06, 0.45, any activity: OR=0.19; 95% CI= 0.09, 0.42), if they belonged to community groups (meets recommendations: OR=0.67, 95% CI=0.39, 1.15, any activity: OR=0.32, 95% CI= 0.15, 0.69), or if they attended religious services (meets recommendations: OR=0.60, 95% CI=0.31, 1.13, any activity: OR=0.41; 95% CI= 0.41, 0.72). (Note: p-values not reported)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Gomez, Johnson (2004) Texas	Distance to neighborhood playgrounds **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood safety from crime 2. Availability of recreational facilities *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 177 students in 7th grade from 4 middle schools and 1 private school in a San Antonio neighborhood **PRIMARY OUTCOME:** Outdoor physical activity (OPA) **MEASURES:** 1. Recall questionnaire (physical activity [activities done more than 10 times in past 12 months not including those done in physical education class, months in which activities were performed, number of days each activity was performed, outdoor activities outside of school], demographic information, participant address, perceived barriers to physical activity, perceived neighborhood safety). 2. San Antonio Newspaper Police blotters (crimes [e.g., robbery] the San Antonio Police Department [SAPD] responded to during the previous 24 hours, crime street address or block number, count for violent crimes) 3. Maps (crime densities) 4. Drafting compass (distance on the map from residence to an open play area [any area readily accessible for use by the public]) 5. Censtats Information Census (census tract level; estimate of per capita income) **DATA COLLECTION:** Data for the present study came from the Project Physical Activity Changes in Teenagers (PACT) study. Participants completed questionnaires during school hours in small groups of 10-15. A second investigator was present to give individual help in completing the questionnaire. Both Spanish and English language versions of the physical activity questionnaire were available. Participants whose primary language was Spanish, were administered the survey separately. Both the newspaper and the SAPD verified the completeness of the information contained in the police blotters. The recall questionnaire was previously developed and validated for adolescents for measures for physical activity. **LIMITATIONS:** Small sample of 7th graders; small sample of boys; lack of information on sports participation; lack of information on other environmental factors	Urban, Hispanic, 11-13 year olds (target) 94% Mexican-Americans, 2% non-Hispanic Whites, 3% African-Americans, and 1% Other ethnicity, 97.7% Minority, Annual income ranged from \$3927 to \$15,887 (evaluation sample) The barrio is inhabited primarily by Mexican-Americans and is characterized by low-income household and high crime rates. The racial/ethnic composition of the study sample closely matched that of the school district to which the study schools, except the private school, belong, with 91% of the students in the district being Mexican-American. **ELIGIBILITY:** A written consent form was signed by a parent or guardian. All 7th graders attending one of four middle schools and one private school in the barrio were asked to participate in Project PACT. **EXPOSURE/ PARTICIPATION:** Sample size for this study only comprised 33% of the students from the 5 schools. Approximately 536 students from the 5 schools are exposed to the same environmental conditions.	**LEAD AGENCY:** The research team was from the University of Texas at San Antonio, the Medical College of Wisconsin, and San Diego State University. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Generalist Physician Faculty Scholar Award from the Robert Wood Johnson Foundation. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Stepwise multiple regression analysis for the entire group revealed none of the environmental factors were significantly associated with outdoor physical activity (OPA). 2. As distance to the nearest open play area increased, OPA for boys decreased significantly (β=-0.317, T= -2.823, p=0.006). 3. For girls, as violent crime within 1/2 mile of home increased, OPA significantly decreased (β=-0.34,T=-0.3.568, p<0.001) (accounted for 9.4% of variances in girls' OPA). When the perception of feeling safe in the neighborhood increased, OPA also increased significantly (β=0.223, T=2.343, p=0.021). **OTHER:** 4. Post hoc analysis showed no significant correlation between objectively measured violent crimes/year within 1/2 mile radius of participants' homes and participants' subjective assessments that the safety of the neighborhood was a barrier to physical activity.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Lindsey, Han (2006)- 1377 Indiana	Population density and land-use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity and greenness in the neighborhood *Complex:* Not reported	**DESIGN:** Non-comparative study **DURATION:** Not applicable **SAMPLE SIZE:** ~800,000 trail users on the Monon White River, Canal Towpath, Fall Creek, and Pleasant Run **PRIMARY OUTCOME:** Trail use **MEASURES:** 1. Geographic Information Systems [GIS] (urban form, neighborhood characteristics) 2. Infrared monitor (total traffic counts) 3. Geographic positioning system [GPS] and Personal digital assistant [PDA] (monitor location and use of trails) 4. 2000 Census TIGER/US Census (network mobility model including neighborhood boundaries, road features, greenway vectors, socio-demographic, gross population density, parcel-level land-use mix) 5. Bio-physical remote sensing techniques (vegetation) 6. Weather data (daily and long-term average weather) 7. Satellite imagery (urban form, neighborhood characteristics) 8. Government agency files (urban form [e.g., gross population density, land-use mix], demographics) **DATA COLLECTION:** Results were monitored at four locations on one trail from February 2001-July 2005, two locations on a second trail from June 2002-July 2005, and 24 locations on five trails from May 2004-July 2005. Trail traffic was tracked 24 hours per day, 7 days per week at 30 locations on five multi-use greenway trails in Indianapolis using infrared monitors. Monitors were located approximately 1 mile apart covering 33-miles of trail network, reflecting barriers such as arterial crossings. The counts do not distinguish between types of users. To adjust for error, the authors periodically recalibrated and conducted field observations (the correction equation is (r^2= 0.99). Detailed land use categories were residential, commercial, industrial, special use, park, water, parking lot, and transportation. To control for the effects of variations in daily weather, long-term average daily measurements from the National Oceanic and Atmospheric Administration were used to define a set of weather variables that were computed as deviation from the long-term daily mean. **LIMITATIONS:** Not reported	General population, 58% Male, 83% White, 14% African-American, 3% Other (evaluation population) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** Researchers were from Indiana University-Purdue University Indianapolis (IUPUI). **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not reported **ADOPTION:** Not reported **IMPLEMENTATION:** Not reported **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not reported **FUNDING:** Active Living Research Program of the Robert Wood Johnson Foundation, Indiana Department of Natural Resources, Greenways Division of Indianapolis, Department of Parks and Recreation, Center for Urban Policy and the Environment in the School of Public and Environmental Affairs at IUPUI **STRATEGIES:** Not reported	**PHYSICAL ACTIVITY:** 1. Daily traffic is positively and significantly correlated with increases in population density (parameter estimate=0.0002, t=18.69, p<0.0001), greenness (parameter estimate=1.988, t=9.36, p<0.0001), the percentage of trail neighborhood in commercial use (parameter estimate=0.0465, t=23.56, p<0.0001), the area in trail neighborhoods in parking lots (parameter estimate=0.0346, t=16.02, p<0.0001), and mean length of street segment (parameter estimate=0.1172, t=6.27, p<0.0001). 2. An increase in population density in trail neighborhoods of 100 persons per square kilometer for example, is associated with an increase in trail traffic of nearly 2%. Every 1% increase in the area of parking lots is correlated with an increase in traffic of less than one-tenth of a percent. A 1% increase in the length of the mean street segment length is associated with an increase in trail traffic of 0.117%. 3. Daily traffic ranged from 52 to 6155. For the year, the mean daily traffic was 87% higher on weekend days (2553) than on weekdays (1360).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Cohen, McKenzie (2007) California	Distance to neighborhood parks **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Neighborhood availability of parks 2. Park safety *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1318 adults including 713 park users and 605 neighborhood residents living within 2 miles of 8 Los Angeles parks (4 designated to receive significant improvements, 4 not to be improved within the next few years). **PRIMARY OUTCOME:** Leisure exercise activity **MEASURES:** 1. System for Observing Play and Recreation in Communities [SOPARC] (physical activity in the park,presence of natural light [after dark], usability/accessibility of the park, availability of supervision or equipment, presence of organized activities) 2. Interviews with park users and area residents (frequency of park visits and exercise, perceptions of park safety, proximity to park, park characteristics,and performance of park staff) 3. 2000 US Census data (park census tracts, demographics) **DATA COLLECTION:** The Multi-Cultural Area Health Education Center and the Los Angeles City Department of Recreation and Parks assisted with questionnaire development and data collection. Observations of the parks were completed between December 2003 and May 2004. Observations were conducted by two observers in all target areas during four 1-hour time periods. The authors conducted face-to-face interviews in either English or Spanish with both park users and neighborhood residents. Park survey participants were selected from the busiest and least-busy target areas, and half in each target area were selected because they were sedentary and half because they were active. **LIMITATIONS:** Observations and interviews were completed for only 56 days, and these days may not be representative of total park use and physical activity, and may not capture secular variations; cross-sectional design limits ability to determine causality; survey data was self-reported	Adults On average, the neighborhoods surrounding the parks were 63.5% Latino, 31.0% African American. 1.8% White and 30.4% lower income **ELIGIBILITY:** Only respondents aged 18 years of age or older were eligible to complete the interviews. **EXPOSURE/ PARTICIPATION:** Residents within 2 miles of the park and all park users for the 8 Los Angeles parks. An average of 159,125 individuals live within the 2-mile radius.	**LEAD AGENCY:** The research team was from the RAND Corporation and San Diego State University. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Institute of Environmental Health Services **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Younger age, being male, and living within 1 mile of a park were positively associated with the frequency of leisure exercise (incident rate ratio= 1.38, 95%CI=1.04, 1.84, $p<0.001$) and park use (incident rate ratio=4.21, 95%CI=2.54, 7.00, $p<0.001$). 2. More residents living within 0.5 miles of the park reported leisurely exercising 5 or more times per week more often than those living more than 1 mile away (49% vs. 35%, $p<0.01$). 3. People who lived within 1 mile of the park were 4 times as likely to visit the park once a week or more and had an average of 38% more exercise sessions per week than those living further away. 4. On average, more people were present during supervised activities (e.g., sports competitions) than unstructured activities (49 vs. 6 people; $p<0.006$).The correlation between the percent of areas being supervised and the total energy expended (METs) estimated for each park was 0.74 ($p<0.04$). 5. Concerns about park safety were not associated with either park use or frequency of exercise. **PARK USE:** 6. Among observed park users, 43% lived within 0.25 mile, and another 21% lived between 0.25 and 0.5 mile of the park ($p<0.001$). Only 13% of park users lived more than 1 mile from the park. 7. Of local residents, 38% living more than 1 mile away were infrequent park visitors, compared with 19% of those living less than 0.5 mile away ($p<0.001$). 8. Nearly all respondents (98%) living near the 2 parks with the lowest percentage of households in poverty indicated that they felt the parks were safe, compared with between 50% and 74% for parks in neighborhoods with over 40% of households in poverty.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Reed, Phillips (2005) Unknown	Distance to physical activity facilities **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to physical activity facilities *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** The participants were 411 university undergraduate students. In fall 2001, the undergraduate enrollment totaled 9,339: 121 freshman (29%); 99 sophomores (24%); 97 juniors (24%); and 94 seniors (23%). **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. Questionnaire (participant address, exercise facilities currently used, location of the facility used, different types of home exercise equipment) 2. Modified Godin Leisure Questionnaire-Time Exercise Questionnaire (frequency and duration of physical activity over a 7-day period) 3. Home Environment Exercise Questionnaire items (quantity of home exercise equipment, specific exercise items in home, age, gender, athletic participation, and the number of semester credit hours completed) 4. Grid map (distance from the individual's residence to the identified exercise facilities) **DATA COLLECTION:** The researchers used a gridded map by overlaying concentric circles to determine distances from participants' residences to facilities. A questionnaire was designed using the Home Environment Exercise Questionnaire and modified items from the Godin Leisure Questionnaire. A test-retest pilot procedure (n=43) was used to establish reliability for the modified Godin Leisure-Time Exercise Questionnaire resulted in r=0.82, and the reliability coefficient for the Home Environment Exercise Questionnaire resulted in r=0.85. Researchers summed (calculation of the average distance to 1 or more facilities) the coordinates between the participants' place of residence and exercise facility for a 7-day period. If a participant reported being active at more than 1 facility during the 7-day period, a summation related the coordinates between the participant's residence and each exercise facility. The definition of intensity of physical activity was the sum of the metabolic equivalent (MET) values of the activities in which the participant engaged in during the 7-day period, multiplied by the number of minutes per activity. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; questionnaire data relied on self-reporting	Adults **ELIGIBILITY:** University-affiliated athletes and participants from the pilot study were excluded for analysis in this study. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Furman University and the University of Northern Colorado **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. There was a significant relationship between intensity of physical activity and proximity for all students (r=0.106; p<0.05). 2. The correlation between duration of physical activity and proximity to facilities was statistically significant (r=0.119; p<0.05). 3. Frequency of physical activity showed a significant negative correlation (r=-0.195; p<0.05) with proximity in male students (n=unknown). 4. It appears that as distance between place of residence and exercise facility increases, the duration and intensity of physical activity also increases. 5. Total physical activity scores and frequency of physical activity revealed no relation to the distance from their residence that participants initiated their leisure-time physical activity.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
International						
Giles-Corti, Knuiman (2008):Tudor-Locke, Giles-Corti (2008): Giles-Corti, Timperio (2006): Giles-Corti, Knuiman (2007) Australia	State implemented neighborhood housing development (RESIDE-The Residential Environments Project) design relating to proximity, access to, and use of, local businesses and neighborhood self-selection ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Prospective cohort study ***DURATION:*** Not reported ***SAMPLE SIZE:*** 1813 movers in 74 new housing developments ***PRIMARY OUTCOME:*** Overweight/obesity, physical activity (PA) and walking behavior ***MEASURES:*** 1. Height and weight (body mass index [BMI]) 2. Neighborhood Physical Activity Questionnaire [NPAQ] (frequency, intensity, and duration of recreational and transport-related walking and cycling, neighborhood characteristics instrument [choice of housing, walking duration to business and recreation], attitude, confidence, social support, demographic data, duration of to/from work travel) 3. Pedometer (digi-walker) (step counts) 4. Diary (duration of pedometer wear, step counts) ***DATA COLLECTION:*** Participants were recruited every 6 months from September 2003 to March 2005. Measures were taken at baseline (T1), 12 months after moving (T2), and 2 years later over a five year period with each collection undertaken in the same season. Baseline activity was measured using the NPAQ, which is acceptably reliable and was developed for RESIDE. For 7 days, on 3 different weeks, over the course of 4 years, participants wore a pedometer, which has been shown to be valid and reliable. Mean steps/day for T1 and T2 were computed from the total weekly steps divided by the total days (6.5 ±1.3 days overall) the pedometer was worn. Participants self-reported neighborhood measures using Likert-type scales (1=not important-5=very important) or (1=less than 5 min walk-5=more than 20 minutes). ***LIMITATIONS:*** Pedometers do not account for non-ambulatory, water activities, or intensity levels; data was self-reported; attrition was problematic; this study was specific to location (Perth, Western Australia) and building homes in new estates; lower socio-economic groups were not included; initial response rate was low; this study could not control for the low-level of transport related walking	Adults, General population, 25% of households income was <$50,000 The state government's Department for Planning and Infrastructure (DPI) classified the developments: 18 as 'Liveable" (LDs), 11 as "Hybrid" (i.e., those identified as having many, but not all of the LN elements) and 45 "Conventional" housing developments (i.e., LDs, HDs, and CDs, respectively). ***ELIGIBILITY:*** Participants were either building homes or selling land. Requirements also included proficiency in English, ≥18 years, plans to move into the new house by December 2005 and willingness to complete surveys and wear a pedometer for a week on three separate occasions over 4 years. ***EXPOSURE/ PARTICIPATION:*** Not reported	***LEAD AGENCY:*** Researchers were from the University of Western Australia, Deakin University, Loughborough University, and the National Heart Foundation. ***THEORY/ FRAMEWORK:*** Ecological framework ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not reported ***ADOPTION:*** In 1998, the Western Australian state government began implementing a new subdivision design code (the 'Liveable Neighborhood (LN) Guidelines'), based on new urbanism principles. ***IMPLEMENTATION:*** The Water Corporation, the state water supply agency, wrote to all its customers building homes and selling land to be a part of the study. ***FORMATIVE EVALUATION:*** The NPAQ was designed for RESIDE. The first trial run (n=121) was unacceptable. The modified NPAQ used the International Physical Activity Questionnaire (IPAQ) and the Active Australia survey (walking: ICC 0.91: 95% CI: 0.84-0.94) (MET minutes: ICC: 0.82, 95%CI: 0.73-0.89). The reliability of physical activity was fair to good (k = 0.67). ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not reported ***FUNDING:*** Funding was received from the Western Australian Health Promotion Foundation (Healthway) and the Australian Research Council. The first author is supported by a NHMRC/ NHF Career Development Award. Another author is supported by a VicHealth Public Health Fellowship (2004 0536). ***STRATEGIES:*** Not reported	***OVERWEIGHT/OBESITY:*** *ΔT2-T1* 1. For both sexes, the relative change in steps/day defined by BMI categories was significant (χ^2 = 22.28, p=0.001 and χ^2= 15.70, p=0.015, respectively). ***PHYSICAL ACTIVITY:*** *Baseline* 2. Those moving into CDs remained significantly more likely than those moving into HDs to meet the threshold for both sufficient walking and physical activity (OR= 1.41; 95% CI= 1.07, 1.86; OR= 1.31; 95% CI= 1.02, 1.69, respectively). 3. The odds of achieving sufficient physical activity were also higher for those moving into LDs compared with HDs (OR= 1.32, 95% CI= 1.00, 1.75), although for walking, the adjusted difference did not reach statistical significance. 4. There were no differences in perceived access to destinations in their baseline neighborhoods among participants moving into different types of developments. *ΔT2-T1* 5. Overall females appeared to be taking more steps per day after the move (Spearman's r=0.551; Δ T2-T1= 34 ± 3.071). 6. The relative change in steps/day was not significant across age groups in males (χ^2=17.35, p=0.137) but was in females (χ^2=50.00, p<0.001). 7. In females, 60+ years of age; the Spearman correlation (0.304; moderate) was statistically significant suggesting a negative change in steps per/day (Δ=T2-T1= -408 ± 3,747). (Pearson's and Spearman's correlations were moderate (r=0.30-0.59) to moderately high (r=0.60-0.70). ***ENVIRONMENT:*** *Baseline:* 8. Participants moving into CDs remained significantly less likely than those moving into LDs to rate as important a desire to be nearby shops and services (OR= 0.65; 95% CI= 0.52, 0.82); ease of walking (OR= 0.76; 95% CI= 0.60, 0.95); sense of community (OR= 0.64; 95% CI= 0.51, 0.81); the presence of footpaths (OR= 0.65; 95% CI= 0.52, 0.82); closeness to parks (OR= 0.69; 95% CI= 0.55, 0.86); closeness to the beach (OR= 0.59; 95% CI= 0.47, 0.73); closeness to transit (OR= 0.59; 95% CI= 0.47, 0.73); and ease of cycling (OR= 0.69; 95% CI= 0.54, 0.87). 9. The only differences in perceived importance between those moving into HDs compared with LDs related to the development's sense of community (OR=0.73; 95% CI= 0.55, 0.97); access to a variety of parks (OR= 0.66; 95% CI= 0.50, 0.87); and access to beach (OR= 0.30; 95% CI= 0.22, 0.41).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Nelson, Foley (2008) Ireland	Population density, urban form, and distance traveled to school **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 4,013 adolescents from 61 schools (subset=272 participants) **PRIMARY OUTCOME:** Active commuting **MEASURES:** 1. Questionnaire (distance to school, mode-choice, barriers to physical activity, physical activity) 2. Map drawing [n=272] (route and barriers) 3. Map wheel (actual distance) **DATA COLLECTION:** All data were collected as part of the Take PART study (Physical Activity Research in Teenagers) from February 2003 through May 2005.Trips outside of school were not examined. Mode of travel responses were categorized as active or inactive commuting. Mixed mode trips (for example walk/cycle to bus/train) were recorded based on the longest portion of their journey only. 50 participants were assessed during each 3-hour school visit, with a trained researcher (ICC≥ 0.70). A subset of participants drew their route on a detailed street level map in addition to the questionnaire. Barriers to active transport were assessed through an open response question. Area of residence was placed into a category based on population density: Large city (>500,000 inhabitants), Suburbs or outskirts of a city, (<500,000 but >50,000), Town (<50,000), Village (<5,000). **LIMITATIONS:** This study was cross-sectional; this study relied on self-reported data	15-17 year olds, mean age16.02 ± 0.66 years (evaluation sample) Subset; mean age 15.93±0.63 years 51.6% male 62.5% **ELIGIBILITY:** Subjects were eligible to participate if they were aged 15-17 years, were physically able to be active, were not participating in state examinations, and provided parental or their own consent. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The researchers were from the University of Strathclyde, the Institute of Technology Tralee, and Dublin City University. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Data was taken from the take PART study which was funded by the Health Services Executive, the Irish Heart Foundation, and the Fingal Sports Partnership. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. There is an inverse relationship between population density and mode of travel to school ($\chi^2(3)=775.32$, p<0.001, r=0.44). Adolescents living in more densely populated areas had greater odds of active commuting than those in the most sparsely populated areas ($\chi^2(3)=839.64$, p<0.001). 2. Compared with village residents, the odds of active commuting are 12.6 (95% CI= 9.3, 17.0), 10.1 (95% CI= 8.3, 12.4) and 6.8 (95% CI= 5.7, 8.2) times higher for those who live in cities, suburbs and towns respectively. 3. Adolescents who walk or cycle to school travel shorter distances (0.98 miles) than those who commute inactively (6.31 miles), (U=292775.0, p<0.001, r=-0.71). 4. Distance traveled to school was influenced by area of residence (H(3)=1043.69, p<0.001). Jonckheere's test revealed a trend in the data: distance traveled to school increased as population density decreased (J=3931634.5, z=29.98, r=0.47). 5. In each density group, active commuters traveled shorter distances: Big city; active (1.02±0.79) vs. inactive (3.91±5.97), Suburbs; active (1.02±0.83) vs. inactive (4.01±3.98), Town; active (0.93±0.88) vs. inactive (5.08±6.33), and Village; active (1.04±1.22) vs. inactive (7.57±5.20) (all p<0.001). 6. A 1-mile increase in distance from school decreased the odds of active commuting by 71% ($\chi^2(1)=2591.86$, p<0.001). 7. Compared with village residents, the odds of active commuting are 2.1, 2.0, and 1.7 times higher for those who live in cities, suburbs and towns, respectively. 8. Individuals who cited distance as a reason for inactive commuting lived significantly further from school (7.89 miles) than those who cited other reasons (2.86 miles), (U=471671.5, p<0.001, r=-0.56). 9. 74% of adolescents who cited distance as a reason for inactive commuting lived less than or equal to 5 miles from school and 92.8% lived less than or equal to 2.5 miles from school. **OTHER:** 10. Time (17.2%) and intrinsic factors (6.3%) were the next most commonly cited reasons for inactive commuting after distance (57.1%). 11. Other factors such as weather (2.7%), heavy bags (1.7%), and safety (0.5%) were reported less than expected. 12. Traffic related danger, unsafe environments, and poor infrastructure for walking and cycling were cited by less than 5% of adolescents.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Hackett, Boddy (2008) United Kingdom	Neighborhood design including residential density and mixed land-use **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Neighborhood access to food stores *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1535 children from 90 primary schools in Liverpool **OUTCOME:** Dietary consumption **MEASUREMENTS:** 1. Food intake questionnaire (food consumption patterns) collected as part of the SportsLinx project [valid and reliable] 2. ArcView geographic information system used to identify areas associated with the most and the least desirable eating habits 3. Ordnance survey census matching map (housing density, width of streets) 4. Direct observation of areas where children with the most and least desirable eating habits lived (green space, shops, food stores, traffic) **DATA COLLECTION:** Dietary data were collected as part of the annual SportsLinx 2004-2005 project. Children recorded whether or not they had eaten 19 types of food children would be encouraged to eat (positive markers, e.g., baked potato) and 25 types that children would be discouraged from eating (negative markers, e.g., chips). An Ordnance Survey grid reference was allocated to each child on the basis of his or her home postcode accurate to the nearest 100m using a matching procedure available from the Census Dissemination Unit. These were plotted to produce point maps showing the geographical distribution of the children, subdivided by the four dietary groups. Kernel Density estimation was used in the geographical information system (GIS) ArcView to produce smoothed boundary free density maps to identify areas associated with the most and least desirable eating habits. In this way population density was produced for the four dietary groups. Areas where children with the most and least desirable eating habits were found to live were visited by the research team, and observations regarding the amount of green space, shops, food stores and traffic were observed. **LIMITATIONS:** Data from the questionnaire were self-reported; cross-sectional study design and therefore causal inferences cannot be made; two areas chosen as the focus of the study were selected somewhat subjectively	9-10 year olds Overall data are presented from approximately 32% of Liverpool's 9-10 year old children. **ELIGIBILITY:** Only children with the least desirable and most desirable eating habits were used in the full analysis **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from Liverpool John Moore University School of Social Science, Canadian Centre for Vaccinology, Liverpool Primary Care Trust, and the Research Institute for Sports and Exercise Sciences **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The study was funded by Liverpool City Council. **STRATEGIES:** Not applicable	**NUTRITION:** 1. The area where children with the least desirable eating habits lived was found to have dense housing, small terraced houses, and narrow streets based on observations from the ordnance survey census matching map. Observations based on a visit to the area found no greenery, little space, many shops especially selling sweets and take-away meals (many boarded up), a large supermarket and several mini-markets and very heavy traffic on the "main" road. 2. The area where children with the most desirable eating habits lived was found to have less dense housing, larger terraced houses, wider streets, wider service ways and allotments based on observations from the ordnance survey census matching map. Observations based on a visit to the area found trees, grass and some flowers, small front gardens on all houses, more space to play, and no shops of any kind.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Garden, Jalaludin (2009) Australia	Density and urban sprawl in a metropolitan area ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* Not reported *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 7,290 subjects from 40 local government areas (LGAs) ***PRIMARY OUTCOME:*** Overweight/obesity, physical activity (PA) and walking behavior ***MEASURES:*** 1. Height and weight (body mass index [BMI]) 2. New South Wales (NSW) Population Health Survey (total exercise in minutes per week, frequency and intensity of exercise, recreation physical activity, walking behavior, sociodemographic data, perception of safety after dark, duration of residence, population density) 3. 2001 Australian Census (population density) 4. 2001 Index of Relative Socio-Economic Disadvantage (area deprivation) ***DATA COLLECTION:*** Data for this study came from adult respondents (persons aged 16 years or older) from the 2002 and 2003 NSW Population Health Survey collected between February and December. Most interviews were conducted in English but the survey was also conducted in Arabic, Chinese, Greek, Italian, and Vietnamese. All respondents within a LGA were assigned the same population density (sprawl measure) for that LGA. It should be noted that decreasing population density represents increasing sprawl and vice versa. The 2001 Index of Relative Socio-Economic Disadvantage was classified in quintiles. ***LIMITATIONS:*** Data was self-reported; causal inferences cannot be made using cross-sectional data; the study only obtained information at the local government agency level rather than at smaller geographic area levels such as postcodes or census collection districts; the New South Wales Population Health Survey did not collect respondents' home addresses; this study only examined health effects of the urban environment through population density	Adults (16+ years), General Population Survey respondents tended to be professional, well-educated, and had moderate incomes. The researchers used a weighted sample from the NSW Population Health Survey to gather generalizable data to metropolitan Sydney and other similar major Australian cities. ***ELIGIBILITY:*** Eligible residents lived in New South Wales metropolitan area and had private telephones. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** The research team was from the University of New South Wales. ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Funded through the NSW Biostatistical Officer Training Program, New South Wales Health Department. ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. There was a significant positive association between urban sprawl and the likelihood of being overweight (OR=1.087, 95% CI=1.035, 1.141, $p<0.01$). 2. There was a significant positive association between urban sprawl and the likelihood of being obese (OR=1.150, 95% CI=1.080, 1.225, $p<0.001$) ***PHYSICAL ACTIVITY:*** 3. There was a significant positive association between urban sprawl (population density only) and the likelihood of inadequate physical activity (OR=1.123, 95%CI=1.071, 1.177, $p<0.001$). 4. There was a significant positive association between urban sprawl (population density only) and the likelihood of not spending any time in the last week walking (OR=1.179, 95% CI=1.095, 1.271; $p<0.001$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Owen, Cerin (2007) Australia	Land-use mix, street and net retail area ratio **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity *Complex:* 1. Neighborhood self-selection	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 2650 participants from 8 neighborhoods stratified as follows: high walkable/ high SES, high walkable/low SES, low walkable/ high SES, and low walkable/low SES totaling 156 districts. **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Survey (walking for transport and recreation, frequency, duration [items from International Physical Activity Questionnaire-Long Form (IPAQ)], neighborhood self-selection [adapted from the Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality (SMARTRAQ) study]) 2. Geographic Information System [GIS] (walkability index [dwelling, density, street connectivity, land-use mix, and net retail area]) 3. Adelaide Bureau of Statistics census (district-level socioeconomic status) **DATA COLLECTION:** Data for this study was taken from participants in the Physical Activity in Localities and Community Environments (PLACE). Validated surveys were collected in a series of waves, between July 2003 and June 2004, which accounted for seasonal variation. All four components of the walkability index were classified into deciles to provide a standard score from 1 to 10, with 1 indicating low walkability and 10 indicating high walkability. Which allowed a possible score of 4 to 40 which was further classified into quartiles (1st=low-walkable districts and 4th=high-walkable districts), validated technique. Using a 5-point Likert-type scale was used for perceived importance of neighborhood selection. **LIMITATIONS:** Survey data was self-reported; IPAQ is not able to differentiate where walking occurs; low-response rate; walkability index did not capture access to recreational destinations nor the quality of the pedestrian environment	General population, Adults, Urban Survey respondents were more likely to be older, female, and employed (all χ^2 tests significant at $p<0.01$) compared to the 2001 Adelaide Bureau of Statistics Census data. **ELIGIBILITY:** Eligible respondents were English-speaking adults, aged 20 to 65 years, residing in private dwellings such as houses, apartments, or units, and able to walk without assistance. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The researchers were from the University of Queensland, the University of Hong Kong, the University of Adelaide, the University of British Columbia, the University of Sydney, the University of Washington, Children's Hospital, and San Diego State University. **THEORY/ FRAMEWORK:** Ecological model **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Living in areas with a walkability index that was one standard deviation above the average was associated with 37 minutes more walking than living in areas with a walkability index that was one standard deviation below the average. 2. Neighborhood self-selection was the only significant moderator of the relationship between neighborhood walkability and weekly minutes of walking for transport (β=1.59; SE=0.73; Wald test: $\chi^2(1)$=4.78; p=0.029). 3. Neighborhood walkability was associated with more walking for transport in residents for whom access to services was an important reason for living in a specific neighborhood (data not shown). 4. Weekly frequency of walking for transport was independently related to neighborhood walkability and neighborhood self-selection (Model 1: β=0.02; Wald test=37.6, df=1; p<0.001 and Model 2: β=0.01; Wald test=29.1, df=1; p<0.001 and for neighborhood self-selection Model 2: β=0.13; Wald test=109.9, df=1; p<0.001, respectively). 5. No significant effect of neighborhood walkability on weekly minutes of walking for transport was observed among residents for whom access to services was not an important reason for living in their neighborhood. 6. For weekly minutes of walking for transport, there were no significant effects of objective walkability and neighborhood SES. 7. No statistically significant relationships between neighborhood walkability and walking for recreation were found. 8. No statistically significant moderators of the relationship between neighborhood walkability and walking for recreation were found. **OTHER:** 9. Neighborhood self-selection was a significant independent predictor of weekly minutes of walking for transport (β=29.8; Wald Test=25.8, df=1; p<0.001). 10. Weekly minutes and weekly frequency of walking for recreation were independently associated with neighborhood self-selection (p<0.05, no other results shown). 11. Choosing to live in a specific neighborhood because of its access to services was predictive of more weekly minutes of walking for transport.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Lee, Kawakubo (2006) Japan	Access to locations within walking distance from residence **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood traffic safety 2. Perceptions of neighborhood safety [lighting] 3. Access to parks and trails 4. Street connectivity (alternate routes to locations) and presence of sidewalks *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 432 adults in two wards: one in metropolitan Tokyo (high walkability region, n=237) and one in rural northeastern Japan (low walkability region, n=195) **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Questionnaire (demographic data, daily walking, frequency and duration of walking for exercise, for commuting, and for purposes other than exercise, perception of neighborhood environment, total walking time, accessibility, safety, convenience, aesthetics, weather) **DATA COLLECTION:** Data was taken from a questionnaire collected for a local government health promotion program in January 2004. Total walking time (walking time for exercise, commuting or shopping and others) was used as neighborhood walking time. Responses regarding the perception of neighborhood characteristics were selected from a 6-point Likert scale ranging from strongly disagree (0) to strongly agree (5). The higher the score the more positive participants' perceptions were. Previous studies provided the definition for high walkability and low walkability regions. Questions were developed for Japanese neighborhood environmental characteristics by modifying questions from earlier studies, ICC of questionnaire 0.70. **LIMITATIONS:** Variation in participant's environment was not accounted for in this study; causal relationships cannot be established using a cross-sectional study design; because this study is cross-sectional it does not represent all respondents in the region; data came from participants in a health promotion study which may have led to selection bias	Adults, 56% Female (evaluation sample) **ELIGIBILITY:** Eligibility for the health promotion program was not discussed. Participants signed a consent form. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from the University of Tokyo, Kyoritsu Women's University, Alliant International University, and the University of Tokyo. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** This study was based on earlier studies that showed comparisons between different regions with large variations in neighborhood's physical environments that correlate to the factors affecting the walking behavior of residents, such as residential density, mixed land use and street connectivity. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not reported **FUNDING:** The Japan Ministry of Health, Labor and Welfare as a part of the Study of the Evaluation of Community Environments for the Effective Health Promotion Plan, and by a grant from the Japan Ministry of Education, Culture, Sports, Science, and Technology as part of the Study of the Evaluation of Neighborhood Environments Affecting Residents' Daily Physical Activity. **STRATEGIES:** Not reported	**PHYSICAL ACTIVITY:** 1. In the high walkable region, those who had high scores for "There is a park nearby that is suitable for taking a walk in" (low perception mean [sd]: 190.8[195.0] vs. high perception mean [sd] 300.2[279.5], p<0.05), "There is a river (or a beach) within walking distance" low perception mean [sd]: 217.2[211.7] vs. high perception mean [sd] 299.1[283.6], p<0.05), and "The neighborhood is conducive for taking a walk" (low perception mean [sd]: 245.0[233.5] vs. high perception mean [sd] 323.4[308.5], p<0.05) spent significantly more walking time. 2. In the low walkable region, those who had high scores for "There are several ways to get to one place" (low perception mean [sd]: 124.9[139.9] vs. high perception mean [sd]: 201.4[249.4], p<0.05), "It is easy to cross streets" (low perception mean [sd]: 145.1[162.7] vs. high perception mean [sd]: 214.6[270.2], p<0.05), "The sidewalks have few inclines and are easy to walk on" [low perception mean [sd]: 89.7[88.2] vs. high perception mean [sd]: 215.6[245.9], p<0.01) and "The sidewalks are wide enough to walk on" (low perception mean [sd]: 132.2[138.8] vs. high perception mean [sd]: 232.8[284.5], p<0.01) spent significantly more walking time. 3. In the safety category, the score for "Vehicular traffic does not hinder taking a walk" was significantly higher in the low walkable region (high; mean [sd]; 2.49[1.48], vs. low; 3.08[1.55], p<0.01). In the safety category the variable, "The sidewalk is well-lit even at night", showed significantly higher scores in the high walkable region (high; mean [sd]; 2.97[1.32] vs. low; 2.11[1.42], p<0.01). 4. In the convenience category, the score for "The sidewalks are wide enough to walk on" was significantly higher in the low walkable region (high; mean [sd]; 2.54[1.50] vs. low; 3.04[1.50], p<0.01), whereas that for "The walking map of the neighborhood is useful" was significantly higher in the high walkable region (high; mean [sd]; 3.58[1.29], vs. low; 2.45[1.64], p<0.01). 5. Those who had high scores for "There are sidewalks suitable for walking in the neighborhood" (high walkable: low perception mean [sd] 191.7[200.6] vs. high perception mean [sd] 302.9[279.7], p<0.05) (low walkable: low perception mean [sd] 125.9[182.1] vs. high perception mean [sd] 211.3[234.5], p<0.05) spent significantly more walking time in both regions. **OTHER:** 6. Those who had high scores for "Residents in the neighborhood are friendly" spent significantly more walking time in both regions (high walkable: low perception mean [sd]: 234.2[212.2] vs. high perception mean [sd] 381.0[254.5], p<0.01) (low walkable: low perception mean [sd]: 135.9[157.1] vs. high perception mean [sd]: 228.3[271.0], p<0.05).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Ball, Bauman (2001) Australia	Convenience of locations within walking distance from residence **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Neighborhood aesthetics *Complex:* 1. Neighborhood social factors (companionship for walking)	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 3392 respondents **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. 1996 Physical Activity Survey for the state of New South Wales [NSW] (leisure time and work-related physical activity, sociodemographic factors, walking behavior, perceptions of neighborhood aesthetics, safety, and convenience to facilities, companionship for walking [social factor]) 2. Medical Outcomes Study Short-Form General Health Survey [SF-12] (health status) **DATA COLLECTION:** This study was based on data collected for the New South Wales Health Department, as part of the 1996 New South Wales Physical Activity Survey. The analyses did not use data on walking for transport. Walking for exercise data were dichotomized into any or no walking in the past 2 weeks. Perceptions of environment influences were assessed using items derived from the findings of an earlier Australian qualitative study. For all the items, a 5-point Likert scale, ranging from strongly agree (1) to strongly disagree (5), was applied. The sum of scores on these items provided a convenience score, ranging from 3 to 15. The physical and mental health component scores (PHCS and MHCS) were used to categorize respondents as having "good" (above the median) or "poor" (below the median) physical health and mental health status. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; the survey data were self-reported; exercise measures were placed in a dichotomous measure rather than a measure varying degree which eliminates a lot of variation; only one indicator was used to describe the social environment	General population, Adults, 54.2% Females (evaluation sample) Demographic data for the sample (age, gender, and household size) were weighted to the NSW population of 4.22 million adults ages 18 years and over. The sample was taken from a statewide representative population of Australian adults. **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from Deakin University, the University of Wollongong, and the University of New South Wales. **THEORY/ FRAMEWORK:** Social ecological framework **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Those reporting more convenient (both men; χ^2=19.1, p<0.05; and women; χ^2=11.2, p<0.05) and more aesthetically pleasing (women only; χ^2=23.5, p<0.05) environments had higher proportions of walkers. 2. Compared to those reporting a highly favorable aesthetic environment, individuals with a moderately aesthetic environment were 16% less likely (OR=0.84, 95%CI=0.71, 0.99, p<0.05) to walk for exercise, while those reporting a low aesthetic environment were 41% less likely (OR=0.59, 95%CI=0.47, 0.75, p<0.01) to walk for exercise. 3. Compared to those reporting a highly convenient environment, individuals with a moderately convenient environment were 16% less likely to walk for exercise (OR=0.84, 95% CI=0.71, 1.00, p<0.05), while those with a low environmental convenience were 36% less likely (OR=0.64, 95% CI=0.54, 0.77, p<0.01) to walk for exercise. **OTHER:** 4. Individuals with poor physical health component scores (PHCS) and individuals with good physical health component scores (PHCS) with lower environmental aesthetics (poor PHCS; OR=0.62, 95%CI=0.46, 0.85, good PHCS; OR=0.57, 95%CI=0.41, 0.79) and convenience ratings (poor PHCS; OR=0.72, 95% CI=0.56, 0.93, good PHCS; OR=0.60, 95% CI=0.46, 0.77), and with no company to walk with (poor PHCS; OR=0.64, 95%CI=0.52, 0.78, good PHCS; OR=0.72, 95%CI=0.59, 0.89), had a decreased likelihood of walking for exercise. 5. Those with poor mental health (MHCS) were comparable with those with good mental health (MHCS), although there was a trend for those with poorer mental health to have slightly weaker associations between walking and both environmental aesthetics (poor MHCS; OR=0.72, 95%CI=0.54, 0.97, good MHCS; OR=0.46, 95%CI=0.33, 0.64) and convenience (poor MHCS; OR=0.68, 95%CI=0.53, 0.87, good MHCS; OR=0.61, 95%CI=0.48, 0.79). 6. Having company was significantly associated with the likelihood of walking for exercise in the past 2 weeks (yes as reference, OR=1.00), individuals without company were 31% less likely to report walking for exercise in the past 2 weeks (OR=0.69, 95%CI=0.59, 0.80, p<0.01).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Stafford, Cummins (2007) England and Scotland	Land-use diversity, urban sprawl, and population density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood disorder (crime) *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 6848 respondents **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Combined data; Health Survey for England [HSE] and Scottish Health Survey [SHS] (sociodemographic data, height and weight (body mass index [BMI]), waist and hip circumference) 2. Registrar General's classification (social class categorization) 3. Manchester Information and Associate Services table (conversion of ward boundaries to postcode sectors [neighborhood boundaries]) 4. Central government departments, local authorities, voluntary and public sector agencies, commercial and industrial organizations databases (crime, policing, physical dereliction, high street services [e.g., local shops, financial services], leisure centers, supermarkets, fast-food outlets, urban sprawl) 5. 70-item Neighborhood Survey (neighborhood disorder, participation in sports clubs, gyms and exercise classes) 6. Geographic Information Systems [GIS] (geocoding contextual variables) **DATA COLLECTION:** Data from the HSE (1994-1999) and the SHS (1995 and 1998) were combined to form the data set. A secondary 70-item survey was developed using cognitive pilot testing. The questionnaire was sent to respondents from the 2 health surveys neighborhoods, not the Health Survey participants themselves. The data were obtained at various spatial scales and converted to postcode sector. Social class was discussed in 6 categories with I being the highest and V being the lowest category. **LIMITATIONS:** Intermediate health behaviors (physical activity and diet) were not included; there was no information related to the residential area; possible self-selection; cross-sectional study design; crime rate is not homogenous within a local authority; environmental data may not match residents' psychologically defined local area; some environmental data were only available at local authority district level	16 years and older, General population (targeted sample) The data was representative of the general population of England and Scotland. The sample of postcode sectors slightly over-represented deprived and urban post-code sectors in England and under-represented deprived postcode sectors in Scotland. **ELIGIBILITY:** Individuals from the electoral register over the age of 16, living in the same neighborhoods as participants in the 2 health surveys were surveyed. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the UCL Medical School, London, United Kingdom; Queen Mary, University of London, United Kingdom; the MRC Social and Public Health Sciences Unit, United Kingdom; and the City University, United Kingdom. **THEORY/ FRAMEWORK:** A model based on existing literature linking socio-relational characteristics, the built environment, and local facilities and services was created. **EVIDENCE-BASED:** Several studies have found neighborhood social disorder and elements of social capital to be related to obesity (Drukker, et. al., (2003); Lochner, et., al., (2003); Sampson, et. al., (1997). Several studies have linked the built environment to obesity and its determinants (Booth, et. al., (2005); Schootman et al., 2006). **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The author is funded by the Department of Health **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. For population density, the corresponding mean difference in BMI was 0.36 kg/m^2 and for supermarkets it was 0.44 kg/m^2 (results not shown). 2. Population density was inversely associated with waist-to-hip ratio (coefficient =-0.041, $p<0.05$), indicating that average waist-to-hip ratios were lower in more densely populated areas. 3. BMI was indirectly linked to neighborhood disorder through average sports participation rate (indirect path coefficient =0.013, $p<0.05$). 4. Resident's BMI was negatively associated with average sports participation rate (coefficient=-0.038), high street facilities (coefficient= -0.033), and proximity to a post office (coefficient= -0.019) ($p<0.05$ for all). 5. Comparing the 75th and 25th percentile of average sports participation, mean BMI was 0.23 kg/m^2 lower in places with greater participation. 6. Greater neighborhood disorder was associated with a higher waist-to-hip ratio (coefficient=0.053, $p<0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Spence, Cutumisu (2008) Canada	Density and land use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Street connectivity *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** Complete bodyweight and geographic data were available for 501 children (boys=239, girls=262) residing in 171 neighborhoods and attending one of the 10 health centers for preschool immunization within the Capital Health region encompassing Edmonton, Canada. **PRIMARY OUTCOME:** Overweight/obesity **MEASURES:** 1. Anthropometric data (height, weight, body mass index [BMI]) 2. Health Care Visit (demographic data [age and sex]) 3. 2001 Canada Census (neighborhood-level; education, income, and employment status) 4. Parent/guardian Questionnaire (duration of physical activity and play, duration of software, video, and TV time, dietary intake) 5. Geographical Information Systems [GIS] (respondent's address, intersection density, dwelling density, street connectivity, land use mix [4 factors=walkability index], number of physical activity facilities within 1500m radius of neighborhood) **DATA COLLECTION:** Data for the present study was collected from a study that conducted recruitment and data collection between March 22 and October 1, 2004. Questionnaires were sent by mail once and then given to parents again at health visit if they forgot to bring the completed version from home. Researchers conducted an in-service program on childhood obesity issue. A walkability index was derived for each neighborhood by taking the sum of the z-scores for intersection density, dwelling density, and land use mix with intersection density being weighted twice that of dwelling density and land use mix. 2 different measures for bodyweight status were used to run regressions (Centers for Disease Control and Prevention [CDC] and International Obesity Taskforce [IOTF] cut-offs/criteria. Any significant results were then individually examined. **LIMITATIONS:** Self-reported dietary and activity levels; cross-sectional study design; low response rate; the sample may have been biased because of the proportion of overweight children and parental attitudes	3-4 year olds 5-10 year olds **ELIGIBILITY:** Must attend one of the 10 health centers for preschool immunization and provide informed consent. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Capital Health and the University of Alberta. **THEORY/ FRAMEWORK:** Authors used the "3 D's of urban form" that influence physical activity for measurements; diversity, density, and design. **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Young Family Wellness funding through the Capital Health **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. The odds of girls being overweight were lower if they lived in walkable neighborhoods (CDC OR=0.78, 95% CI= 0.66, 0.91; IOTF OR=0.73, 95% CI= 0.61, 0.88) with more intersections (CDC OR=0.57, 95% CI= 0.39, 0.86; IOTF OR=0.48, 95% CI= 0.30, 0.76). 2. No significant associations were found between boys body weight status and intersection density. 3. Neither physical activity nor junk food consumption was associated with overall bodyweight status. 4. Significant interactions were found between sex and intersection density for both Center for Disease Control and Prevention, $\chi^2(2)=9.01$, N=501, p=0.011, and International Obesity Task Force criteria, $\chi^2(2)=11.76$, N=501, p=0.003) when examining components of walkability.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Hume, Salmon (2007) Australia	Land-use mix and distance to neighborhood destinations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions ofneighborhood safety 2. Safety from traffic 3. Pedestrian/ bicycling friendly street design *Complex:* 1. Social support (presence of friends in the area)	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 280 children attending 3 elementary schools in Melbourne, Australia **PRIMARY OUTCOME:** Physical activity (PA) and walking/cycling behavior **MEASURES:** 1. Accelerometers (physical activity and physical activity related energy expenditure) 2. Student questionnaire (frequency of dog walking, walking for exercise, walking to and from school during the past month, access to 15 neighborhood destinations, perceptions of aestheticand safety characteristics of neighborhood environment, perception of the social neighborhood environment, presence of friends in the area, friends living within walking or cycling distance, knowledge of all neighborhoods and people in the area, presence of multiple children to play with, other children as play companions) **DATA COLLECTION:** This data is part of the baseline assessment for a randomized controlled trial. Two trained researchers fitted accelerometers, which were worn for 8 consecutive days. Data was recorded in 1-minute periods. Each participant completed a questionnaire at school during class time under the supervision of 2 teachers and 2 research staff. Self-reported physical activity and environment measures were pilot-tested in a small sample of 38 children of a similar age to those in the study sample. Reliability was rated for all three walking measures (ICC=0.69-0.95), overall walking frequency (ICC=0.86), and access to neighborhood destinations (Cronbach alpha=0.91, ICC=0.84). Percent agreement was rated for access to neighborhoods (76-100%), perceptions of aesthetic and safety characteristics of the environment (86-100%), and children's perception of the social environment in their neighborhood (68%-100%). **LIMITATIONS:** Cross sectional study design; self-reported data; children's awareness of destinations may be dependent on previous access; the neighborhood was fairly homogenous	10-year-olds Lower income; 49% boys (evaluation sample) **ELIGIBILITY:** All children in grade 5 in the schools were invited to participate. Parents had to provide active consent.Children had to maintain enrollment between recruitment and testing. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from Deakin University (evaluation) **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Among boys, access to the total number of neighborhood destinations (0.35, p=0.03), knowing their neighbors well (β=2.13, p=0.04), and perceiving that it was a safe neighborhood to walk/cycle to school (β=-1.92, p=0.07) were positively associated with weekly walking frequency. Total number of accessible destinations score remained significantly positively associated with walking frequency in the multiple regression model (p<0.05). 2. Chi square analyses showed that significantly more boys than girls reported access to a walking or cycling track in their neighborhood (94% vs. 85%; $\chi^2[1]$=5.59, p=0.02), lots of graffiti (27% vs. 15%; $\chi^2[1]$=5.34, p=0.02), that it is safe to walk or cycle to school (71% vs. 56%; $\chi^2[1]$=5.79, p=0.02), and that they knew all their neighbors quite well (73% vs. 61%; $\chi^2[1]$=3.86, p=0.05). In contrast, more girls than boys reported that they were worried about strangers in their neighborhood (45% vs. 30%; $\chi^2[1]$=6.06, p=0.01). 3. Among girls, the perceptions of nice houses in the neighborhood (β=2.98, p=0.003); lots of neighborhood graffiti (β=2.59, p=0.04); nice neighborhood house gardens (β=1.91, p=0.03);safety in the neighborhood for walking/ cycling to school (β=2.78, p=0.03); and safety when crossing the road (β=1.99, p=0.07); having an easily walkable/ cyclable neighborhood (β=2,75, p=0.0001); knowing lots of people in the area (β=2.61, p=0.05); and having lots of friends in the area (p=0.08) were significantly positively associated with walking frequency. Easy to walk/cycle and lots of graffiti remained significantly associated with walking frequency in the multiple regression model (both p<0.05). 4. Perceiving lots of litter and rubbish in the neighborhood (β=51.28, p=0.02), lots of children in the neighborhood to play with (β=110.51, p=0.03), friends within walking/cycling distance of home (β=104.79, p= 0.04), and the overall neighborhood social environment scale (β=31.68, p=0.006) were significantly associated with overall physical activity among boys. 5. For boys' overall physical activity, having friends living in walking/cycling distance and presence of lots of litter (both p<0.05) remained significantly positively associated in the multiple regression model.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Carver, Salmon (2005) Australia	Perceptions of access to convenience stores (land-use mix) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of access to sports facilities 2. Neighborhood perceptions of safety (unattended dogs) 3. Neighborhood perceptions of safety (traffic) *Complex:* 1. Social support	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 347 adolescents (172 boys, 175 girls) and their parents in Sydney, Australia (birth cohort from the Nepean Kids Growing Up Study) **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Parent Questionnaire (level of maternal education, perceptions of local neighborhood) 2. Adolescent questionnaire (duration and frequency of participation in walking for exercise, walking to and from school, walking for transport, walking the dog, cycling for recreation, cycling to and from school, cycling for other transport from Monday to Friday and Saturday to Sunday, presence of places for physical activity, presence of peers, safety, traffic, dogs, bullying, strangers, convenience foods, walkability/ bikeability) **DATA COLLECTION:** Between July 2002 and February 2003, questionnaires were completed by adolescents and their parents at home. A few items were tested for reliability in a previous study yielding an ICC=0.86 for walking to school and an ICC=0.71 for cycling to school. Perceptions of the local neighborhood were also tested in a previous study yielding an ICC range=0.63-0.91 for parents and ICC range=0.51-0.84 for children. **LIMITATIONS:** Data was self-reported; birth cohort may not represent the general population; cross-sectional study design	12-13 year olds, mean age 13.0 ±0.2 (evaluation sample) **ELIGIBILITY:** Written consent was obtained. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Research team (evaluation) **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Health and Medical Research Council, Meat and Livestock Australia, Novo Nordisk, AMP Foundation, and the Raymond E. Purves Foundation **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** *Girls' perceptions* 1. Girls' perception of convenience stores near home was negatively associated with frequency (β= -0.157, p<0.01) and duration (β= -0.15, p<0.01) of walking for transport on weekends. 2. Girls' worry about roaming dogs was negatively associated with frequency (β= -0.164, p<0.01) and duration (β=-0.153, p<0.05) of cycling for recreation on weekends, frequency (β= -0.219, p<0.01) and duration (β=-0.183, p<0.05) of cycling for recreation on weekdays, and frequency of walking the dog on weekends (β= -0.138, p<0.05). 3. Girls' perception of road safety was positively associated with frequency (β=0.179, p<0.05) and duration (β=0.183, p<0.01) of walking for transport on weekdays, frequency of walking for exercise on weekdays (β=0.094, p<0.01), duration of walking for exercise on weekends(β=0.184, p<0.05), and frequency of walking the dog on weekends (β=0.128, p<0.05). *Boys' perceptions* 4. Boys' worry about roaming dogs was negatively associated with frequency (β=-0.213, p<0.05) and duration (β=-0.194, p<0.05) of walking for exercise on weekdays, duration of walking for exercise on weekends (β=-0.189, p<0.05), and duration of walking for transport on weekdays (β=-0.159, p<0.05). *Parents' perceptions:* 5. Parents' perception that their neighborhood had good sports facilities for their child to use was positively associated with girls' frequency (β=0.115, p<0.01) and duration (β=0.092, p<0.05) of cycling for recreation of weekdays, girls' frequency of cycling for recreation on weekends (β=0.092, p<0.05), girls' frequency of walking the dog on weekends (β=0.123, p<0.05), and boys' frequency of cycling for transport on weekdays (β=0.155, p<0.05). 6. Parents' perception that there was so much traffic that it was difficult/unpleasant to go for a walk was negatively associated with girls' frequency (β=-0.164, p<0.01) and duration (β=-0.161, p<0.05) of cycling for recreation on weekends, girls' frequency (β=-0.190, p<0.01) and duration (β=-0.188, p<0.01) of walking for exercise on weekdays, girls' duration of cycling for recreation on weekdays (β=-0.109, 0.05), girls' duration of walking to school (β=-0.128, p<0.01), and boys' frequency of walking for transport on weekdays (β=-0.138,p<0.05). *(continued next page)*

(Continued from previous study)						
						SOCIAL ENVIRONMENT: 7. Boys' perception of having lots of boys/girls the same age to hang out with was positively associated with duration ($\beta=0.27$, $p<0.01$) and frequency ($\beta=0.242$, $p<0.01$) of cycling for recreation on weekdays, frequency of cycling for transport on weekdays ($\beta=0.141$, $p<0.05$), and duration of walking for transport weekdays ($\beta=0.129$, $p<0.05$). 8. Boys' perception of waving/talking to neighbors most days was positively associated with duration ($\beta=0.108$, <0.05) and frequency ($\beta=0.149$, $p<0.05$) of walking for transport on weekdays. 9. Girls' reports of waving/talking to neighbors most days were positively associated with frequency ($\beta=0.119$, $p<0.05$) and duration ($\beta=0.103$, $p<0.01$) of walking for transport on weekdays and frequency ($\beta=0.16$, $p<0.01$) and duration ($\beta=0.156$, $p<0.01$) of walking for exercise on weekdays. 10. Girls' perception of having many friends in the neighborhood was positively associated with frequency ($\beta=0.078$, $p<0.05$) and duration of walking ($\beta=0.119$, $p<0.01$) for transport on weekdays, frequency ($\beta=0.193$, $p<0.01$) and duration ($\beta=0.189$, $p<0.01$) of walking for transport on weekends, and frequency ($\beta=0.211$, $p<0.01$) and duration ($\beta=0.23$, $p<0.01$) of walking to school. 11. Girls' perception of having lots of boys/girls the same age to hang out with was positively associated with frequency ($\beta=0.118$, $p<0.01$) and duration ($\beta=0.1$, $p<0.01$) of walking to school and frequency of cycling for recreation on weekends ($\beta=0.164$, $p<0.01$). 12. Girls' perception of having friends close to home was positively associated with frequency of walking for transport on weekdays ($\beta=0.069$, $p<0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kirby, Levesque (2007) Canada (Moose Factory Island)	Convenient access to neighborhood destinations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of safety for walking in the community 2. Aesthetic quality of the neighborhood *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 263 Adult community members of Moose Factory **PRIMARY OUTCOME:** Walking behavior and various intensities of physical activity **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. 15-item survey (environmental perceptions [convenience, safety, aesthetics, accessibility, home-level environmental supports], walking, physical activity, sociodemographic data, anthropometric data) 3. Godin Leisure-Time Questionnaire (frequency, duration, and intensity of physical activity) **DATA COLLECTION:** The brief survey used items that were drawn from standardized, validated questionnaires and refined with community input. The Godin-Leisure Time Exercise Questionnaire required participants to separately recall frequency of physical activity over the past 7-days (ICC; vigorous, moderate, and light intensities: 0.94, 0.46, and 0.48, respectively). Total weekly walking scores were calculated. Safety and aesthetics were used as predictor variables. Total weekly walking scores and safety and aesthetics were transformed into square root transformations, to normalize the positively skewed data. **LIMITATIONS:** Cross-sectional study design limits causal conclusions; convenience sampling limits the generalizability of results; objective measures of the environment were not collected: data was self-reported	Adults in an Aboriginal Community 130 women (mean age 35.6 years ±12.3), 133 men (mean age 36.3 years ±12.7) (evaluation sample) Statistics Canada did not completely enumerate Moose Factory during the 1996 and 2001 Censuses; it is not possible to confirm the representativeness of the sample. **ELIGIBILITY:** For the study at Moose Factory, individuals were eligible if they were physically able to participate in activities, 18 years of age or older, and had lived in the community for greater than 5 years. Verbal informed consent was obtained prior to participation. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The researchers were from the Kahnawake School Diabetes Prevention Project Centre for Research and Training in Diabetes Prevention, Memorial University of Newfoundland, Queen's University, and Wilfrid Laurier University. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Canadian Institutes for Health Research, The Kahnawake School Diabetes Prevention Project, and the Kahnawake Community Advisory Board. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Total weekly physical activity involvement decreased with increasing BMI ($\chi^2(4)=11.72$, N=253, p=0.02) and total weekly walking decreased with increasing BMI ($\chi^2(4)=19.59$, N=253. p=0.001). 2. Both the square root of safety and aesthetics were significantly related to total weekly walking ($p<0.05$; $\beta=0.130$, 0.186 respectively). 3. Hierarchical regressions revealed that perceived environmental variables were not related to the variation in response for all intensity, strenuous, moderate, and light physical activity ($p>0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
De Bourdeaudhuij, Sallis (2003) Belgium	Residential density and land-use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Quality and access to sidewalks and street connectivity 2. Perceptions of neighborhood safety from crime 3. Access to physical activity facilities 4. Proximity to public transportation stops *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 521 residents of Ghent, Belgium **OUTCOME:** Overweight/obesity, moderate and vigorous intensity physical activity, walking behavior, and sedentary behavior **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Seven-page questionnaire (International Physical Activity Questionnaire [IPAQ] items [physical activity], environmental perceptions and factors, demographic data, anthropometric data) 3. IPAQ short-form items (past 7 day duration and intensity of physical activity and sedentary behavior) 4. Environmental items from 2 questionnaires (residential density, land use mix, access to public transportation, availability of sidewalks and bike lanes, neighborhood aesthetics, perceived safety from crime and traffic, connectivity of the street network, satisfaction with the neighborhood and its services, recreational physical activity [worksite environment, physical activity equipment in the home, convenience of physical activity facilities]) **DATA COLLECTION:** A seven page questionnaire was mailed with a letter explaining the purpose of the study and addressed to the randomly selected person who was requested to answer to the questionnaire. At 6 and 12 weeks non-respondents received additional requests to complete the questionnaire.Two existing questionnaires were combined to measure environmental correlates of physical activity. A separate study was executed to test the reliability of the newly combined items. It had interclass coefficients ranging from 0.40 to 0.97 and validity coefficients ranging from 0.21 to 0.91. The IPAQ short, self-administered, had 7 items to identify physical activity in the past 7 days. Validity and reliability results in 12 countries demonstrate that the IPAQ has comparable reliability and validity to other self-report measures of physical activity. **LIMITATIONS:** Purpose of walking was not distinct; survey data was self-reported; study conducted in one city limits generalizability; causal relations cannot be obtained using cross-sectional data; there was a lack of context specific physical activity measures; using the IPAQ short form, the difference between the purpose or context of an activity could not be disentangled	Adults, 18-65 year olds (target sample) 41 ±12.22 (mean) years, 48.3% Female, 70.1% Employed, 39.3% Urban dwellers, 54.9% Suburban, 5.9% Countryside (evaluation sample) Respondents appear to have better jobs, have a higher education, are more often employed, and under represent the number of individuals living alone compared with the Flemish reference population. **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** The local government from the pool of all residents of Ghent, a city with 224,000 inhabitants and consisting of a city center, suburbs, and countryside.	**LEAD AGENCY:** Researchers were from Ghent University in Belgium and San Diego State University in California **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** A separate study was executed to test the reliability of the newly combined environmental items. It was translated to Flemish and pretested with a small sample (n=40). **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Participants with a higher BMI reported less safety from crime (Pearson r= -0.11, p<0.05), less physical activity equipment in the home (Pearson r=-0.15, p<0.001), and fewer convenient physical activity facilities (Pearson r=-0.11, p<0.05). **PHYSICAL ACTIVITY:** 2. In males, moderate intensity activity was related to more satisfaction with neighborhood services (semi-partial correlate; 0.15, p≤0.05). In females, more moderate intensity physical activity was related to better access to shopping in local stores (semi-partial correlate; 0.16, p≤0.05) and more emotional satisfaction with the neighborhood (semi-partial correlate; 0.13, p≤0.05). 3. Greater availability of sidewalks in the neighborhood was associated with walking in males (semi-partial correlate; 0.14, p≤0.05). In females, more walking was associated with greater ease of the walk to public transportation stops (semi-partial correlate; 0.16, p≤0.05) and to longer distances to shops and businesses (semi-partial correlate; 0.15, p≤0.05). 4. In males, vigorous intensity physical activity was related to more convenient physical activity facilities (semi-partial correlate; 0.11, p≤0.05). In females, vigorous intensity physical activity was related to more convenient physical activity facilities (semi-partial correlate; 0.14, p≤0.05) and supportive worksite environment was related to more high intensity activity (semi-partial correlate; 0.12, p≤0.05). **SEDENTARY BEHAVIOR:** 5. In males, the amount of sitting was related to higher perceived criminality in the neighborhood (semi-partial correlate; -0.22, p≤0.01), longer distances to shops and businesses (land use mix, diversity) (semi-partial correlate; 0.14, p≤0.05), and more convenience of shopping in local stores (land use mix, access to local shopping) (semi-partial correlate; 0.15, p≤0.01). For females, less emotional satisfaction with the neighborhood was associated with greater amounts of sitting (semi-partial correlate= -0.15, p≤0.05).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Harten, Olds (2003) Australia	Distance to neighborhood destinations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 136 students (Year 6) in 8 primary schools in Adelaide, Australia (79 boys and 57 girls). **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. Weight and height (body mass index [BMI]) 2. Energy cost of Active Transport model ([Westerterp et. al., 1995] effects of changes in daily energy expenditure on body mass) 3. Multimedia Activity Recall for Children and Adolescents (MARCA) activity diary (analytical model for overall daily physical activity level in metabolic equivalent units [METs], time distribution of active and passive transport) 4. Neighborhood satisfaction questionnaire (perceptions of safety, crime, traffic, scenery, pollution, accessibility of amenities) 5. One-on-one Interviews (transport patterns; road maps [route, mode choice, travel companion, destinations]) 6. Socio-Economic Index For Areas (SEIFA) data (socio-economic status using address) **DATA COLLECTION:** Each child was questioned on three occasions in spring, including one Monday when they recalled their activities and movements on the previous Sunday (a non-school day), and two other weekdays (when they recalled school days).The reliability and validity of the MARCA have been shown to be as good as the best pencil-and-paper recall instruments. Responses from the neighborhood satisfaction questionnaire were used to calculate a global neighborhood dissatisfaction index. The energy cost of active transport was estimated using the mean values for physical activity level, height, and mass. Responses to the neighborhood satisfaction items were used to calculate a global 'neighborhood dissatisfaction index'. Trips were divided by level of dissatisfaction. **LIMITATIONS:** The study was cross-sectional and data was self-reported	11-12 year olds, 58% Male (evaluation sample) The socioeconomic status value for the evaluation sample (1011 ± 102) was not statistically different from the nationwide average (1000 ± 100). **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of South Australia. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. For every unit change in distance, there was approximately a tenfold decrease in active trips (OR=0.09, 95% CI=0.06, 0.15, p<0.0001). 2. Trips made by children whose parents were highly dissatisfied with their environment were less likely to be active than those with low environmental dissatisfaction (OR=0.53, 95% CI=0.28-, .00, p<0.05).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kondo, Lee (2009) Japan	Residential density and land-use mix diversity **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood safety from crime 2. Perceptions of neighborhood traffic safety 3. Street connectivity and length of streets and sidewalks 4. Availability of places to be active *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 156 residents; 83 residents were in the Type A region (high residential density, land use mix-diversity, and street connectivity). 73 residents were in the Type B region (low residential density, land use mix-diversity, and street connectivity). **PRIMARY OUTCOME:** Walking and cycling behavior **MEASURES:** 1. Geographical Information System (GIS) Data (500-m radius residence buffer, household count, land use type count, length of streets and sidewalks, intersection count, width of streets) 2. Fieldwork and Tokyo City Planning Basic Survey (land use) 3. Abbreviated version of the Neighborhood Environment Walkability Scale (ANEWS) data (residential density, land use mix-diversity, land use mix-access, street connectivity, aesthetics, and traffic and crime safety) 4. Accelerometer ([Type A=48; Type B=64] total number of walking steps) 5. International Physical Activity Questionnaire (IPAQ) (types and duration of physical activity) **DATA COLLECTION:** Subjects were stratified and selected using the Basic Resident Register in September 2006. This study was part of the Study on the Evaluation of Neighborhood Environments Affecting Residents' Daily Physical Activity. A self-administered questionnaire was sent by mail. After acceptance to participate an accelerometer was sent to the subjects. Subjects were asked to wear the accelerometer for 1 week, 8 hours per day, and return it by mail. For this study the ANEWS, was translated into Japanese and pretested (n=72) finding Cronbach's alpha coefficients were 0.57-0.94 and the reliability scores were 0.61-0.95, except for street connectivity (0.46). Based on the GIS measurements or the perception scores of the ANEWS, subjects were classified as being in the high scoring group (measurement or score was equal to and above the median) or low scoring group (measurement or score was below the median). **LIMITATIONS:** Low response rate; causal information cannot be assessed using cross-sectional data	Adults, 30-69 years old (evaluation sample) **ELIGIBILITY:** Participant consent was required The city has a relatively small population of 57,990 in a 699-km^2 area. Those who responded to the questionnaire and wore accelerometers were significantly older than those who did not. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Tokyo and Kyoritsu Women's University **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Previous studies were used to incorporate a study high residential density, high land use mix-diversity, high street connectivity and accessibility to facilities. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Support came from a grant provided by the Japan Ministry of Education, Culture, Sports, Science and Technology **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** *For both sexes* 1. There were no significant differences in walking steps related to land use type, length of streets or sidewalks, number of intersections, and width of streets between the high and low scoring groups. There were no differences in walking time for leisure or transport associated with objective neighborhood measures between the high and low scoring groups. There were no differences in mean walking time for transport or cycling time for transport related to neighborhood environment perception scores between the high and low scoring groups. *For females* 2. Mean cycling time for transport was significantly longer in the high scoring group than in the low scoring group for the number of land use types (mean ± standard error: 11.9 ± 3.0 vs. 0.8 ± 4.4; p<0.05) including post offices (12.1 ± 3.1 vs. 1.5 ± 4.2; p<0.05), banks/credit unions (15.4 ± 3.8 vs. 3.1 ± 3.3; p<0.05), gymnasiums/fitness facilities (31.9 ± 7.8 vs. 5.8 ± 2.5; p<0.01), and/or amusement facilities (16.4 ± 4.6 vs. 4.8 ± 3.0; p<0.05) in the area when compared to subjects without these facilities. 3. Mean total walking steps was significantly higher in the high scoring group than in the low scoring group for the walking places score (mean± standard error: 9488±511 vs. 7957 ± 538; p<0.05). *For males* 4. Mean walking time for leisure was significantly longer in the high scoring group than in the low scoring group for the aesthetics score (mean ± standard error: 20.6 ± 6.0 vs. 0.6 ± 6.7; p<0.05) and for individuals with parks in the area compared to those without (26.2 ± 6.4 vs. 2.7 ± 6.9; p<0.05). 5. Mean total walking steps was significantly higher for subjects with bookstores (10568 ± 898 vs. 6983 ± 881; p<0.01) or rental video stores (10336 ± 962 vs. 7422 ± 873; p<0.05) in the area (within 10-minute walk) than for subjects without these facilities. 6. There were no differences in walking steps between the high scoring group and the low scoring group for residential density, land use mix-diversity, land use mix-access, street connectivity, and safety.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Duncan, Mummery (2005) Australia	Distance to places for physical activity ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Access to opportunities for physical activity 2. Perceptions of neighborhood safety and cleanliness 3. Route directness (street connectivity) *Complex:* 1. Social support	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 760 respondents from Rockhampton, Queensland. ***PRIMARY OUTCOME:*** Physical activity (PA) ***MEASURES:*** 1. Active Australia Physical Activity Questionnaire (sociodemographic factors, self-efficacy, walking for leisure and transport, intensity, duration, and frequency of physical activity, safety, aesthetics, accessibility) 2. Geographic Information Systems [GIS] (linking residence with environmental measures, euclidian and street distance, amount of streetlights) 3. Electronic White pages (location of news agent outlets) ***DATA COLLECTION:*** Data used for this study was collected in August 2001 and September 2001. Levels of self-efficacy (Cronbach alpha=0.76) for performing physical activity and 4 social support items (Cronbach alpha=0.77) were assessed individually using a five-point Likert scale from 'not at all confident'/'never' to 'very confident'/'very often'. All items were subsequently summed to form a single item for self-efficacy and social support and dichotomized into high and low categories using a mean split. The Active Australia Physical Activity Questionnaire has shown good test-retest reliability. Participation in 'sufficient' levels of physical activity was defined as attaining 150 minutes of activity throughout the previous week in all activities excluding vigorous gardening, derived from national activity guidelines. Lighting information was provided to RCC in 2002 by the State's electrical supplier. ***LIMITATIONS:*** Survey data was self-reported; causal inferences cannot be made using a cross-sectional study; geo-coding was performed 17 months after the questionnaire was given; dog registration and street lightning data were taken one year after questionnaire collection; sample was taken from a very specific geographic location	General population Ages 18 and older ***ELIGIBILITY:*** All participants were 18 years of age or older at the time of the survey and lived in a residence that was accessible by land-based telephone and could be geo-coded. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers from Central Queensland University ***THEORY/ FRAMEWORK:*** Social-ecological framework ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Queensland Health as part of 10,000 Steps Rockhampton ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. People with the most proximal parkland beyond a network distance of 0.6 km, were 41% more likely to achieve recommended levels of activity than those with parkland within this distance (OR=1.41, 95% CI=1.01, 1.97). 2. People who had unacceptable route directness to the nearest parkland were 41% more likely to achieve sufficient levels of activity than those people who had acceptable route directness to parkland (OR=1.41, 95% CI=1.00, 1.98). 3. Euclidian distance of 0.4 km from their home were 69% less likely to walk in the previous week than those who had a footpath within that distance from their place of residence (OR=0.31, 95% CI=0.18, 0.55). 4. People not agreeing that their neighborhood was clean and tidy were 2.67 times more likely to attain sufficient levels of activity than those people who agreed with the statement (OR=2.67, 95% CI=1.28, 5.55). 5. People who did not agree that the neighborhood footpaths were in good condition were 38% more likely to participate in recreational walking than those who thought the footpaths were in good condition (OR=1.38, 95% CI=1.00, 1.91). 6. People whose home was classed as being in the middle tertile of registered dog numbers within 0.8 km were 66% more likely to have reported some recreational walking than those people living in a residence with the lowest tertile of registered dog numbers (OR=1.66, 95% CI=1.13, 2.43). ***OTHER:*** 7. People reporting high levels of self-efficacy were 93% more likely to attain sufficient activity than those people reporting low levels of self-efficacy (OR=1.93, 95% CI=1.40, 2.64). 8. People reporting high levels of social support for activity were 65% more likely to participate in recreational walking than those people who reported low levels of social support [OR=1.65, 95% CI=1.17, 2.3]. (Note: No p-values provided)

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Carnegie, Bauman (2002) Australia	Land-use mix **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood traffic safety 2. Perceptions of neighborhood perceptions of safety (dogs barking) 3. Access to open spaces (beaches and parks) 4. Neighborhood aesthetics *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1,197 adults **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. Survey (environment, intensity, frequency, and duration of physical activity [2 week and 6 month recall], sociodemographic data, stage of change, perceived walking, friendliness of neighborhood, pleasantness, accessibility to facilities, traffic) **DATA COLLECTION:** This study used data from interviews conducted from October 25 to November 13, 1995. The questionnaire was field tested with 30 respondents to ensure that all of the items were comprehensible. Total duration of each type of exercise/physical activity reported was multiplied by MET values (9, 3.5, and 3.5 for high-, moderate-intensity, and walking respectively). Respondents were categorized as active (>800 kcal per week) or inactive (<800 kcal/week). The reliability and validity of these two (physical activity) measures have been shown to be adequate. Behavioral and motivational questions were combined to assess identification of the respondent's stage of change for physical activity. Perception responses were recorded on a 5-point Likert scale ranging from strongly agree (1) to strongly disagree (5) (items from previous research). **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; survey data was self-reported; aspects of the practical environment may have been addressed in too large-scale of an area	General population, Adults, 40-60 years old, 57.4% Female (evaluation sample) The demographic composition of the sample was very similar to that provided by the most recent national census data. Respondents aged 40-45 were slightly overrepresented (29.2%), and those aged 56-60 years were slightly underrepresented (20.1%). Two percent of the resident population within the target age range were sampled for this study. **ELIGIBILITY:** Participants 40-60 years old were eligible. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from University of Sydney, University of New South Wales, South Western Sydney Area Health Service, Illawarra Area Health Service, and the Children's Hospital at Westmead. **THEORY/ FRAMEWORK:** Stages of Change (transtheoretical) Model **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Australian Commonwealth Department of Health Family Services funded the Illawarra Physical Activity Project. **STRATEGIES:** Not reported	**PHYSICAL ACTIVITY:** 1. Those who did little walking (20 minutes or less per week) reported more negative perceptions of their aesthetic environment than those who reported walking for between 20 minutes and 2 hours and those who reported walking for more than 2 hours (F(2, 1.163)=5.19, p<0.01). 2. There was an independent association between the stage of change variable and the aesthetic environment (F (2, 1.168) = 5.67; p<0.01) and with the practical environment factor (F (2, 1.157) =12.05; p<0.001). 3. Those who walked for less than 20 minutes and those who walked for between 20 minutes and 2 hours both reported that shops, parks, and beaches were less near to their home than those who reported walking more than 2 hours per week (F (2, 1.168) = 11.24, p<0.001). 4. Those who did little walking (20 min or less per week) reported more negative perceptions of their aesthetic environment than those who reported walking for between 20 min and 2 hrs and those who reported walking for more than 2 hrs (F (2, 1.163)= 5.19, p<0.01). 5. Those who walked more than 2 hours per week (M=2.96, SD=1.1) strongly agreed that they perceived traffic to be bothersome more than those who walked less than 20 minutes per week (M=3.15, SD=1.12; F(2, 1.168)=5.19; p=0.006). 6. The "dogs barking" variable showed no relationship with walking activity nor did the "safety at night" question. 7. The "feel safe walking at night" question was much more of an issue for women than men (M=3.7 for women and 2.4 for men, p<0.001), showing that women felt much less safe than men walking at night.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Tucker, Irwin (2009) Ontario	Land-use mix ***OTHER INTERVENTION COMPONENTS:*** *Multi-component:* 1. Presence of neighborhood recreational opportunities (percentage of park space) *Complex:* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 811 children from 21 geographically diverse schools located in the urbanized areas of London, Ontario Canada ***PRIMARY OUTCOME:*** Physical activity (PA) ***MEASURES:*** 1. Parent questionnaire (child's involvement in organized physical activity or sport, presence of neighborhood recreation facilities, quality of facilities, neighborhood safety, and demographic data) 2. AdaptedPrevious Day Physical Activity Recall [PD-PAR] (type, frequency, and intensity of physical activity) 3. Geographic Information System [GIS](participants' geo-coded addresses, land-use mix, density of recreation opportunities, level of neighborhood park coverage) 4. London planning department data/field surveys/ aerial photos (verification for location of schools, parks, and public recreational opportunities) ***DATA COLLECTION:*** Parents/guardians who provided consent for their child's participation were asked to complete a questionnaire. The adapted PD-PAR, a previously validated survey, was completed by students to assess type and intensity (in 30 min. blocks) of physical activity throughout the afternoon and evening of the previous day (3pm-11pm). A distance of 1.6 km was used to define school neighborhoods. Park coverage was calculated in ArcGIS as the percent of public parkland divided by the total area of all land within each buffer. Recreational opportunities were defined as all publicly funded recreational facilities. To calculate land use mix, every land parcel within the city of London was classified into 6 broad classes: recreational, agricultural, residential, institutional, industrial and commercial. The total area of each of the land uses was calculated in each buffer. ***LIMITATIONS:*** No causal inferences can be made due to cross-sectional study design; the PD-PAR itself may have inflated activity findings given the 30-minute block structure of the instrument; information was self-reported; study did not measure quality of neighborhood activity opportunities; possible that the 49% of students who volunteered to participate in the study were the most active and therefore not representative of the entire student body	11-13 year olds Parent demographics 75.3% White, 1.5% Black, 6.6% Latin-American, 5.8% Asian, 8.8% Other, 9 % Lower income (sample) ***ELIGIBILITY:*** Parental consent was required. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** The research team was from the University of Western Ontario, Brescia University College and Middlesex London Health Unit, and the University of Toronto. ***THEORY/ FRAMEWORK:*** Not reported ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** Not reported ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Canadian Institutes of Health Research ***STRATEGIES:*** Not applicable	***PHYSICAL ACTIVITY:*** 1. Land-use mix and percentage of park coverage were not significant factors influencing physical activity level among London, Ontario adolescents. 2. Children with parent-reported recreation facilities in their neighborhood were 13.91 minutes more active after school than children without facilities ($p=0.03$). 3. Children whose parents reported access to neighborhood recreation facilities were 2.04 (95% CI=1.06, 3.92, $p=0.03$) times more likely to fall within the upper quartile of after school physical activity (>180 minutes per day) than those in the bottom quartile (<60 minutes per day). 4. Students who had 2 or more recreational facilities in their neighborhood were 1.65 times (95% CI=1.09, 2.50, $p=0.02$) more likely to be categorized in the upper quartile for after school physical activity. 5. Children with more than 2 recreation opportunities engaged in 16.49 (standard error 4.97, $p=0.004$) more minutes of physical activity than those with fewer than 2.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
De Vries, Bakker (2007) The Netherlands	Residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to neighborhood recreation spaces 2. Intersection density 3. Safety from traffic *Complex:* 1. Friendliness of neighborhood	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** Total of 422 children from 20 elementary schools in 10 neighborhoods in six cities in the Netherlands. **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. 7-day activity diary (duration and type of at least moderate intensity physical activity) 3. Neighborhood Walkability Scale [NEWS] (built environment categories; residential vs. commercial space, type of residence, sports/ recreation facilities and playgrounds, green space and water, safe walking and cycling, garbage and dirt, traffic safety, and the activity friendliness of the neighborhood) **DATA COLLECTION:** Researchers used previously collected data from the Spatial Planning and Children's Exercise [SPACE] study that collected data from pre- and post-World War II neighborhoods that had variation in type of residences (private and rented properties, low- and high-rise buildings) amount of green space, and presence of at least two elementary schools. Five neighborhoods were chosen from a list of 56 disadvantaged neighborhoods designated by the government for spatial restructuring. All measurements (i.e., physical activity diary, neighborhood observations, and anthropometric measures) were collected between October 2004 and January 2005. Two trained research assistants collected data after school in the neighborhoods using a checklist identifying built environment variables. The checklist is based on the Neighborhood Environment Walkability Scale (test-retest reliability: ICC=0.58-0.80) but was modified to reflect the Dutch built environment. Residential areas were assessed by type and period of construction, socioeconomic status, and age distribution of residents. Neighborhood boundaries were defined by city councils and varied in size and population. **LIMITATIONS:** The sample had a low response rate; the final sample varied significantly in age from the original sample;cross-sectional design does not allow for causal relationshipsto be made; the 10 neighborhoods chosen for study had limited variance	6 to 11 years, 8.3 ± 1.4 years (mean) No difference was found in weight, sex, or maternal education between the final and original samples. **ELIGIBILITY:** Informed consent was obtained from the parents **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** Researchers were from the University Medical Center, Amsterdam, the Netherlands and the Department of Physical Activity and Health, TNO Quality of Life, Leiden, Leiden, the Netherlands. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** This study was supported by a grant from the Dutch Ministry of Health, Welfare, and Sport and the Dutch Ministry of Housing, Spatial Planning, and the Environment. **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Children's physical activity was also positively associated with the frequency of parallel parking spaces (β=2.152; 95%CI= 1.408, 2.897) and parking lots (β=3.169; 95% CI=2.055, 4.284) in the neighborhood with the residential density (β=0.009; 95% CI= 0.001, 0.017), and with the general rating of activity-friendliness of neighborhood (β=1.990; 95%CI= 1.255, 2.724) ($p<0.05$ for all). 2. Children's physical activity was negatively associated with the frequency of staircase entrance flats (3-4 stories without elevator) (β= -1.472; 95% CI= -1.992, -0.953), unoccupied (boarded up) houses (β= -3.080; 95% CI= -4.625, -1.535), dog waste (β= -1.182; 95% CI= -2.104, -0.260), heavy traffic (lorry and bus) (β= -2.356; 95% CI= -3.587, -1.125), intersections in the neighborhood (β= -1.035; 95% CI= -1.825, -0.246), frequency of paved playgrounds (β= -1.372; 95% CI= -2.549, -0.195) and frequency of stripped crossings (β= -1.815; 95% CI -2.854, -0.776) ($p<0.05$ for all). 3. Children's physical activity was positively associated with the proportion of green space (β=0.865; 95% CI= -0.494, 2.225) and with the frequency of terrace houses (β=1.508; 95% CI=0.726, 2.290), blocks of flats with fewer than 6 stores (β=-1.472; 95%CI=-1.992, -0.953), water (β= 2.662; 95%CI= 1.453, 3.871), cycle tracks (β=2.445; 95%CI= 0.439, 4.451), and 30-km speed zones (β=1.815; 95% CI=0.700, 2.929) in the neighborhood ($p<0.05$ for all). 4. No significant associations were found for sports and recreation facilities, except for sports fields ($p<0.05$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Hume, Salmon (2005) Australia	Access to diverse locations in the neighborhood **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Presence of parks and green spaces 2. Access to food stores and restaurants *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 147 children from three Victorian metropolitan government funded coeducational primary schoolsof more than 500 students enrolled. **PRIMARY OUTCOME:** Low and moderate intensity physical activity and sedentary behavior **MEASURES:** 1. Mapping through use of drawings (perceptions of importance in home and neighborhood [places and things]) 2. Photograph Mapping (perceptions of importance [places and things in the home and neighborhood environment]) 3. Accelerometers (duration of physical activity) 4. Qualitative Assessments (features drawn and photographed were analyzed for common themes, 6 themes identified [family home, opportunities for physical activity and sedentary pursuits; food items and locations; green space and outside areas; the school and opportunities for social interaction]) 5. 1998 SEIFA index from the Australian Bureau of Statistics (socioeconomic status and disadvantage) **DATA COLLECTION:** The map drawing lessons were 1 week apart, with the home map completed in the first week and the neighborhood map completed the following week. The word "home" and boundaries of the home were specified to children to create a standard of understanding. The word 'environment' was explained as 'our surroundings, the places and things that are around us'. A subsample of children (n = 44) were given disposable cameras and asked to take about 8 photos. One week after camera distribution, film was collected and processed. Photographs were developed and returned to each child to provide a brief written explanation for each of their photos.The children wore the accelerometers approximately 6 weeks prior to completing the maps and taking the photographs for 8 consecutive days. Only children with more than 10,000 steps per day were included. Day 1 and 8 were not included in data report because of fittings and collection. Children wore the accelerometers during March/April of 2002. All children received individualized feedback about their physical activity participation in the form of a brief report and were given compensation (e.g. sports drink bottle, balls, frisbees) for participating in the study. **LIMITATIONS:** Data was based on child perception; study design was cross-sectional; the sample was homogenous, as only 3 schools were used, making generalizations difficult; the sample was small which limited statistical power	10.1 ± 0.4 years old (evaluation sample) **ELIGIBILITY:** Schools were eligible for participation if they were government funded coeducational primary schools, they had more than 500 students enrolled, and facilities were adequate for fundamental motor skill lessons and physical education. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Deakin University in Australia **THEORY/ FRAMEWORK:** Ecological Systems Theory **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Victorian Health Promotion Foundation **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Food locations drawn within the neighborhood showed a significant positive association with moderate intensity activity [F (1, 48) =4.16, p=0.05, r^2=0.08). 2. There were no associations between perceived environmental variables and low or moderate intensity activity among boys. 3. Among girls, physical activity opportunities in the neighborhood were positively associated with low intensity activity [F(1, 51) =5.29, p=0.03, r^2=0.09]. 4. Sedentary and vigorous intensity activity was not associated with any environmental variables among girls. 5. Opportunities for sedentary behaviors drawn at home showed a significant positive association with vigorous activity [F(1, 60) =4.06, p=0.05, r^2=0.06] and an inverse association with time spent being sedentary [F(1, 60)=3.65, p=0.06, r^2=0.06].

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Rabin, Boehmer (2007) Europe	Urbanization (urban population density) **_OTHER INTERVENTION COMPONENTS:_** *Multi-component:* 1. Neighborhood availability of fruits and vegetables 2. Public transportation 3. Density of motorways *Complex:* Not reported	**_DESIGN:_** Cross-sectional study **_DURATION:_** Not applicable **_SAMPLE SIZE:_** Approximately 591 million participated in this study that was conducted in 24 European countries. **_OUTCOME:_** Overweight/obesity **_MEASURES:_** 1. National-level Surveys and Databases (self-reported body mass index [BMI], disease prevalence, total amount of food available for consumption, percent of total energy available from fat, average available fruits and vegetables per person, urbanization, number of people living in a household, number of vehicles per household, price of gasoline, percentage of paved roads, density of motorways, government policies [accountability, stability, effectiveness, regulatory quality, control of corruption, rule of law], economic components [gross domestic product, students in tertiary education, unemployment rates]) 2. Geographical Information System (GIS) software (mapped data of obesity prevalence) **_DATA COLLECTION:_** A search was performed to identify physical, economic, and policy macro-environmental indicators from databases of international health, economic, and other governmental organizations for the selected countries. Databases included: World Health Organization non-communicable diseases InfoBase, World Health Organizations European Health for All Databases; the United Nations Economic Commission for Europe/ Environment and Human Settlements Division trends in Europe and North America; the World Bank Institute World Development Indicators; the Panorama of transport, statistical overview of transport in the EU, European Commission, and Eurostat; and the World Bank Institute Governance indicators for 1996-2002. Average governance indicator was calculated as a mean of the six policy variables for each country. **_LIMITATIONS:_** Cross-sectional study design introduces potential biases and cannot establish temporality; conclusions are limited to country-level associations, ignoring within-country variations and individual-level associations; self-reported obesity data was used; quality of data identified from international databases may differ depending upon the accuracy and methodology used by reporting countries; not all countries had the same types of information	General Population As part of the selection criteria only studies that were nationally representative (both rural and urban samples) and based on self-reported data were used. **_ELIGIBILITY:_** Countries were eligible if they had data in all 3 of the obesity categories. **_EXPOSURE/ PARTICIPATION:_** Not applicable	**_LEAD AGENCY:_** The research team was from Saint Louis University. **_THEORY/ FRAMEWORK:_** Ecological model **_EVIDENCE-BASED:_** Not reported **_REPLICATION/ ADAPTATION:_** Not applicable **_ADOPTION:_** Not applicable **_IMPLEMENTATION:_** Not applicable **_FORMATIVE EVALUATION:_** Not reported **_PROCESS EVALUATION:_** Not reported	**_RESOURCES:_** Not applicable **_FUNDING:_** Not reported **_STRATEGIES:_** Not applicable	**_OVERWEIGHT/OBESITY:_** 1. Overall obesity prevalence was inversely associated with economic variables (real domestic product: β=-0.175, p=0.002; gross domestic product: β=-0.168, p<0.0001), food availability (available fat: β=-0.323, p=0.010, available fruits/vegetables: β=-0.019, p=0.049), urbanization (urban population: β=-0.095, p=0.080), transportation (total passenger cars: β=-0.017, p<0.0001, new passenger cars: β=-0.081, p=0.018, price of gasoline: β=-0.095, p=0.042, paved roads: β=-0.064, p=0.033, motorways: β=-0.224, p=0.022), and policy (governance indicator: β=-2.528, p=0.007). 2. Female obesity prevalence was inversely associated with economic variables (real domestic product: β=-0.257, p=0.001), food availability (available fat: β=-0.399, p=0.004), transportation (passenger cars: β=-0.020, p<0.0001, new passenger cars: β=-0.087, p=0.028, price of gasoline: β=-0.096, p=0.041, paved roads: β=-0.073, p=0.032, density of motorways: β=-0.227, p=0.030), and policy (governance indicator: β=-3.575, p<0.0001). 3. Male obesity prevalence was inversely associated with available fruits/vegetables (β=-0.022, p=0.028) and density of motorways (β=-0.197, p=0.067).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Giles-Corti, Donovan (2002); Giles-Corti, Donovan (2002); Giles-Corti, Donovan (2003); Giles-Corti, Macintyre (2003); McCormack, Giles-Corti (2007); McCormack, Giles-Corti (2008) Australia	Access to destinations and land-use mix ***OTHER INTERVENTION COMPONENTS:*** *Multi-component* 1. Access to transit stations 2. Neighborhood perceptions of traffic safety 3. Access to recreation destinations 4. Road network distance and presence of sidewalks 5. Perceived neighborhood safety *Complex* Not reported	***DESIGN:*** Cross-sectional study ***DURATION:*** Not applicable ***SAMPLE SIZE:*** 1755 participants in Perth, Australia ***PRIMARY OUTCOME:*** Overweight/obesity, physical activity (PA), meeting recommendations for walking, and walking behavior ***MEASURES:*** 1. Survey (physical activity [type, frequency, duration, and intensity during past 2 weeks], streetscape of the respondents home, attractiveness of open spaces, physical activity club memberships, access to a motor vehicle, recreation destinations [inside or outside neighborhood, free or pay parking], perceptions of safety and interest [traffic and hazards], perceptions of the social environment, perceptions of access [sidewalks, etc.], opportunities for activity within walking distance, height and weight [body mass index [BMI]) 2. Geographic Information Systems [GIS] (geo-coded address, shortest road network distance [destination present within 400 m and 1500m of home], individual access for destinations and facilities [Hansen's spatial accessibility model; objective factors for access]) 3. Environmental Scan (access to footpaths, shops, traffic, aesthetic environment) 4. Yellow and White Pages Telephone Directory, the Australian postal service, the Western Australian Department of Transport, and the Western Australian Ministry of Planning (total count for available destinations, commercial addresses for post boxes, convenience stores, newsagents, schools, bus stops, transit stations, parks, the river, and beaches) 5. Socioeconomic Index for Areas [SEIFA; Australian Bureau of Statistics] (socioeconomic status, demographic data) ***DATA COLLECTION:*** This study used data from the Study of Environmental and Individual Determinants of Physical Activity (SEID 1). Only items with an intra-class coefficient of k greater than or equal to 0.60 were included in the main study. The survey was modified using items from other major Australian studies. Objective assessments were made on the street in front of the respondent's home. Data collection began in late spring 1995 and took 5 months to complete (August 1995-March 1996). One household participant was interviewed in a face-to-face meeting. Interviews were followed-up with a telephone survey 2-4 weeks later. Perceptions of access were placed into quartiles. *(continued next page)*	Adults, 18-59 years old (evaluation sample) The sample was comprised of relatively young, healthy, sedentary workers and homemakers living in high or low SES areas. ***ELIGIBILITY:*** Eligible participants were under the age of 59, employed, residing in their suburb for 1 or more years, could not regularly exercise at work, could not have a medical condition restricting physical abilities, and had to be proficient in English. ***EXPOSURE/ PARTICIPATION:*** Not applicable	***LEAD AGENCY:*** Researchers were from the University of Western Australia and the University of Glasgow. ***THEORY/ FRAMEWORK:*** Theory of Planned Behavior and the Theory of Trying; These are derived from the theory of reasoned action an 'expectancy model' that states that individuals are more motivated to perform behaviors they believe will result in highly valued outcomes. ***EVIDENCE-BASED:*** Not reported ***REPLICATION/ ADAPTATION:*** Not applicable ***ADOPTION:*** Not applicable ***IMPLEMENTATION:*** Not applicable ***FORMATIVE EVALUATION:*** The reliability of newly developed items was assessed in the extensive pilot phase. Modified weights for attractiveness were derived from a survey of urban planners. ***PROCESS EVALUATION:*** Not reported	***RESOURCES:*** Not applicable ***FUNDING:*** Western Australian Health Promotion Foundation (Healthway) Health Promotion Research Scholarship, a NHMRC/ NHF Career Development Award. ***STRATEGIES:*** Not applicable	***OVERWEIGHT/OBESITY:*** 1. Overweight individuals were more likely to live on highways (OR=4.24; 95%CI= 1.62, 11.09), streets with no sidewalks (OR=1.4, 95%CI= 1.01, 1.95), streets with sidewalks on one side only (OR=1.32; 95%CI= 0.98, 1.79) and perceive no paths within walking distance (OR=1.42; 95% CI= 1.08, 1.86). 2. Those who always had access to a motor vehicle were about half as likely to be obese as those who never had access to a motor vehicle (OR=0.56, 95%CI= 0.32, 0.99). 3. Obese individuals were nearly twice as likely as others to perceive that there was no shop within walking distance (OR=1.84, 95%CI= 1.01, 3.36). 4. Individuals with poor access to 4 or more recreational facilities were 68% more likely to be obese compared with others (95%CI= 1.11, 2.55). ***PHYSICAL ACTIVITY:*** 5. Residing within 1500 m of destinations including schools (OR=1.75, 95% CI= 1.28, 2.39, p<0.001), convenience stores (OR=1.89, 95% CI= 1.26, 2.84, p<0.001), shopping malls (OR=2.07, 95% CI= 1.43, 3.00, p<0.001), newsagents (OR=2.20, 95% CI= 1.60, 3.03, p<0.001), and transit stations (OR=2.38, 95% CI= 1.67, 3.39, p<0.001) was significantly associated with regular walking for transport. 6. Having a transit station located within 1500 m was positively associated with regular walking for recreation (OR=1.50, 95% CI= 1.09, 2.05, p<0.05), while having a beach within 1500 m was positively associated with irregular walking for recreation (OR=1.97, 95% CI= 1.01, 3.83, p<0.05) and regular vigorous physical activity (OR=1.93, 95% CI= 1.20, 3.13, p<0.01). 7. For each additional different type of destination (including recreational and utilitarian destinations) within 400 and 1500 m, the odds of regular walking for transport increased by 43% (95% CI= 1.27, 1.61, p<0.001) and 41% (95% CI= 1.26, 1.58, p<0.001) and the odds of irregular walking for transport increased by 27% (95% CI= 1.12, 1.44, p<0.001) and 23% (95% CI= 1.12, 1.35, p<0.001). 8. For each additional type of destination located within 1500 m the odds of regular walking for recreation increased by 16% (95% CI= 1.06, 1.27, p<0.01), while the odds of irregular walking increased by 12% (95% CI= 1.01, 1.26, p<0.05). 9. The mix of utilitarian destinations within 1500 m was positively associated with regular walking for recreation (OR=1.17, 95% CI= 1.05, 1.29, p<0.01). 10. Destination mix was not associated with time spent walking for recreation or vigorous physical activity. 11. In comparison with those who had no sidewalk and no shop on their street, those who had access to either or both of these attributes were about 25% more likely to achieve recommended levels of walking (combined OR=1.25, 95%CI= 0.90, 1.74). *(continued next page)*

(Continued from previous study)						
		LIMITATIONS: Individual measures were self-reported; Perthhas a higherstandard of living than national and international standards; study only used data from participants in the top and bottom quintile of social advantage; study area was restricted by available resources; this study used distance-only model to determine spatial accessibility; use of cross-sectional data limits assumptions of causality; random chance cannot be ruled out; several destinations that may be important for transport-related and vigorous-intensity physical activity were not included				12. Among individuals who frequented pay for use recreational destinations, each additional pay destination (OR=1.51, 95%CI= 1.32, 1.73, p<0.001), having access to a motor vehicle (OR=0.51, 95%CI= 0.26, 0.99, p<0.05), and having a club membership (OR=6.83, 95%CI= 3.39, 13.73, p<0.001) were associated with the use of pay-destinations located in the neighborhood. 13. Those who used a pay destination located within or outside (OR=8.46, 95%CI= 3.98, 18.00, p<0.001 and OR=3.48, 95%CI= 2.59, 4.66, p<0.001, respectively) the neighborhood were more likely than those who did not use a pay destination to achieve sufficient vigorous-intensity physical activity. 14. Respondents using free destinations within and outside (OR=1.56, 95%CI= 1.00, 2.33, p<0.05 and OR=2.13, 95%CI= 1.56, 2.89, p<0.001, respectively) the neighborhood were more likely to achieve sufficient levels of vigorous-intensity physical activity than those not using a free recreational destination. 15. Respondents were more likely to walk for transport if they were in the top quartile for access to attractive public open space (OR=1.35, 95%CI= 1.05, 1.73, p=0.02) and if they perceived that their neighborhood had sidewalks (OR=1.65, 95%CI= 1.12, 2.41, p=0.011), a shop within walking distance (OR=3, 95%CI= 2.04, 4.4, p<0.0001), and more traffic and busy roads (OR=1.26, 95%CI= 1.01, 1.56, p=0.038). 16. The likelihood of walking for recreation was higher in residents in the top quartile of access to the beach (OR=1.49, 95%CI= 1.14, 1.93, p=0.003) and those who perceived their neighborhood as being attractive, safe and interesting (OR=1.49, 95%CI= 1.14, 1.95, p=0.003), and that there was support for walking locally (OR=1.8, 95%CI= 1.36, 2.4, p<0.0001) 17. Respondents were more likely to walk as recommended if they were in top quartile of access to public open space (OR=1.43, 95%CI= 1.07, 1.91, p=0.015) and perceived their neighborhood as being attractive, safe, and interesting (OR=1.50, 95%CI= 1.08, 2.09, p=0.017), and supportive of walking locally (OR=1.52, 95%CI= 1.09, 2.11, p=0.014). 18. Those who exercised vigorously were more likely to live in high SES areas (OR=1.00) when compared to low SES (low SES OR= 0.68), to be in the top quartile of access to the beach (OR=1.38, 95%CI= 1.07, 1.79, p=0.013), to perceive their neighborhood as being attractive, safe, and interesting (OR=1.39, 95%CI= 1.08, 1.79; p=0.01); and to claim that there were sidewalks in the neighborhood (OR=1.52, 95%CI= 1.05, 2.21, p=0.027). 19. The greater the number of significant others who exercised weekly with the respondent, the more likely recommended levels of activity were achieved (four or more vs. none, OR=1.37m 95%CI= 0.83, 2.25) test for trend p<0.001). 20. Walking at recommended levels was significantly associated with perceived behavioral control, frequency of a behavioral skill used in past month, intention to be active (high vs. low, OR=1.83, 95%CI= 1.14, 2.94, p=0.13), having a club membership (OR=0.53, 95%CI= 0.39, 0.74, p<0.001), owning a dog (OR=1.58, 95%CI= 1.19, 2.09, p=0.002), social support for physical activity in the past 3 months, and being in the top quartile of access to attractive public open space (OR=1.47, 95%CI= 1, 2.15, p=0.048). 21. In comparison with those who had major traffic and no trees on their street, the odds of achieving recommended levels of walking were nearly 50% higher among those who lived on a street with one or both of these features (combined)R=1.49, 95%CI= 0.96, 2.33, not significant). 22. Relative to respondents in the lowest determinant score categories, the odds of achieving recommended levels of walking were 3.1 times higher among those in the high individual determinant score category (95%CI= 2.2, 4.37, p<0.0001), 2.79 times higher among those in the high social environmental determinant score category (95%CI= 2, 3.9, p<0.0001), and 2.13 times higher among those in the high physical environmental determinant score category (95%CI= 1.54, 2.94, p<0.0001). More associations with socioeconomic, demographic, irregular walking, minutes of walking, social support and attractive environment in text, not shown.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Santos, Silva (2008) Portugal	Access to destinations (land-use mix) and residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Availability of places to be active 2. Aesthetic quality of the neighborhood *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 7330 adult residents of Azorean islands that participated in the Azorean Physical Activity and Health Study. **PRIMARY OUTCOME:** Physical activity(PA) **MEASURES:** 1. Anthropometric measures (self-reported weight and height, body mass index [BMI]) 2. Questionnaire (International Physical Activity Questionnaire [IPAQ] short form items, Environmental Module of the IPAQ items, and educational level [Portuguese Educational System categorization; 4 yrs, 4-9 yrs, 10-12 yrs and higher education] 3. IPAQ short form items(intensity and frequency of physical activity) 4. Environmental Module of the International Physical Activity Prevalence Study questionnaire items (perceptions of residential density, access to destinations [presence and quality of sidewalks, places to bicycle, free or low-cost recreational facilities, land-use diversity, distance to locations], aesthetics, social environment, street connectivity, interpersonal and traffic safety, number of household vehicle, access to public transit, and housing type) **DATA COLLECTION:** Data for the present study was taken from results of the Azorean Physical Activity and Health study. Questionnaires were mailed to adult residents of all islands. The questionnaires were sent through school children to their parents or relatives aged ≥ 18 years.The Environmental Module of the International Physical Activity Prevalence Study questionnairehas previously shown good reliability. Total physical activity was expressed as metabolic equivalent (MET) minutes/ week, by weighting the reported min/week, in each activity category, by the MET specific to each category. **LIMITATIONS:** BMI and education were categorized by very specific criteria;data relied on self-reported variables; study design was cross sectional; proportions of total variability were low; professional physical activity was not controlled	Adults (18 years and older), Azorean The nature of the sampling design was not random and generalizability is limited. **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of Porto in Portugal. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Azorean Government - Department of Sports and by the FCT grants(Portuguese Department of Science) **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Women with a positive overall perception of the dimension infrastructures; access to destinations, social environment, and aesthetics were 32.5% (95%CI= 1.150, 1.528; $p<0.001$) more likely to have a moderate physical activity level and 31.9% (95%CI= 1.121,1.551; $p<0.001$) more likely to have a health enhancing physical activity (HEPA) level. 2. Normal weight women (BMI <25 kg/m^2) with a positive overall perception of the dimension infrastructures; access to destinations, social environment, and aesthetics were 44.5% (95%CI= 1.166,1.791; $p<0.001$) more likely to have moderate physical activity levels, whereas overweight/ obese women (BMI ≥ 25 kg/m^2) 22% (95%CI= 1.007,1.478; $p<0.05$) more likely to have moderate physical activity levels and 34.5% (95%CI=1.080-1.675; $p<0.05$) more likely to have HEPA levels. 3. Normal weight men (BMI<25kg/m^2) with a positive perception of the dimension infrastructures; access to destinations, social environment, and aesthetics were 51.4% (95% CI= 1.091, 2.101; $p<0.05$) more likely to have moderate physical activity levels.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Panter, Jones (2008) England	Residential density **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to indoor and outdoor facilities for physical activity, access to green space and biking and walking facilities for physical activity 2. Street connectivity and neighborhood aesthetics 3. Perceptions of traffic safety *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 401 respondents from six neighborhoods of varying socio-economic deprivation in Norwich, England. **PRIMARY OUTCOME:** Physical activity (PA) **MEASURES:** 1. Questionnaire (personal characteristics, neighborhood perceptions of physical activity, access to facilities, parks, and green spaces, residential density, street connectivity, walking/ cycling facilities including sidewalks and trails, aesthetics, and pedestrian traffic safety) 2. Geographical Information System [ArcGIS] (accessibility of leisure facilities and green spaces from respondent's home) 3. Global Positioning System [GPS] (residential location of each respondent) **DATA COLLECTION:** Questionnaires were delivered in person to each neighborhood during July 2005. Questionnaires were collected after 3 days. The physical activity section of the questionnaire was adapted from the European Prospective Investigation into Cancer Study Physical Activity Questionnaire (ICC >0.68). Respondents were asked whether they agreed with 16 statements, adapted from the Neighborhood Environmental Walkability Survey (NEWS; ICC ≥0.58), related to neighborhood perceptions. A composite scorewas produced from the 16 items whereby a high score indicated a more favorable environment. GIS and the Ordnance Survey digital road network were combined to obtain accurate distances to facilities. Shortest road distance between residence and nearest facility was used. All respondents' scores from the NEWS and the questionnaire were calculated and placed into tertiles, with the highest tertiles having the best scores. **LIMITATIONS:** Cross sectional study design limits ability to determine causality; differential response rate as less affluent members of the population were under-represented; self-reported data; no information on utilization of facilities, quality or cost of the facilities or duration of physical activity	Adults When compared with 2001 census data for the neighborhoods from which the sample was drawn, respondents tended to be older and contain a greater percentage of females. Respondents also tended to be better educated with only 17.5% of local residents reporting a postgraduate qualification in the census compared with 29.4% of survey respondents. **ELIGIBILITY:** Participants were eligible if they were over 16 years of age, able to complete the questionnaire in English and were not precluded from walking because of a disability. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the University of East Anglia, Norwich, United Kingdom. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Participants that reported 5 sessions of activity per week, lived closer to sports facilities (mean distance [standard error] = 1268.9 [104.99], p<0.05) and had higher neighborhood walkability scores (mean= 48.10 [0.79]. p<0.01) than their less active counterparts (mean distance= 1479.9 [34.25] and mean walkability scores= 44.46 [0.37]). 2. Individuals that reported 5 or more weekly aerobic activity sessions gave a higher neighborhood walkability score (mean= 46.05 [0.48]) than individuals who did not (mean =43.79 [0.54]), although this association was not apparent when walking alone was considered (p<0.01). 3. Respondents rating their neighborhood as having intermediate or good walkability were over 3 times as likely to report 5 or more sessions of physical activity per week compared to those who gave the lowest rating (OR= 3.14, p=0.02; and OR= 3.04, p=0.03 respectively). 4. Those who lived in the closest tertile to a park or greenspace were over twice as likely to report five or more sessions of physical activity (OR=2.17, 95% CI= 1.00, 4.78, p≤0.05). 5. None of the associations with access to leisure facilities were statistically significant and were generally in a contrary direction to that expected; those living nearest to the facilities generally reported lower levels of activity than those farther away.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Humpel, Owen (2004); Humpel, Marshall (2004) Australia	Perceptions of community convenience to facilities **OTHER INTERVENTION COMPONENTS:** *Multi-components* 1. Perceptions of traffic safety 2. Access to public transit 3. Accessibility of paths, parks, and other walking opportunities 4. Neighborhood aesthetic quality *Complex* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 800 faculty and general staff (n=398 women, n=402 men) of an Australian university **PRIMARY OUTCOME:** Walking behavior and physical activity (PA) **MEASURES:** 1. Survey (frequency and duration of neighborhood weekly walking, type of walking [e.g., transport] perceptions of neighborhood aesthetics, convenience, access to services, and traffic) 2. International Physical Activity Questionnaire [IPAQ]-short form items (intensity, frequency, and duration of physical activity, total physical activity) 3. Australian Bureau of Statistics 1996 Census data (postal code data, distinguishing coastal from non-coastal regions) **DATA COLLECTION:** The results of this study came from a larger study examining a physical activity intervention trial designed to test the efficacy of a Web site delivered self-help physical activity program in a workplace setting. The researchers administered the survey to participants via telephone and used a rating scale of 1-10 to determine participants' perception of their environment; higher scores meant more positive perceptions of the environment. The intra-class correlation and 95% confidence interval for the total sample were 0.92 (0.88, 0.95). The survey also combined items from the IPAQ-short form, which has been designed and evaluated for reliability and validity by the International Consensus Group on Physical Activity Measurement. Activity categories could be analyzed separately or summed to gain an overall estimate of the total physical activity performed in one week. **LIMITATIONS:** Causality cannot be determined using cross-sectional data; the generalizability of the sample was limited, with the majority having college educations and living in coastal areas, which may also introduce selection bias; specific and detailed environmental characteristics were not accessible through the study design	General Population (target sample) Ages ranged from 18 to 71 years of age (mean age 43 years), 49.8% women (evaluation sample) Participants did not differ in their responses whether they were part of the original sample or follow-up. **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not reported	**LEAD AGENCY:** The research team was from the University of Wollongong, the University of Queensland, and the University of New South Wales. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Heart Foundation of Australia **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Men with moderate aesthetics scores (OR=1.77, 95% CI=1.06, 2.97, p<0.05), high aesthetic scores (OR=1.91, 95% CI=1.08, 3.37, p<0.05), high scores for convenience (OR=2.20, 95% CI=2.21, 3.99, p<0.01) and access (OR=1.98, 95% CI=1.12, 3.49, p<0.05) were more likely to walk in their neighborhood than individuals with lower scores. 2. Men who increased their perception of aesthetics (OR=2.25, 95% CI= 1.24, 4.05, p<0.01) and convenience (OR=1.95, 95% CI=1.10, 3.45, p<0.05) were more likely to have increased walking and twice as likely to have increased walking more than 30 minutes (aesthetics; OR=2.0, 95%CI= 1.12, 3.79, p<0.05, convenience; OR=2.02, 95% CI=1.12, 3.65, p<0.05) compared to men with no perception change. Men with increased perceptions of convenience were also 1.98 (95%CI 1.08, 3.61; p<0.05) times more likely to have increased their walking to more than 60 minutes. 3. Men with a high convenience score were 1.82 times more likely to engage in total physical activity than those with a lower score (95%CI= 1.02, 3.24, p<0.05). 4. Women with increased perceptions of convenience were twice as likely to report increased walking (any increase; OR=2.58; 95%CI=1.46, 4.56, p<0.001, increase of 30 minutes or more; OR=2.31, 95% CI= 1.29, 4.14, p<0.01, increase of 60 minutes or more; OR=2.01, 95%CI= 1.09, 3.70, p<0.05) compared to those who did not positively change perceptions. 5. Participants with a low aesthetic scores at baseline reported a mean relative increase of 0.42 (SD=0.46), whereas those with a high initial scores reported a decrease, with a relative change score of -0.16 (SD=0.18). 6. Participants with low baseline convenience scores reported a mean relative change increase of 0.79 (SD=0.87) and those with high baseline scores reported a relative change decrease of -0.21 (SD=0.22). 7. Participants with low aesthetic scores at baseline reported a mean relative change increase of 0.42 (SD=0.46), whereas those with high scores reported a decrease, with a relative change of -0.16 (SD=0.16). 8. Participants with low baseline convenience scores reported a mean relative change increase of 0.79 (SD=0.87), and those with high scores reported a relative change decrease of -0.21 (SD=0.22). 9. Women with moderate convenience (OR=3.19, 95% CI=1.81, 5.59, p<0.001) and access (OR=1.92, 95% CI=1.10, 3.37, p<0.05 for walking; total physical activity non-significant, p>0.05) were more likely to report higher levels of walking and higher total physical activity, respectively. Women with a high convenience scores were 3.78 times more likely (95% CI=2.12, 6.73, p<0.001) to report the highest levels of neighborhood walking, whereas women with high access scores were 52% less likely (OR=0.48, 95% CI=0.27, 0.87, p<0.05) to walk in the neighborhood when compared to those with low scores. *(continued next page)*

(Continued from previous study)						
						10. Men who perceived traffic as being less of a problem were found to be less likely to have increased their walking across all three outcome variables (any increase in walking; OR=0.40, 95%CI=0.22, 0.72, p<0.01, increase of 30 minutes; OR=0.29, 95%CI=0.15, 0.54, p<0.001, increase of 60 minutes; OR=0.39, 95%CI= 0.21, 0.73, p<0.01). 11. Increased perceptions that traffic was not a problem were significantly associated with women being 1.76 (95%CI=1.01, 3.05, p<0.05) times more likely to have increased their walking for 30 minutes or more. 12. Participants with low initial access scores reported a mean relative change increase of 0.35 (SD=2.14), and a decrease score of -0.24 (SD=0.24) was reported for those with an initial high score. 13. Participants with low baseline scores reporting traffic as a problemhad a relative change increase of 1.13 (SD=1.83), whereas those with high initial scores reported a decrease of -0.2 (SD=0.22).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Craig, Brownson (2002) Canada	Level of urbanization (suburban and urban) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of safety from crime 2. Perceptions of traffic safety 3. Access to public transit 4. Street connectivity and aesthetic quality *Complex:* 1. Social support in the environment	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** Approximately 296,541residents from a convenience sample of 27 neighborhoods in Ontario, Quebec, and Alberta. **PRIMARY OUTCOME:** Walking behavior **MEASURES:** 1. 1996 Canadian Census self-administered questionnaire (education, income, mode of transportation, family size) 2. Neighborhood observations (number of facilities, mix of facilities, accessible to pedestrian, potential to see other people, walking routes, meets pedestrians' needs, connection to transport modes and traffic, amount and variety of stimuli, aesthetics, time and effort, traffic threats, safety from crime, potential for crime) **DATA COLLECTION:** The current study was designed to merge data from two Canadian sources, a neighborhood observational study (27 observations) and the 1996 Canadian Census. Data collectors received a two-day training before conducting observations. Ratings were compiled for the neighborhoods using a ten-point Likert-type scale between late fall 1999 and early spring 2000 to obtain an environment score. Observations were taken during the morning and afternoon over both weekday and weekend days. In a small sub-study, the same observers independently coded environmental factors in two or four assigned neighborhoods, which yielded 156 values .3-level hierarchical linear models estimated inter-rater reliability, correlations ranged from 0.9-1.0. One fifth of the Census respondents received a longer version, including questions on education, income, and usual mode of transportation to work, with the latter including "walking to work" as a distance response category. The environment score came from 18 items taken from the survey linked to land-use mix, street connectivity, social support, aesthetics, safety, and access to places to walk. **LIMITATIONS:** Cross-sectional study design does not allow for causal or temporal inferences to be made; distance of destination was not accounted for in the study design	General Population (target population) The observed neighborhoods were known for diversity of urban design, social class, and economic status. **ELIGIBILITY:** All citizens, landed immigrants, and nonpermanent residents were eligible to participate. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the Canadian Fitness and Lifestyle Research Institute, Saint Louis University, and the Cooper Institute for Aerobics Research. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Physical Activity Unit, Health Canada, Government of Canada **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Walking to work was significantly related to the environment score (T-ratio (25)=3.32, p=0.003), with a one-unit increase in the score being associated with a 25-percentage-point increase in the percentage walking to work. 2. The degree of urbanization altered the relationship between the environment score and walking to work (no statistical data). 3. The environment score was related to the percentage walking to work, controlling for degree of urbanization (T-ratio (23)=2.03, p=0.054; Coefficient=0.02). **OTHER:** 4. The predicted environment score was lower in both small urban (T-ratio (23)=-3.61, p=0.002; Coefficient; -0.77) and suburban neighborhoods (T-ratio (23)=-4.42, p<0.0001; Coefficient=-0.12) than in urban neighborhoods. 5. The environmental factor coefficients ranged from -1.82 to 2.20.Each factor was a significant contributor to the variation of the environment score (mean p=0.10 for "transportation system" and p<0.05 for other factors), except for visual interest and aesthetics.The inclusion of environmental factors (destinations, social dynamics, transportation system, and traffic) reduced the variation in the score by 46%.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Bjork and Albin (2008) Sweden	Presence and absence of 5 recreational values (types of natural environment: serene, wild, lush, spacious, culture), distance to natural spaces, and neighborhood satisfaction **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported **COMPLEX:** Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 24,819 total individuals living in the Scania region in southern Sweden on June 2004 **PRIMARY OUTCOME:** Overweight/obesity and moderate physical activity (MPA) **MEASURES:** 1. Anthropometric (self-reported height and weight used to calculate body mass index [BMI]) 2. Public Health Survey (satisfaction of neighborhood environment, time spent on moderate physical activity per week and self-related physical and psychological health, presence or absence of recreational values [serene, wild, lush, spacious, and culture], distance to natural environment from residence) **DATA COLLECTION:** This study was based on data from an extensive public health survey distributed as a mailed questionnaire in the Scania region in Southern Sweden. Answers were obtained during September 2004 to January 2005. Researchers assessed the presence/absence of each of the five recreational values within 100-300 meters from the center of the property at each geocoded residential address. Data for the natural neighborhood environment were obtained from Lantmateriet (the National Land Survey of Sweden) that mapped the land and vegetation cover of Sweden into approximately 58 classes, using 25 x 25 meter grids. Regional GIS databases from the County Administrative Board of Scania were also used. **LIMITATIONS:** Reasonable overall validity of self-reported BMI was observed in a recent Swedish study but the fraction of obesity was markedly underestimated compared with actual measurements; cross-sectional setup limits definite conclusions of cause and effects; low participation rate within population may be a threat to validity	Adults 54.3% Female Rural and Suburban **ELIGIBILITY:** Only rural and suburban areas were included; participants from inner-city areas were excluded. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Research team from Lund University Hospital in Sweden **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not reported **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. There was a weak overall negative correlation between the number of recreational values within 300 meters distance from the residence and BMI ($p=0.04$). 2. The proportion of obese ($BMI>30kg/m^2$) individuals among tenants was 17% in residences with zero recreational values within 300 meters compared with 13% in residences with at least one recreational value present. **PHYSICAL ACTIVITY:** 3. There was a clear positive correlation between the number of recreational values present within 300 meters distance from the residence and time spent on moderate physical activities every week ($p<0.001$, see figure in text). **OTHER:** 4. The number of recreational values near the residence was positively correlated with neighborhood satisfaction ($p<0.001$ both for 100 and 300 meters, see figure). 5. There was a positive correlation between the number of recreational values and good self-rated health for 300 meters ($p=0.03$) but not for 100 meters distance from the residence ($p>0.30$). 6. Vitality correlated positively with the numbers of recreational values both within 100 and 300 meters distance from the residence ($p=0.02$ and $p<0.001$).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Riva, Gauvin (2007) Canada	Distance to facilities and neighborhood design **OTHER INTERVENTION COMPONENTS:** *Multi-component:* Not reported *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1006 adults from 22 non-contiguous areas in three Canadian provinces (Alberta, Ontario, and Quebec). Overall, 13 local areas were sampled in large urban centers, and a further three local areas were sampled in each of the suburban, small urban and rural environments. **PRIMARY OUTCOME:** Use of physical activity facilities **MEASURES:** 1. Interviews adapted from the Canadian Community Health Survey (use of local area activity facilities, type and levels of physical activity, age, educational attainment, and socio-economic status) 2. Walking tours/audits, phone book, word of mouth, and internet searches (location and number of physical activity facilities) **DATA COLLECTION:** The present data was part of a larger project designed to study public health infrastructures, policies and practices in Canada. Telephone interviews were conducted in the fall of 2000 by trained research members. Physical activity levels were categorized as low (70–90 min per week), average (135–180 min per week), and high volume vigorous exercisers (270–360 min per week). Local areas were categorized into three groups: those having an average household income below $40,000; those between $40,000 and $60,000; and those having an average household income above $60,000. Local areas were situated in four types of communities: large urban centers, small urban centers, suburban areas, and rural areas. As part of the larger research project, a list of organizations offering physical activity programs and services to the adult population in each of the 22 local areas was compiled. A ratio of number of facilities per 1000 inhabitants was computed and modeled as a continuous variable. **LIMITATIONS:** Cross-sectional nature limits ability to make causal inferences and ascertain whether individuals self-selected their resident neighborhoods because of activity opportunities	Adults General population 49% Women 51% Men (evaluation sample) **ELIGIBILITY:** Eligible participants were required to have resided at their current address for at least 12 months, be able to communicate in French or English, and participate in at least 15-30 minutes of vigorous-physical activity 3 times per week. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the Interdisciplinary Research Group on Health, the University of Montreal and the Lea-Roback Research Center on Social Inequalities of Health of Montreal, Canada. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Health Research and Development Program **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Women living in small local urban areas were significantly more likely to use facilities in their area for involvement in physical activity than women residing elsewhere (OR = 2.68; 95% CI= 1.15, 6.23, p<0.05). 2. Women reporting average and higher involvement in vigorous physical activity were more likely to use facilities to engage in physical activity than lower exercisers (the difference in facility use between average and high exercisers was not statistically significant; $\chi^2(1) = 0.05$; p> 0.50). 3. For men, none of the selected individual characteristics was significantly associated with the likelihood of using local facilities for physical activity.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Potwarka, Kaczynski (2008) Canada	Proximity to parks and facilities in neighborhood **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Availability of Parks *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 108 (55 aged 2-9; 53 aged 10-17) children in a mid-sized city in Ontario, Canada **PRIMARY OUTCOME:** Overweight/obesity (body mass index [BMI]) **MEASURES:** 1. Height and weight (BMI) 2. Geographic Information Systems [GIS] mapping of municipal data sets(number [within 1-km radius] and size of parks, distance between home and parks [ICC=0.98 with Cartesian mapping]) 3. Municipality database (park size) 4. Environmental Assessment for Public Recreation Spaces [EAPRS](absence or presence of paved trails, unpaved trails, paths, open spaces, playgrounds, meadows, wooded areas, water areas, soccer pitches, ball diamonds, tennis courts, basketball courts, and swimming pools) **DATA COLLECTION:** The present study used data from previous research conducted in August of 2006. All parks were visited by a trained observer who used the EAPRS instrument (ICC=0.88) **LIMITATIONS:** There was a lack of variability in the predictor variable and it was excluded from analyses; parents reported child's height and weight; parks closest to children's residences may not be the parks that children visit	2-17 year old, mean age was 9.6 ± 5.1 years, 55.6% Male, 68.5% healthy weight, 31.5% at risk/overweight (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team from the University of Waterloo **THEORY/ FRAMEWORK:** Ecological model **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Compared to at-risk or overweight children, none of the 3 park variables (distance to the closest park, number of parks within 1 km, or amount of park area within 1 km) was associated with significantly increased odds of being classified in the healthy weight category for either the entire sample or either of theage sub groups. 2. Of the 13 park facilities examined, only one variable was a significant predictor of a child's weight category. Children with a park playground within 1 km of their home were almost 5 times more likely to be classified as being of a healthy weight than those children without playgrounds in nearby parks (OR=4.92; 95% CI=1.36, 9.71).No significant associations were found for the other park facilities or when the age sub-samples were examined. 3. No significant associations were found for the other park facilities or when the two age sub-samples were examined. [No p-values provided]

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Wendel-Vos, Schuit (2003) Netherlands	Distance to parks within the neighborhood **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Neighborhood access to green space and parks *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 11541 residents in and around Maastricht, The Netherlands **PRIMARY OUTCOME:** Walking and cycling behavior and active commuting **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Questionnaire (demographic factors, perceived health status) 3. Short Questionnaire to Assess Health Enhancing Physical Activity [SQUASH] (frequency, duration, and intensity of 4 domains of physical activity [commuting activities, occupational physical activity, household activity, and leisure-time physical activity]) 4. Geographic Information Systems [GIS] databases of Statistics Netherlands (land utilization, amount of green and recreational space [e.g., woods, parks, sport grounds, allotments for growing vegetables]) 5. Municipal Health Service examination (physical health assessment) **DATA COLLECTION:** Data for the present study was taken from 2 National Institute for Public Health and the Environment monitoring studies conducted from 1987-1992 and 1993-1997. GIS databases were coded at the level of postal codes. Two neighborhoodsaround the six postal codes were defined; one with a radius of 300 m and one with a radius of 500 m. For every neighborhood, the square meters of woods, parks, sport grounds, allotments, and day-trip grounds within the 300-and 500-m radius neighborhoods were calculated using GIS. Every individual was linked to a neighborhood through his/her postal code and every postal code was linked to an amount of square meters of green or recreational space. In a previous study, the SQUASH was validated with a CSA activity monitor and achieved a correlation coefficient for validity of 0.45(95% CI=0.17, 0.66) and a reproducibility of 0.44-0.96. **LIMITATIONS:** GIS databases are not sufficient to fully describe the association under study; cross-sectional study design; use of self-report data; information in the GIS databases was probably aggregated to a higher level than necessary	General population 46% Men, 54% Women, 20-59 years old, mean age of 49 yrs (evaluation sample) **ELIGIBILITY:** All participants signed a consent form. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the National Institute for Public Health and the Environment, the Netherlands; Wageningen University, the Netherlands; and Nutrition and Toxicology Research Institute at Maastricht University, the Netherlands. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. In neighborhoods within a 300m radius, inhabitants spent more time biking for leisure (β=0.04, 95%CI= 0.0, 0.07, p<0.05) and commuting purposes (β=0.02, 95%CI= 0.01, 0.04, p<0.05) where there was more square area of sports ground. 2. The association between biking during leisure time and square area of sports grounds was not present in neighborhoods with a 500m radius. 3. There was an association between biking for commuting purposes and the square area of parks in neighborhoods within a 300-m radius (β=0.02, 95%CI= 0.01, 0.04, p<0.05). 4. No associations were found for attributes of green and recreational space and walking. 5. There was an association between square area of sports ground and total time spent biking and walking (β=0.06, 95%CI= 0.01, 0.1, p<0.05).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kaczynski, Potwarka (2009) Canada	Distance to parks within the neighborhood and total neighborhood used for park space **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Availability of parks, presence and absence of amenities *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 384 participants (241 were female) **PRIMARY OUTCOME:** Moderate-strenuous physical activity (PA), park-based physical activity **MEASURES:** 1. Geographic Information System [GIS] data (distance to park, participant address) 2. 7-day physical activity log booklet (duration, intensity, location, and other details of physical activity) (n=384 reported physical activity episodes; n=218 physical activity episodes in the park **DATA COLLECTION:** In August 2006 trained research assistants distributed study packages door-to-door to adults, which would be collected 10 days later. Based on GIS-produced municipal maps, the four study areas contained a total of 33 municipal parks. Another 19 parks within a buffer zone of 800 meters (m) around each neighborhood also were included in the analysis to account for participants' potential use of parks falling outside the relatively artificial boundaries of defined neighborhoods. According to the municipality's database, the 52 parks ranged in size from .10 to over 232 hectares (1 hectare equals just under 2.5 acres) and possessed various facilities, amenities, and terrain. Weekly minutes of moderate-to-strenuous physical activity was reported in 3 contexts (i.e., total, neighborhood-based, and park-based). Activity totals were calculated based on the weekly log booklets and were dichotomized as "no moderate to strenuous physical activity" and "150-minutes of moderate to strenuous physical activity (threshold of 150 from Healthy People 2010). Euclidean distance between each participant's home and each park was calculated and a tally of the number of parks within a 1 km radius was obtained. **LIMITATIONS:** Data was self-reported; cross sectional study design does not allow causal inferences to be made	Adults (18-88 years of age, mean age 45.8 ± 15.6 years), General Population, 62.8% Female (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from Kansas State University and the University of Waterloo. **THEORY/ FRAMEWORK:** Social ecological model **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Not reported **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Each additional hectare (i.e., 2.47 acres) of park area within 1 km increased the odds of participating in 150 or more minutes of total moderate-strenuous physical activity by 2% (OR=1.02, 95% CI= 1.01, 1.03, p<0.05) and each additional park increased the odds of participating in 150 or more minutes of neighborhood-based moderate-strenuous physical activity by 17% (OR=1.17, 95% CI= 1.01, 1.34, p < 0.05). 2. Both the number and total area of parks within 1 km were significant predictors of "park-based moderate-to-strenuous physical activity," with each additional park within 1 km of participants' homes increasing the odds of engaging in some park-based physical activity by 15% (OR= 1.15, 95% CI= 1.01, 1.28, p<0.05). 3. Distance to the closest park did not play a significant role in predicting moderate-to-strenuous physical activity in any of the three contexts. 4. For neighborhood based activity, significant results were observed among females with each additional park and each additional hectare of park area within 1 km increasing their odds of engaging in 150 or minutes of moderate-to-strenuous physical activity by 19% and 2%, respectively (OR= 1.19,95% CI= 1.03, 1.36 and OR= 1.02,95% CI= 1.01, 1.03, respectively p<0.05 for both). 5. Among men, the odds of engaging in some amount of moderate-to-strenuous physical activity in parks increased 2% with each additional hectare of nearby parkland (OR= 1.02, 95% CI= 1.01, 1.03, p<0.05). 6. Among women, each additional hectare was related to a 3% increase and each additional park to a 17% increase in engaging in at least some moderate-to strenuous park-based physical activity (OR= 1.03, 95% CI= 1.01, 1.05, OR= 1.17, 95% CI= 1.02, 1.31, respectively, p<0.05 for both). 7. Both the number and total area of parks within 1 km of participants' homes increased the odds of engaging in some park-based moderate-to-strenuous physical activity among both the 18–34 year olds (number; OR= 1.19,95% CI= 1.03, 1.33, and total; OR=1.03, 95% CI= 1.01, 1.04, n=107) and the 55 and older (number OR= 1.16, 95% CI= 1.01, 1.31, n=104 and total; OR= 1.04, 95% CI= 1.03, 1.05 age group (p<0.05 for all). 8. No significant relationships between the 3 park variables and any physical activity measure were observed among adults 35-54 years(n=167).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Veugelers, Sithole (2008) Nova Scotia, Canada	Access to shops (mixed land-use) **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Neighborhood access to parks, playgrounds and recreational facilities 2. Access to a safe neighborhood 3. Access to shops with moderately priced fresh produce *Complex:* Not reported	**DESIGN:** Cross-sectional study **INTERVENTION DURATION:** Not applicable **SAMPLE SIZE:** 4966 5th grade students from 282 elementary schools **PRIMARY OUTCOME:** Overweight/obesity and sports engagement, consumption of fruits and vegetables, sedentary behavior **MEASURES:** 1. Children's height and weight (N=4298) 2. Parental survey (socioeconomic status, neighborhood characteristics, child physical activity) 3. Child Harvard Food Frequency questionnaire (# daily servings of fruits and vegetables [F&V], % energy obtained from dietary fat) **DATA COLLECTION:** Children's height and weight measurements were collected by research assistants and public health staff. Children's physical activity was based on parental responses and characterized in terms of number of times per week the child engages in sports with/without a coach and number of hours per day child spends playing video games, watching TV or using the computer. Based on the food frequency questionnaire, diet was characterized in terms of: number of daily servings of F&V, % energy obtained through dietary fat, and a diet quality index. **LIMITATIONS:** Study participation rates were slightly lower in residential areas with lower average household income, so the authors calculated response weights to overcome potential non-response bias	5-13 year olds, 10.8% lower-income (income <20,000) (evaluation sample) **ELIGIBILITY:** Children whose parents did not complete the parental survey, or who reported energy intakes less than 500 kcal or greater than 5,000 kcal per day were excluded from data analysis (n=1173). **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from the University of Alberta and the University of Saskatchewan. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Canadian Population Health Initiative, Canadian Institute of Health Research New Investigator Award, Canada Research Chair in Population Health Scholarship, and Alberta Heritage Foundation for Medical Research Scholarship **STRATEGIES:** Not applicable	**OVERWEIGHT/OBESITY:** 1. Children in neighborhoods with good access to playgrounds and parks were 24% less likely to be overweight (OR=0.76, 95% CI=0.62, 0.95) and 29% less likely to be obese (OR=0.71, 95% CI=0.53, 0.99) than children in neighborhoods with poor access. 2. Children in neighborhoods with good access to recreational facilities were 29% less likely to be overweight (OR=0.71, 95% CI=0.56, 0.90) and 42% less likely to be obese (OR=0.58, 95% CI=0.40, 0.84) than children in with poor access. 3. Children in neighborhoods with good access to shops were 26% less likely to be overweight (OR=0.74. 95% CI=0.60, 0.91) and 33% less likely to be obese (OR=0.67, 95% CI=0.48, 0.94) than children from neighborhoods with poor access to shops. 4. No association between neighborhood safety and overweight and obesity. **PHYSICAL ACTIVITY:** 5. Children in neighborhoods with good access to playgrounds, parks and recreational facilities engaged more in sports with a coach than children in neighborhoods with poor access (Incremental Risk (IR)=1.64, 95% CI= 1.38, 1.95; IR=1.76, 95% CI= 1.47, 2.12, respectively). 6. Children in safe neighborhoods engaged more in sports without a coach than children in unsafe neighborhoods (OR=1.23, 95% CI= 1.04, 1.46). **NUTRITION:** 7. Children in neighborhoods with the best access to shops (highest one-third) reported more consumption of F&V (IR=1.04, 95% CI= 1.00, 1.09), substantially less consumption of dietary fat (IR=0.51, 95% CI= 0.33, 0.78), and a higher diet quality index (IR=2.26, 95% CI= 1.09, 4.69) in comparison to neighborhoods with the poorest access to shops (lowest one-third). **SCREEN TIME:** 8. Children in neighborhoods with good access to playgrounds, parks and recreational facilities spent less time in front of a computer or TV screen than children in neighborhoods with poor access (IR=0.72, 95% CI= 0.62, 0.84; IR=0.64, 95% CI= 0.55, 0.75, respectively). [no p-values provided]

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Humpel, Owen (2004) Australia	Distance to facilities **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of neighborhood safety 2. Access to areas for physical activity (beach, lake, facilities) 3. Aesthetic quality of the neighborhood *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 399 respondents: clients from a health insurance organization **PRIMARY OUTCOME:** Neighborhood walking, walking for exercise, and walking for pleasure **MEASURES:** 1. Neighborhood Environment Walkability Scale [NEWS]- (adapted measures on environment attributes including aesthetics, accessibility, safety, and weather) 2. Self-reported survey (walking for transport, exercise, and pleasure, walking frequency, walking duration, postal codes, and sociodemographics) 3. 1996 Australian Bureau of Statistics Census data (coastal and non-coastal locations) **DATA COLLECTION:** The survey was sent in the spring. Reported frequency of walking was multiplied by the number of usual minutes, to give an index of estimated minutes of walking each week, for each type of walking. Reliability of the neighborhood walking item had been examined previously. Neighborhood environment attribute items were collected from previous studies and theNEWS items (valid instrument, ICC range 0.73-0.91).The scores of aesthetics, accessibility, safety, and weather were transformedinto categorical variables with three levels: low, a less positive perception of the environment; moderate; or a highly positive perception of the environment. A structured query language identifiedpostal areas that intersect the coastline for non-coastal (27%) and coastal (73%) locations. **LIMITATIONS:** Causal inferences cannot be made using a cross-sectional study design; survey data was self-reported; there was a low response rate; the sample was from an extremely specified primarily coastal region	Adults 57% Female **ELIGIBILITY:** A list of clients aged >40 years from a health insurance organization were eligible for the study. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers from the University of Wollongong, the University of Queensland, and the University of New South Wales **THEORY/ FRAMEWORK:** Ecologic model of health behavior **EVIDENCE-BASED:** Previous Australian studies have found physical activity to be higher among coastal residents, after adjusting for education attainment and other demographic factors. **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not applicable **PROCESS EVALUATION:** Not applicable	**RESOURCES:** Not applicable **FUNDING:** The Carelink, a division of the Australian Health Management Group, a registered health benefits organization **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. A higher proportion of those with the most positive perceptions for all four environmental perception categories reported more neighborhood walking (data not shown). 2. Higher proportions of neighborhood walkers were found among those with high perceptions for aesthetics (66.7%; χ^2=17.08, p<0.001). 3. Significantly higher proportions of those walking for exercise were found among those with the most positive perceptions for all four environmental perception categories (results not shown). 4. A higher proportion of those with the most positive perceptions for accessibility reported more walking for pleasure (45.2%; χ^2=7.28, p<0.05). 5. No significant differences in proportions were found for walking to get from place to place. 6. Participants living in coastal locations (mean [M]=189 minutes) walked significantly more minutes in their neighborhood (F(1,382)=5.10, p<0.05) than did participants in noncoastal locations (M=149 minutes). 7. Participants reporting that a beach/lake was within easy walking distance reported significantly more neighborhood walking minutes (M=224) than did those reporting a beach/ lake was not within walking distance (M=139; F(2,379)=11.0, p<0.0001); significantly more exercise walking (M=163 compared to M=100 minutes; F(2,382)=9.72, p<0.001); and significantly more walking for pleasure compared to those perceiving that a beach/lake is not within walking distance (M=33 and M=21, respectively; F(2,380)=3.88, p<0.02). 8. Men with the most positive perceptions about the aesthetic nature of the environment were more than seven times more likely to be high neighborhood walkers (OR=7.43; 95%CI= 1.92, 28.82; p<0.05). 9. For men, accessibility of facilities for walking demonstrated a negative relationship with neighborhood walking (for high walkers: OR=0.30; 95% CI= 0.09, 0.91; p<0.05). 10. No evidence of a relationship between safety and neighborhood walking was found for men or women. 11. Men with a high score on aesthetics were nearly four times as likely to walk for exercise (OR=3.86; 95%CI= 1.03, 14.46; p<0.05). 12. Men who perceived their environment as highly safe for walking were less likely to walk for pleasure (OR=0.22; 95% CI= 0.06, 0.78; p<0.05). 13. Women with moderately positive perceptions about accessibility were more than three times more likely to walk for pleasure (OR=3.51; 95% CI= 1.64, 9.15, p<0.01).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Utter, Denny (2006) New Zealand	Distance to community locations **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Neighborhood safety 2. Accessibility of community-based recreational facilities and physical activity resources *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 9,699 high school students **PRIMARY OUTCOME:** General and vigorous physical activity **MEASURES:** 1. Survey (intensity [vigorous and regular vigorous], frequency, and duration of physical activity, motivation for exercise, partners to exercise with, neighborhood safety, perceived opportunities for physical activity [within walking distance from home], age, sex, ethnicity, socioeconomic status) **DATA COLLECTION:** Data for the current study was collected as part of Youth2000, the New Zealand national youth health survey completed during 2001. If students chose more than one ethnicity they were assigned an ethnic category following the New Zealand Census Prioritization Method. Participation in vigorous activity was determined by 2 questions about frequency and duration of doing an activity that "makes you sweat or breathe hard or gets your heart rate up." Regular vigorous activity was defined as doing that activity at least 3 days per week for at least 20 minutes. **LIMITATIONS:** Access to community facilities was based on participation not objective measurement; survey data was self-reported	13-17 year olds No racial/ethnic demographics given. Participating students were demographically similar to the general New Zealand population of young people aged 13 to 17 years. **ELIGIBILITY:** Informed consent was obtained. Eligible participants were in high school. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team from the University of Auckland **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** The Health Research Council of New Zealand **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Students were significantly more likely to engage in regular vigorous activity when they lived within walking distance of the following perceived community features: a park (OR=1.17, 95% CI= 1.1, 1.3), a skateboard ramp (OR=1.32, 95% CI= 1.2, 1.5), a sports field (OR=1.59, 95% CI= 1.4, 1.8), a swimming pool (OR=1.38, 95% CI= 1.2, 1.5), a gym (OR=1.44, 95% CI= 1.3, 1.6), and a bicycle track (OR=1.44, 95% CI= 1.3, 1.6). Note: students could respond yes to more than one facility. 2. Students were significantly less likely to engage in activity if they perceived there was nothing to do where they lived (OR=0.78, 95% CI= 0.7, 0.9). 3. Neighborhood safety was positively associated with participation in regular physical activity (OR=1.46, 95% CI= 1.3, 1.6).

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Kaczynski, Potwarka (2008) Canada	Distance to neighborhood features **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Access to parks and park amenities (water fountain, toilet, trash can, bench, bike rack) *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 380 residents from 4 neighborhoods (2 mixed-use, grid-like street patterns; 2 residential, curvilinear street patterns) in a medium-sized city in Ontario, Canada **PRIMARY OUTCOME:** Park-based physical activity **MEASURES:** 1. 7-day Physical Activity Log (duration, intensity, and location of physical activity) 2. Environmental Assessment for Public Recreation Spaces [EAPRS](presence or absence of 28 park features, facilities [trails, open space, playgrounds], and amenities [water fountain, toilet, trash can, bench, shelter, bike rack]) 3. Neighborhood Environment Walkability Survey [NEWS](perceptions of neighborhood safety and aesthetics) 4. Geographic Information Systems [GIS](mapped neighborhoods [street and park layers],geo-coded residences, calculated distance to each park) 5. Municipality database(park size) **DATA COLLECTION:** In late summer 2006, trained research assistants went door-to-door to distribute and explain study packages. 10 days later staff returned to collect completed forms. Staff coded the location descriptions for each physical activity episode for use of a park within the participants' neighborhood. Park and physical activity data were collected during the same period. Two trained researchers observed parks using the EAPRS tool during August 2006 (ICC=0.81). The NEWS was collected within 500 meters of each park to calculate measures of safety and aesthetics using 12 items on a 4 point scale. **LIMITATIONS:** Use of straight-line rather than street-network distance from parks to homes may have affected the observed importance of distance; neither objective crime data around the parks nor data describing the safety of individual parks were collected	Adults, 18-88 years old with mean age of 45.8 years, 36.2% men (evaluation sample) **ELIGIBILITY:** Not reported **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** Researchers were from the University of Waterloo, the Seattle Children's Hospital Research Institute, and the Department of Pediatrics at the University of Washington. **THEORY/ FRAMEWORK:** Not reported **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** National Cancer Institute of Canada via the Socio-behavioral Cancer Research Network and the Centre for Behavioral Research and Program Evaluation at the University of Waterloo **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Of the 3 park variables (i.e., size, features, distance), only the number of features was a significant predictor of a park being used for some physical activity (OR=1.45, 95% CI= 1.09, 1.82, p=0.03). 2. Only the number of facilities was significantly associated with increased odds of at least some physical activity occurring in the park (OR=2.04, 95% CI= 1.05, 3.96, p=0.03). 3. The presence of paved trails (OR=25.93, 95% CI=2.15, 312.51, p=0.01), was significantly related to park-based physical activity.

Source	Intervention Components	Study Design and Execution	Reach	Adoption, Implementation and Process Evaluation	Enforcement/ Sustainability	Impacts and Outcomes
Li, Dibley (2006) China	Access to shops in the neighborhood **OTHER INTERVENTION COMPONENTS:** *Multi-component:* 1. Perceptions of safety from crime 2. Presence and absence of sidewalks 3. Access to recreational facilities (playgrounds, gyms, sports equipment, and public open spaces) 4. Access to physical activity during recess *Complex:* Not reported	**DESIGN:** Cross-sectional study **DURATION:** Not applicable **SAMPLE SIZE:** 1787 adolescents attending 30 junior high schools in Xi'an, China **PRIMARY OUTCOME:** Sedentary behavior **MEASURES:** 1. Height and weight (body mass index [BMI]) 2. Adolescent Physical Activity Recall Questionnaire (time spent in organized or non-organized activities over an average week) 3. Parent Questionnaire (sociodemographic and environmental factors at the community and household levelsincluding recreation facilities in the community, places around the home for children to play, level of residence, safety concerns, parents' involvement with children doing exercise, household facilities for playing games, and family rules for playing games) 4. School Doctor Questionnaire (environmental factors at the school level[availability of playgrounds, gyms, sports equipment, sports meetings, recess exercises, physical education, bicycle riding policies]) **DATA COLLECTION:** Questionnaires were completed by adolescents, parents, and school doctors. Trained research staff measured the students' height and weight. Environmental factors used for survey items were based on focus group identification with student, parents, and school doctors. An expert panel reviewed items and studies conducted in Western countries. **LIMITATIONS:** Causal inferences cannot be made using cross-sectional data; socially desirable responses may have influenced respondents; questionnaires measuring environmental factors were not validated for use in a Chinese city	Urban, 11-17 year olds **ELIGIBILITY:** Participants provided written informed consent. **EXPOSURE/ PARTICIPATION:** Not applicable	**LEAD AGENCY:** The research team was from the Xi'an Jiaotong University and the University of Newcastle. **THEORY/ FRAMEWORK:** A conceptual framework was developed and linked to physical activity in adolescents. **EVIDENCE-BASED:** Not reported **REPLICATION/ ADAPTATION:** Not applicable **ADOPTION:** Not applicable **IMPLEMENTATION:** Not applicable **FORMATIVE EVALUATION:** Not reported **PROCESS EVALUATION:** Not reported	**RESOURCES:** Not applicable **FUNDING:** Health Consequences of Population Change Program of the Welcome Trust **STRATEGIES:** Not applicable	**PHYSICAL ACTIVITY:** 1. Access to public facilities (OR= 1.4, 95% CI=1.0, 1.9, p=0.03 for moderate access and OR= 1.7, 95% CI=1.2, 2.4, p<0.01 for difficult access) and concerns about neighborhood safety (OR= 2.1, 95% CI=1.1, 4.1, p=0.03) were positively associated with inactivity. 2. Lack of recreational facilities was associated with a higher percentage of inactivity in girls (OR=2.4, 95%CI= 1.6, 3.5, p<0.001). 3. Perceived unsafe neighborhoods were associated with a higher percentage of inactive adolescents, but the difference was not statistically significant (p=0.08). **OTHER:** 4. Lack of extracurricular sports (OR= 1.3, 95% CI= 1.1, 1.6, p=0.01) and sports meetings (OR= 2.0, 95% CI=1.4, 2.9, p<0.01) were significantly associated with physical inactivity, but physical education was inversely associated with inactivity (OR= 3.1, 95% CI=1.6, 6.0, p<0.01 for twice a week and OR= 2.6, 95% CI=1.3, 5.1, p=0.01 for three times a week). 5. Lack of recess exercise or sports meetings was associated with higher percentages of inactivity in boys (OR=2.2, 95% CI= 1.2, 4.0, p=0.02 and OR=1.5, 95% CI= 1.0, 2.2, p=0.05, respectively). 6. For boys, lack of class recess sports (OR= 2.2, 95% CI=1.2, 4.0, p=0.02) and sports meetings (OR= 1.5, 95% CI= 1.0, 2.2, p=0.05) were associated with low levels of physical activity, and boys at schools forbidding bike riding to school were 60% less likely to be inactive (OR= 0.4, 95% CI= 0.2, 0.8, p=0.02). 7. For girls, fewer sports meetings (OR= 1.7, 95% CI= 1.03, 2.8, p=0.04) was associated with inactivity. 8. Adolescents living in a house without sidewalks were 30% more likely to be inactive (OR= 1.3, 95% CI= 1.0, 1.6, p=0.01). 9. Adolescent boys living in surroundings without vacant fields were 1.7 times (95% CI= 1.2, 2.5, p=0.01) more likely to be inactive. 10. Unavailability of video game shops around the home was associated with a higher percentage of inactive boys (OR=1.5, 95% CI= 1.1, 2.1, p=0.02). 11. Lack of sidewalks around the house was associated with physical inactivity in girls (OR= 1.5, 95% CI= 1.04, 2.0, p=0.03).

REFERENCES

Atkinson, J.L., Sallis, J. F., Saelens, B. E., Cain, K. L., & Black, J. B. (2005). The association of neighborhood design and recreational environments with physical activity. *American Journal of Health Promotion*.19(4):304-9.

Aytur, S.A., Rodriguez, D.A., Evenson, K.R., and Catellier, D.J. (2008).Urban containment policies and physical activity.A time-series analysis of metropolitan areas, 1990-2002.*American Journal of Preventive Medicine*.34(4): 320-32.

Aytur, S.A., Rodriguez, D.A., Evenson, K.R., Catellier, D.J., and Rosamond, W.D. (2007).Promoting active community environments through land use and transportation planning.*American Journal of Health Promotion*. 21(4 Suppl): 397-407.

Ball, K., Bauman, A., Leslie, E., & Owen, N. (2001). Perceived environmental aesthetics and convenience and company are associated with walking for exercise among Australian adults. *Preventive Medicine*.33(5):434-40.

Bell, J.F., Wilson, J.S., Liu, G.C. (2008). Neighborhood greenness and 2-year changes in body mass index of children and youth. *American Journal of Preventive Medicine*.35(6):547-53.

Berrigan, D. and Troiano, R.P. (2002).The association between urban form and physical activity in U.S. adults.*American Journal of Preventive Medicine*.23(2 Suppl): 74-9.

Bjork, J., Albin, M., Grahn, P., Jacobsson, H., Ardo, J., Wadbro, J., et al. (2008). Recreational values of the natural environment in relation to neighbourhood satisfaction, physical activity, obesity and wellbeing. *Journal of Epidemiology and Community Health*.62(4):e2.

Boehmer, T.K., Lovegreen, S.L., Haire-Joshu, D., Brownson, R. (2006). What Constitutes an Obesogenic Environment in Rural Communities? *The Science of Health Promotion*.20(6):411-421.

Boer, R., Zheng, Y., Overton, A., Ridgeway, G.K., andCohen, D.A. (2007).Neighborhood design and walking trips in ten U.S. metropolitan areas. *American Journal of Preventive Medicine*.32(4): 298-304.

Brown, A. L., Khattak, A. J., Rodriguez, D.A. (2008). Neighborhood types, travel and body mass: A study of new urbanist and suburban neighborhoods in the US. *Urban Studies*. 45(4): 963-988.

Brownson, R.C., Baker, E.A., Housemann, R.A., Brennan, L.K., Bacak, S.J. (2001). Environmental and policy determinants of physical activity in the United States.*American Journal of Public Health*. 91(12):1995-2003.

Brownson, R.C., Housemann, R. A., Brown, D. R., Jackson-Thompson, J., King, A. C., Malone, B. R., & Sallis, J. F. (2000). Promoting physical activity in rural communities: walking trail access, use, and effects. *American Journal of Preventive Medicine*.18(3):235-41.

Burdette, H.L., & Whitaker, R. C. (2004). Neighborhood playgrounds, fast food restaurants, and crime: relationships to overweight in low-income preschool children. *Preventive Medicine*.38(1):57-63.

Carnegie, M.A., Bauman, A., Marshall, A. L., Mohsin, M., Westley-Wise, V., & Booth, M. L. (2002). Perceptions of the physical environment, stage of change for physical activity, and walking among Australian adults. *Research Quarterly for Exercise and Sport*. 73(2):146-55.

Carver, A., Salmon, J., Campbell, K., Baur, L., Garnett, S., Crawford, D. (2005). How Do Perceptions of Local Neighborhood Relate to Adolescents' Walking and Cycling? *The Science of Health Promotion*.20(2):139-147.

Cervero, R. (2002). Built environments and mode choice: toward a normative framework. *Transportation Research Part D*. 7:265-284.

Cervero, R. and Duncan, M. (2003). Walking, bicycling, and urban landscapes: Evidence from the San Francisco Bay Area. *American Journal of Public Health*.93(9): 1478-83.

Cohen, D.A., Ashwood, J.S., Scott, M.M., Overton, A., Evenson, K.R., Staten, L.K., et al. (2006). Public parks and physical activity among adolescent girls. *Pediatrics*.118(5):e1381-9.

Cohen, D.A., McKenzie, T. L., Sehgal, A., Williamson, S., Golinelli, D., & Lurie, N. (2007).Contribution of public parks to physical activity.*American Journal of Public Health*.97(3):509-14.

Coogan, M.A., Karash, K.H., Adler, T., and Sallis, J. (2007).The role of personal values, urban form, and auto availability in the analysis of walking for transportation. *American Journal of Health Promotion*. 21(4 Suppl): 363-70.

Craig, C.L., Brownson, R. C., Cragg, S. E., & Dunn, A.L. (2002).Exploring the effect of the environment on physical activity: A study examining walking to work.*American Journal of Preventive Medicine*.23(2S):36-43.

de Bourdeaudhuij, I., Sallis, J. F., & Saelens, B. E. (2003). Environmental correlates of physical activity in a sample of Belgian adults. *American Journal of Health Promotion*.18(1):83-92.

de Vries, S.I., Bakker, I., van Mechelen, W., Hopman-Rock, M. (2007). Determinants of Activity-friendly Neighborhoods for Children: Results from the SPACE Study. *American Journal of Health Promotion*. 21(4):312-316.

Duncan, M., & Mummery, K. (2005). Psychosocial and environmental factors associated with physical activity among city dwellers in regional Queensland. *Preventive Medicine*.40(4):363-72.

Eid, J., Overman, H.G., Puga, D., and Turner, M.A. (2008). Fat city: Questioning the relationship between urban sprawl and obesity. *Journal of Urban Economics*.63: 385-404.

Ewing, R., Brownson, R. C., & Berrigan, D. (2006). Relationship Between Urban Sprawl and Weight of United States Youth. *American Journal of Preventive Medicine*.31(6):464-474.

Ewing, R., Schmid, T., Killingsworth, R., Zlot, A., and Raudenbush, S. (2003). Relationship between urban sprawl and physical activity, Obesity, and Morbidity.*American Journal of Health Promotion*. 18(1): 47-57

Forsyth, A., Hearst, M., Oakes, J. M., & Schmitz, K. H. (2008). Design and Destinations: Factors Influencing Walking and Total Physical Activity. *Urban Studies*.45(9):1973-1996.

Forsyth, A., Oakes, J. M., Schmitz, K. H., & Hearst M. (2007). Does Residential Density Increase Walking and Other Physical Activity? *Urban Studies*.44(4):679-696.

Frank, L.D., Andresen, M.A., and Schmid, T.L. (2004). Obesity relationships with community design, physical activity, and time spent in cars. *American Journal of Preventive Medicine*.27(2): 87-96.

Frank, L., Kerr, J., Chapman, J., and Sallis, J. (2007). Urban form relationships with walk trip frequency and distance among youth. *American Journal of Health Promotion*. 21(4 Suppl): 305-11.

Frank, L.D., Saelens, B.E., Powell, K.E., Chapman, J.E. (2007). Stepping towards causation: do built environments or neighborhood and travel preferences explain physical activity, driving, and obesity? *Social Science and Medicine*.65(9):1898-914.

Frank, L.D., Sallis, J.F., Conway, T.L., Chapman, J.E., Saelens, B.E., and Bachman, W. (2006).Many pathways from land use to health. *Journal of the American Planning Association*. 72(1): 75-87.

Frank, L.D., Schmid, T.L., Sallis, J.F., Chapman, J., and Saelens, B.E. (2005). Linking objectively measured physical activity with objectively measured urban form: Findings from SMARTRAQ. *American Journal of Preventive Medicine*.28(2 Suppl 2): 117-25.

Franzini, L., Elliott, M. N., Cuccaro, P., Schuster, M., Gilliland, M. J., Grunbaum, J. A., Franklin, F., & Tortolero, S. R. (2009).Influences of physical and social neighborhood environments on children's physical activity and obesity. *American Journal of Public Health*.99(2):271-8.

Fulton, J.E., Shisler, J. L., Yore, M. M., & Caspersen, C. J. (2005). Active transportation to school: findings from a national survey. *Research Quarterly for Exercise and Sport*. 76(3):352-357.

Garden, F.L. and Jalaludin, B.B. (2009).Impact of urban sprawl on overweight, obesity, and physical activity in Sydney, Australia. *Journal of Urban Health*.86(1): 19-30.

Giles-Corti, B., & Donovan, R. J. (2003). Relative influences of individual, social environmental, and physical environmental correlates of walking. *American Journal of Public Health*.93(9):1583-9.

Giles-Corti, B., & Donovan, R. J. (2002).Socioeconomic status differences in recreational physical activity levels and real and perceived access to a supportive physical environment.*Preventive Medicine*.35(6):601-11.

Giles-Corti, B., & Donovan, R. J. (2002).The relative influence of individual, social and physical environment determinants of physical activity.*Social Science and Medicine*.54(12):1793-812.

Giles-Corti, B., Macintyre, S., Clarkson, J. P., Pikora, T., & Donovan, R. J. (2003). Environmental and lifestyle factors associated with overweight and obesity in Perth, Australia. *American Journal of Health Promotion*.18(1):93-102.

Giles-Corti, B., Knuiman, M., Pikora, T.J., Van Neil, K., Timperio, A., Bull, F.C., Shilton, T., and Bulsara, M. (2007). Can the impact on health of a government policy designed to create more liveable neighbourhoods be evaluated? An overview of the RESIDential Environment Project.*NSW Public Health Bulletin*. 18(11-12): 238-42.

Giles-Corti, B., Knuiman, M., Timperio, A., Van Niel, K., Pikora, T.J., Bull, F. C., Shilton, T., and Bulsara, M. (2008). Evaluation of the implementation of a state government community design policy aimed at increasing local walking: Design issues and baseline results from RESIDE, Perth Western Australia. *Preventive Medicine*. 46(1): 46-54.

Giles-Corti, B., Timperio, A., Cutt, H., Pikora, T.J., Bull, F.C., Knuiman, M., Bulsara, M., Van Niel, K., and Shilton, T. (2006). Development of a reliable measure of walking within and outside the local neighborhood: RESIDE's Neighborhood Physical Activity Questionnaire. *Preventive Medicine*. 42(6): 455-9.

Gomez, J.E., Johnson, B. A., Selva, M., & Sallis, J. F. (2004).Violent crime and outdoor physical activity among inner-city youth. *Preventive Medicine*.39(5):876-81.

Greenwald, M., Boarnet, M.G. (2001). The Built Environment as a Determinant of Walking Behavior: Analyzing Non-Work Pedestrian Travel in Portland, Oregon. Transportation Research Record; *Journal of the Transportation Research Board*. 1780:33-42.

Grow, H.M., Saelens, B.E., Kerr, J., Durant, N.H., Norman, G.J., Sallis, J.F. (2008). Where are youth active? Roles of proximity, active transport, and built environment. *Medicine and Science in Sports and Exercise*.40(12):2071-9.

Hackett, A., Boddy, L., Boothby, J., Dummer, T.J., Johnson, B., Stratton, G. (2008). Mapping dietary habits may provide clues about the factors that determine food choice. *Journal of Human Nutrition and Dietetics*.21(5):428-37.

Handy, S.L., Cao X, Mokhtarian PL. (2008). The causal influence of neighborhood design on physical activity within the neighborhood: evidence from Northern California. *American Journal of Health Promotion*.22(5):350-8.

Handy, S., Cao, X., Mokhtarian, P.L. (2006).Self-Selection in the Relationship between the Built Environment and Walking. *Journal of the American Planning Association*. 72(1):55-74.

Harten, N., & Olds, T. (2004).Patterns of active transport in 11-12 year old Australian children.Australian and New Zealand *Journal of Public Health*. 28(2):167-72.

Hoehner, C.M., Brennan Ramirez, L. K., Elliott, M. B., Handy, S. L., & Brownson, R. C. (2005). Perceived and objective environmental measures and physical activity among urban adults. *American Journal of Preventive Medicine*.28(2 Suppl 2):105-16.

Hume, C., Salmon, J., & Ball, K. (2007). Associations of children's perceived neighborhood environments with walking and physical activity. *American Journal of Health Promotion*.21(3):201-7.

Hume, C., Salmon, J., Ball, K. (2005). Children's perceptions of their home and neighborhood environments, and their association with objectively measured physical activity: a qualitative and quantitative study. *Health Education Research*. 20(1):1-13.

Humpel, N., A. L. Marshall, et al. (2004). "Changes in neighborhood walking are related to changes in perceptions of environmental attributes." *Ann Behav Med* 27(1): 60-7.

Humpel, N., Owen, N., Iverson, D., Leslie, E., Bauman, A. (2004). Perceived environment attributes, residential location, and walking for particular purposes. *American Journal of Preventive Medicine*.26(2):119-25.

Humpel, N., Owen, N., Leslie, E., Marshall, A.L., Bauman, A.E., Sallis, J.F. (2004). Associations of location and perceived environmental attributes with walking in neighborhoods.*American Journal of Health Promotion*.18(3):239-42.

Jilcott, S.B., Evenson, K.R., Laraia, B.A., Ammerman, A.S. (2007). Association between physical activity and proximity to physical activity resources among low-income, midlife women.*Preventing Chronic Disease*.4(1):A04.

Joshu, C.E., Boehmer, T.K., Brownson, R.C., Ewing, R. (2008). Personal, neighbourhood and urban factors associated with obesity in the United States. *Journal of Epidemiology and Community Health*. 62(3):202-8.

Kaczynski, A.T., Potwarka, L.R., Smale, B.J.A., Havitz, M.E. (2009). Association of Parkland Proximity with Neighborhood and Park-based Physical Activity; Variations by Gender and Age. *Leisure Sciences* 2009;31:174-191.

Kaczynski, A.T., Potwarka, L. R., & Saelens, B. E. (2008).Association of park size, distance, and features with physical activity in neighborhood parks.*American Journal of Public Health*.98(8):1451-6.

Kelly-Schwartz, A., Stockard, J., Doyle, S., and Schlossberg, M. (2004). Is sprawl unhealthy? A multilevel analysis of the relationship of metropolitan sprawl to the health of individuals.*Journal of Planning Education and Research*.24:184-196.

Kerr, J., Frank, L., Sallis, J.F., Chapman, J. (2007). Urban Form Correlates of Pediatrician Travel in Youth: Differences in Gender, Race-Ethnicity, and Household Attributes. *Transportation Research Part-D*.12:177-182.

Kerr, J., Rosenberg, D., Sallis, J. F., Saelens, B. E., Frank, L. D., & Conway, T. L. (2006). Active commuting to school: Associations with environment and parental concerns. *Medicine and Science in Sports and Exercise*.38(4):787-94.

Khattak, A.J. and Rodriguez, D.A. (2005). Travel behavior in neo-traditional neighborhood developments: A case study in USA. *Transportation Research Part A*. 39: 481-500.

King, A.C., Toobert, D., Ahn, D., Resnicow, K., Coday, M., Riebe, D., Garber, C.E., Hurtz, S., Morton, J., Sallis, J.F. (2006).Perceived Environments as Physical Activity Correlates and Moderators of Intervention in Five Studies. *American Journal of Health Promotion*. 21(1):24-35.

Kirby, A.M., Levesque, L., Wabano, V., & Robertson-Wilson, J. (2007).Perceived community environment and physical activity involvement in a northern-rural Aboriginal community. *International Journal of Behavioral Nutrition and Physical Activity*.4:63.

Kligerman, M., Sallis, J.F., Ryan, S., Frank, L.D., Nader, P.R. (2007). Association of neighborhood design and recreation environment variables with physical activity and body mass index in adolescents. *American Journal of Health Promotion*. 21(4):274-7.

Kondo, K., Lee, J.S., Kawakubo, K., Kataoka, Y., Asami, Y., Mori, K., Umezaki, M., Yamauchi, T., Takagi, H., Sunagawa, H., Akabayashi, A. (2009).Association between daily physical activity and neighborhood environments. *Environmental Health and Preventative Medicine*.14:196-206.

Krizek, K.J., Johnson, P.J. (2006). Proximity to Trails and Retail: Effects on Urban Cycling and Walking. *Journal of the American Planning Association*. 72(1):33-42.

Lee, C., Vernez Moudon, A. (2006). Correlates of Walking for Transportation or Recreation Purposes.*Journal of Physical Activity and Health*.3(Suppl. 1):S77-S98.

Lee, R.E. and Cubbin, C. (2002).Neighborhood context and youth cardiovascular health behaviors. *American Journal of Public Health*.92(3): 428-36.

Lee, J.S., Kawakubo, K., Kohri, S., Tsujii, H., Mori, K., & Akabayashi, A. (2007).Association between Resident's Perception of the Neighborhood's Environments and Walking Time in Objectively Different Regions. *Environmental Health and Preventative Medicine*.12.

Li, M., Dibley, M. J., Sibbritt, D., & Yan, H. (2006). Factors associated with adolescents' physical inactivity in Xi'an City, China. *Medicine and Science in Sports and Exercise*.38(12):2075-85.

Li, F., Harmer, P., Cardinal, B.J., Bosworth, M., Johnson-Shelton, D., Moore, J.M., Acock, A., and Vongjaturapat, N. (2009).Built environment and 1-year change in weight and waist circumference in middle-aged and older adults: Portland Neighborhood Environment and Health Study. *American Journal of Epidemiology*. 169(4): 401-8.

Li, F., Harmer P., Cardinal B.J., Bosworth, M., and Johnson-Shelton, D. (2009). Obesity and the built environment: Does the density of neighbourhood fast-food outlets matter?*American Journal of Health Promotio*n. 23(3): 203-209.

Li, F., Harmer, P.A., Cardinal, B.J., Bosworth, M., Acock, A., Johnson-Shelton, D., and Moore, J.M. (2008). Built environment, adiposity, and physical activity in adults aged 50-75. *American Journal of Preventive Medicine*.35(1): 38-46.

Lindsey, G., Han, Y., Wilson, J., Yang, J. (2006). Neighborhood Correlates of Urban Trail Use. *Journal of Physical Activity and Health*.3(Suppl. 1):S139-S157.

Liu, G.C., Wilson, J.S., Qi, R., and Ying, J. (2007). Green neighborhoods, food retail and childhood overweight: Differences by population density. *American Journal of Health Promotion*. 21(4 Suppl): 317-325.

Lopez, R.P. (2007). Neighborhood risk factors for obesity. *Obesity (Silver Spring)*. 15(8): 2111-2119.

Lopez, R. (2004). Urban sprawl and risk for being overweight or obese. *American Journal of Public Health*.94(9): 1574-1579.

McCormack, G., Giles-Corti, B., & Bulsara, M. (2008).The relationship between destination proximity, destination mix and physical activity behaviors. *Preventive Medicine*.46:33-40.

McCormack, G.R., Giles-Corti, B., & Bulsara, M. (2007).Correlates of using neighborhood recreational destinations in physically active respondents.*Journal of Physical Activity and Health*.4(1):39-53.

McDonald, N. C. (2007). Children's mode choice for the school trip: The role of distance and school location in walking to school. *Transportation*. 35(1): 23-35.

Moudon, A.V., Lee, C., Cheadle, A.D., Collier, C.W., Johnson, D., Schmid, T.L., et al. (2005). Cycling and the built environment, a US perspective.*Transportation Research Part D*.10:245-261.

Mowen, A.J., Confer, J.J. (2003). The relationship between perceptions, distance, and socio-demographi charateristics upon public use of an urban park "in-fill". *Journal of Park and Recreation Administration*. 21(3):58-74.

Nelson, N.M., Foley, E., O'Gorman, D.J., Moyna, N.M., and Woods, C.B. (2008). Active commuting to school: How far is too far? *International Journal of Behavioral Nutritionand Physical Activity*.5(1).

Nelson, M.C., Gordon-Larsen, P., Song, Y., & Popkin, B. M. (2006). Built and social environments associations with adolescent overweight and activity. *American Journal of Preventive Medicine*.31(2):109-17.

Norman, G.J., Nutter, S.K., Ryan, S., Sallis, J.F., Calfas, K.J., Patrick, K. (2006).Community Design and Access to Recreational Facilities as Correlates of Adolescent Physical Activity and Body-Mass Index. *Journal of Physical Activity and Health*.3(Supplement 1):S118-S128.

Oakes, J.M., Forsyth, A., & Schmitz, K. H. (2007). The effects of neighborhood density and street connectivity on walking behavior: the Twin Cities walking study. *Epidemiologic Perspectives and Innovation*.4:16.

Owen, N., Cerin, E., Leslie, E., duToit, L., Coffee, N., Frank, L.D., Bauman, A.E., Hugo, G., Saelens, B.E., and Sallis, J.F. (2007).Neighborhood walkability and the walking behavior of Australian adults.*American Journal of Preventive Medicine*.33(5): 387-95.

Panter, J.R., Jones, A.P. (2008).Associations between physical activity, perceptions of the neighbourhood environment and access to facilities in an English city.*Social Science and Medicine*.67(11):1917-23.

Potwarka, L.R., Kaczynski, A.T., Flack, A.L. (2008). Places to Play: Association of Park Space and Facilities with Healthy Weight Status among Children. *Journal of Community Health*. 33:344-350.

Rabin, B.A., Boehmer, T.K., Brownson, R.C. (2007). Cross-national comparison of environmental and policy correlates of obesity in Europe. *European Journal of Public Health*. 17(1):53-61.

Reed, J.A., Phillips, D.A. (2005). Relationships between physical activity and the proximity of exercise facilities and home exercise equipment used by undergraduate university students. *Journal of American College Health*.53(6):285-90.

Riva, M., Gauvin, L., Richard, L. (2007). Use of local area facilities for involvement in physical activity in Canada: insights for developing environmental and policy interventions. *Health Promotion International*. 22(3):227-35.

Rodriguez, D. A., Khattak, A. J, Evenson, K.R. (2006). Can New Urbanism Encourage Physical Activity? *Journal of the American Planning Association*. 72(1): 43-49.

Roemmich, J.N., Epstein, L.H., Raja, S., Yin, L. (2007). The neighborhood and home environments: disparate relationships with physical activity and sedentary behaviors in youth. *Annals of Behavioral Medicine*. 33(1):29-38.

Rutt, C.D., & Coleman, K.J. (2005). The Impact of the Built Environment on Walking as a Leisure-Time Activity Along the U.S./Mexico Border. *Journal of Physical Activity and Health*. 3:257-271.

Rutt, C.D., Coleman, K.J. (2004). Examining the relationships among built environment, physical activity, and body mass index in El Paso, TX. *Preventive Medicine*.40(6):831-841.

Saelens, B.E., Sallis, J. F., Black, J. B., Chen, D. (2003). Neighborhood-based differences in physical activity: an environment scale evaluation. *American Journal of Public Health*.93(9):1552-8.

Sallis, J.F., Saelens, B.E., Frank, L.D., Conway, T.L., Slymen, D.J., Cain, K.L., et al. (2009). Neighborhood built environment and income: examining multiple health outcomes. *Social Science and Medicine*. 68(7):1285-93.

Samimi, A., Mohammadian, A., Mdanizadeh, S. (2009). Effects of transportation and built environment on general health and obesity.*Transportation Research Part-D*.14(1).

Sanderson, B.K., Foushee, H. R., Bittner, V., Cornell, C. E., Stalker, V., Shelton, S., & Pulley, L. (2003). Personal, social, and physical environmental correlates of physical activity in rural African-American women in Alabama. *American Journal of Preventive Medicine*.25(3 Suppl 1):30-7.

Santos, R., Silva, P., Santos, P., Ribeiro, J. C., & Mota, J. (2008). Physical activity and perceived environmental attributes in a sample of Portuguese adults: results from the Azorean Physical Activity and Health study. *Preventive Medicine*. 47(1):83-8.

Smith, K.R., Brown, B.B., Yamada, I., Kowaleski-Jones, L., Zick, C.D., and Fan, J.X. (2008). Walkability and body mass index density, design, and new diversity measures. *American Journal of Preventive Medicine*.35(3): 237-44.

Spence, J.C., Cutumisu, N., Edwards, J., Evans, J. (2008). Influence of neighbourhood design and access to facilities on overweight among preschool children. *International Journal of Pediatric Obesity*. 3(2):109-16.

Stafford, M., Cummins, S., Ellaway, A., Sacker, A. Wiggins, R. D. & Macintyre, S. (2007). Pathways to obesity: identifying local, modifiable determinants of physical activity and diet. *Social Science and Medicine*.65(9):1882-97.

Suminski, R.R., Poston, W. S., Petosa, R. L., Stevens, E., & Katzenmoyer, L. M. (2005).Features of the neighborhood environment and walking by U.S. adults. *American Journal of Preventive Medicine*.28(2):149-55.

Tilt, J.H., Unfried, T.M., and Roca, B. (2007). Using objective and subjective measures of neighborhood greenness and accessible destinations for understanding walking trips and BMI in Seattle, Washington.*American Journal of Health Promotion*. 21(4 Suppl): 371-9.

Troped, P.J., Saunders, R.P., Pate, R.R., Reininger, B., Ureda, J.R., Thompson, S.J. (2001).Associations between Self-Reported and Objective Physical Environmental Factors and Use of a Community Rail-Trail. *Preventive Medicine*.32:191-200.

Tucker, P., Irwin, J. D., Gilliland, J., He, M., Larsen, K., & Hess, P. (2009).Environmental influences on physical activity levels in youth. *Health Place*.15(1):357-63.

Tudor-Locke, C., Giles-Corti, B., Knuiman, M., and McCormack, G. (2008). Tracking of pedometer-determined physical activity in adults who relocate: results from RESIDE. *International Journal of Behavioral Nutrition and Physical Activity*.5(39).

Utter, J., Denny, S., Robinson, E. M., Ameratunga, S.,& Watson, P. (2006). Perceived access to community facilities, social motivation, and physical activity among New Zealand youth.*Journal of Adolescent Health*. 39(5):770-3.

Vernez Moudon, A., Lee, C., Cheadle, A.D., Garvin, C., Rd, D.B., Schmid, T.L., and Weathers, R.D. (2007).Attributes of environments supporting walking. American Journal of Health Promotion. 21(5): 448-59.

Veugelers, P.J., Sithole, F., Zhang, S., & Muhajarine N. (2008). Neighbourhood characteristics in relation to diet, physical activity and overweight of Canadian children. *International Journal of Pediatric Obesity*. 3:152-159.

Voorhees, C.C., & Young, D. R. (2003). Personal, social, and physical environmental correlates of physical activity levels in urban latinas. *American Journal of Preventive Medicine*.25(3Si):61-68.

Wells, N. M. and Yang, Y. (2008).Neighborhood design and walking.A quasi-experimental longitudinal study.*American Journal of Preventive Medicine*.34(4): 313-9.

Wen, M., & Zhang, X. (2009). Contextual effects of built and social environments of urban neighborhoods on exercise: a multilevel study in Chicago. *American Journal of Health Promotion*.23(4):247-54.

Wendel-Vos, G.C., Schuit, A.J., de Niet, R., Boshuizen, H.C., Saris, W.H., Kromhout, D. (2004). Factors of the physical environment associated with walking and bicycling. *Medicine and Science in Sports and Exercise*. 36(4):725-30.

Zhu, X., Arch, B., Lee, C. (2008). Personal, social, and environmental correlates of walking to school behaviors: case study in Austin, Texas. *Scientific World Journal*. 8:859-72.