HEALTH & THE BUILT ENVIRONMENT

RESEARCH & RESOURCES

12 March 2015

Scott C. Brown, Ph.D., Miller School of Medicine Dept . of Public Health Sciences and School of Architecture
Joanna Lombard, Professor, School of Architecture & Miller School of Medicine Dept. of Public Health Science
University of Miami Built Environment, Behavior & Health Team

Public Health & Built Environment

The built environment

- includes homes, schools, workplaces, parks/recreation areas, business areas and roads.
- extends overhead in the form of electric transmission lines, underground in the form of waste disposal sites and subway trains, and across the country in the form of highways.
- encompasses all buildings, spaces and products that are created or modified by people.
- impacts indoor and outdoor physical environments as well as social environments (e.g., civic participation, community capacity and investment) and subsequently our health and quality of life.

Creating Healthy Communities, Healthy Homes, Healthy People: Initiating a Research Agenda on the Built Environment and Public Health ," Shobha Srinivasan, PhD, Liam R. O'Fallon, MA and Allen Dearry, PhD, September 2003, Vol 93, No. 9 | *American Journal of Public Health* 1446-1450

Public Health & Built Environment

- 19th century- Industrial revolution & immigration moves population to cities; unsanitary conditions lead to infectious disease epidemics
- 20th century- Public health policy implemented through zoning that restricts population density; and separates commerce, industry and residences
- 21st century- Primary public health problems are chronic diseases rather than infectious diseases, and half of Americans live in suburban rather than urban or rural settings

Image, South Street NYC, Fordham University

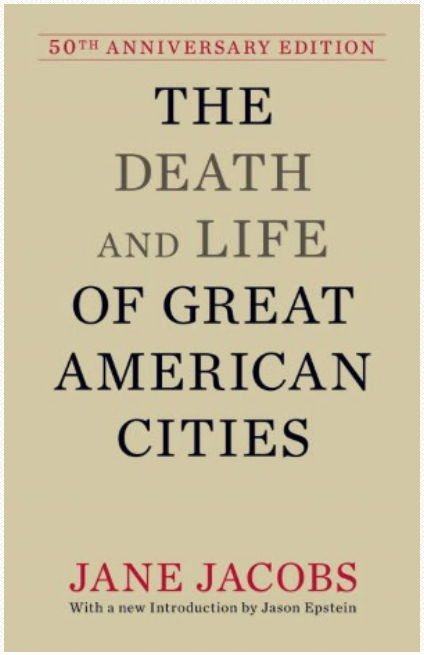
Wendy Collins Perdue, Lesley A. Stone, Lawrence O. Gostin, "The Built Environment and Its Relationship to the Public's Health: The Legal Framework," *American Journal of Public Health,* September 2003, Vol 93, No. 9: 1390-4.

Threshold

Until lately the best thing that I was able to think of in favor of civilization, apart from blind acceptance of the order of the universe, was that it made possible the artist, the poet, the philosopher, and the man of science. But I think that is not the greatest thing. Now I believe that the greatest thing is a matter that comes directly home to us all. When it is said that we are too much occupied with the means of living to live, I answer that the chief worth of civilization is just that it makes the means of living more complex; that it calls for great and combined intellectual efforts, instead of simple, uncoordinated ones, in order that the crowd may be fed and clothed and housed and moved from place to place. Because more complex and intense intellectual efforts mean a fuller and richer life. They mean more life. Life is an end in itself, and the only question as to whether it is worth living is whether you have enough of it.

I will add but a word. We are all very near despair. The sheathing that floats us over its waves is compounded of hope, faith in the unexplainable worth and sure issue of effort, and the deep, sub-conscious content which comes from the exercise of our powers.

Oliver Wendell Holmes, Jr. quotation in the frontispiece to Jane Jacobs 1961 book, *The Death and Life of Great American Cities*, New York: Random House.



http://cdn1.tabletmag.com/wp-content/files_mf/jacobs_090911_620px.jpg

Research Landmarks

1973

Mark S. Granovetter, (1973) "The Strength of Weak Ties," *American Journal of Sociology*, 78(6) 1360-1380.

The Strength of Weak Ties[1]

Mark S. Granovetter
Johns Hopkins University

Analysis of social networks is suggested as a tool for linking micro and macro levels of sociological theory. The procedure is illustrated by elaboration of the macro implications of one aspect of small-scale interaction: the strength of dyadic ties. It is argued that the degree of overlap of two individuals' friendship networks varies directly with the strength of their tie to one another. The impact of this principle on diffusion of influence and information, mobility opportunity, and community organization is explored. Stress is laid on the cohesive power of weak ties. Most network models deal, implicitly, with strong ties, thus confining their applicability to small, well-defined groups. Emphasis on weak ties lends itself to discussion of relations *between* groups and to analysis of segments of social structure not easily defined in terms of primary groups.

A fundamental weakness of current sociological theory is that it does not relate micro-level interactions to macro-level patterns in any convincing way. Large-scale statistical, as well as qualitative, studies offer a good deal of insight into such macro phenomena as social mobility, community organization, and political structure. At the micro level, a large and increasing body of data and theory offers useful and illuminating ideas about what transpires within the confines of the small group. But how interaction in small groups aggregates to form large-scale patterns eludes us in most cases.

I will argue, in this paper, that the analysis of processes in interpersonal networks provides the most fruitful micro-macro bridge. In one way or another, it is through these networks that small-scale interaction becomes translated into large-scale patterns, and that these, in turn, feed back into small groups.

Sociometry, the precursor of network analysis, has always been curiously peripheral—invisible, really—in sociological theory. This is partly because it has usually been studied and applied only as a branch of social psychology; it is also because of the inherent complexities of precise network analysis. We have had neither the theory nor the measurement and sampling techniques to move sociometry from the usual small-group level to that of larger structures. While a number of stimulating and suggestive

[1] This paper originated in discussions with Harrison White, to whom I am indebted for many suggestions and ideas. Earlier drafts were read by Ivan Chase, James Davis, William Michelson, Nancy Lee, Peter Rossi, Charles Tilly, and an anonymous referee; their criticisms resulted in significant improvements.

1988

James S. House, Karl R. Landis, Debra Umberson, (1988) "Social Relationships and Health," *Science*, July 29, 241:540-544.

Social Relationships and Health
House, James S;Landis, Karl R;Umberson, Debra
Science; Jul 29, 1988; 241, 4865; ProQuest
pg. 540

22. C. J. Pedersen, U.S. Patent 3,232,914 (1 February 1966) to Du Pont.
23. ——, U.S. Patent 3,320,214 (16 May 1967) to Du Pont.
24. ——, U.S. Patent 3,361,778 (2 January 1968) to Du Pont.
25. ——, *J. Am. Chem. Soc.* **89**, 2495 (1967); *ibid.*, p. 7017.
26. ——, *Aldrichimica Acta* **4** (no. 1), 1 (1971).
27. M. R. Truter and C. J. Pedersen, *Endeavour* **30**, 142 (1971).
28. C. J. Pedersen, *Fed. Proc.* **27**, 1305 (1968).
29. ——, *J. Am. Chem. Soc.* **92**, 386 (1970).
30. ——, *ibid.*, p. 391.
31. ——, *J. Org. Chem.* **36**, 254 (1971).
32. ——, *ibid.*, p. 1690.
33. ——, and H. K. Frensdorff, *Angew. Chem.* **84**, 16 (1972); *Angew. Chem. Int. Ed. Engl.* **11**, 16 (1972).
34. C. J. Pedersen, *Org. Synth.* **52**, 66 (1972).
35. ——, U.S. Patents 3,562,295 (9 February 1971); 3,622,577 (23 November 1971); 3,686,225 (22 August 1972); 3,687,978 (29 August 1972); —— and M. Bromels, U.S. Patent 3,847,949 (12 November 1974); C. J. Pedersen, U.S. Patent 3,856,813 (24 December 1974); 3,873,569 (25 March 1975); 3,987,061 (19 October 1976); 3,998,838 (21 December 1976); —— and M. Beomels, U.S. Patent 4,031,111 (21 June 1977), all to Du Pont.

Social Relationships and Health

JAMES S. HOUSE, KARL R. LANDIS, DEBRA UMBERSON

Recent scientific work has established both a theoretical basis and strong empirical evidence for a causal impact of social relationships on health. Prospective studies, which control for baseline health status, consistently show increased risk of death among persons with a low quantity, and sometimes low quality, of social relationships. Experimental and quasi-experimental studies of humans and animals also suggest that social isolation is a major risk factor for mortality from widely varying causes. The mechanisms through which social relationships affect health and the factors that promote or inhibit the development and maintenance of social relationships remain to be explored.

. . . my father told me of a careful observer, who certainly had heart-disease and died from it, and who positively stated that his pulse was habitually irregular to an extreme degree; yet to his great disappointment it invariably became regular as soon as my father entered the room.—Charles Darwin (*1*)

SCIENTISTS HAVE LONG NOTED AN ASSOCIATION BETWEEN social relationships and health. More socially isolated or less socially integrated individuals are less healthy, psychologically and physically, and more likely to die. The first major work of empirical sociology found that less socially integrated people were more likely to commit suicide than the most integrated (*2*). In subsequent epidemiologic research age-adjusted mortality rates from all causes of death are consistently higher among the unmarried than the married (*3–5*). Unmarried and more socially isolated people have also manifested higher rates of tuberculosis (*6*), accidents (*7*), and psychiatric disorders such as schizophrenia (*8, 9*). And as the above quote from Darwin suggests, clinicians have also observed potentially health-enhancing qualities of social relationships and contacts.

The causal interpretation and explanation of these associations has, however, been less clear. Does a lack of social relationships cause people to become ill or die? Or are unhealthy people less likely to establish and maintain social relationships? Or is there some other factor, such as a misanthropic personality, which predisposes people both to have a lower quantity or quality of social relationships and to become ill or die?

Such questions have been largely unanswerable before the last decade for two reasons. First, there was little theoretical basis for causal explanation. Durkheim (*2*) proposed a theory of how social relationships affected suicide, but this theory did not generalize to morbidity and mortality from other causes. Second, evidence of the association between social relationships and health, especially in general human populations, was almost entirely retrospective or cross-sectional before the late 1970s. Retrospective studies from death certificates or hospital records ascertained the nature of a person's social relationships after they had become ill or died, and cross-sectional surveys of general populations determined whether people who reported ill health also reported a lower quality or quantity of relationships. Such studies used statistical control of potential confounding variables to rule out third factors that might produce the association between social relationships and health, but could do this only partially. They could not determine whether poor social relationships preceded or followed ill health.

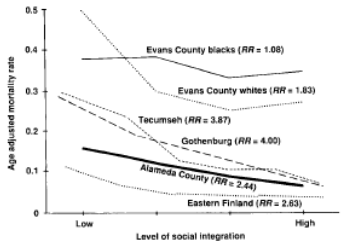
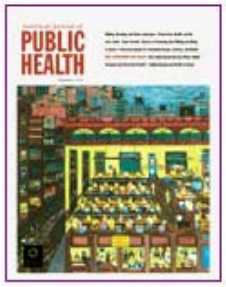


Fig. 1. Level of social integration and age-adjusted mortality for males in five prospective studies. *RR*, the relative risk ratio of mortality at the lowest versus highest level of social integration.

J. S. House is professor and chair of sociology and a research scientist in the Survey Research Center of the Institute for Social Research, Institute of Gerontology, and Department of Epidemiology at the University of Michigan, Ann Arbor, MI 48109. K. R. Landis is a doctoral candidate in the Department of Sociology and research assistant in the Survey Research Center. D. Umberson is a postdoctoral fellow in the Survey Research Center at the University of Michigan and assistant professor-designate of sociology at the University of Texas, Austin.

Research Landmarks

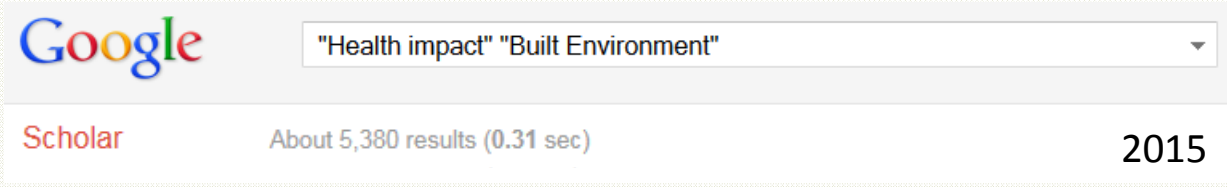


2003

1992-2002: 230 results
2003-2013: 3,870 results

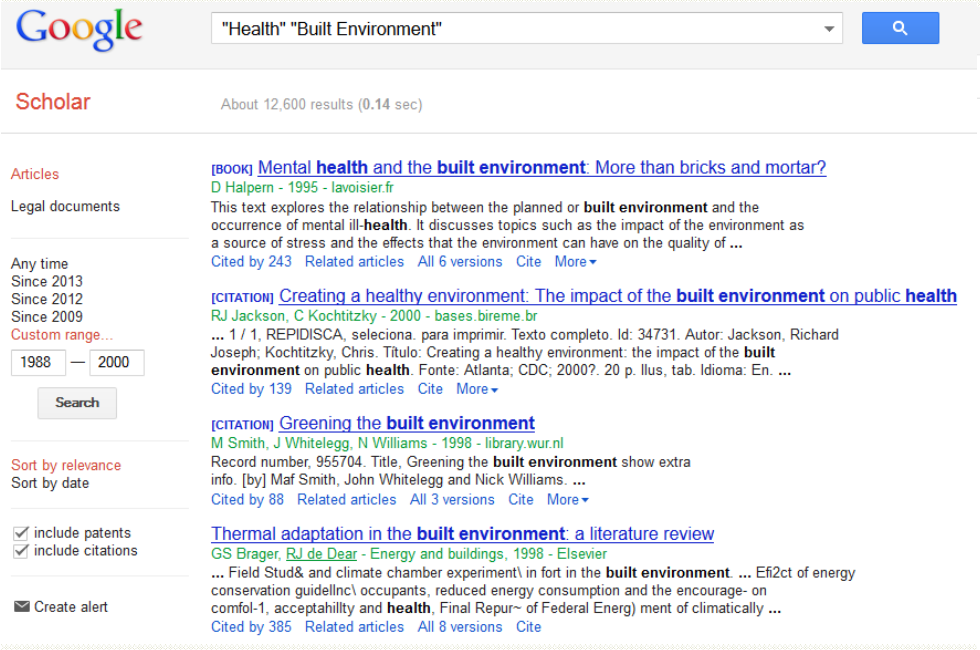
The National Institute of Environmental Health Sciences of the National Institutes of Health and other funding agencies sponsored a range of studies and in 2003, Richard J. Jackson, as guest editor, drew upon this body of work for the September issue of *The American Journal of Public Health*, "The Impact of the Built Environment on Health: An Emerging Field."

September 1, 2003,
Volume 93, Issue 9

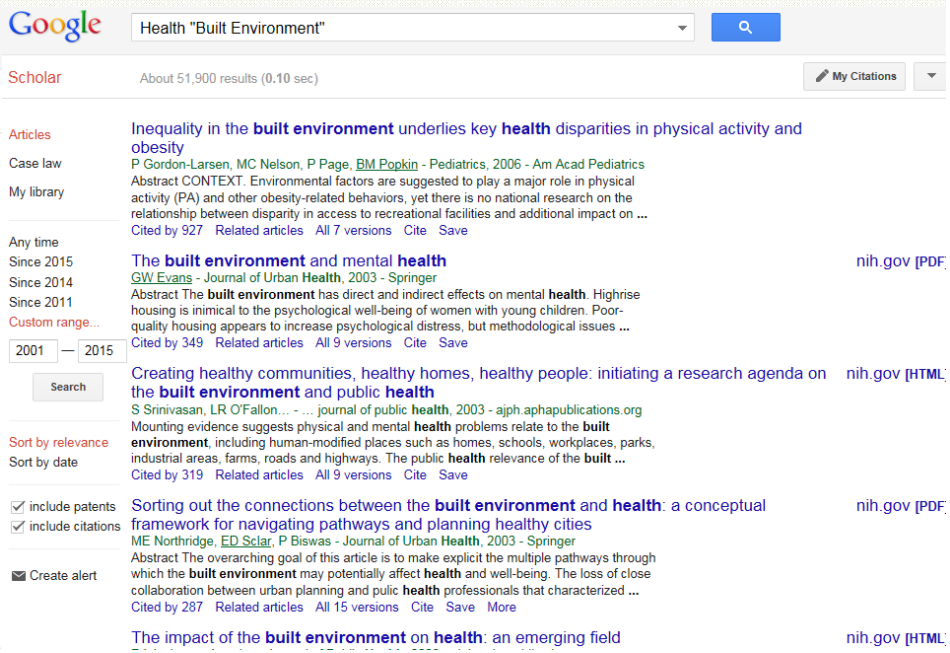


2015

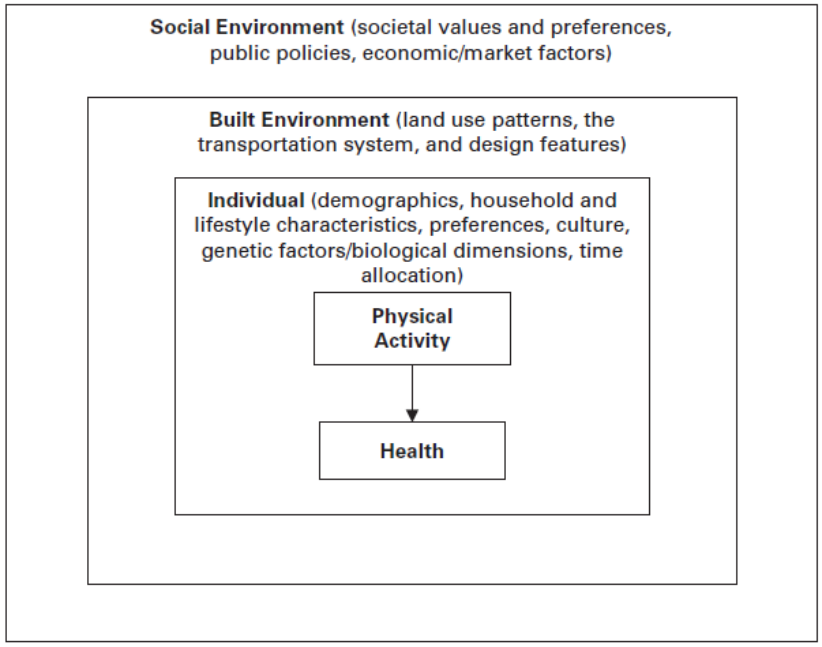
1988-2000: 12,600

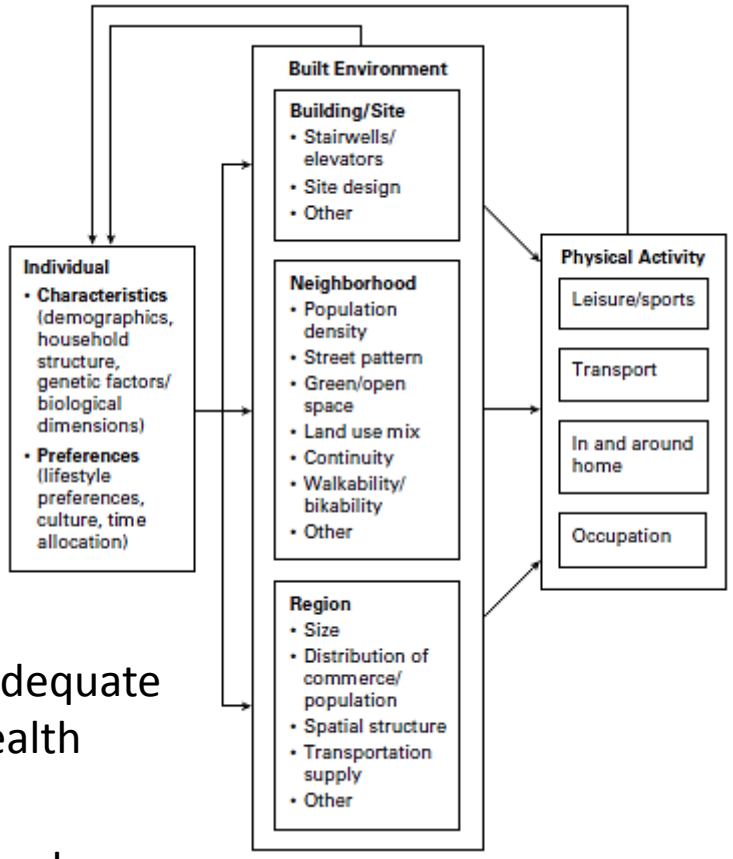


2001-2015: 51,000



Built Environment Influence on Physical Activity





- Regular physical activity is important for health, and inadequate physical activity is a major, largely preventable public health problem.
- Built environments that facilitate more active lifestyles and reduce barriers to physical activity are desirable because of the positive relationship between physical activity and health. (8)

Committee on Physical Activity, Health, Transportation, and Land Use, (2005) *Does The Built Environment Influence Physical Activity? Examining The Evidence*, Transportation Research Board Institute of Medicine of The National Academies, Transportation Research Board Special Report 282, National Academy of Sciences.

Built Environment & Physical Activity

CDC Vitalsigns™

More People Walk to Better Health

On this Page
- Introduction
- Problem
- What Can Be Done
- Science Behind this Issue
- Related Links
- Social Media
- Read Associated MMWR

48% About half of all adults get enough aerobic physical activity* to improve their health.

6 in 10 Walking is the most popular aerobic physical activity. About 6 in 10 adults reported walking for at least 10 minutes in the previous week.

6% Adults who walk for transportation, fun, or exercise went up 6 percent in 5 years.

More than 145 million adults now include walking as part of a physically active lifestyle. More than 6 in 10 people walk for transportation or for fun, relaxation, or exercise, or for activities such as walking the dog. The percentage of people who report walking at least once for 10 minutes or more in the previous week rose from 56% (2005) to 62% (2010).

Physical activity helps control weight, but it has other benefits. Physical activity such as walking can help improve health even without weight loss. People who are physically active live longer and have a lower risk for heart disease, stroke, type 2 diabetes, depression, and some cancers. Improving spaces and having safe places to walk can help more people become physically active.

*Aerobic activities like brisk walking, running, swimming and bicycling make you breathe harder and make your heart and blood vessels healthier.

http://www.cdc.gov/vitalsigns/Walking/index.html

Physical Activity & Health

http://www.bta4bikes.org/at_work/walknbikecmte.php

- Regular physical activity seems to protect from diabetes and cardiovascular disease (Carnethon et al., 2005).
- Walking, the most common form of physical activity (CDC, 1991) has been associated with reduced weight (Schilling & Linton, 2004), and reduced risk for diabetes and cardiovascular disease (Carnethon et al., 2005).
- Fitness increases with even minimal levels of activity. Moving from totally sedentary to an activity level of approximately 72.2 minutes per week—a little over 10 minutes per day—resulted in improved cardiorespiratory fitness. (Carnethon, 2009).

Mercedes R. Carnethon, Martha Gulati, Philip Greenland, (2005) "Prevalence and Cardiovascular Disease Correlates of Low Cardiorespiratory Fitness in Adolescents and Adults," *JAMA,* 294(23):2981-2988.
Mercedes R. Carnethon, (2009) "Physical Activity and Cardiovascular Disease: How Much Is Enough?" *American Journal of Lifestyle Medicine*, 3(1) Suppl., 44S-49S.

Built Environment & Physical Activity

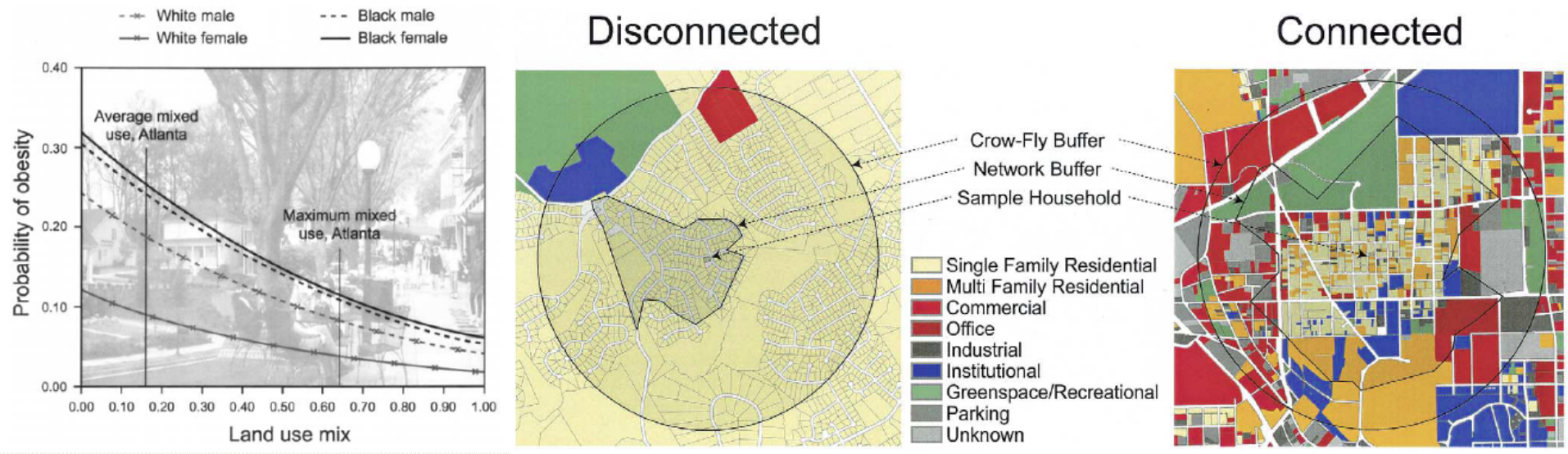
Aleppo Street – **Before**
Frank Shea, Olneyville Housing Corporation
24 March 2010

http://www.instituteccd.org/news/1410 **After**

- 11 country (*Belgium, Brazil, Canada, Colombia, China (Hong Kong), Japan, Lithuania, New Zealand, Norway, Sweden, U.S., with a combined sample of 11,541 adults living in cities*) survey on physical activity
- Five of seven environmental variables were significantly related to meeting physical activity guidelines, ranging from access to low-cost recreation facilities (OR1.16) to sidewalks on most streets (OR1.47).
- Supportive neighborhoods : 100% higher rates of sufficient physical activity compared to those with no supportive attributes.
- Conclusions: Neighborhoods built to support physical activity have a strong potential to contribute to increased physical activity. Designing neighborhoods to support physical activity can now be defined as an international public health issue (Sallis et al. 2009).

James F. Sallis, Heather R. Bowles, Adrian Bauman, Barbara E. Ainsworth, Fiona C. Bull, Cora L. Craig, Michael Sjöström, Ilse De Bourdeaudhuij, Johan Lefevre, Victor Matsudo, Sandra Matsudo, Duncan J. Macfarlane, Luis Fernando Gomez, Shigeru Inoue, Norio Murase, Vida Volbekiene, Grant McLean, Harriette Carr, Lena Klasson Heggebo, Heidi Tomten, Patrick Bergman, (2009) "Neighborhood Environments and Physical Activity Among Adults in 11 Countries," *American Journal of Preventive Medicine*, 36(6):484–490.

Built Environment Influence on Physical Activity



- Frank et al. (2004) investigated the relationships among obesity, physical activity, and urban form in greater Atlanta.
- **Proximity to mixed use destinations, and higher density of intersections and housing,** were associated with **reduced obesity rates and increased walking trips.**

Lawrence D. Frank, Martin A. Andresen and Thomas .L. Schmid, (2004) "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars," *American Journal of Preventative Medicine*, Vol. 27 (2): 87–96.

Built Environment Influence on Physical Activity

http://homecareassistance.com/resources/home-care-blog/page/2/

www.inmanpark.org
http://freeportusa.com/FreeportPhotoTour.html

- Older women who lived within a 20-minute walk of stores, parks or trails had significantly higher pedometer readings than women who did not. The more destinations that were near the home, the more they walked (King et al., 2003).
- Proximity to mixed use destinations was related to lower rates of obesity in a study of low-income, uninsured women from five U.S. states (CT, MA, NE, NC, SD).
- Women living in areas with greater diversity of use showed a lower BMI and lower coronary heart disease risk while women living in more residential areas evidenced higher BMI and coronary risk (Mobley et al., 2006).

W.C. King, J.S. Brach, S. Belle, et al. (2003) The Relationship Between Convenience of Destinations and Walking Levels in Older Women. *American Journal of Health Promotion, 18*(1): 74-82.
L.R. Mobley, E.D. Root, E. A. Finkelstein, et al. (2006) "Environment, obesity and cardiovascular disease risk in low-income women," *American Journal of Preventive Medicine* 30 (4): 327-32

Built Environment Influence on Physical Functioning

"Eyes on Street" & Elders' Health

Above Grade

Stoop

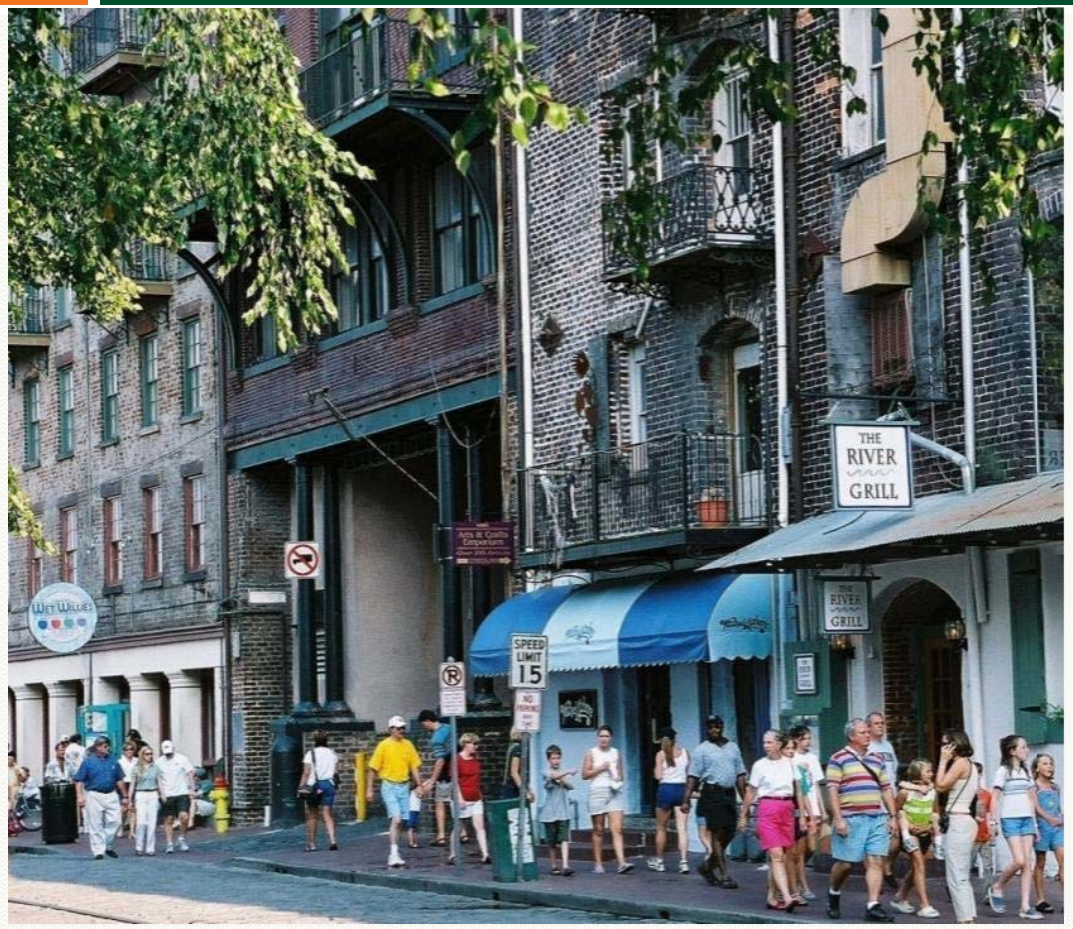
Porch

- 16,000 households in East Little Havana enumerated for Hispanic elders > 70 years.
- 273 elder-blocks were included in the final study – 1 elder per block.
- Elders assessed at baseline, 12, 24, 36, and 54 months post baseline.
- Built environment coded before baseline.

Elders who lived in blocks with few positive front-entrance-features were 2.7 times as likely to have poor physical functioning, compared to elders residing on blocks with greater numbers of positive front-entrance qualities.

NIMH/NIEHS Grant No. MH63709 NIA Grant No. AG27527 PI: J. Szapocznik; Brown et al. (2008) "Built environment and physical functioning in Hispanic elders: The role of "eyes on the street"." *Environmental Health Perspectives*, 116(110), 1300-1307.

Built Environment Influence on Physical Activity



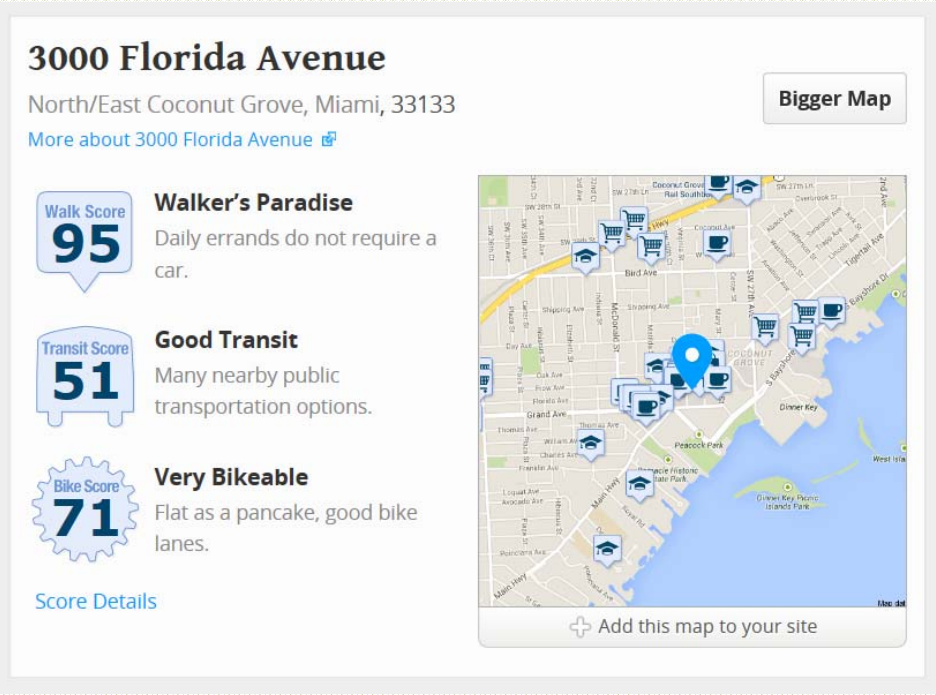
Christine M. Hoehner, Laura K. Brennan Ramirez and colleagues conducted a study of residents in Savannah, Georgia and St. Louis, Missouri, and found that **physical activity increased when greater numbers of non-residential destinations occurred within walking distance of a person's home**.

C.M. Hoehner, L.K. Brennan Ramirez, M.B. Elliott, S.L. Handy, & R.C. Brownson, "Perceived and objective environmental measures and physical activity among urban adults," *American Journal of Preventive Medicine*, (2005, 28, 2S2), pp. 105-16.

Built Environment & Metabolic Syndrome: Walk Score

Walkability measured by Walk Score® is associated with "Purposive Walking" in the last week (measured by IPAQ)

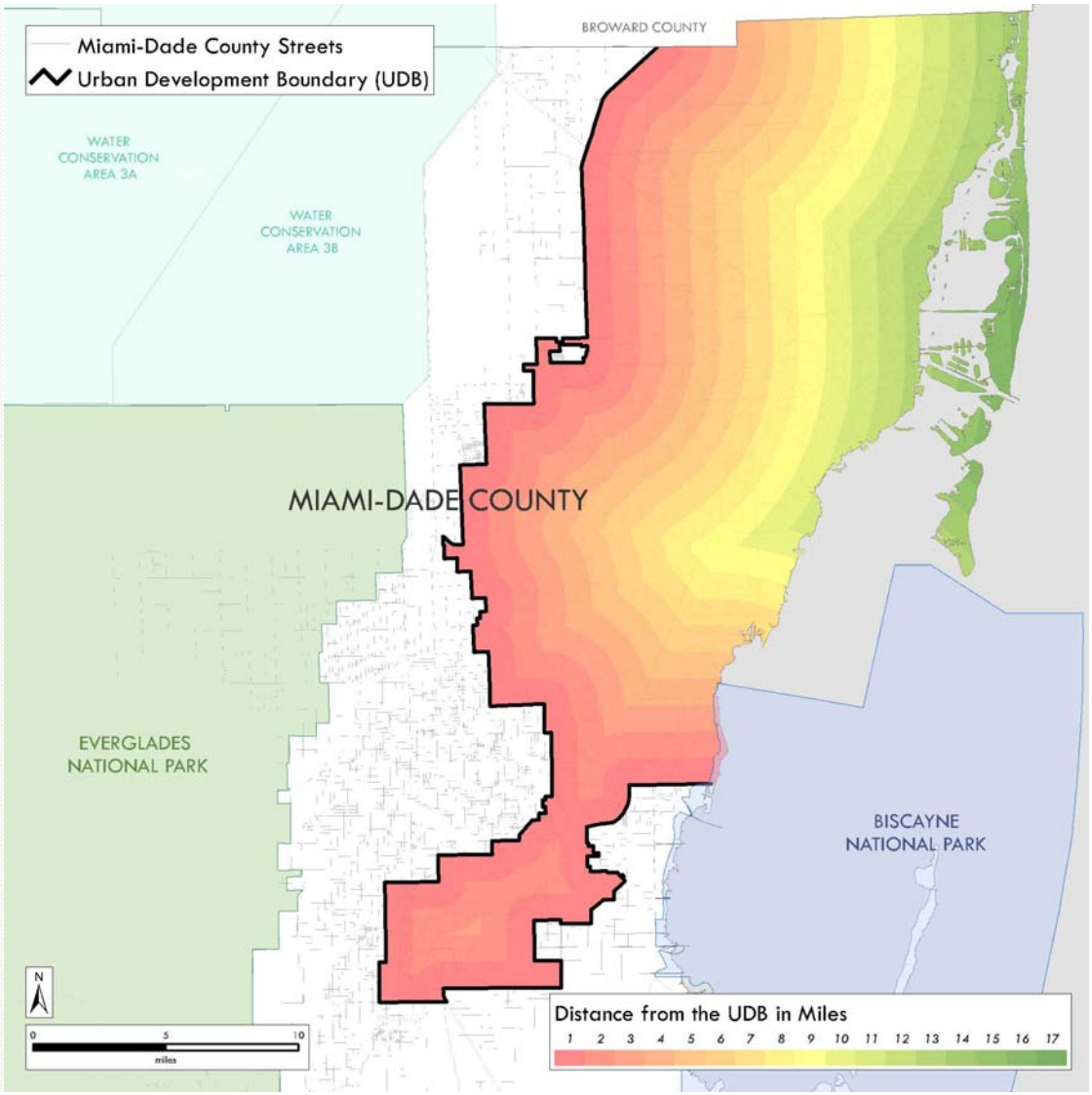
- Whether walked: Each 10-pt. increase associated with significant **19% increase** in purposive walking
- Amount walked: Each 10-pt. increase associated with significant **27% increase** in number of minutes of purposive walking
- Meeting PA recommendations (CDC ≥ 150min): Each 10-pt. increase associated with significant **26% increase** in likelihood of meeting PA recommendations through purposive walking.
- Participants residing in "highly-walkable" neighborhoods (Walk Score®=70-100) were 2.23 times as likely to meet PA recommendations through walking as were those who lived in "car-dependent" neighborhoods (Walk Score®=0-49).



NIDDK Grant No. DK-74687; PI: J. Szapocznik; Brown et al. (2013) "Walk Score: Associations with Purposive Walking in Recent Cuban Immigrants." *American Journal of Preventive Medicine,* 45(2):202–206.

Built Environment & Metabolic Syndrome: UDB

- Regression analyses examined UDB distance in relation to baseline walking (adjusting for age, gender, education, BMI, days in US, and habitual walking in Cuba):
- For each 1-mile increase in the distance from the UDB, there was a 10% increase (statistically significant) in WHETHER the participant walked in the last week.
- For each 1-mile increase in distance from the UDB, there was an 11% increase (statistically significant) in the AMOUNT of purposive walking in the last week (Brown et al., 2013, in prep.).

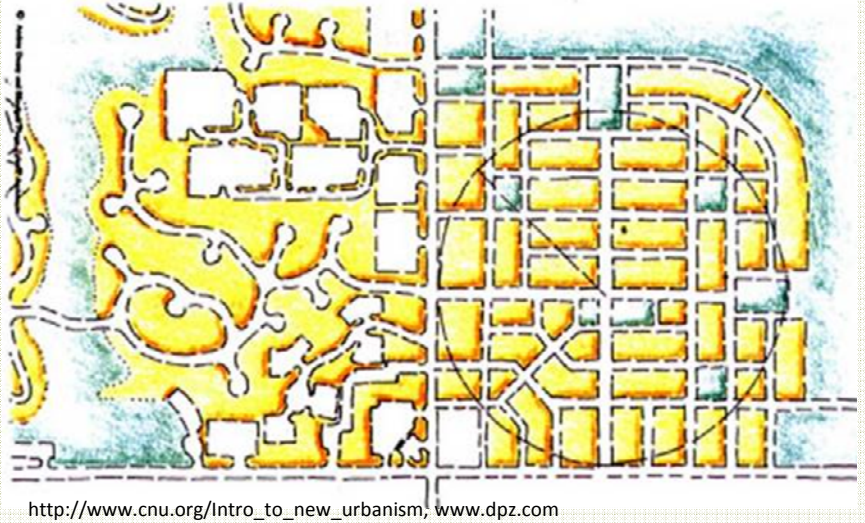


NIDDK Grant No. DK-74687; PI: J. Szapocznik

Supportive Neighborhoods:
Car-Dependent to Walkable Built Environment

http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals#presentation

Excelsior, Minnesota, http://walkbikebus.com/category/uncategorized/



http://www.cnu.org/Intro_to_new_urbanism, www.dpz.com

http://www.youtube.com/watch?v=VGJt_YXIoJI&feature=c4-overview-vl&list=PL0C21D05D4A380716

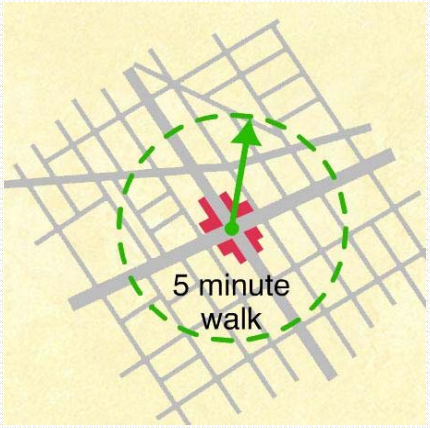
Supportive Neighborhoods:
Car-Dependent to Walkable Built Environment

Disconnected

Connected

Images by Dover Kohl & Partners, www.doverkohl.com

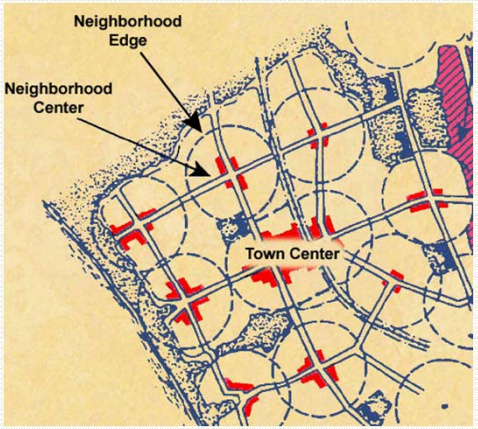
Supportive Neighborhoods: Indicators



5-Minute Walk

Mixed Use

5



Centers & Edges

Access to Transit

Access to Green

Vegetation & Safety

- Study using police crime reports to examine the relationship between vegetation and crime in an inner-city neighborhood. Crime rates for 98 apartment buildings with varying levels of nearby vegetation were compared.
- Results indicate that although residents were randomly assigned to different levels of nearby vegetation, the greener a building's surroundings were, the fewer crimes reported. Furthermore, this pattern held for both property crimes and violent crimes.
- Results indicate that although residents were randomly assigned to different levels of nearby vegetation, the greener a building's surroundings were, the fewer crimes reported. Furthermore, this pattern held for both property crimes and violent crimes.
- The relationship of vegetation to crime held after the number of apartments per building, building height, vacancy rate, and number of occupied units per building were accounted for.

Ida B. Wells Buildings with varying tree cover

Buildings with high levels of vegetation had 52% fewer total crimes, 48% fewer property crimes, and 56% fewer violent crimes than buildings with low levels of vegetation. (354-5)

Frances E. Kuo and William C. Sullivan, (2001) "Environment and Crime in the Inner City: Does Vegetation Reduce Crime?" *Environment and Behavior,* 33, (3) May: 343-367.

Street Trees & Value

- Study using hedonic price model to simultaneously estimate the effects of street trees on the sales price and the time-on-market (TOM) of houses in Portland, Oregon.
- On average, street trees add $8870 to sales price and reduce TOM by 1.7 days.
- Benefits of street trees spill over to neighboring houses.
- Because the provision and maintenance of street trees in Portland is the responsibility of adjacent property owners, . . . results suggest that if the provision of street trees is left solely to homeowners, then there will be too few street trees from a societal perspective.

American Forests -Portland : Top 10 Best Cities for Urban Forests in the U.S. : "*Goals for the city's canopy are actually built into multiple management plans, and the improvements the city is seeing are related to the work of a dedicated government, nonprofits and community groups. Meanwhile, the city is using green infrastructure as a cost-effective alternative to gray infrastructure and is protecting its trees through public and private ordinances and a diversification strategy. Portland estimates that its street trees alone have added more than $13 million in property resale value, and its entire urban forest provides more than $38 million in environmental benefits*."

Geoffrey H. Donovan, David T. Butry, (2010) "Trees in the city: Valuing street trees in Portland, Oregon," *Landscape and Urban Planning*, (94): 77–83.

http://www.portlandoregon.gov/bes/50716?&archive=2013&page=3

http://www.americanforests.org/our-programs/urbanforests/10-best-cities-for-urban-forests/

Community Garden Impacts

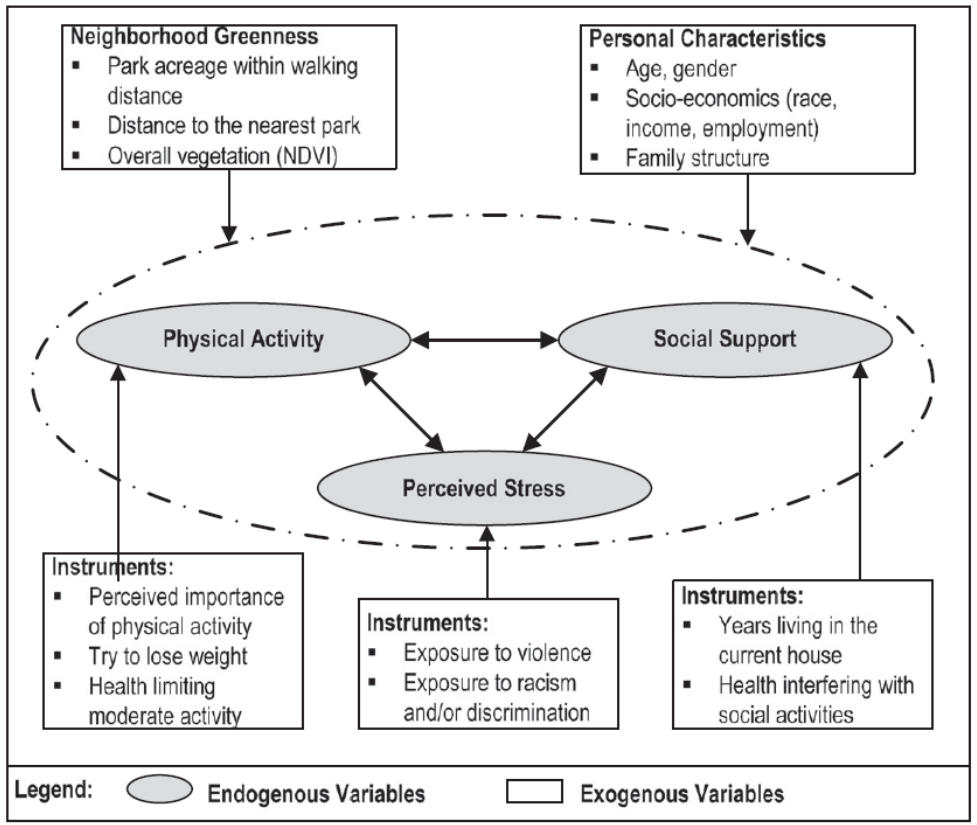
- Study of associations between participation in community gardening/beautification projects and neighborhood meetings with perceptions of social capital at both the individual and neighborhood levels, Flint, Michigan (N51916).
- At the individual level, household involvement in community gardening/ beautification activities and in neighborhood meetings were associated with residents' perceptions of bonding social capital, linking social capital, and neighborhood norms and values.
- Results suggest involvement in neighborhood meetings augment the individual and neighborhood-wide perceptions of social capital associated with community gardening and beautification projects.
- Neighborhood community gardens' impact on neighborhood residents' perceptions of social capital can be enhanced by neighborhood wide meetings.

http://resourcegenesee.tumblr.com/post/37912856617/jobs-education-training-and-reforming-cash

Resource Genesee & Hurley Medical Center community garden on the corner of 5th Ave and Begole, Flint, Michigan

Alaimo, K., Reischl, T. and Allen, J.O. (2010). "Community Gardening, Neighborhood Meetings, and Social Capital." *Journal of Community Psychology, 38*(4), 497-514.

Parks & Social Support



- We estimate the cumulative stress mitigating impact of neighborhood greenness by investigating whether neighborhood green mitigates stress directly, and indirectly by encouraging physical activity and/or fostering social support.
- Using data from a recent community health survey in Chicago and two- stage instrumental variables regression modeling, we find that different components of neighborhood green play distinct roles in influencing stress.
- **Park spaces are found to indirectly mitigate stress by fostering social support.**

Conceptual Model

Yingling Fan, Kirti V. Das, Qian Chen, (2011) "Neighborhood green, social support, physical activity, and stress: Assessing the cumulative impact,"*Health & Place*, 17:1202- 1211.

Parks, Dogs & Physical Activity

http://www.weekendnotes.com/best-off-leash-dog-parks-in-melbourne/

- Intrapersonal and environmental factors associated with dog walking (N = 483) were examined.
- A greater proportion of regular (80%) than irregular (59%) dog walkers met the recommended 150 minutes of physical activity per week.
- Owners who perceived greater social support and motivation from their dog to walk, and who had access to a dog-supportive park within their neighborhood, were more likely to regularly walk with their dog, even after adjustment for other well-known correlates of physical activity.
- The higher level of physical activity of regular dog walkers can be attributed to the additional walking these owners perform with their dog.

Hayley Christian (nee Cutt), Billie Giles-Corti, Matthew Knuiman, (2010) "'I'm Just a'-Walking the Dog': Correlates of Regular Dog Walking," *Family & Community Health,* 33(1)JanMar:44-52.

Park Attributes & Park Use

Bryant Park, NYC
"before"

"after"

http://blog.bryantpark.org/search/label/20th%20anniversary

- **. . . attributes including safety, aesthetics, amenities, maintenance, and proximity are important for encouraging park use**.
- . . . physical attributes of parks as well as perceptions of these attributes (formed in relation to broader social contexts) may influence physical activity patterns.

Gavin R. McCormack, Melanie Rock, Ann M. Toohey , Danica Hignell, (2010) "Characteristics of urban parks associated with park use and physical activity: A review of qualitative research," *Health & Place,* 16:712–726.

NDVI Impact on 250,000 Medicare Beneficiaries

An increase in mean block-level NDVI from -1 SD below to +1 SD above the mean was associated with reductions of:

45%
11,250

10%
Hyper-
Lipidemia

58%
18,850

13%
Hypertension

28%
10,500

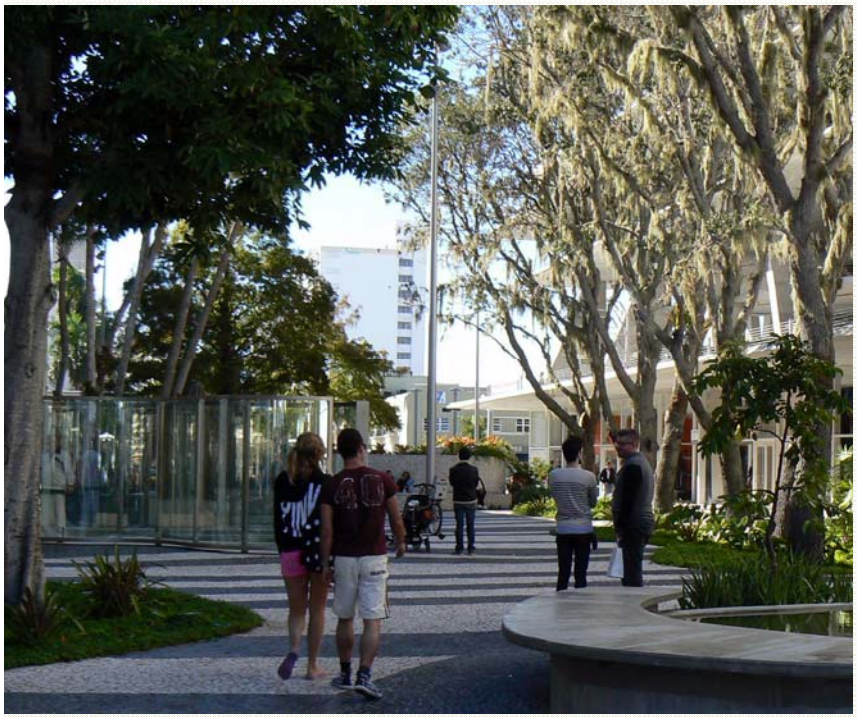
15%
Diabetes

*Adjusting for age, gender, race, ethnicity, and neighborhood median household income

U.S. Dept. of Housing & Urban Development (HUD) Sustainable Communities Research Grant# HUD H-21620-RG; Health Foundation of South FL Grant ,PIs: S. Brown , E. Plater-Zyberk, Is, J. Lombard, M. Byrne K. Wang, J. Szapocznik

NDVI Impact on 250,000 Medicare Beneficiaries

An increase in mean block-level NDVI from -1 SD below to +1 SD above the mean was associated with reductions of:



- 3 years reduction in biomedical aging of population
- 49 fewer chronic conditions per 1000 individuals

*Adjusting for age, gender, race, ethnicity, and neighborhood median household income

U.S. Dept. of Housing & Urban Development (HUD) Sustainable Communities Research Grant# HUD H-21620-RG; Health Foundation of South FL Grant ,PIs: S. Brown , E. Plater-Zyberk, Is, J. Lombard, M. Byrne K. Wang, J. Szapocznik

Checklists

Neighborhood Design Checklist

- ❑ 1. Identifiable Center & Edge within 5-minute walk
- ❑ 2. Mixed Use
- ❑ 3. Connectivity
- ❑ 4. Streetscape Transparency & Definition
- ❑ 5. Greenscape & Parks within 5-minute walk

Walkability Checklist

- ❑ 1. Connectivity *(4-way intersections/roundabouts)*
- ❑ 2. Block Size *(1000-2000 foot perimeter)*
- ❑ 3. Mixed Use
- ❑ 4. Proximity of Transit *(within 2500')*
- ❑ 5. Pedestrian Safety
- ❑ 6. Sidewalks
- ❑ 7. Residential Density
- ❑ 8. Parks

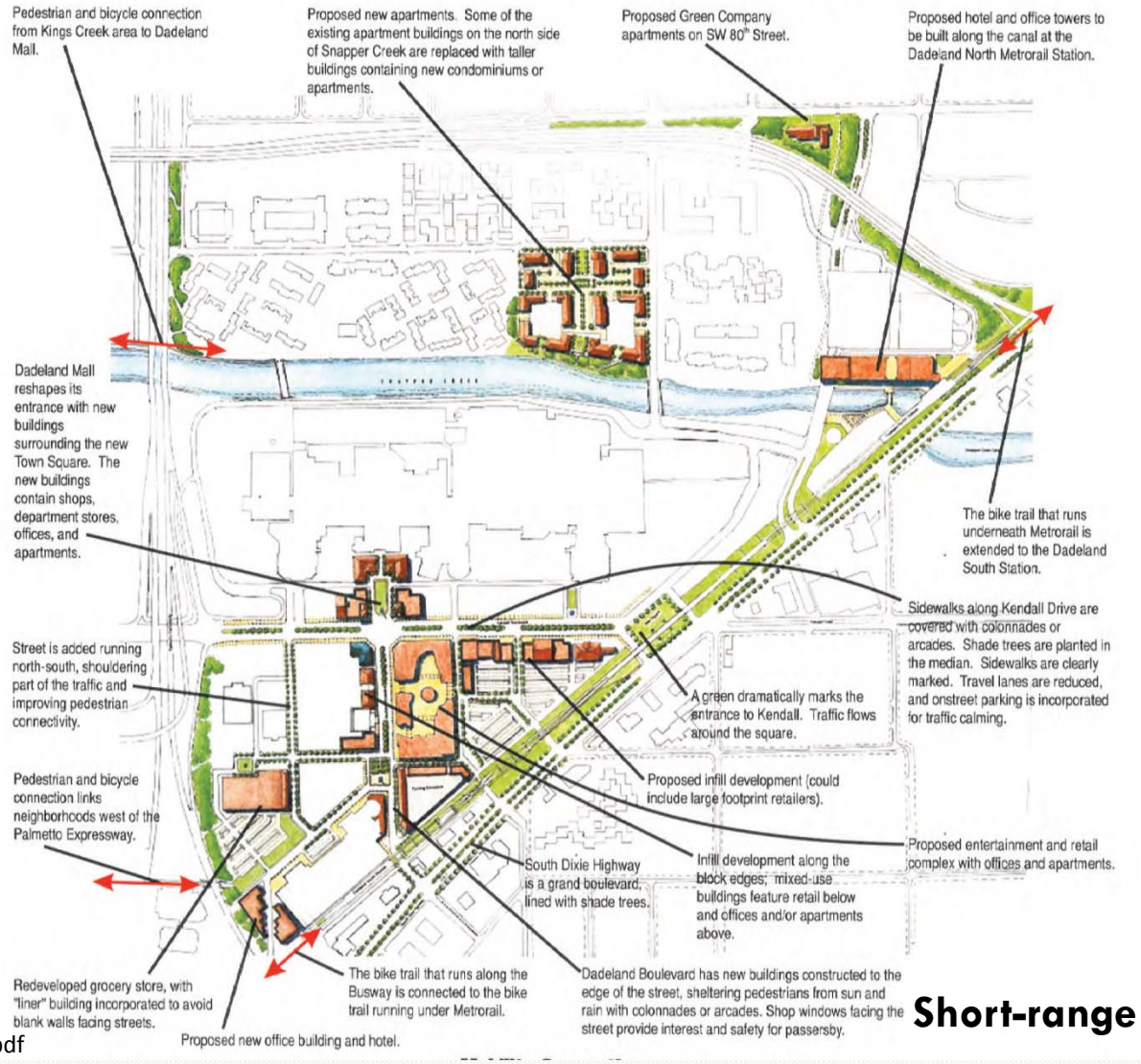
"Before" and "After" images from *Downtown Kendall Plan,* Dover Kohl & Partners

Checklists: Florida Department of Health / University of Miami Built Environment Behavior & Health Team

Intervention

Downtown Kendall, Dover, Kohl & Partners

http://blog.ewm.com/2008/07/23/dadeland-area-summer-night-photos%E2%80%A6/

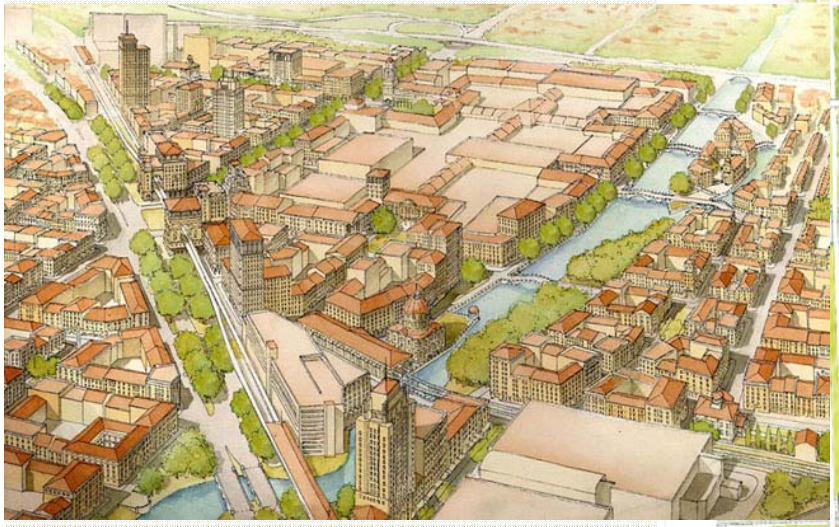


Short-range

http://www.doverkohl.info/reports/DowntownKendallReport.pdf

Intervention

Downtown Kendall, Dover, Kohl & Partners



http://www.doverkohl.info/reports/DowntownKendallReport.pdf