

STRIDE

Southeastern Transportation Research,
Innovation, Development and Education Center

T+H

Transportation + Health

Quality of Life, Livability, & Active Living

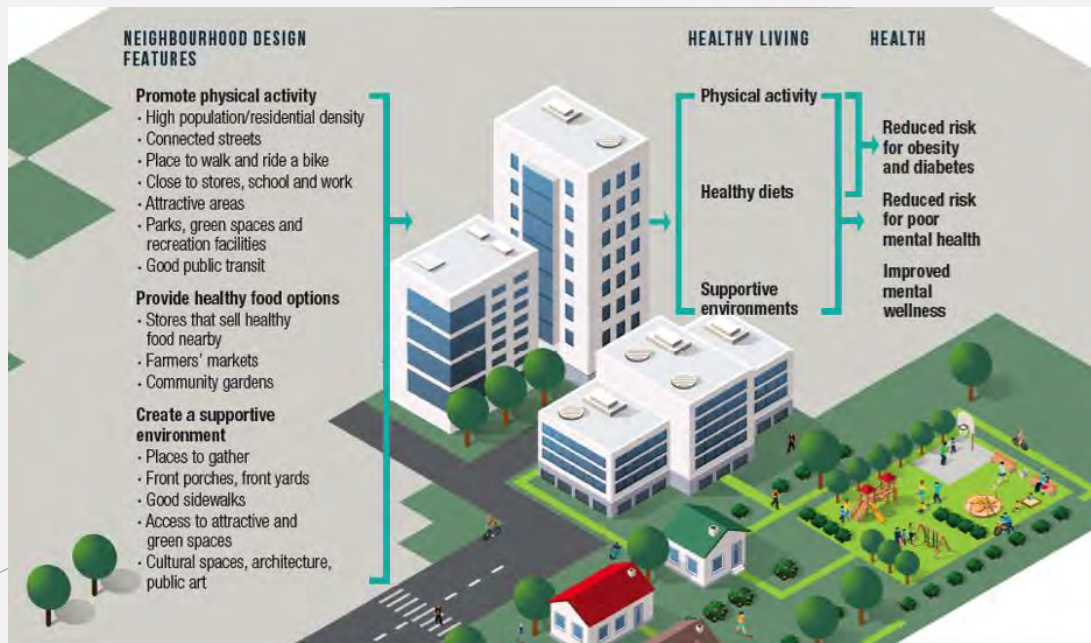
THE
CITADEL



CIVL 642 Public Health, Physical Activity, and Design of the Built Environment

1. **Quality of Life** is “the satisfaction in life that comes from having good health, comfort, good relationship etc., rather than from money” ... It is “The personal satisfaction (or dissatisfaction) with the cultural, or intellectual, conditions under which one lives.”
2. Term **Quality of Life** is credited to philosophers like Aristotle (384–322 BC) who wrote about “the good life” and “living well,” and how public policy can support these ideals.
3. Modern roots of the term “**Quality of Life**” can be traced back to the World Health Organization as defined in 1948.





Quality of Life, Livability, Active Living

1. Designing Healthy Communities

- Neighborhood Activity Centers
- Higher street connectivity
- destination diversity
- net residential density

2. Active Living Collaboratives in the US

- 200 projects to create a built environment that fosters PA

3. Neighborhood-Based Differences in Physical Activity



Designing Healthy Communities

International Journal of Behavioral Nutrition and Physical Activity, Volume 14, Article number: 164 (2017)

<https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-017-0621-9>

Table 1 Built environment variables calculated within 800m of a supermarket

Variables and definitions
<i>Community Design</i>
Pedshed: ratio of area within 800m street network buffer to the area within 800m Euclidean buffer
Number of community resources: post offices, community centres, child care centres, libraries
Number of small food stores: butcher, green grocers, convenience stores
Number of other retail stores: banks, pharmacy, petrol station, newsagent
Number of supermarkets: includes major and minor supermarkets
Supermarket diversity: number of different major supermarkets (0-4)
Number of transport stops: buses, trams, train
Transport diversity: number of different types of transport (0-5)
Destination diversity: number of different individual destination types (0-16)

Movement Network

- Street connectivity: number of ≥ 3 way intersections
- Cul de sacs: number of cul de sacs
- Cul de sac segments ≤ 120 m long: number of cul de sac segments ≤ 120 m long
- Connected node ratio: number of ≥ 3 way intersections \div all intersections including cul de sacs
- Disconnected node ratio: number of cul de sacs \div all intersections including cul de sacs
- Mean block perimeter (m)
- Walkable block ratio: number of blocks ≤ 620 m perimeter \div total number of blocks
- Traffic exposure ratio: length of low traffic roads \div length of low and high traffic roads

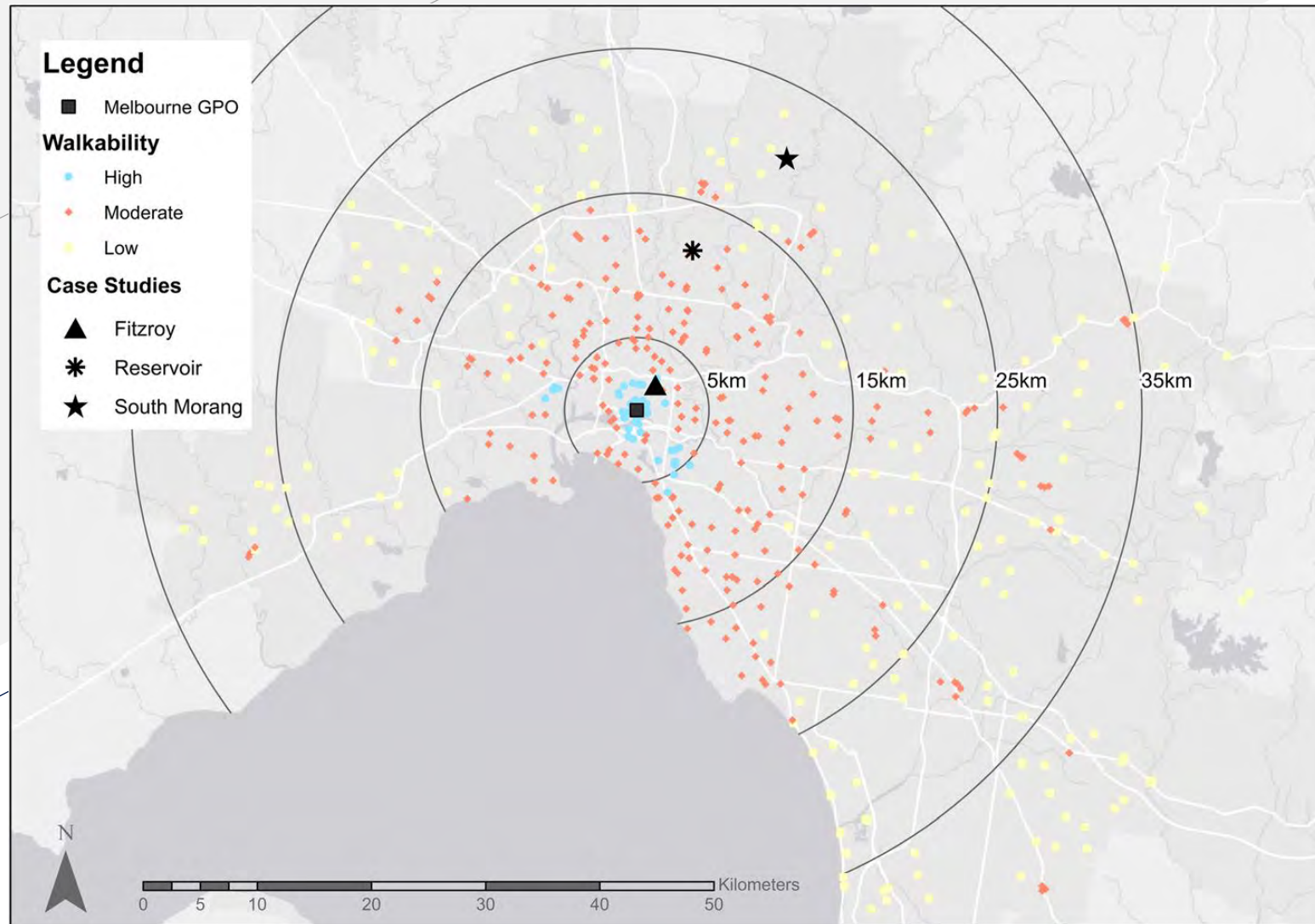
Lot Layout

- Housing diversity: number of different housing types (0-8)
- Net residential density: number of commercial dwellings + number of residential dwellings \div commercial and residential area

Designing Healthy Communities

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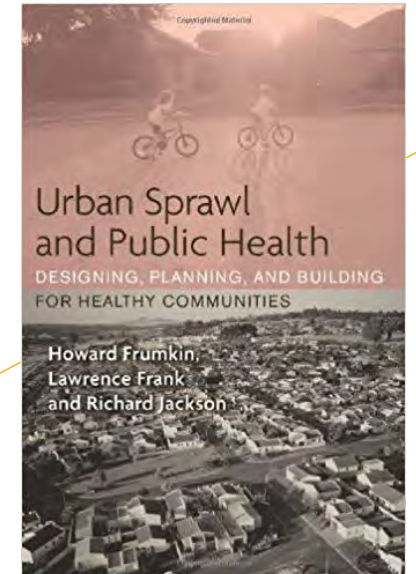
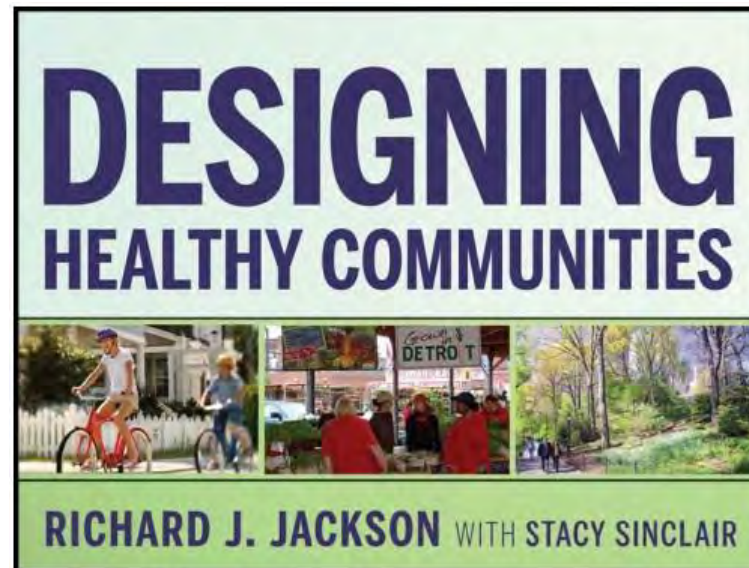


Designing Healthy Communities

Dr. Richard Jackson, Fielding School of Public Health UCLA

Idaho Public Television, Dialogue, Season 2016 Episode 11 | 28m 50s

<https://www.pbs.org/video/dialogue-designing-healthy-communities-dr-richard-jackson/>



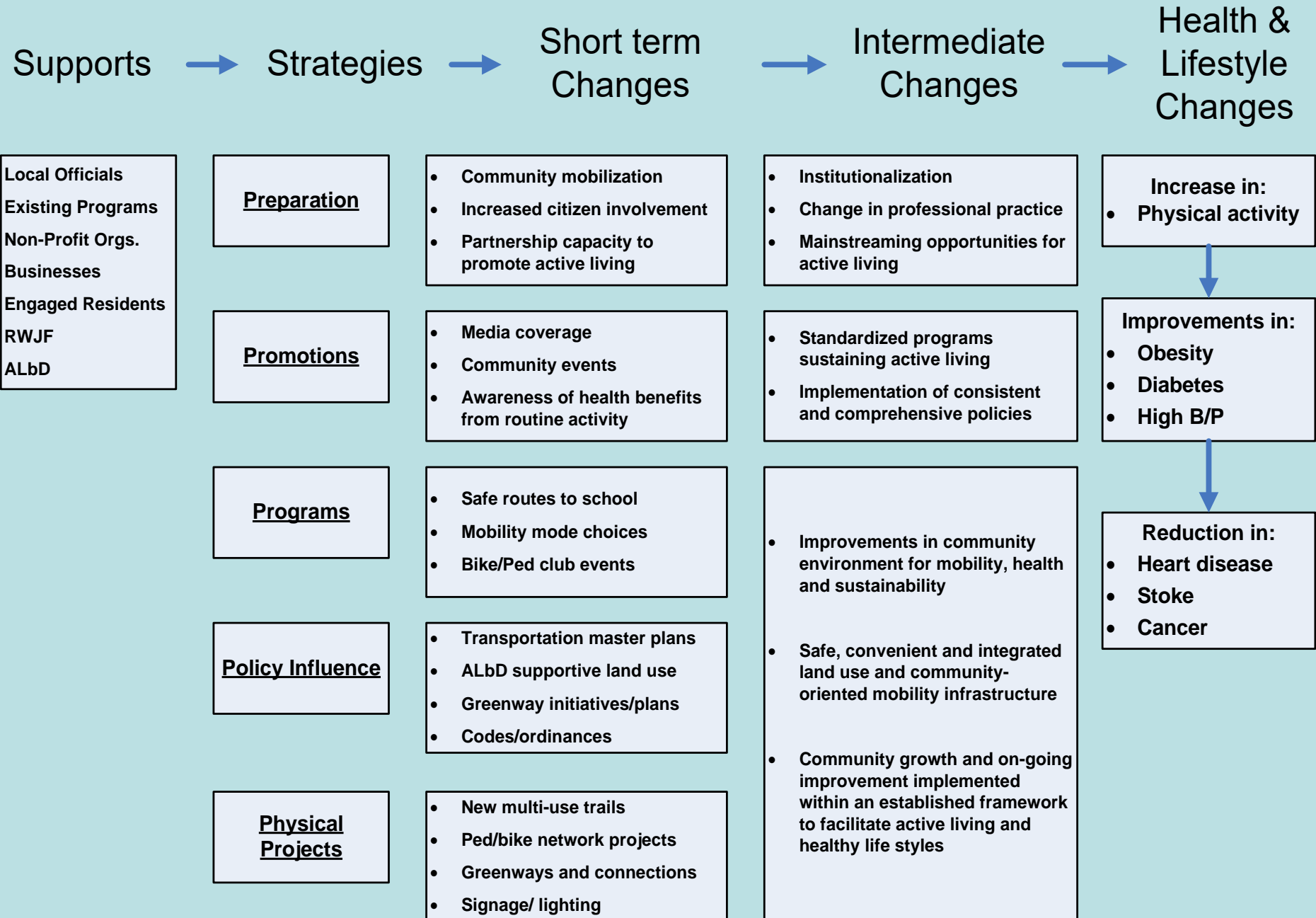
Robert Woods Johnson Foundation – Active Living By Design

<https://www.rwjf.org/en/library/research/2011/10/active-living-by-design.html>

<https://dirt.asla.org/2011/01/26/designing-for-active-living/>

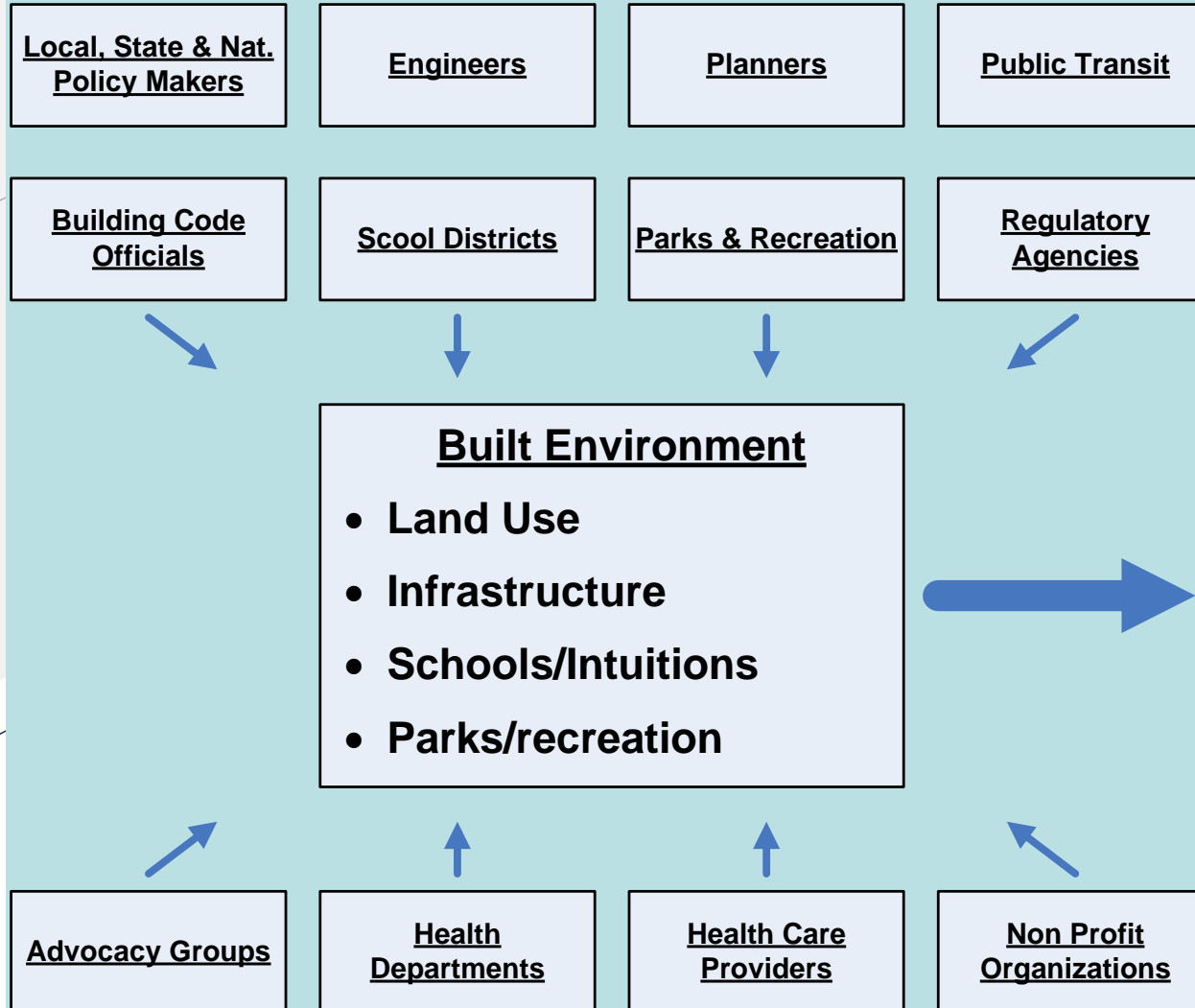


Active Living by Design Community Action Model



Framework for Emerging Influences on the Built Environment

Traditional Professional & Political Influences



New Performance Measures

- Livability
- Sustainability
- Healthy Communities

Improvements in:

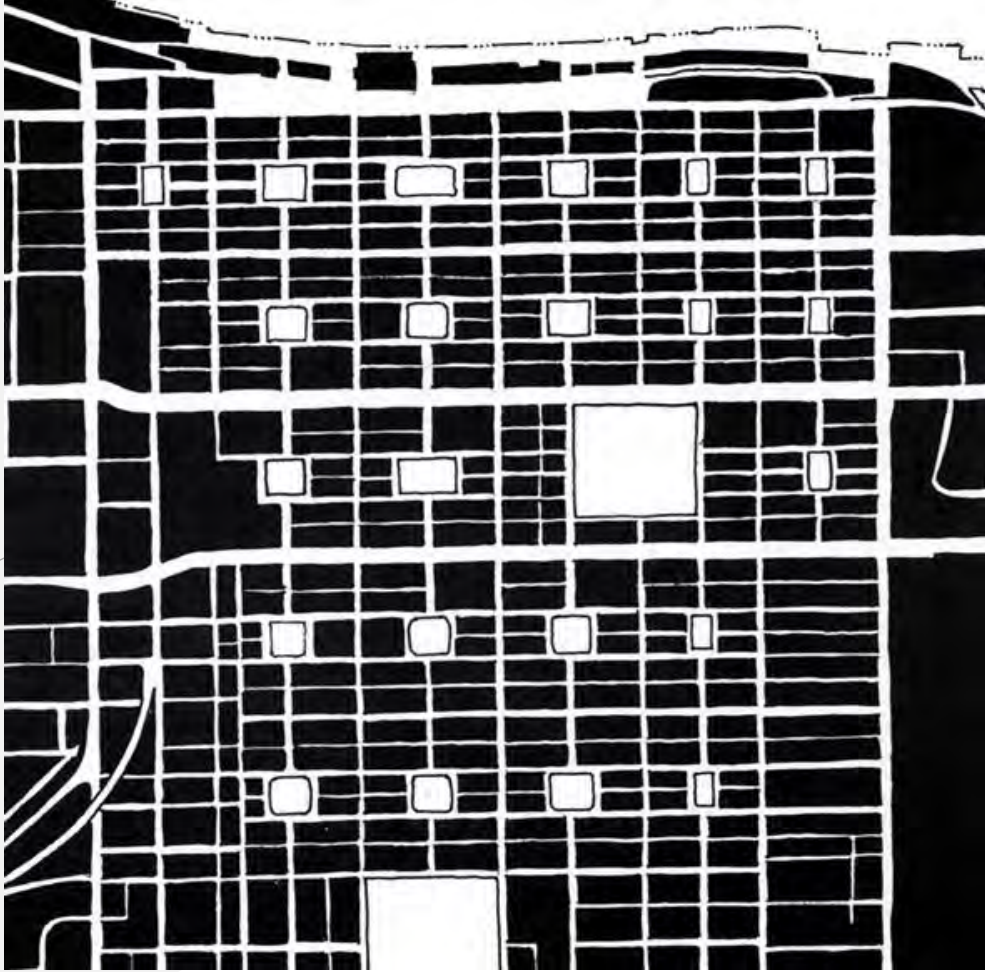
- Obesity
- Diabetes
- High B/P

Reduction in:

- Heart disease
- Stoke
- Cancer

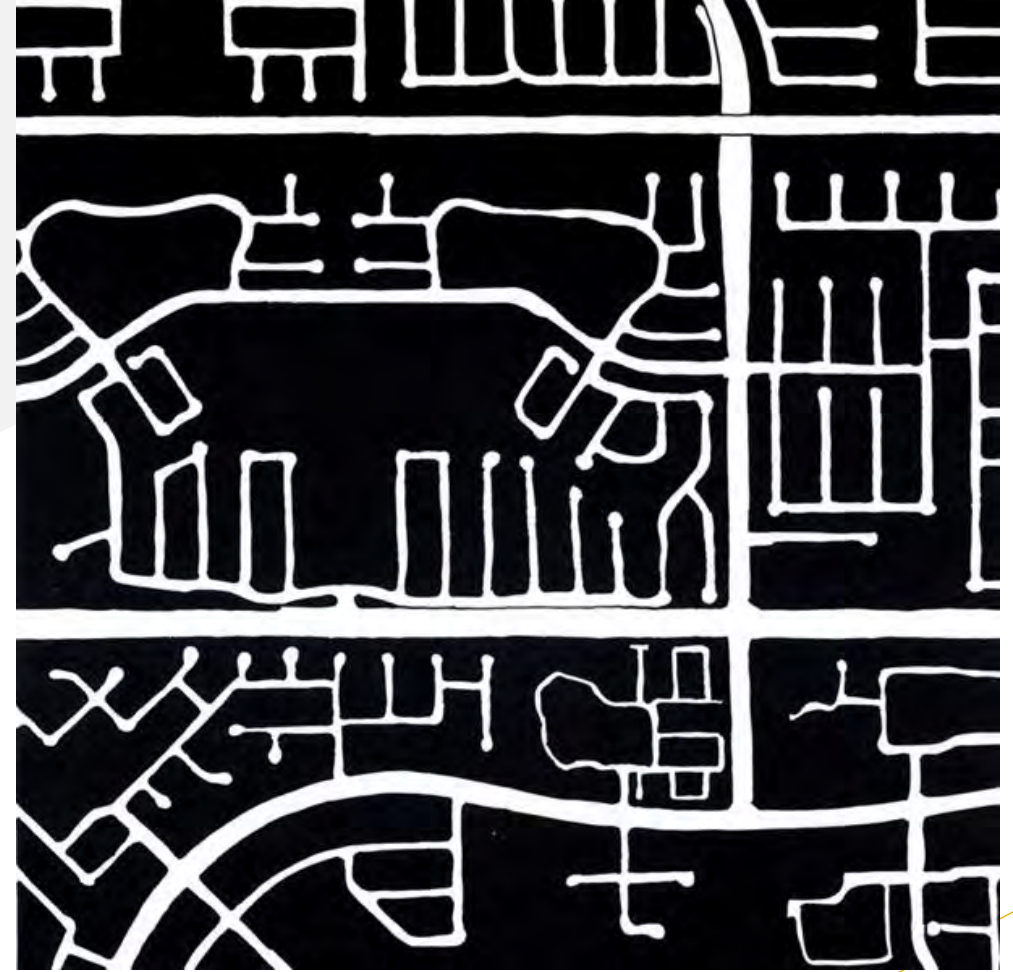
Increase in:

- Physical activity



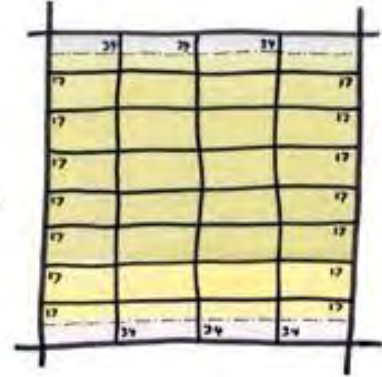
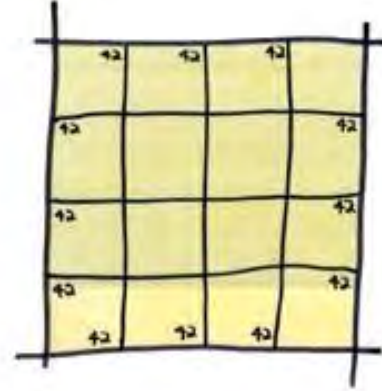
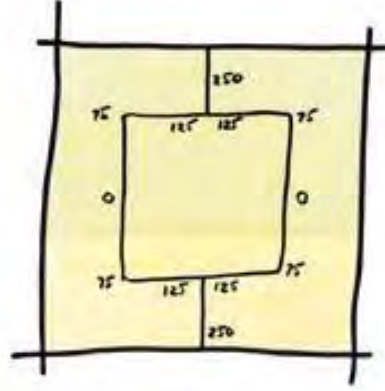
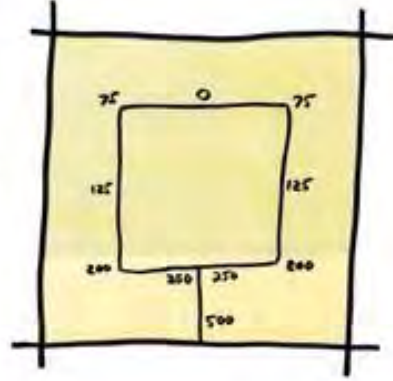
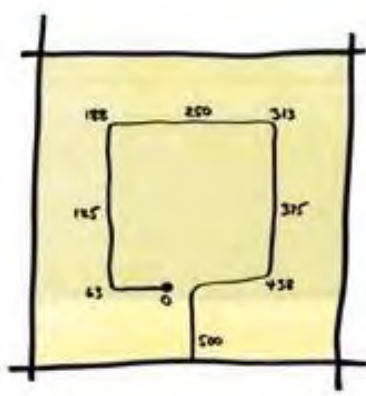
Good Urban Design

- interconnected network of streets
- mixed land use
- very walkable
- more physical activity
- more livable



Poor Urban Design

- disconnected network of streets
- segregated land use
- often not very walkable
- increased reliance on cars
- less physical activity
- more stress



Complete Streets



Chico, CA

Nord Avenue



Chico, CA

Nord Avenue



Chico, CA

Nord Avenue

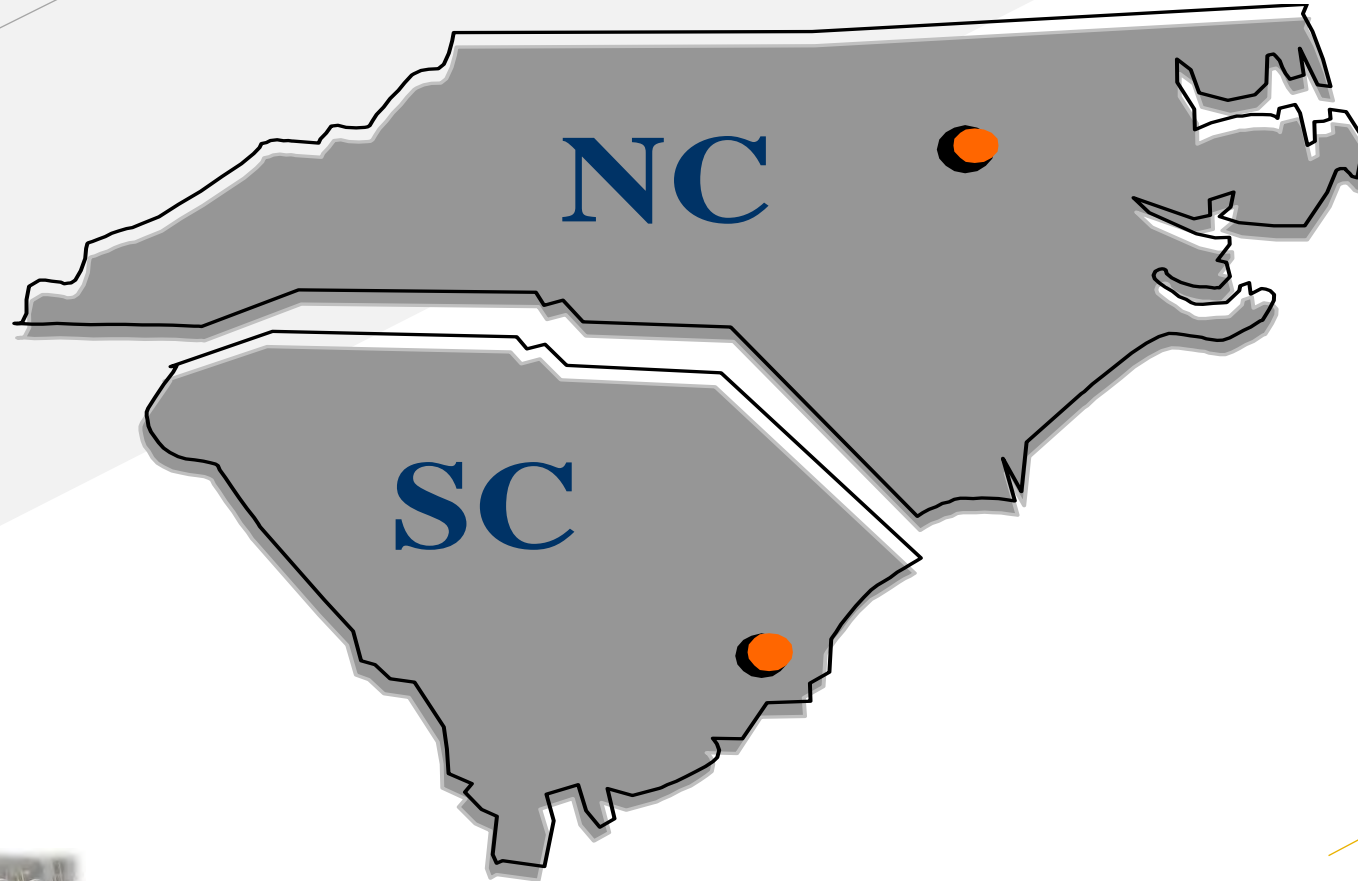


Chico, CA

Nord Avenue



Functional Multi-Use Path Design & Supportive Elements of the Built Environment; Case Study Research in the Carolinas



William J. Davis, Ph.D., P.E.
The Citadel



AlbD - Research Project

Exploring Policy Change in Development of Community Trails: A Comparison of Case Study Locations in the Carolinas

1. Research is focused on evaluating correlations between public health and supportive elements of the built environment
2. Research objectives focus on a comparative analysis of case-study community trail projects in Durham, NC and Georgetown, SC, and include:
 - To identify the process by which policies are enacted, or changed, to facilitate community/multi-use trail development.
 - To evaluate how policy changes influence the built environment and affect levels of physical activity.
 - To evaluate land use and transportation infrastructure elements that affect trail use and levels of physical activity



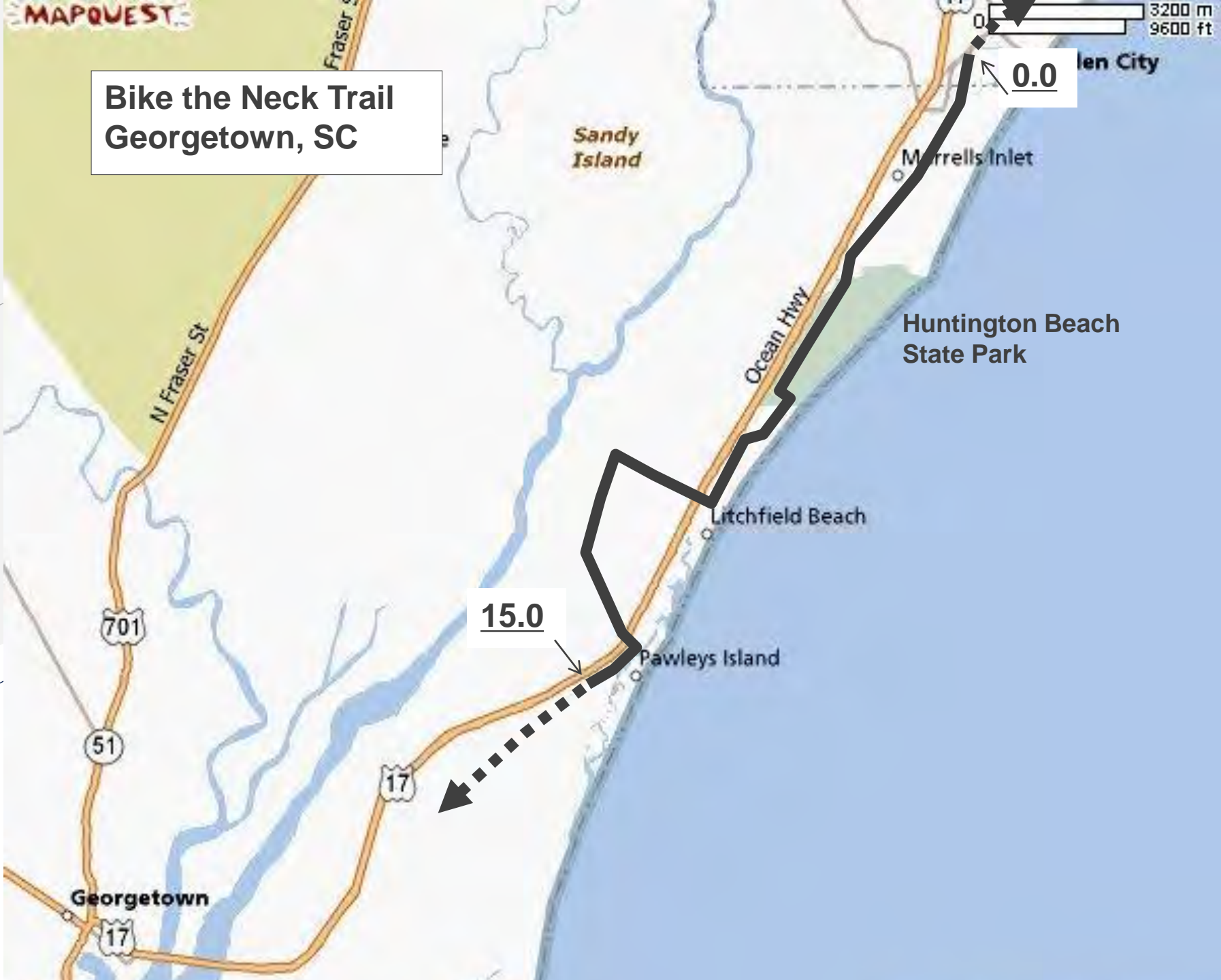
**Ellerbe Cr. Trail &
American Tobacco Trail
Durham, NC**



Ellerbe Cr. / ATT - Durham, NC



**Bike the Neck Trail
Georgetown, SC**



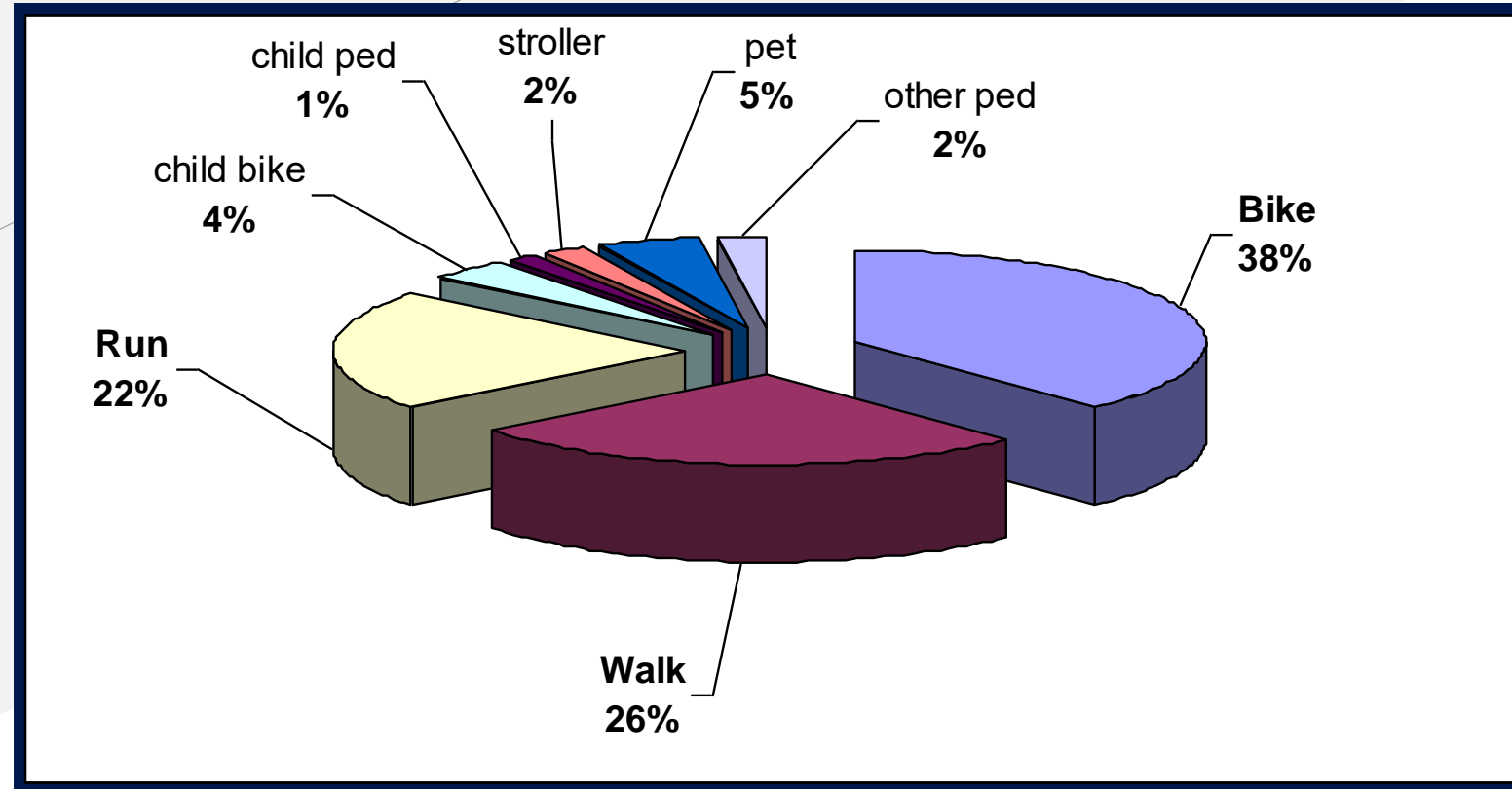
Bike the Neck – Georgetown, SC



Overview of Case Study Locations

Facility type	Durham, NC Ellerbe Cr/ATT	Georgetown, SC Bike The Neck
Multi-use path (rails-to-trails)	6.4	
Multi-use path (in park)	3.2	2.9
Multi-use path (in road r/w)		3.4
Multi-use path (in development)	0.4	
Side walk	1.4	
Side walk w/ shared lane	1.6	
Bike lanes		3.3
Shared road		0.8
<i>Planned multi-use path (in rd r/w)</i>		4.6
Total Dist.	13.0 mi.	15.0 mi.

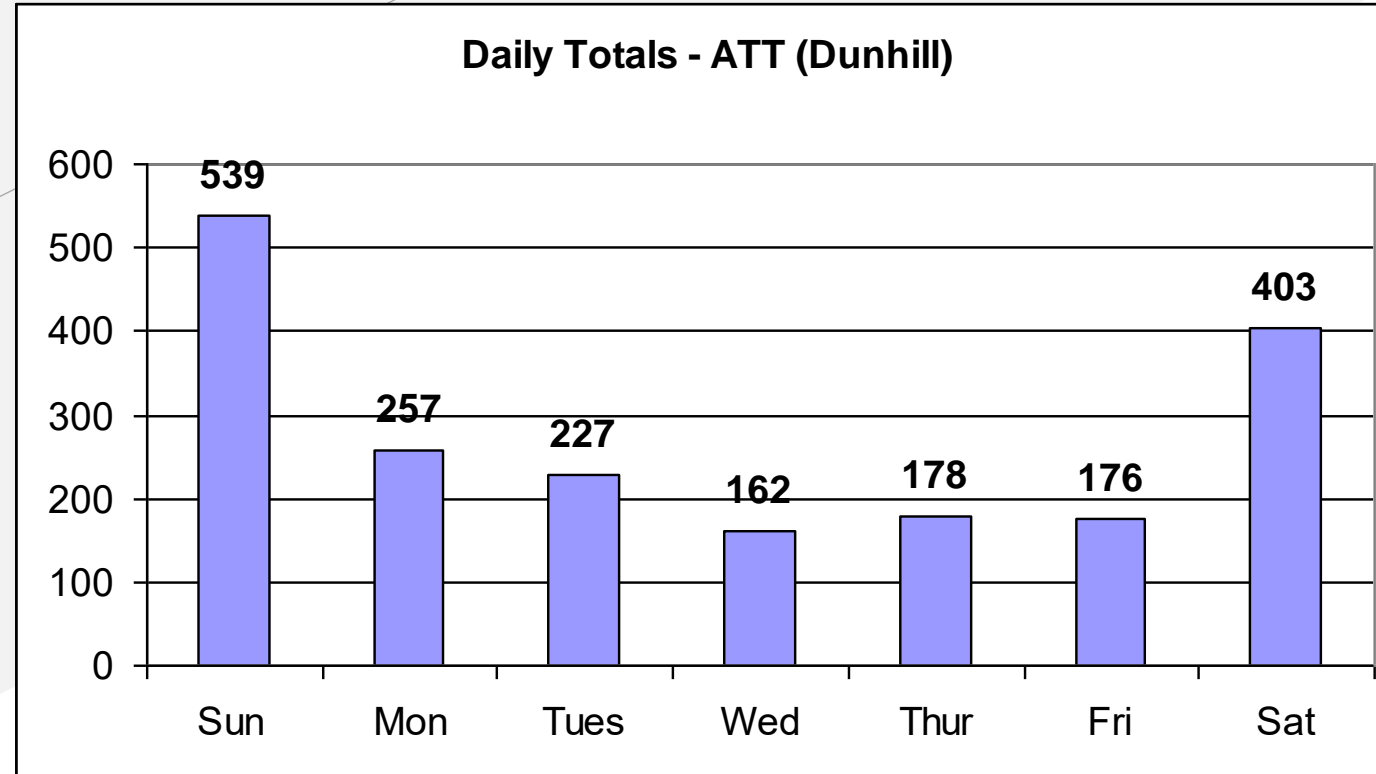
ATT Trail Use Count Data



Based on 14.25 hrs of user classification count data = 1,063 total



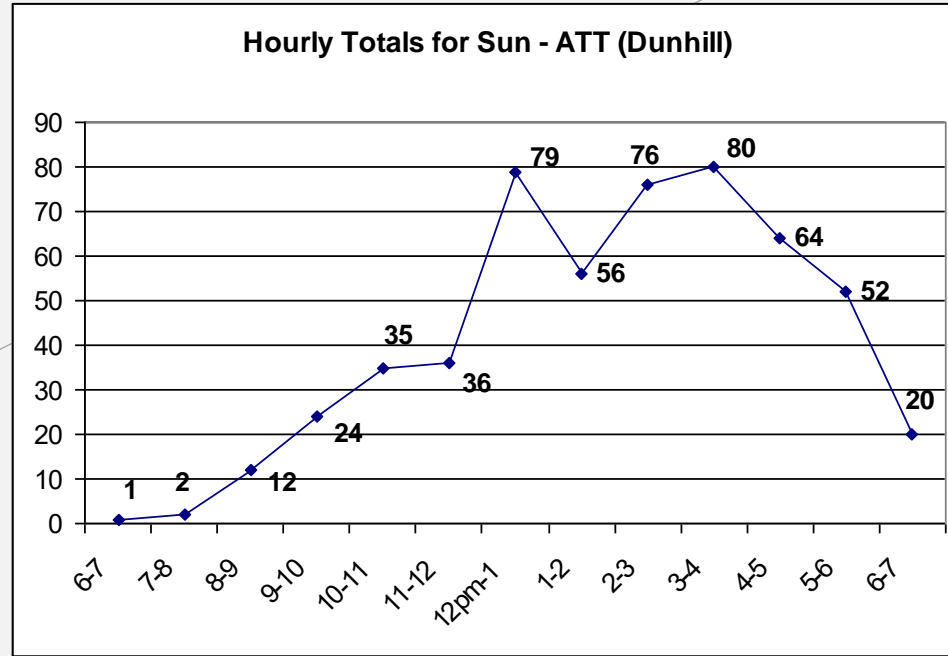
ATT Daily Trail Use



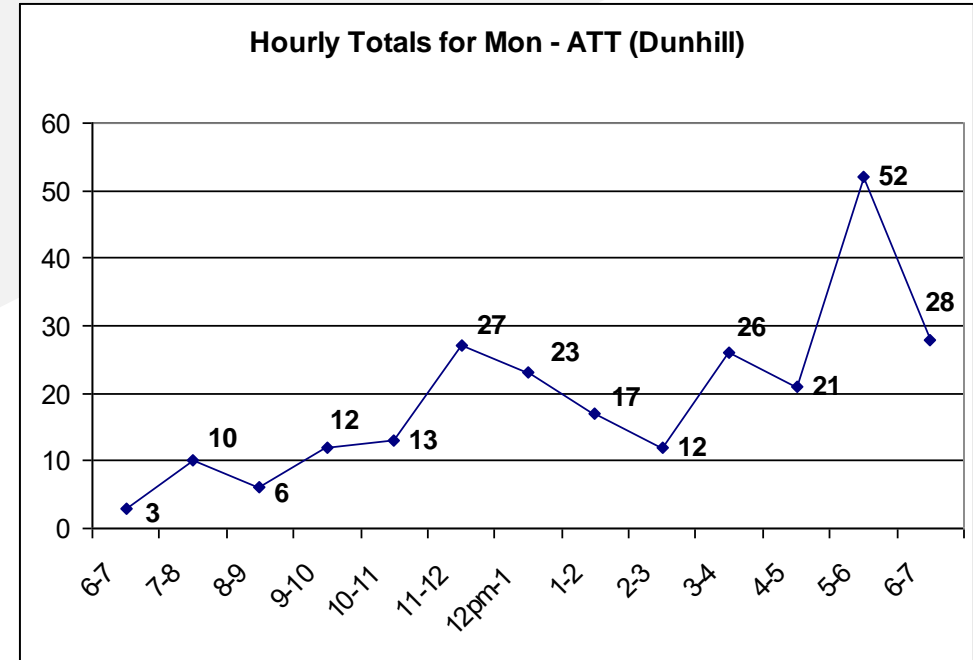
Data collected from 11-04 to 11-10-07, total = 1,942



ATT Hourly Distribution



Daily total for Sunday, 11-04-07, = 539
peak K= 14.8%, 3-4 pm



Daily total for Monday, 11-05-07, = 257
Peak K = 20.2%, 5-6 pm



Important elements of functional multi-use path design

- Consideration of differing users
- Horizontal, vertical alignment, drainage
- Right-of-way and min. separation from road
- At grade crossings & grade separations
- Width & buffers
- Pavement design & sub-base preparation
- Traffic control issues
- Safety, lighting, amenities, signing, kiosks, etc.
- Maintenance & periodic sweeping

Common trail creation elements in NC & SC case study communities

- Novel locally adopted public policies
- Inclusion in long-range transportation plans
- Highly engaged advocacy groups
- Public & private partnerships
- Public agency ownership
- Local matching funds
- Successful facilities & happy users

Neighborhood-Based Differences in Physical Activity: An Environment Scale Evaluation

Brian E. Saelens, PhD, James F. Sallis, PhD, Jennifer B. Black, BA, and Diana Chen, BA

Am J Public Health. 2003 September; 93(9): 1552–1558.



Subscales and Sample Items From the Neighborhood Environment Walkability Scale

Subscale	Sample Items
Residential density	How common are detached single-family residences in your immediate neighborhood? How common are apartments or condos 1–3 stories in your immediate neighborhood?
Land use mix–diversity	About how long would it take to get from your home to the <i>nearest</i> businesses or facilities if you <i>walked</i> to them? <ul style="list-style-type: none">• Convenience/small grocery store• Post office• Video store• Non–fast food restaurant
Land use mix–access	I can do most of my shopping at local stores. Parking is difficult in local shopping areas.
Street connectivity	The streets in my neighborhood do not have many, or any, cul-de-sacs. The distance between intersections in my neighborhood is usually short.
Walking/cycling facilities	The sidewalks in my neighborhood are well maintained. There is a grass/dirt strip that separates the streets from sidewalks in my neighborhood.
Aesthetics	There are many attractive natural sights in my neighborhood (such as landscaping, views). There are attractive buildings/homes in my neighborhood.
Pedestrian/automobile traffic safety	The speed of traffic on most nearby streets is usually slow (30 mph or less). There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood.
Crime safety	There is a high crime rate in my neighborhood. My neighborhood streets are well lit at night.

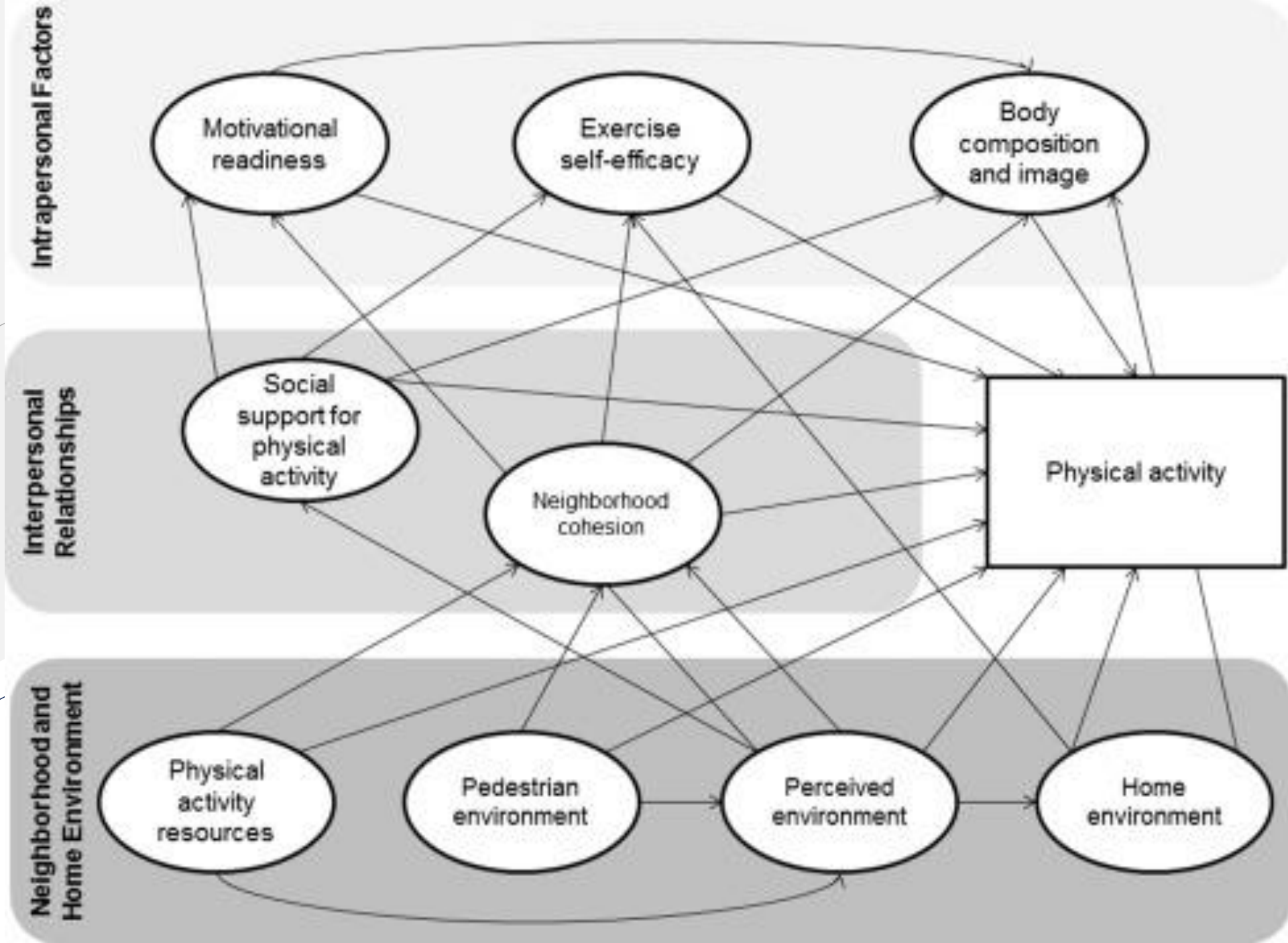
Neighborhood-Based Differences in Physical Activity: An Environment Scale Evaluation

Neighborhood Environment Factor or Subscale	Test–Retest Reliability (n = 106)	Mean (SD) Subscale Score	
		High-Walkability Neighborhood (n = 54)	Low-Walkability Neighborhood (n = 53)
Residential density	.63	203.2 (19.2)*	194.4 (21.6)
Land use mix-diversity	.78	3.5 (0.6)*	2.8 (0.7)
Land use mix-access	.79	3.2 (0.3)*	2.8 (0.5)
Street connectivity	.63	3.2 (0.5)*	2.9 (0.5)
Walking/cycling facilities	.58	3.0 (0.3)	3.2 (0.4)**
Aesthetics	.79	3.0 (0.5)*	2.8 (0.5)
Pedestrian/traffic safety	.77	3.1 (0.5)*	2.7 (0.5)
Crime safety	.80	3.1 (0.4)	3.1 (0.5)

Note. Subscale scores ranged from 1 to 4 (with the exceptions of land use mix-diversity [possible range: 1–5] and residential density [possible weighted score range: 177–473]), with higher scores indicating a more favorable value of the environmental characteristic

^aIntraclass correlation, *R*.

*high walkability > low walkability, $P < .03$; **low walkability > high walkability, $P = .003$.



Best & Worst Cities for an Active Lifestyle

Jan 4, 2019 | Adam McCann

<https://wallethub.com/edu/best-and-worst-cities-for-an-active-lifestyle/8817/>



Quality of Life, Livability, & Active Living



T+H

Transportation + Health

Thank You.

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