

The Built Environment and Obesity

Physical Activity Research in New
Orleans

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- Physical and social environmental factors influencing obesity
- Participatory research
- Collaboration with community partners
- Communication – practitioners, policy-makers, partners
- Training
- Advocacy and Policy Development

The Main Points

- The physical environment influences physical activity and obesity
- Changes in street/neighborhood design can increase walking and bicycling and improve health

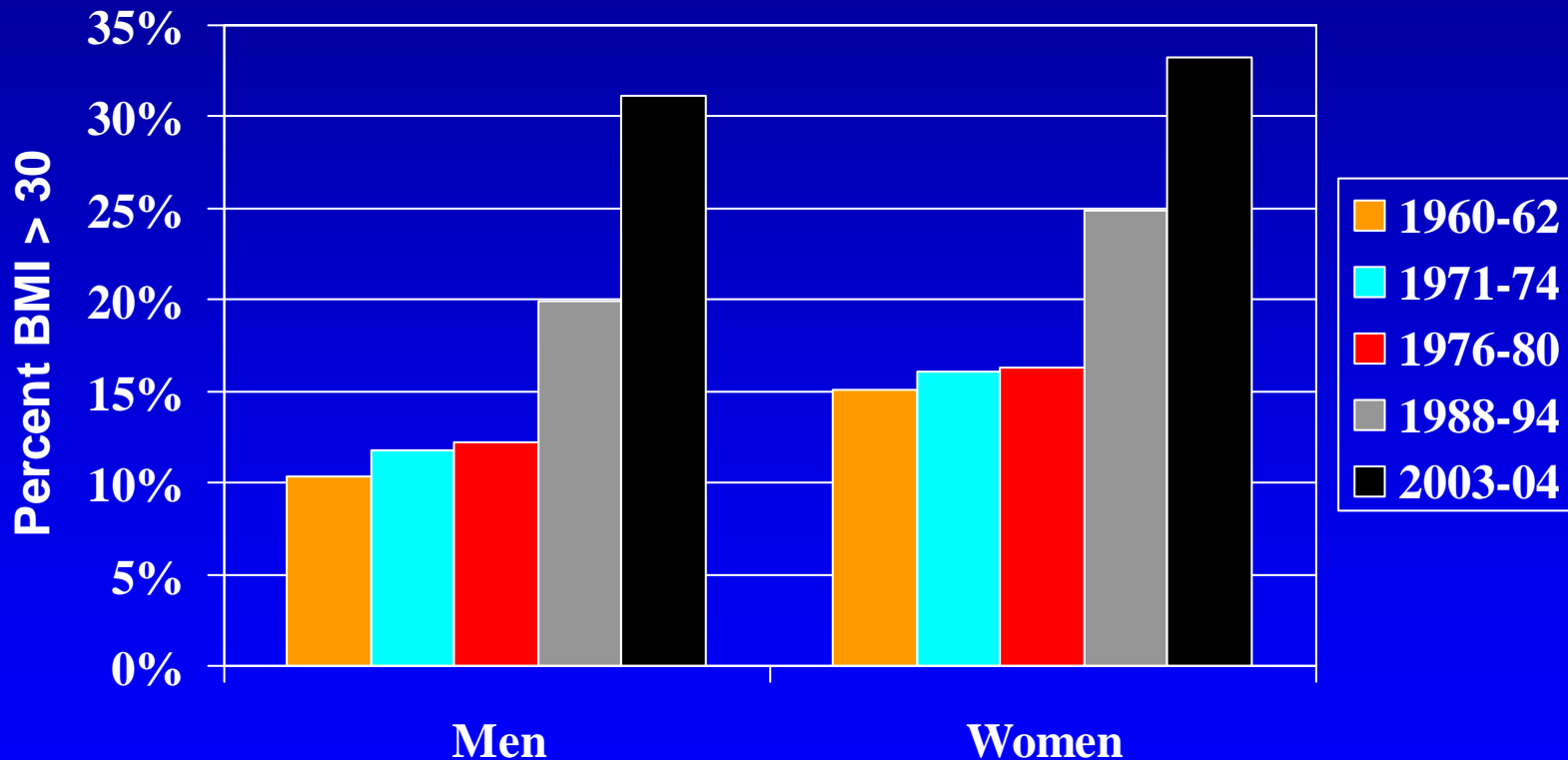
Rationale

- Obesity epidemic – 65% of American adults and 25% of American children are overweight^{1,2}
- Obesity is #2 underlying cause of death in America

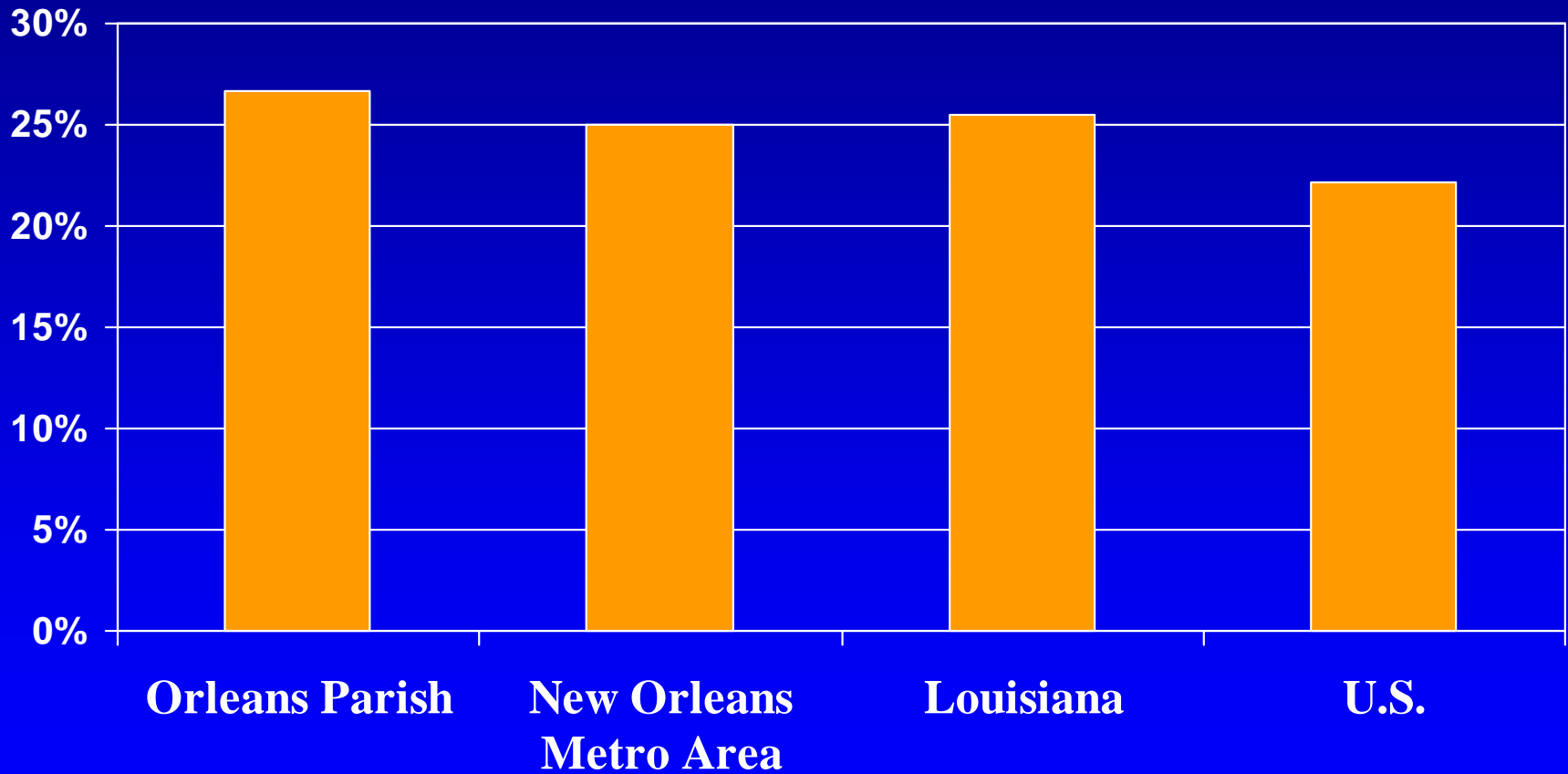
¹ Felgal et al. JAMA 2002; 288:1723-7.

² Hedley et al. JAMA 2004; 291:2847-50

Trends in Prevalence of Obesity U.S., 1960-2004



Obesity in Louisiana vs. Louisiana and U.S., 2002



Source: Centers for Disease Control and Prevention, SMART Behavioral Risk Factor Surveillance System, 2002

Obesity and Energy

- Caloric intake greater than energy expenditure
- Modern environment prevents energy expenditure
- Our everyday world encourages us to be physically *inactive*

Energy Expenditure for Various Activities

Activity	Kcal per Hour*
Sleeping	65
Watching television	70
Sitting and talking	105
Walking slowly (2.5 mph)	210
Walking quickly (4 mph)	280
Climbing stairs	560
Jogging (5 mph = 12 min/mile)	560

* For 70 Kg person; *Ainsworth BE et al, Med Sci Sports Exercise 25;71:1993 and 32;S498:2000*

Effectiveness of Treatment for Obesity

- Diet - Persons following any low-calorie diets lose weight temporarily
 - Loss of both of fat and “lean tissue”
 - Large majority quickly regain weight
- Physical activity – if sustained, can lead to long-term weight loss
- Drug therapy – side/toxic effects
- Surgery (intestinal bypass, stomach bands) – high complication rate, improving
- Overall results not good

Prevention of Obesity

Environmental approaches proposed

- Increasing number of parks
- Require sidewalks, bike paths
- Mixed-use neighborhoods (“active community environments”)
- Removing calorie-dense snack foods from schools and workplaces
- Regulating advertising of high calorie, high-fat foods
- Calorie labeling of menus
- Taxes on high-fat foods
- Media campaigns to counter advertising of high-fat foods



Want to take a walk?



Features of the Built Environment Theorized to Influence Walking

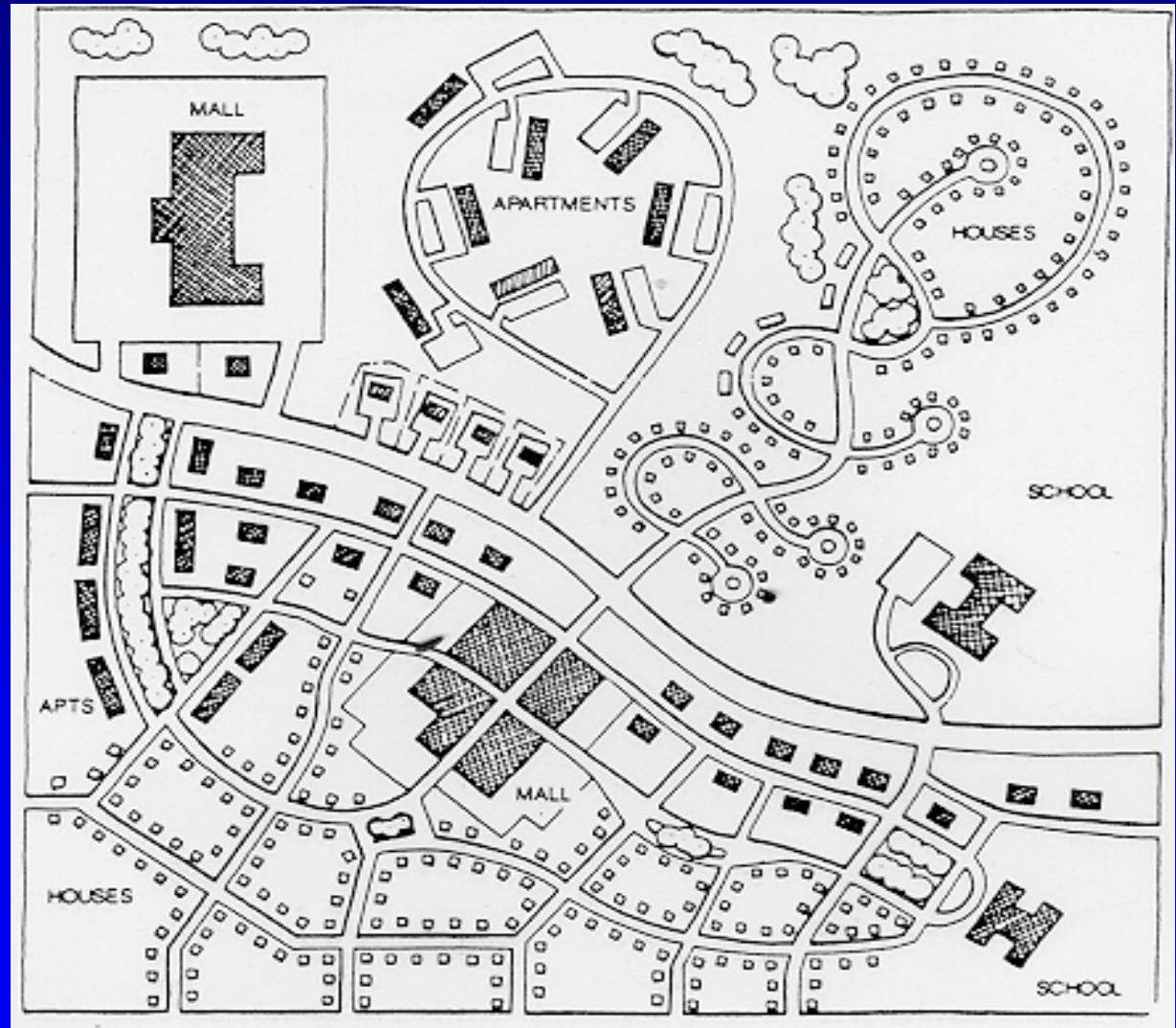
- High Density
- Land Use Mix
- Connectivity
- Street design – crosswalks, sidewalks
- Site design – close setbacks
- Aesthetics

Sprawl: A Schematic

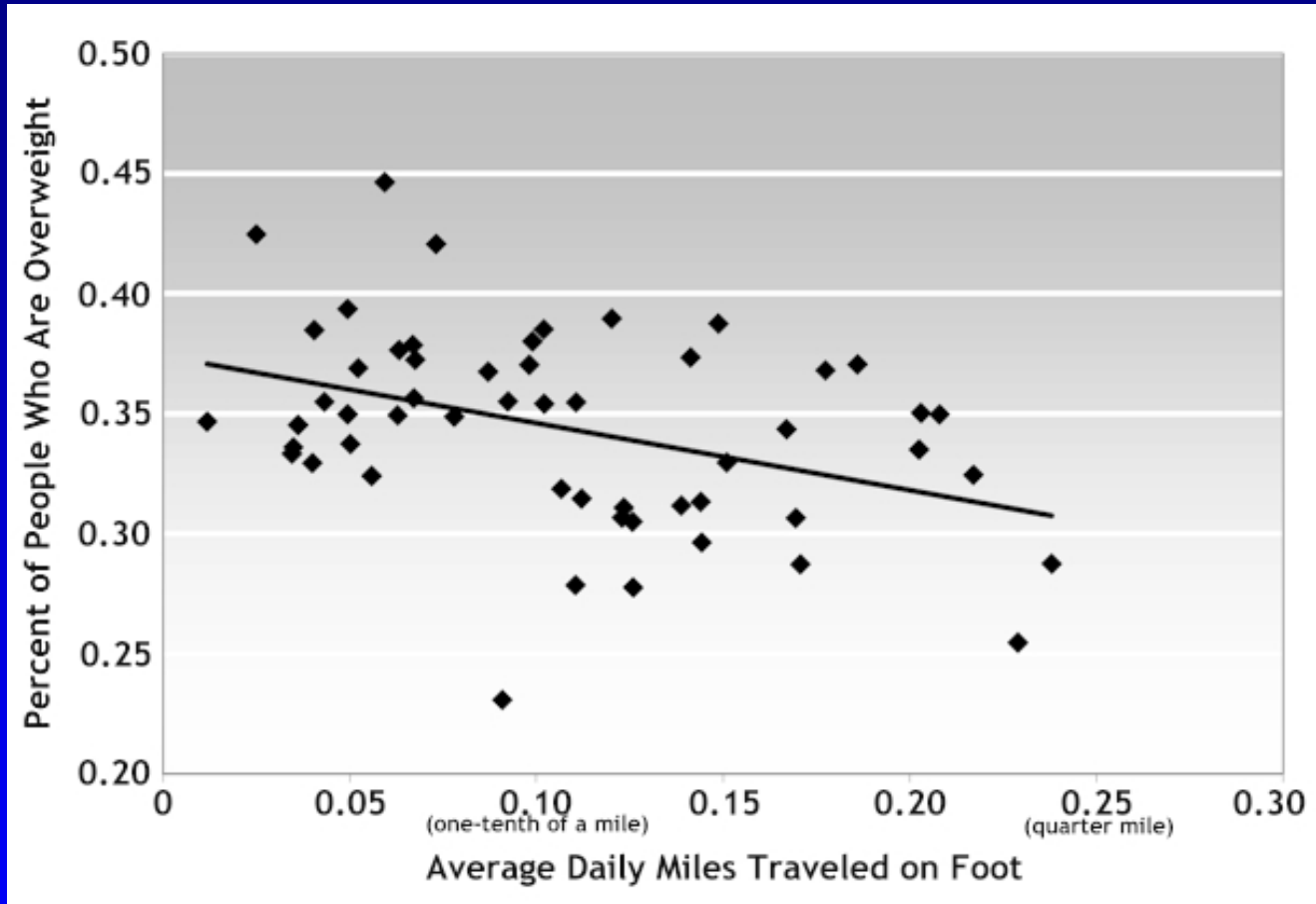
Suburban
Development



Traditional
Neighborhood



Sprawl Makes Us Fat



More people are overweight in places where people walk less

Layout of Traditional Neighborhood Austin, Texas

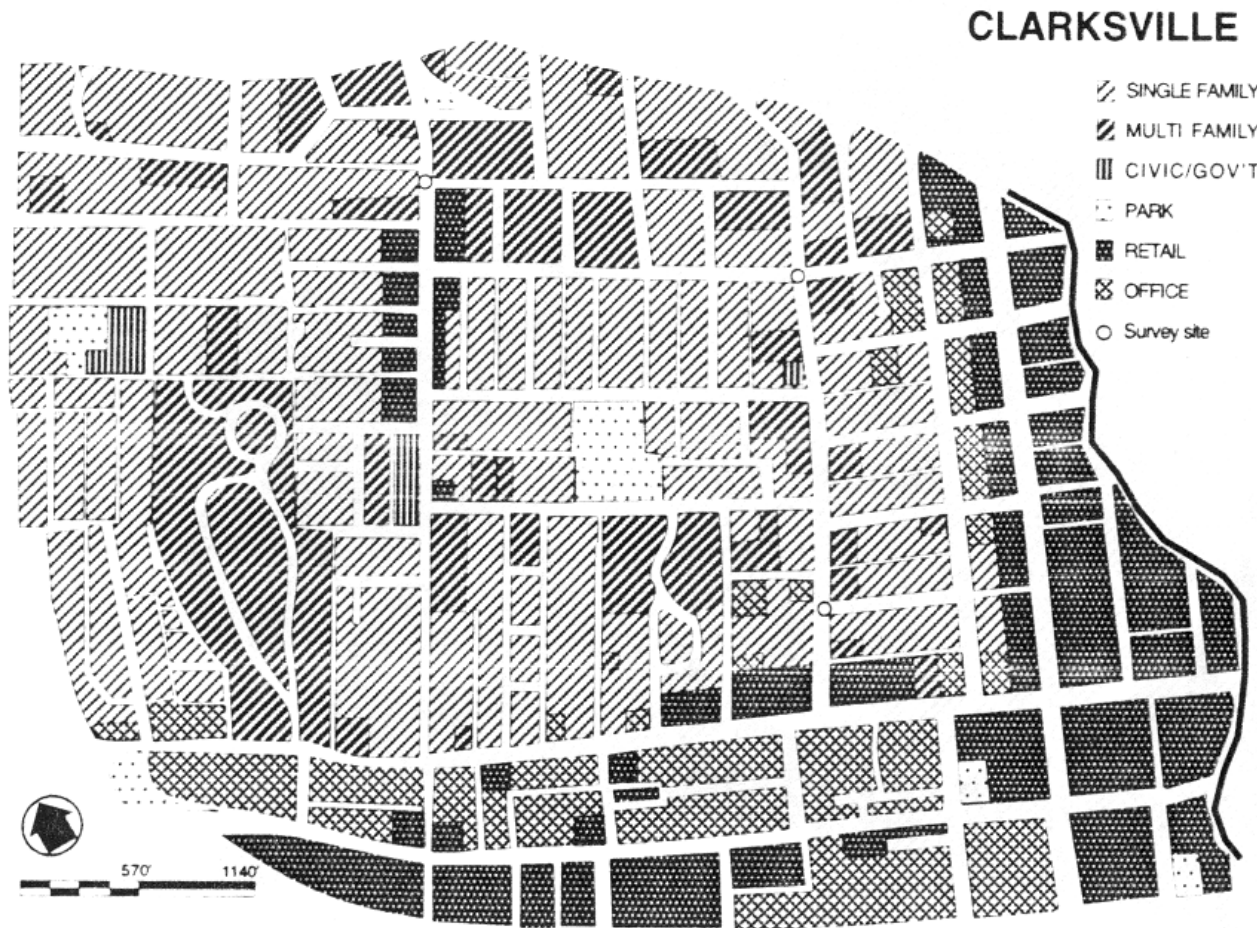
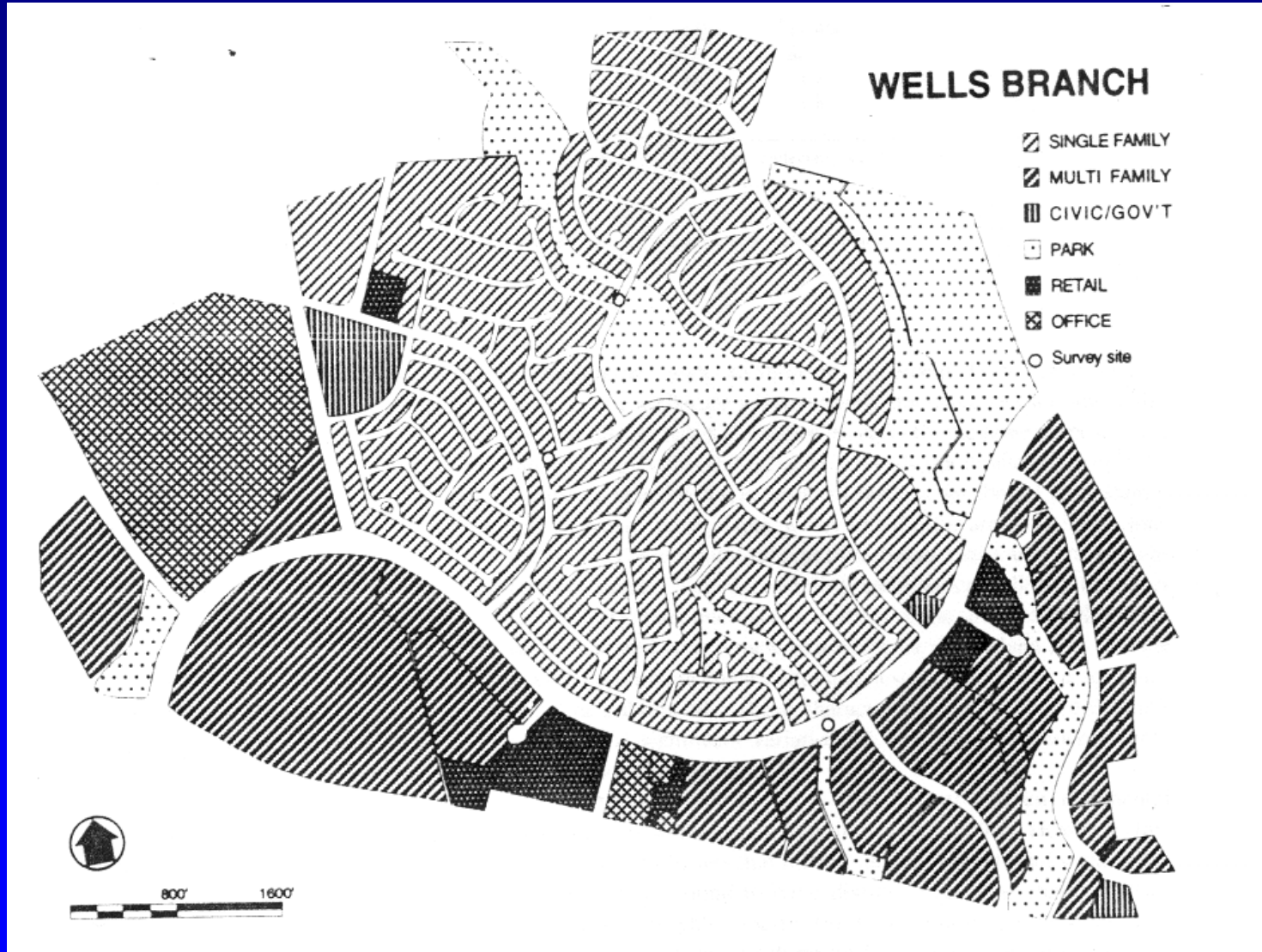


FIGURE 2 Street and land use characteristics of two traditional neighborhoods.

Layout of Modern Neighborhood Austin, Texas



Connectivity and Land Use Mix vs. Walking Austin, Texas

	Clarksville (Traditional)	Wells Branch (Modern)
Walking trips last 30 days	10.95	8.61
Walks to store last 30 days	6.29	0.72

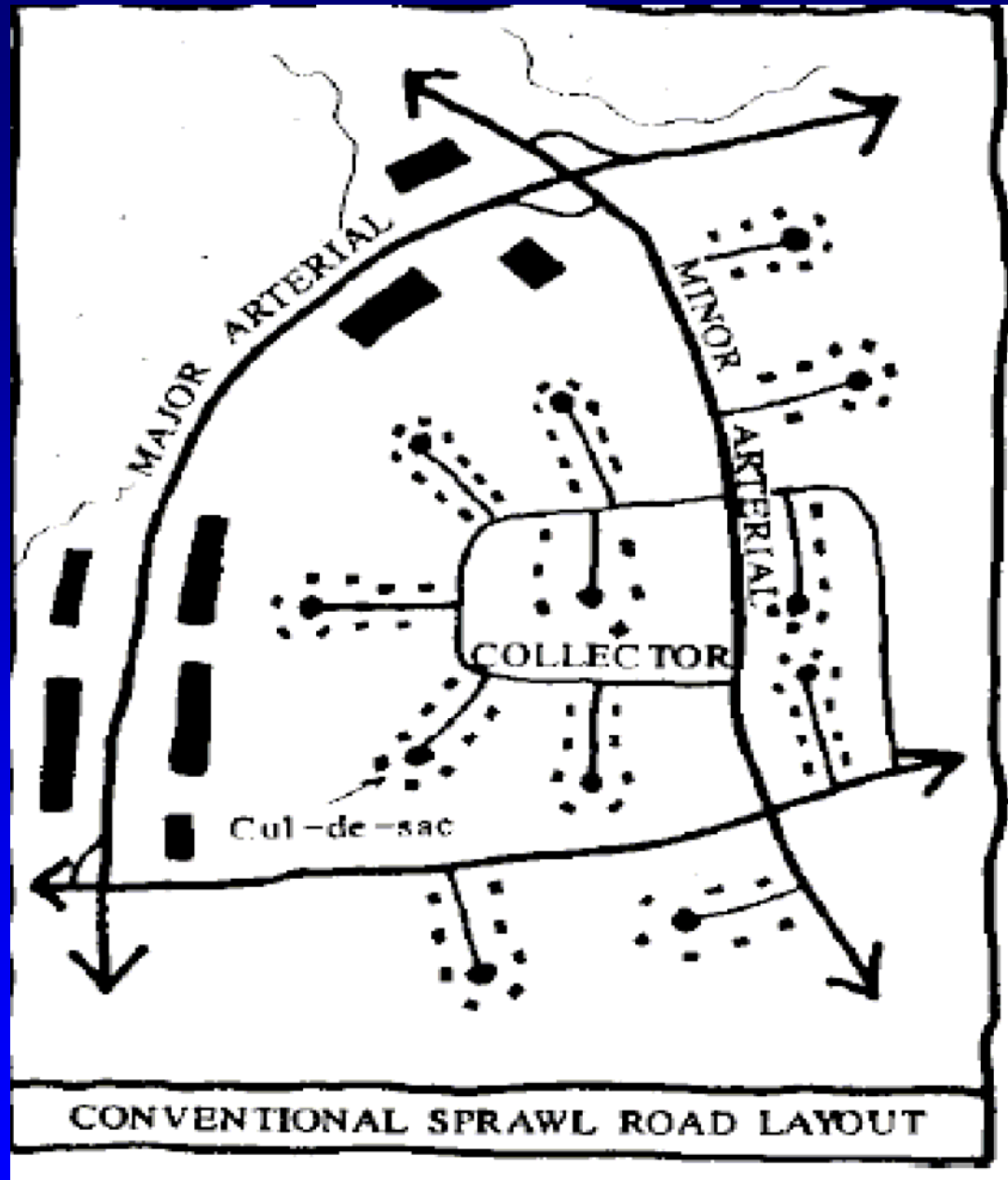
Neighborhoods matched for density, income, and car ownership

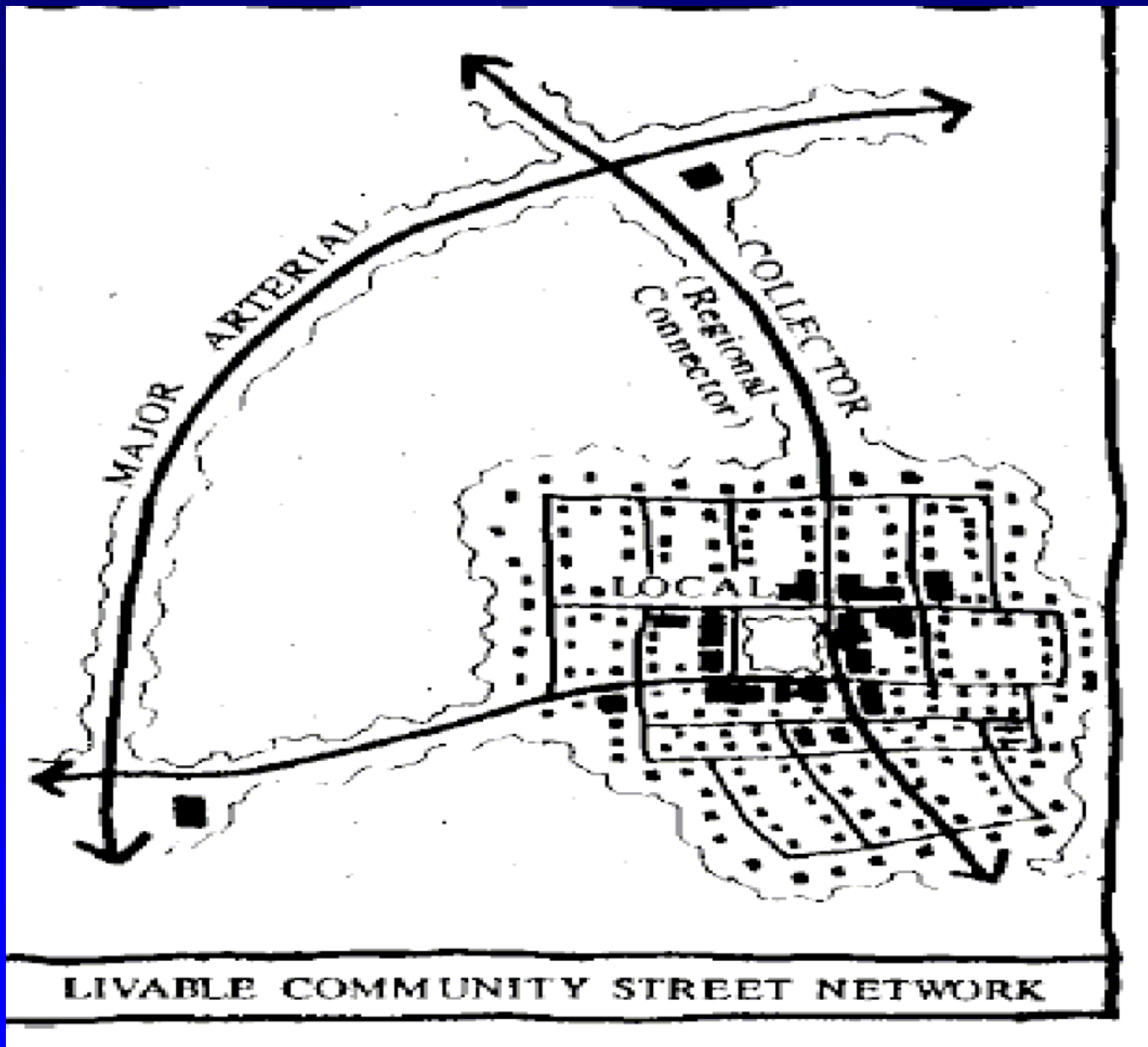


Photo courtesy of TRW-REDI.



Drawing by David Goodman, ©1998 Treasure Coast Regional Planning Council.





Street Design and “Traffic Calming”

- Features that increase traffic speed and inhibit walking
 - Wide streets
 - One-way streets
 - Lack of traffic stops, lights, crosswalks
- “Traffic calming” devices
 - Narrow streets, narrow lanes
 - Median strips, “plantings”
 - Speed bumps
 - Speed limits
 - “Roundabouts” (traffic circles)
- These devices have been shown in before-after studies to reduce traffic crashes and increase pedestrian/bicycle traffic



before...



...after

Relationship Between Neighborhood Features and Obesity

<u>Feature</u>	<u>% obese</u>	<u>Odds Ratio*</u>
Type of street		
Cul-de-sac	15.0%	-
Highway	14.3%	4.2
Other	11.6%	1.4
Sidewalks		
Both sides	6.9%	-
One side	14.1%	1.3
None	15.0%	1.4
Walking paths		
Available	10.7%	-
Not available	15.9%	1.4

* Adjusted for demographic factors and other neighborhood features

Childhood Obesity

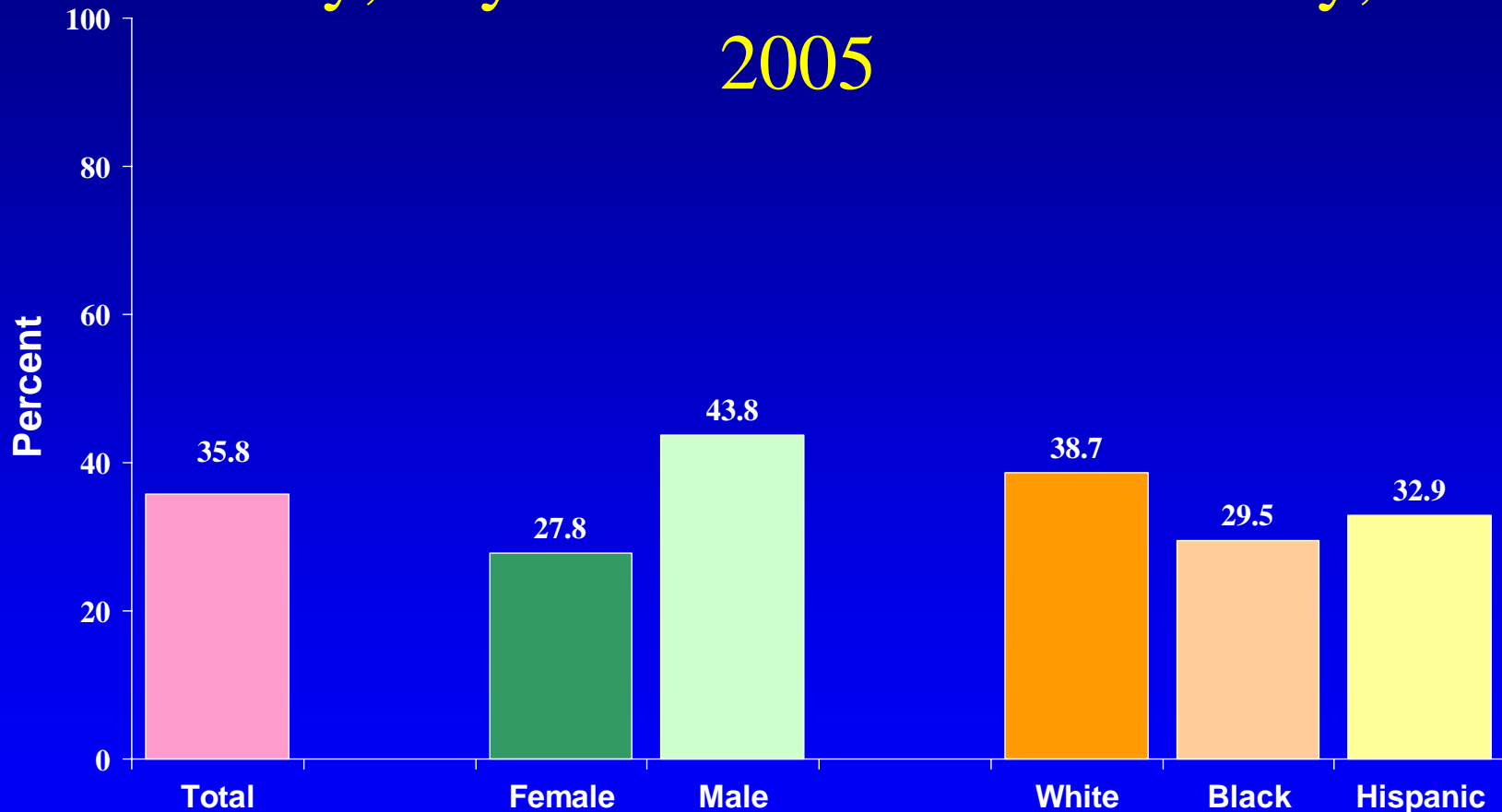
- 25% of American children are overweight¹
- Nearly 2/3 do not engage in vigorous physical activity²

1 Hedley et al. JAMA 2004: 291:2847-50

2 *National Youth Risk Behavior Survey, 2005*

Percentage of High School Students Who Met Currently Recommended Levels of Physical Activity,* by Sex** and Race/Ethnicity,***

2005



* Were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes/day on ≥ 5 of the 7 days preceding the survey

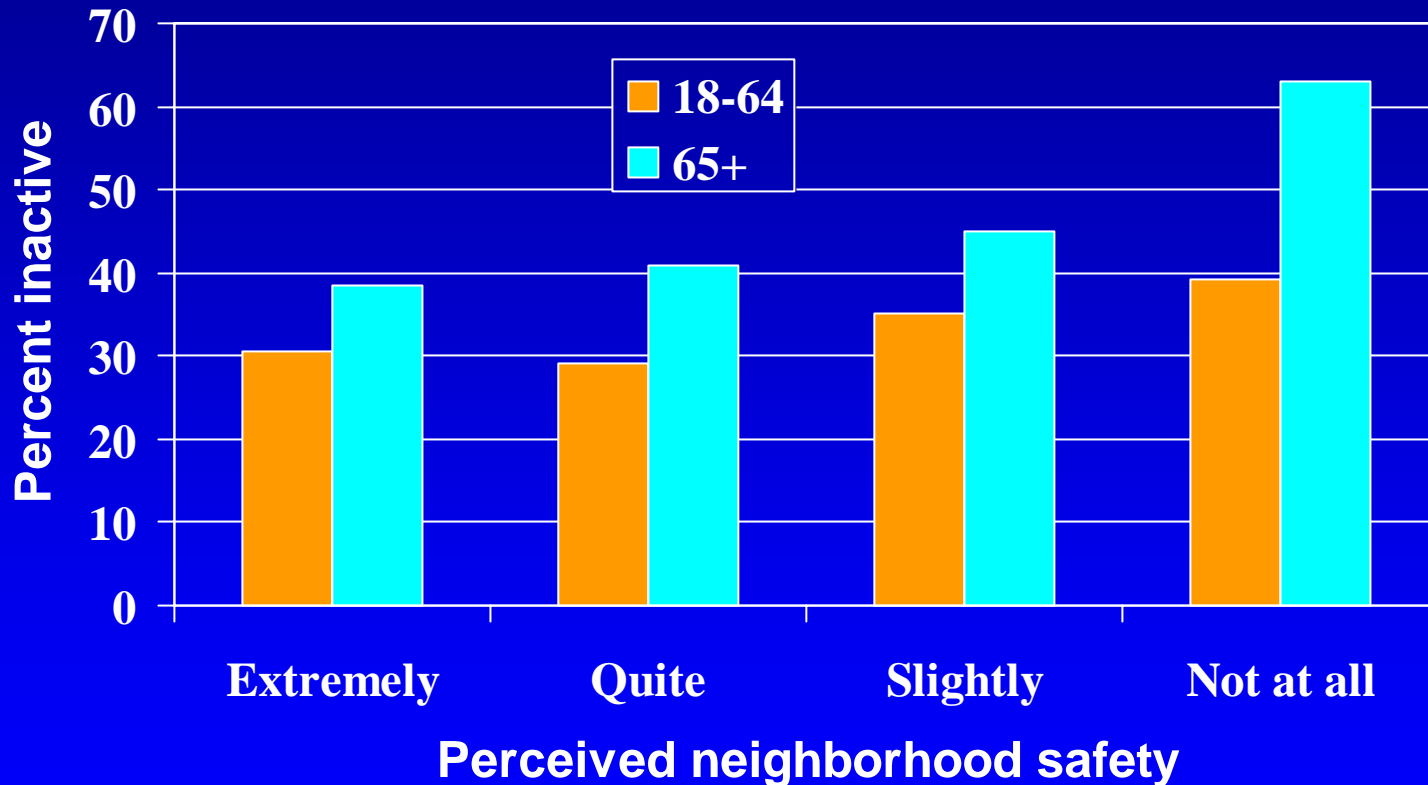
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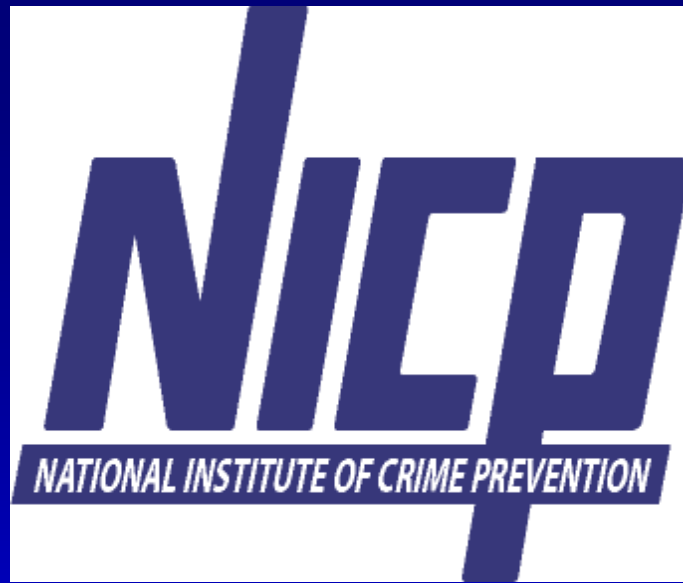
*** W > B, H

Environmental Determinants of Physical Activity in Children

- Being outdoors (strong)
- Number of play spaces near home
- Perceived safety of parks and play spaces by parents
- Organized sports and activity classes
- Transportation to activities by parents

Physical Inactivity and Sense of Neighborhood Safety





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CPTED

Crime Prevention Through Environmental Design

Key Concepts - CPTED

- Behavior of people
 - Strong sense of ownership to a space
- Productive use of space
- Architecture impacts safety and security
- Natural Surveillance
 - Designing landscapes that allow clear, unobstructed views of surrounding areas

Food Availability/Access

- 25% of heart attacks, stroke, cancer, and diabetes can be attributed to an unhealthy diet¹
- Nationally, 77% and in Louisiana 84% of adults do not consume recommended servings of fruits and vegetables²
- Food access is limited in low-income neighborhoods – there are no grocery stores
- Corner stores stock unhealthy snacks and processed foods

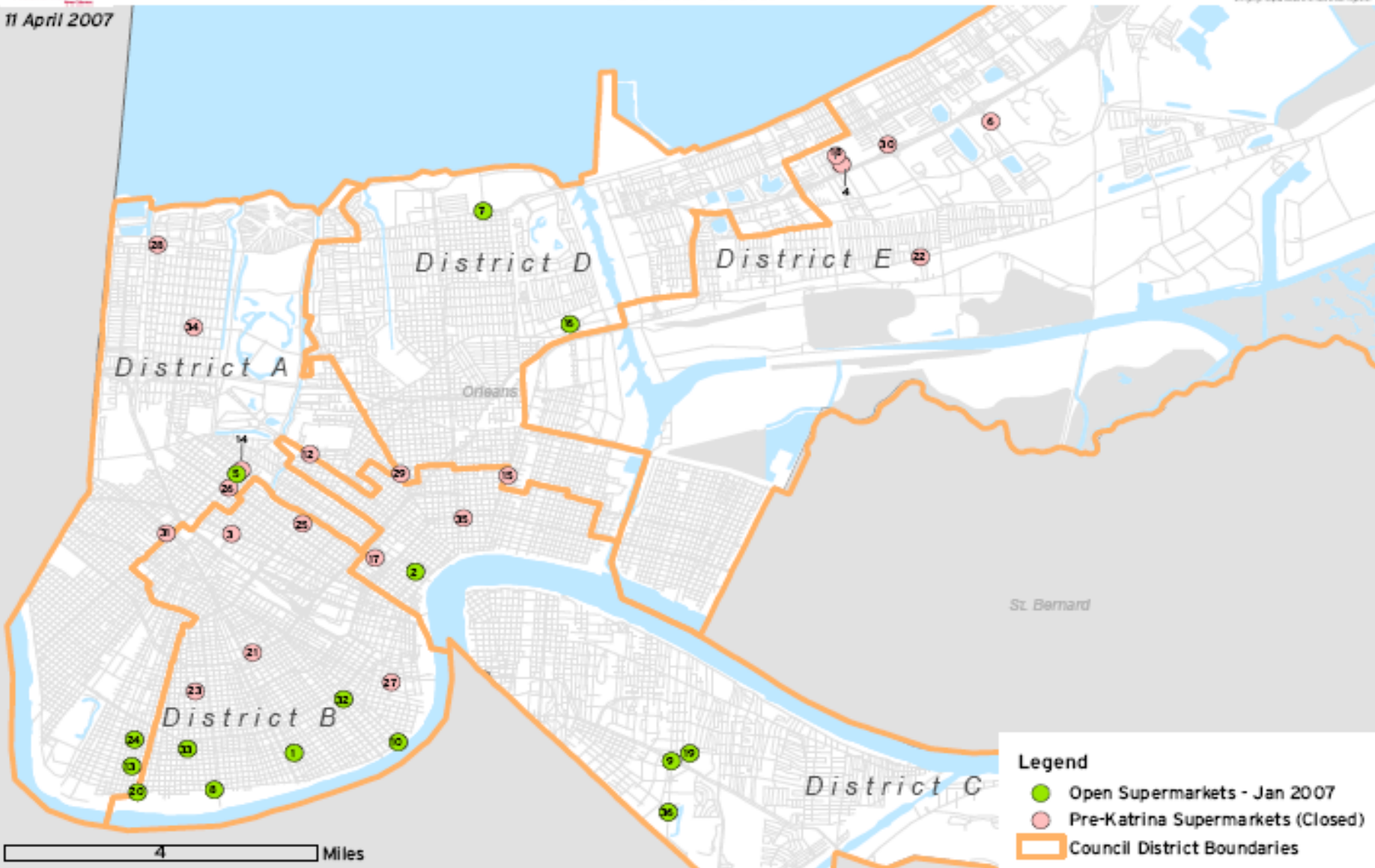
¹ Produce for Better Health Foundation. National Action Plan to Promote Health Through Increased Fruit and Vegetable Consumption, 2005.

² CDC. BRFSS, 2002.

Food Access

- Fresh food access is limited
- Currently, 15 major supermarkets in New Orleans

11 April 2007



Legend

- Open Supermarkets - Jan 2007
- Pre-Katrina Supermarkets (Closed)
- ▭ Council District Boundaries

Food Policy Advisory Committee

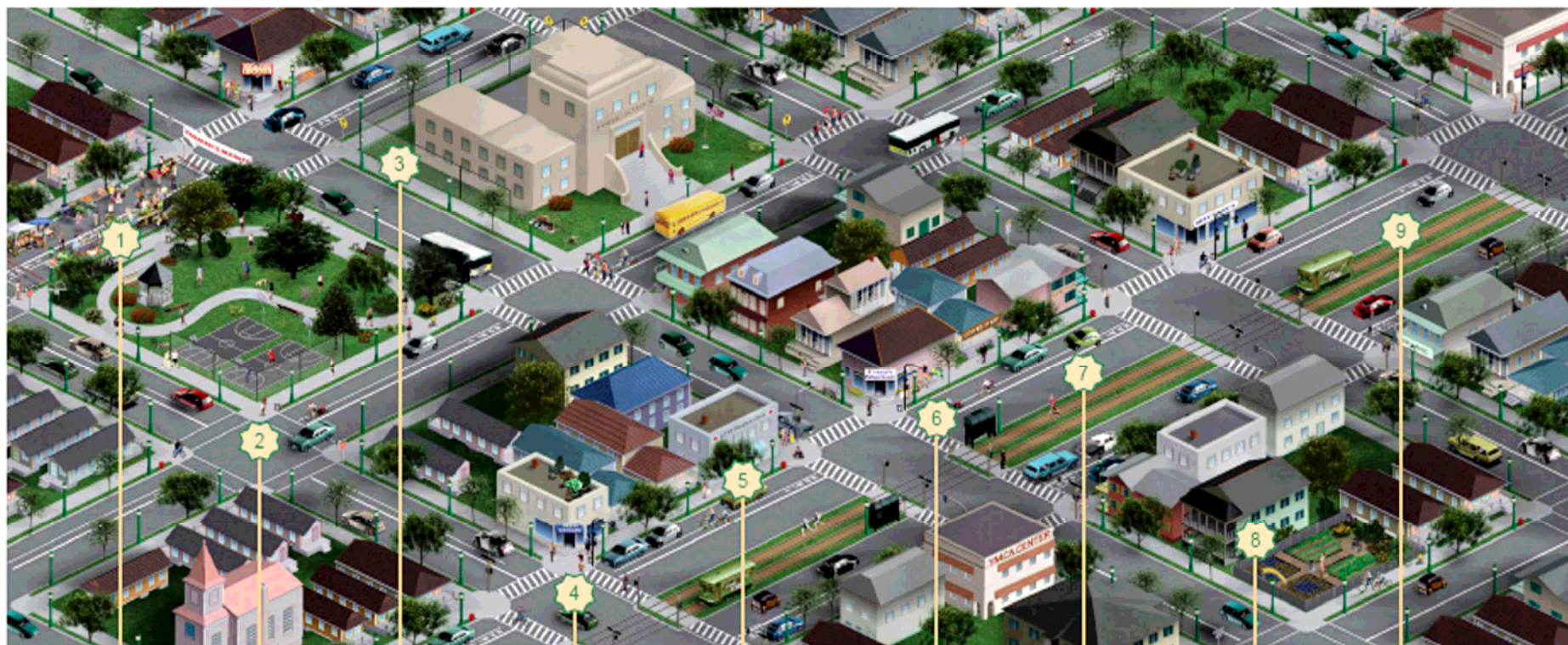
- **Members**

- The Prevention Research Center at Tulane University
- Second Harvest of Greater New Orleans and Acadiana
- The City of New Orleans Health Department
- Steps to a Healthier LA/New Orleans
- The Louisiana Public Health Institute
- The Renaissance Project
- The New Orleans Food & Farm Network

- **Supported by a New Orleans City Council resolution – May 3rd, 2007**

- Final report due January, 2008

What Makes a Neighborhood Healthy?



Graphic Illustration
by David Sullivan

1) Parks and playgrounds are places where children and adults can exercise and where neighbors can talk to each other and solve common problems.

2) Bicycle lanes provide a safe way for people to travel that gives them the benefit of exercise and does not cause air pollution.

3) Neighborhood schools allow kids to walk or bike to school, increasing their physical activity and reducing car traffic. The whole neighborhood benefits when school buildings and grounds are used for community activities and events after school hours.

4) Safer street designs encourage walking and prevent injuries. Wide sidewalks keep pedestrians away from car traffic. In commercial areas, large rounded curb extensions slow car traffic and provide safer parking lanes. Well-marked crosswalks let drivers know that pedestrians have the right-of-way at intersections.

5) Neighborhood health clinics make it easier for children to receive immunizations and for adults to be tested for common diseases like high blood pressure and diabetes.

6) Healthier corner stores help people have healthier habits by selling fruits and vegetables (which prevent cancer, stroke, and heart disease) instead of chips, soda, cigarettes, and liquor. When small stores are near houses, people can get exercise by walking to shop.

7) Lighting and "neighborhood visibility" discourage crime and violence. Crime happens where people are not watching. Crime can be prevented with street lighting, especially at bus and streetcar stops, and building features like porches and street-level windows that make it easier for residents to watch outdoor areas.

8) No liquor stores. Stores that sell alcohol tend to encourage loitering, littering, crime, and violence, and make people afraid to walk outdoors.

9) Public transportation gets people out of cars, which increases their physical activity, and reduces air pollution from cars, which helps to reduce asthma. When more people are on the street, it also helps prevent crime.



generation research center

PACE

Partnership for an Active Community Environment

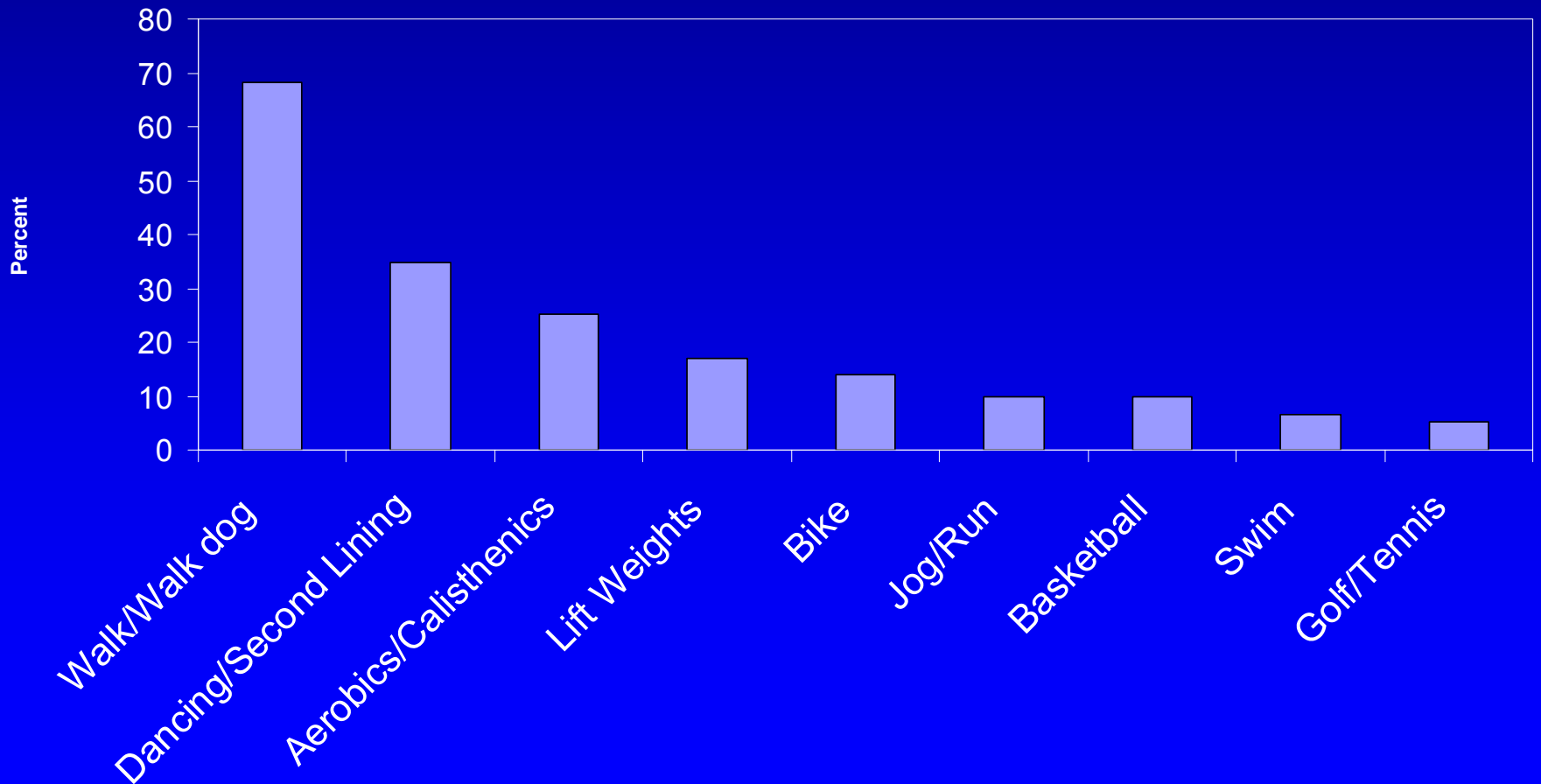
***The Project* - Changing the environment to promote physical activity**

- Community-based Participatory Research (CBPR)
- Pre and post intervention surveys
- Recording of physical activity observations
- Intervention
 - Physical change
 - Social change

Baseline Survey Data

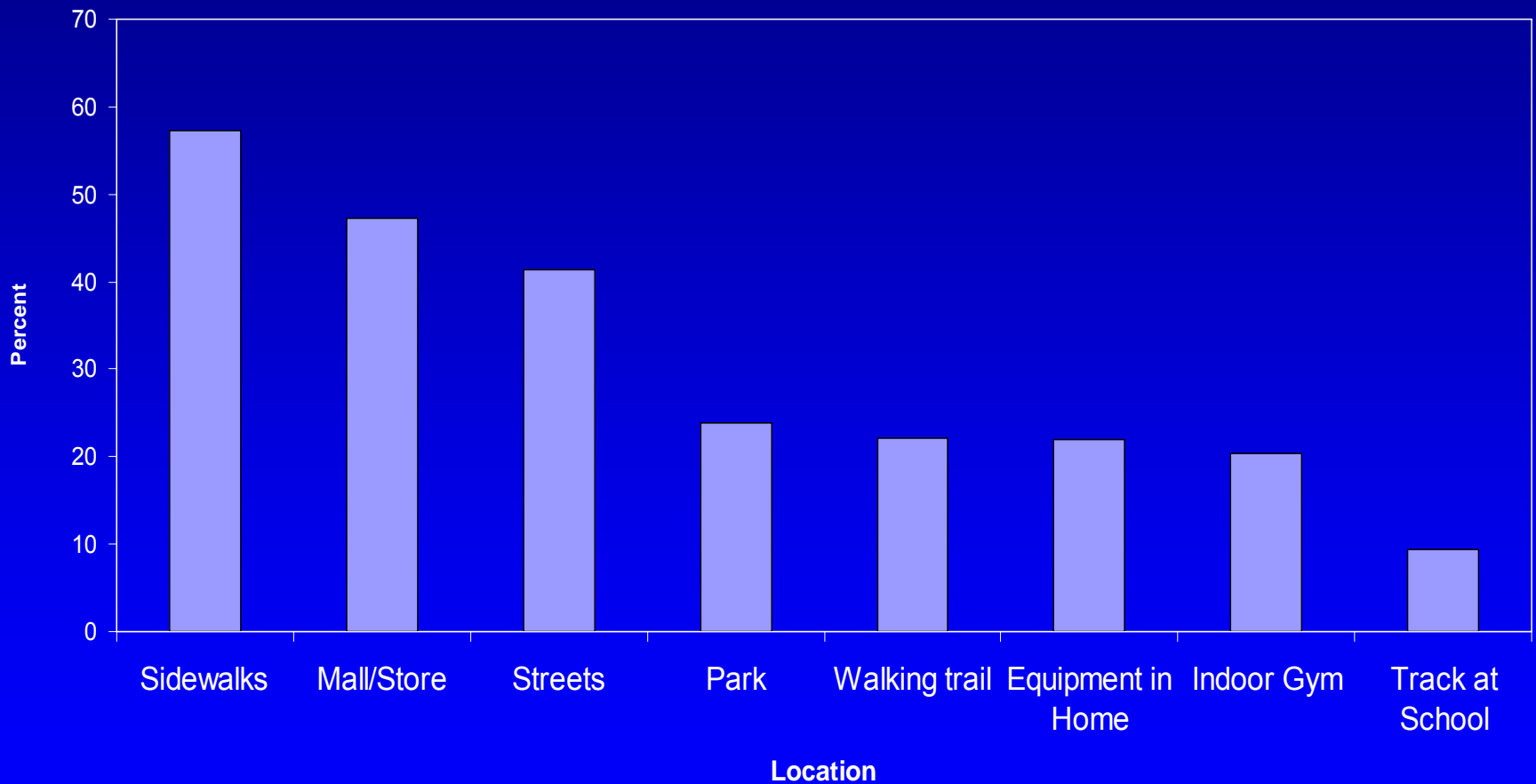
- 499 respondents
- 94% African American
- 61% female
- Income 60.3% < \$20,000/year

Types of Activity



PACE baseline survey data

Where respondents exercise



Factors that Influence Use of Place to be Physically Active



PACE baseline survey data





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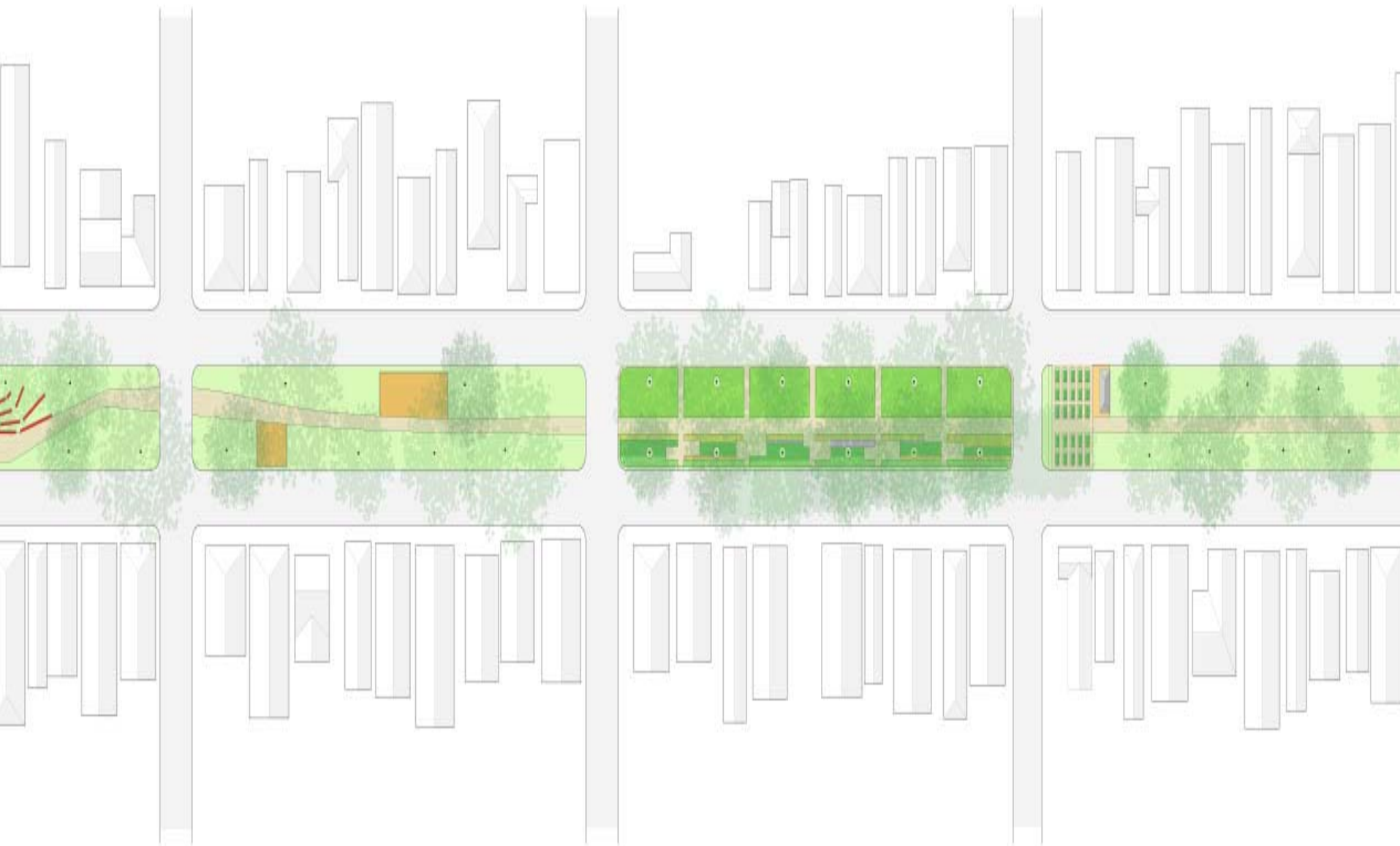
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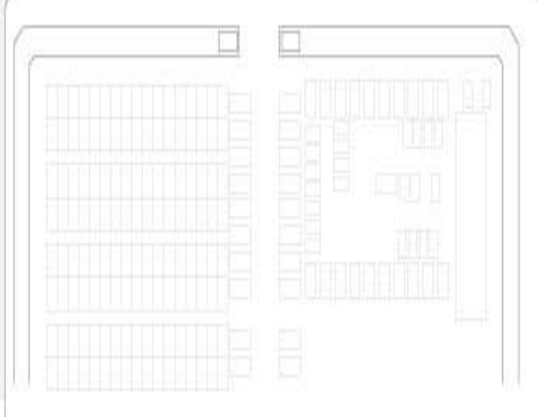
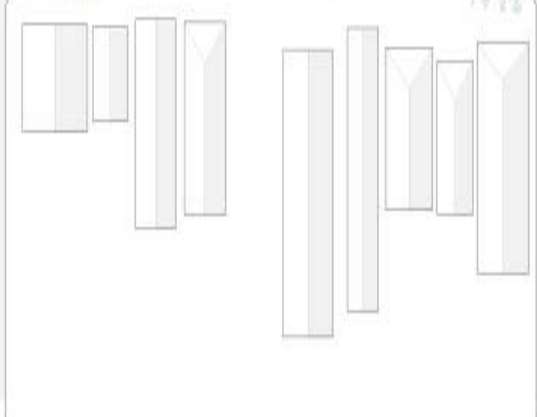
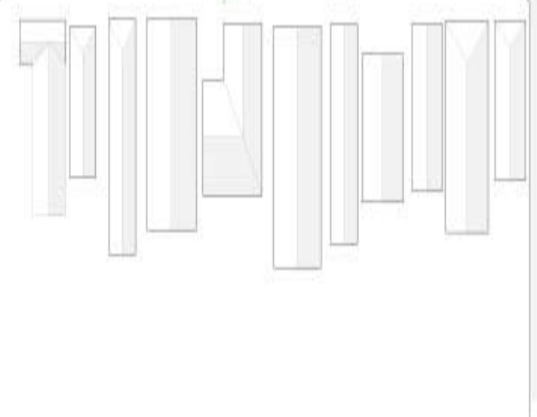
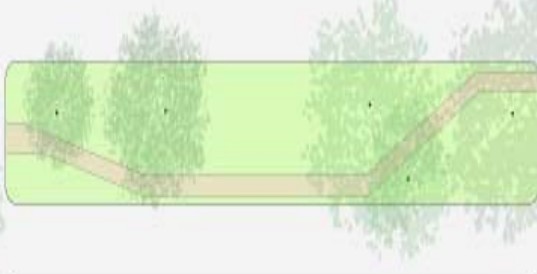
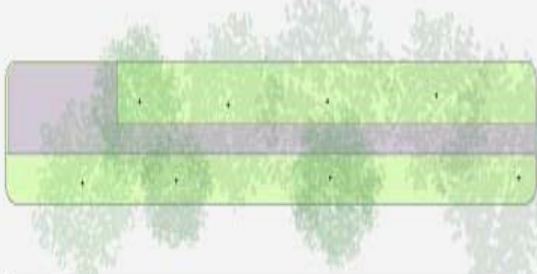
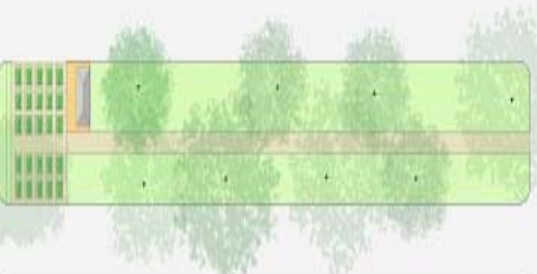
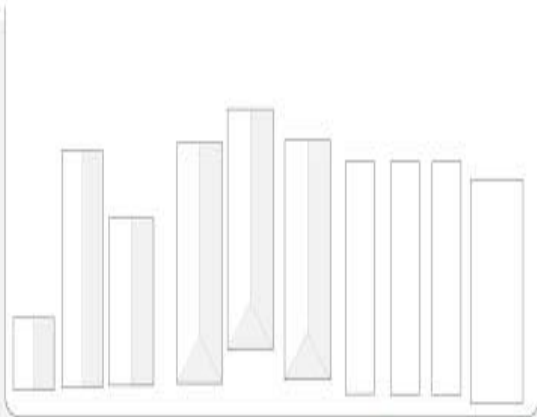
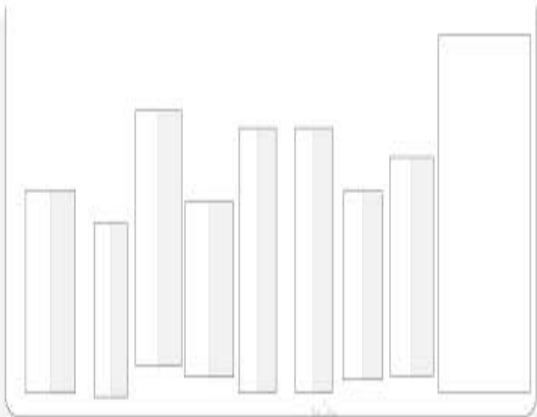
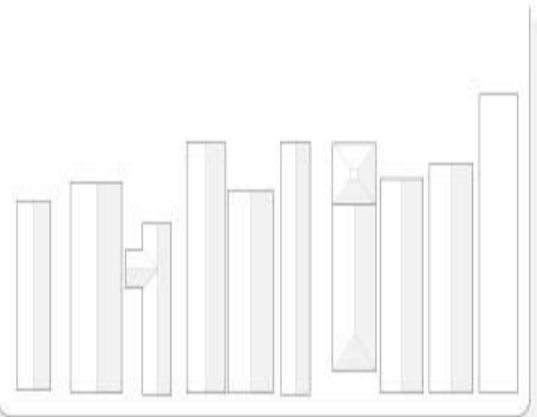
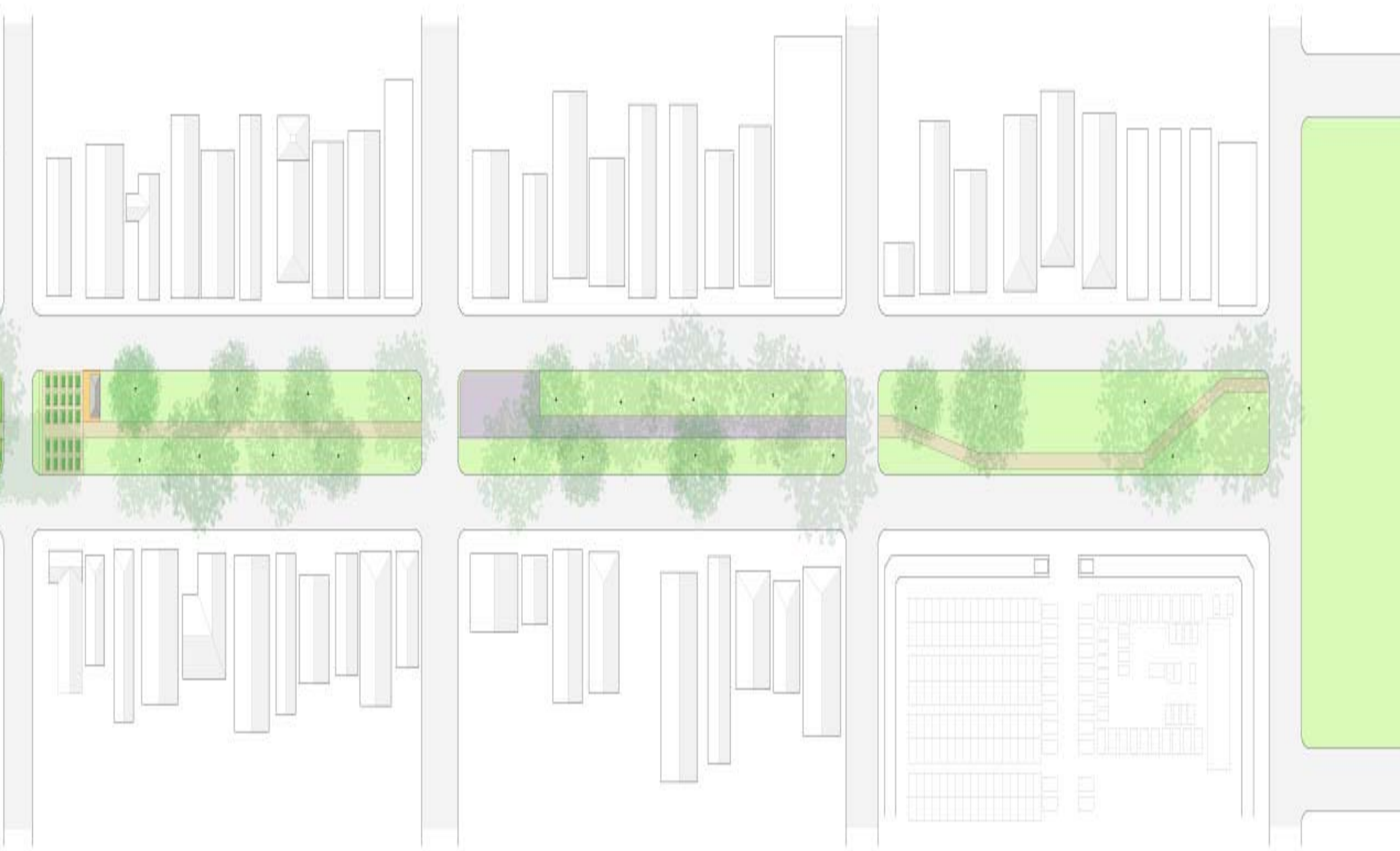


NO PARKING
EXCEPT FOR
LOADING AND UNLOADING
PASSENGERS
OR MERCHANDISE
OR FOR THE
DELIVERY OR PICKUP
OF PASSENGERS
OR MERCHANDISE
OR FOR THE
DELIVERY OR PICKUP
OF PASSENGERS
OR MERCHANDISE







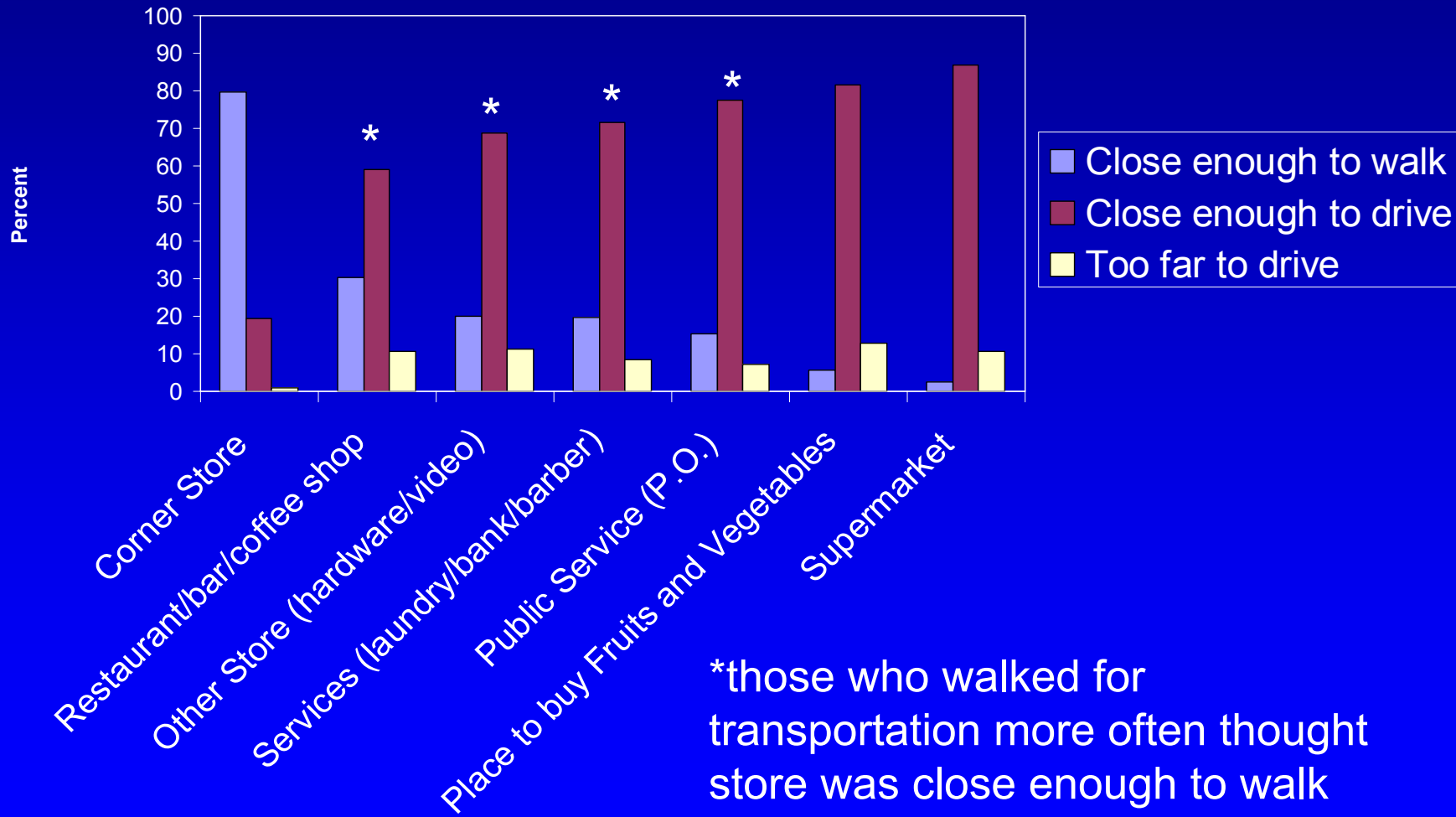


Summary

- Neighborhood/environmental features are powerful determinants of behavior and health
- We can modify existing environments in ways to improve health

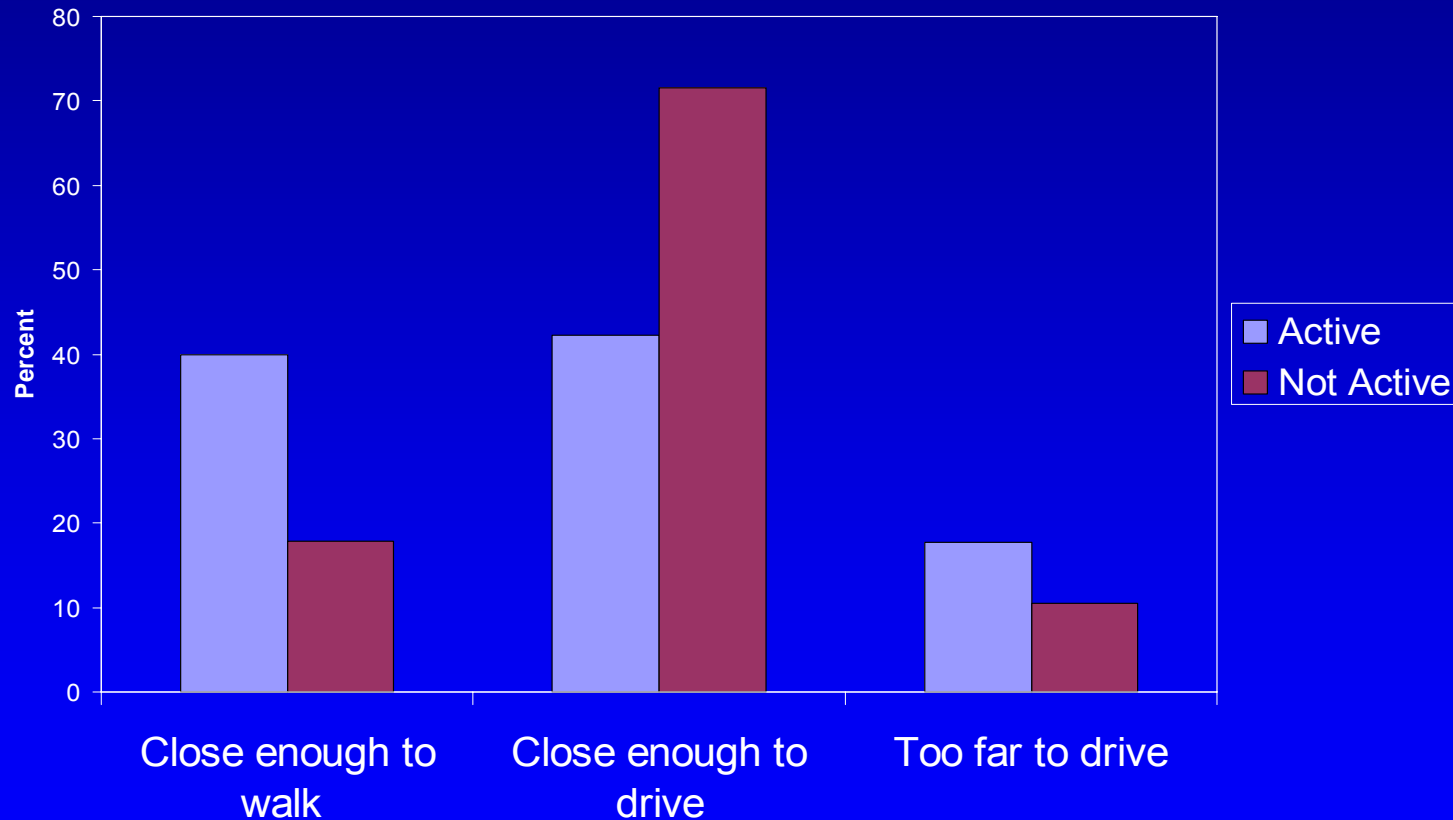
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Distance from Home to Nearby Businesses



*those who walked for transportation more often thought store was close enough to walk
 $p < 0.05$

Nearby Other Businesses (video/hardware) by Active Status*



*Walk for transportation ≥ 30 min/day, χ^2 $p < 0.05$