

DO OUR NEIGHBORHOODS REALLY MATTER FOR CHILDREN'S HEALTH AND PHYSICAL ACTIVITY?

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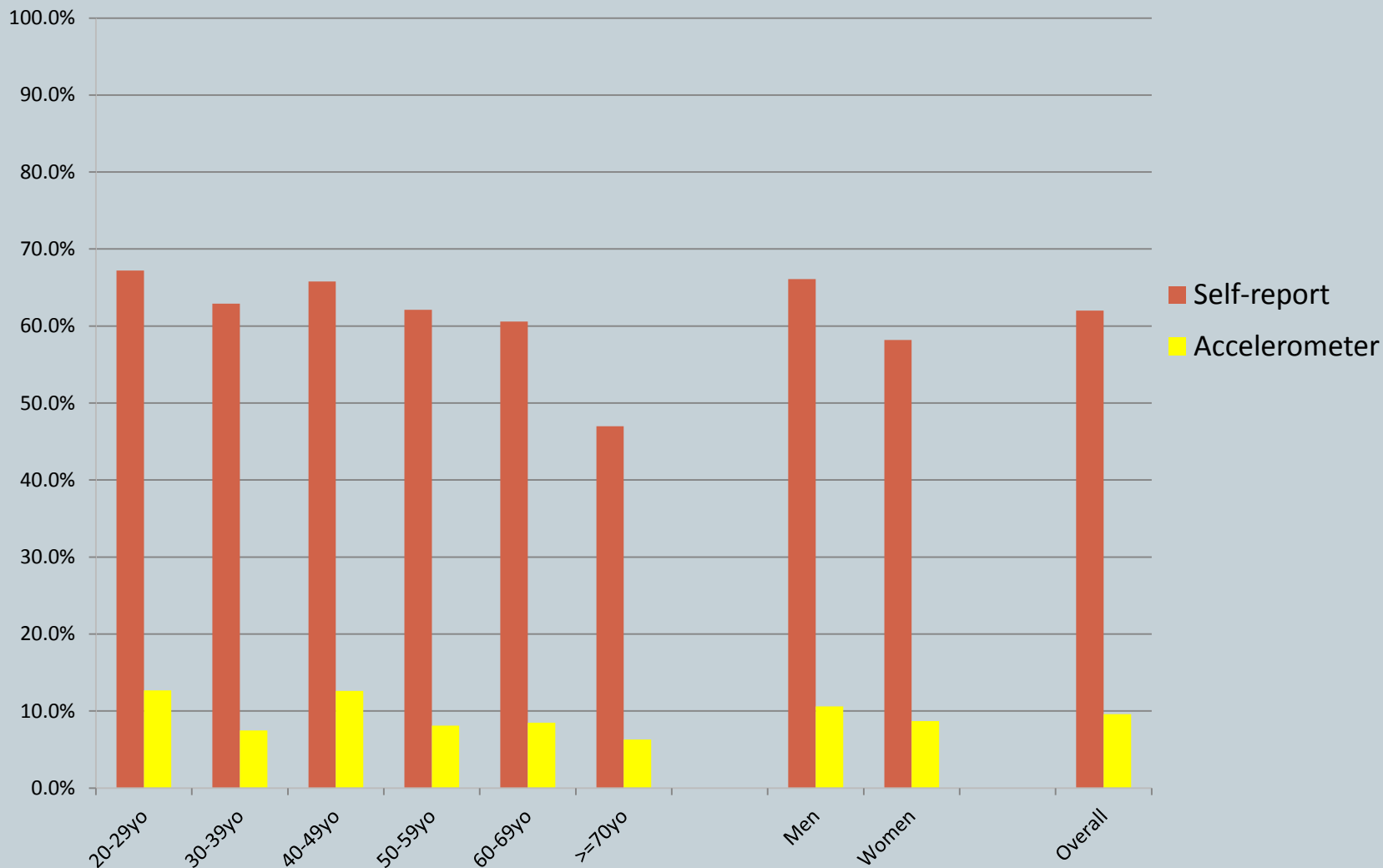
Childhood Obesity and Public Health Conference

Pennington Biomedical Research Center

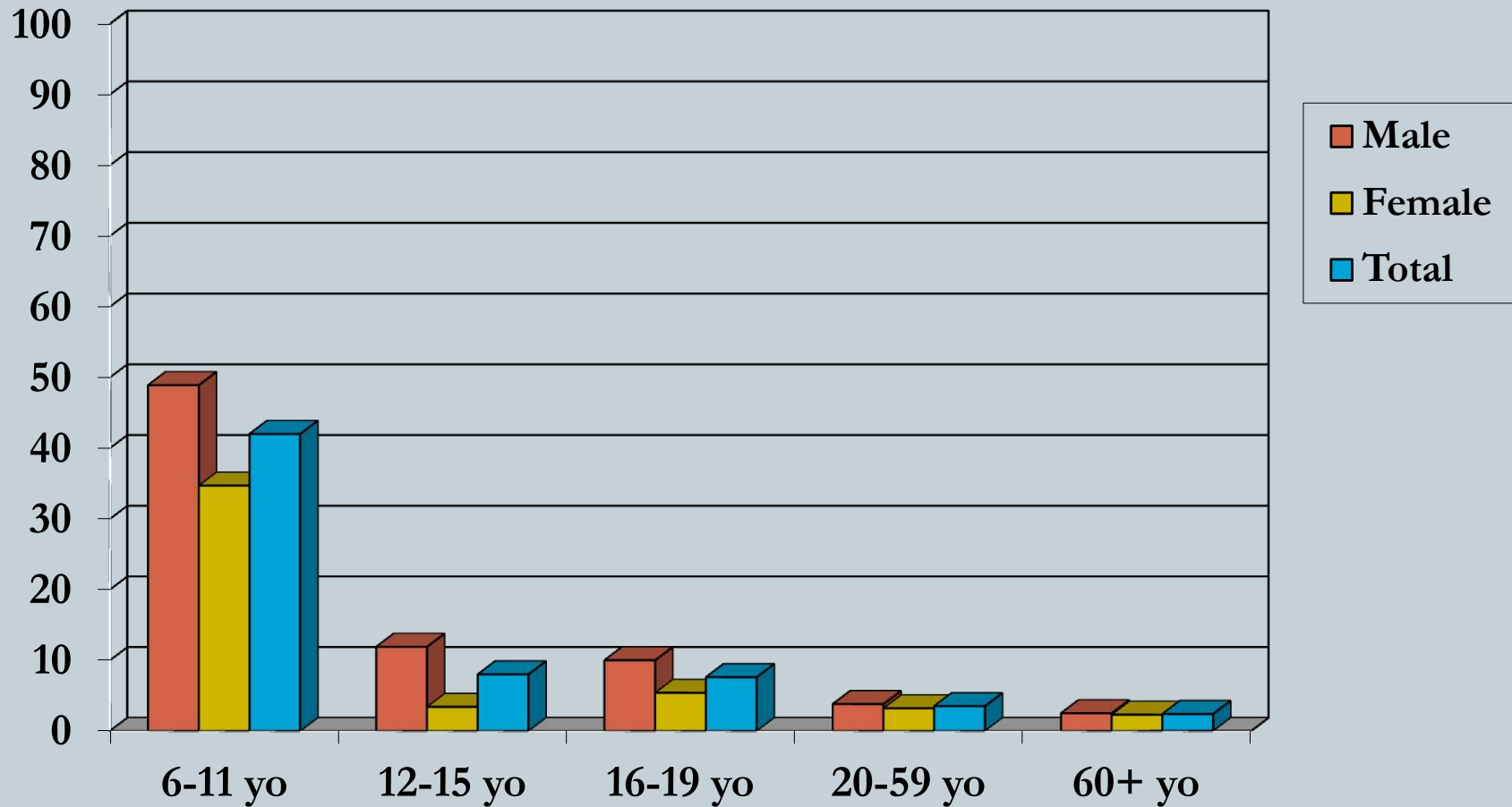
Objectives

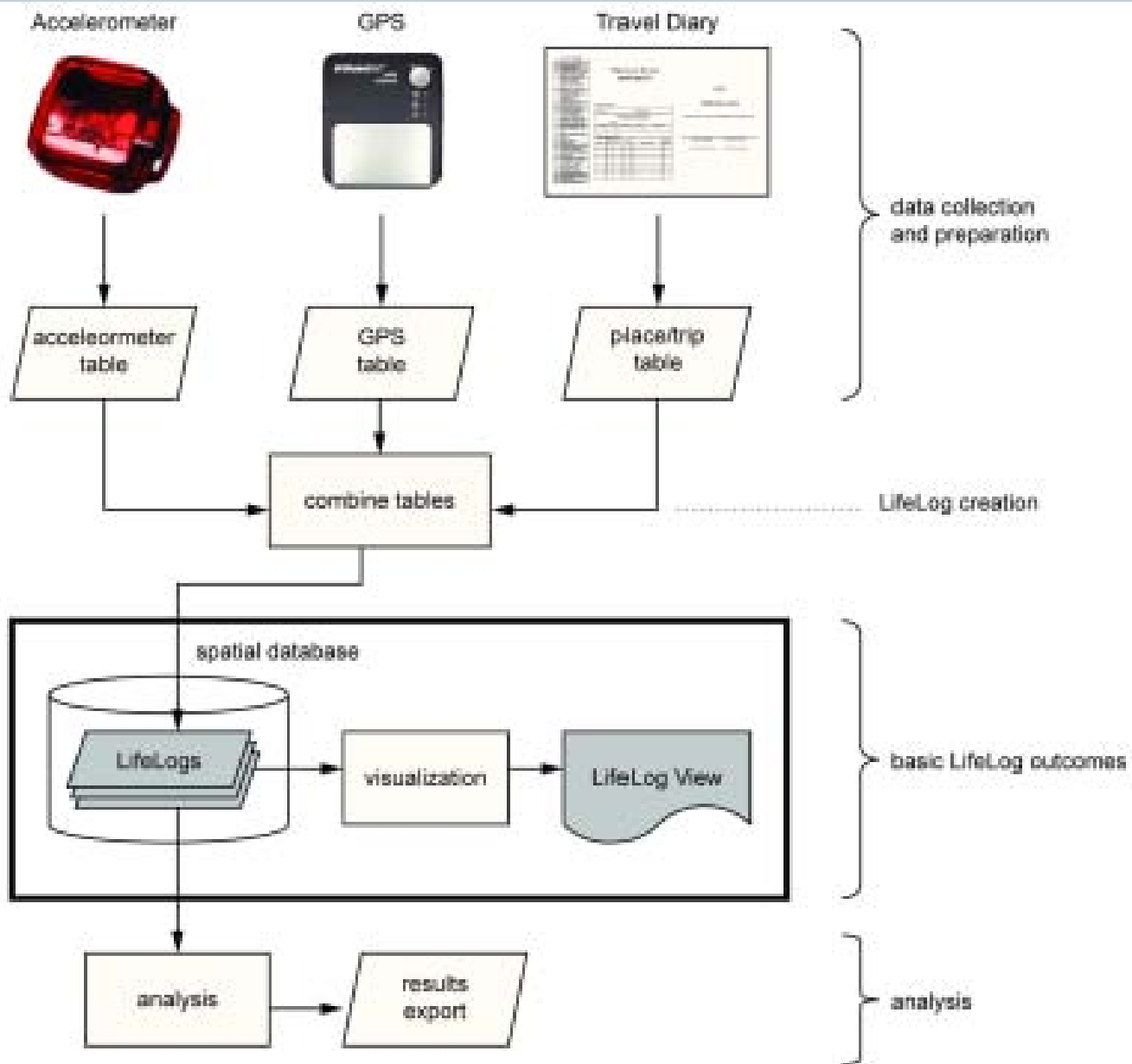
- Why neighborhood?
- What aspects of neighborhood?
- Framework - easiest choice exercise
- Movement in the right direction?

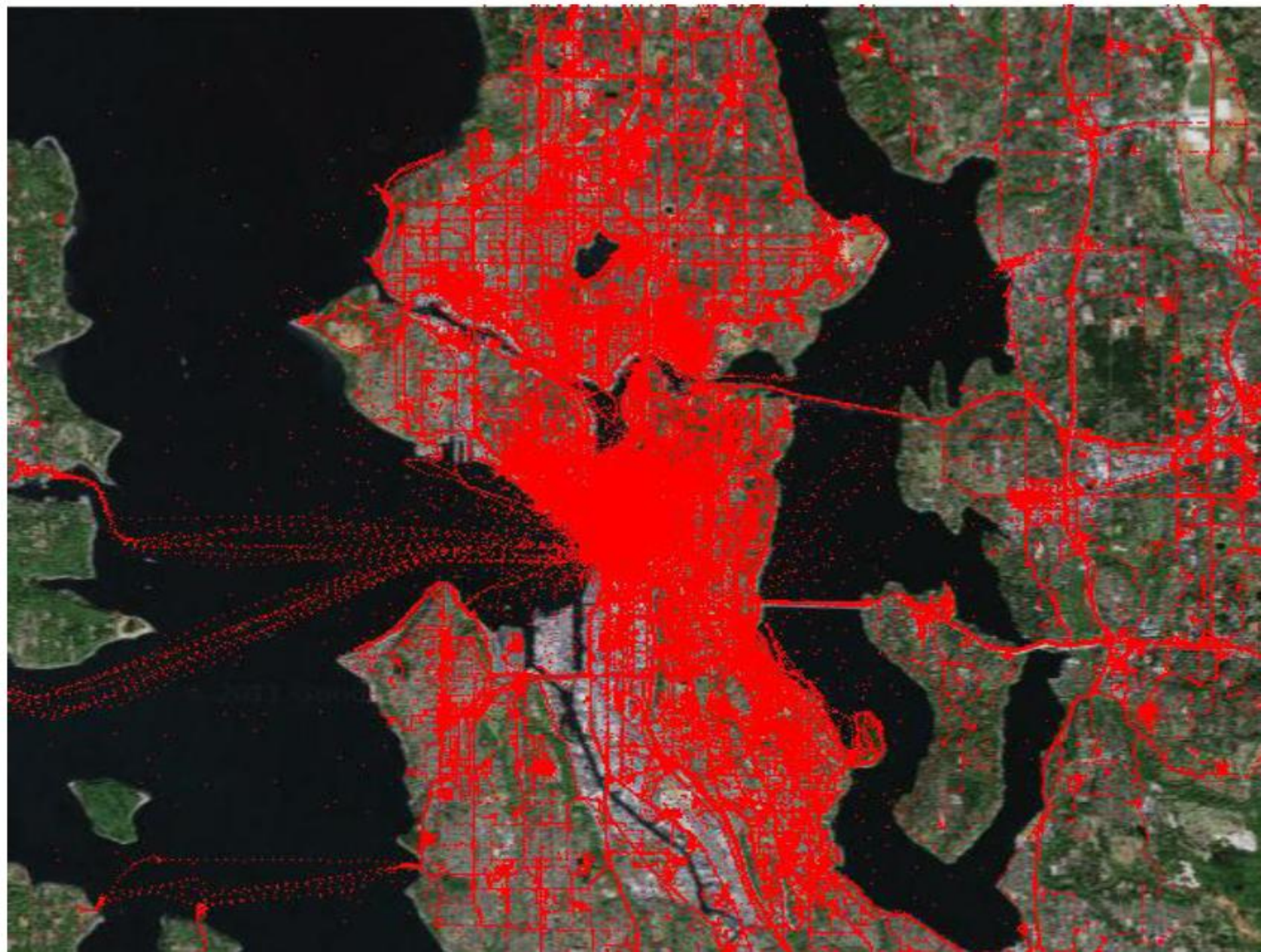
Percentage Meeting Physical Activity Recommendations in U.S.

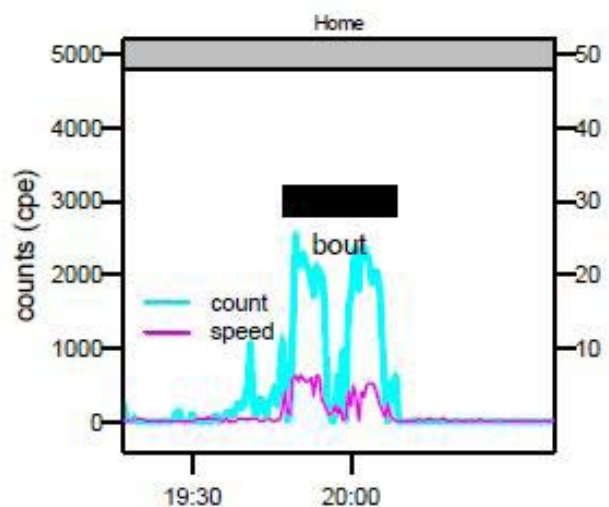


Percentage Meeting PA recommendation (Accelerometry Only)

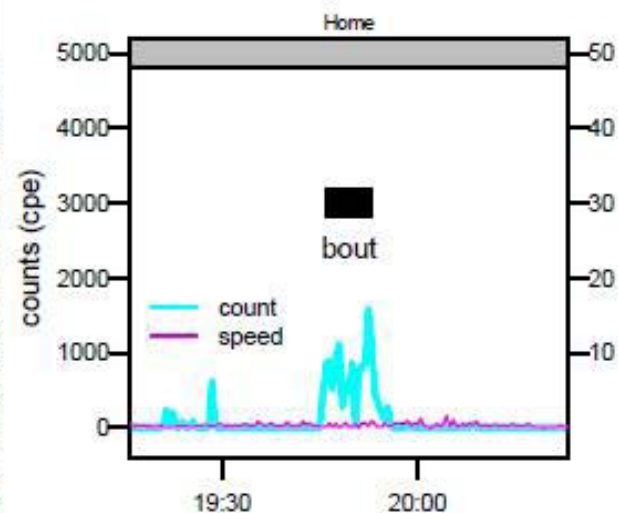




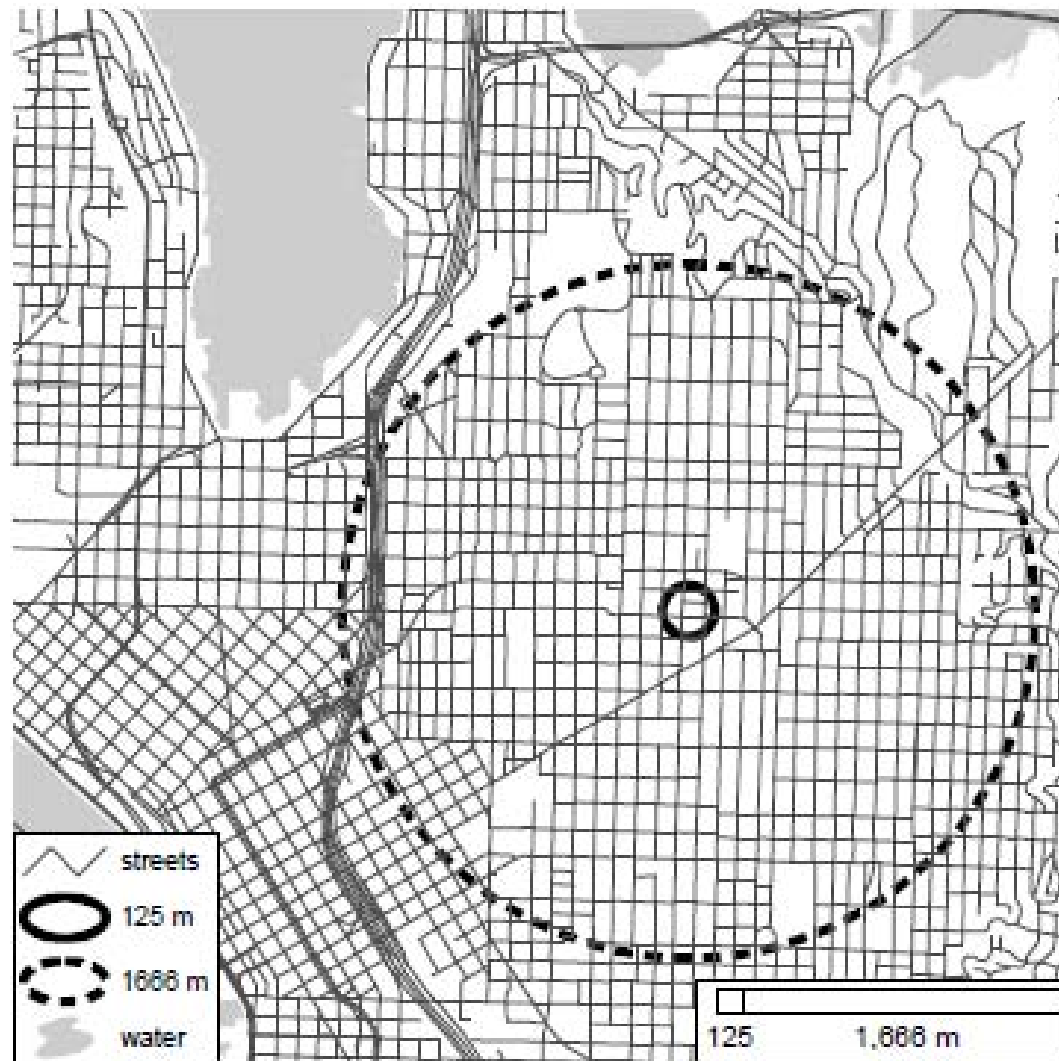




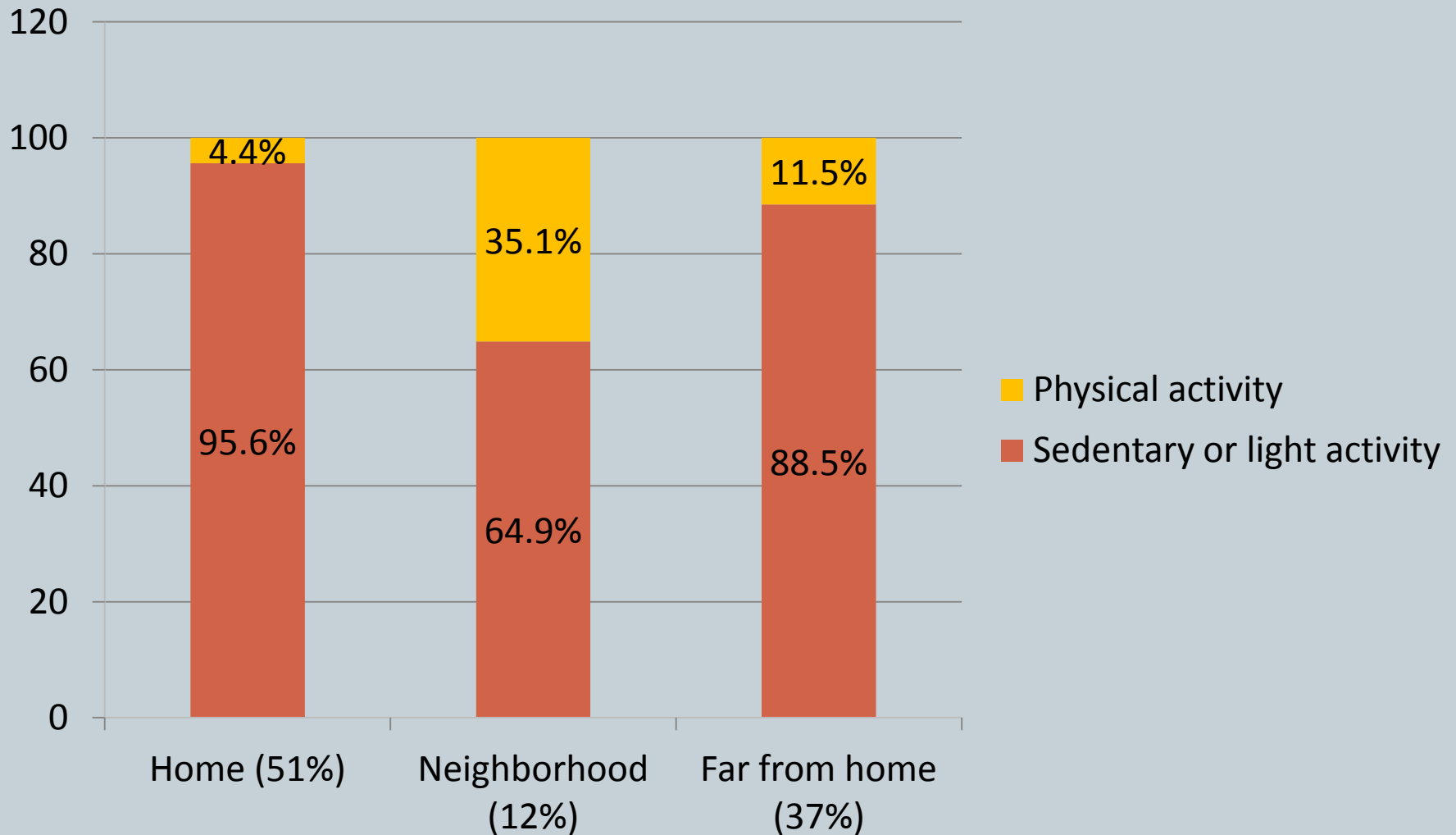
A: Walk1-GPS



E: NonWalk2-GPS

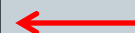
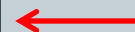


Neighborhood Matters



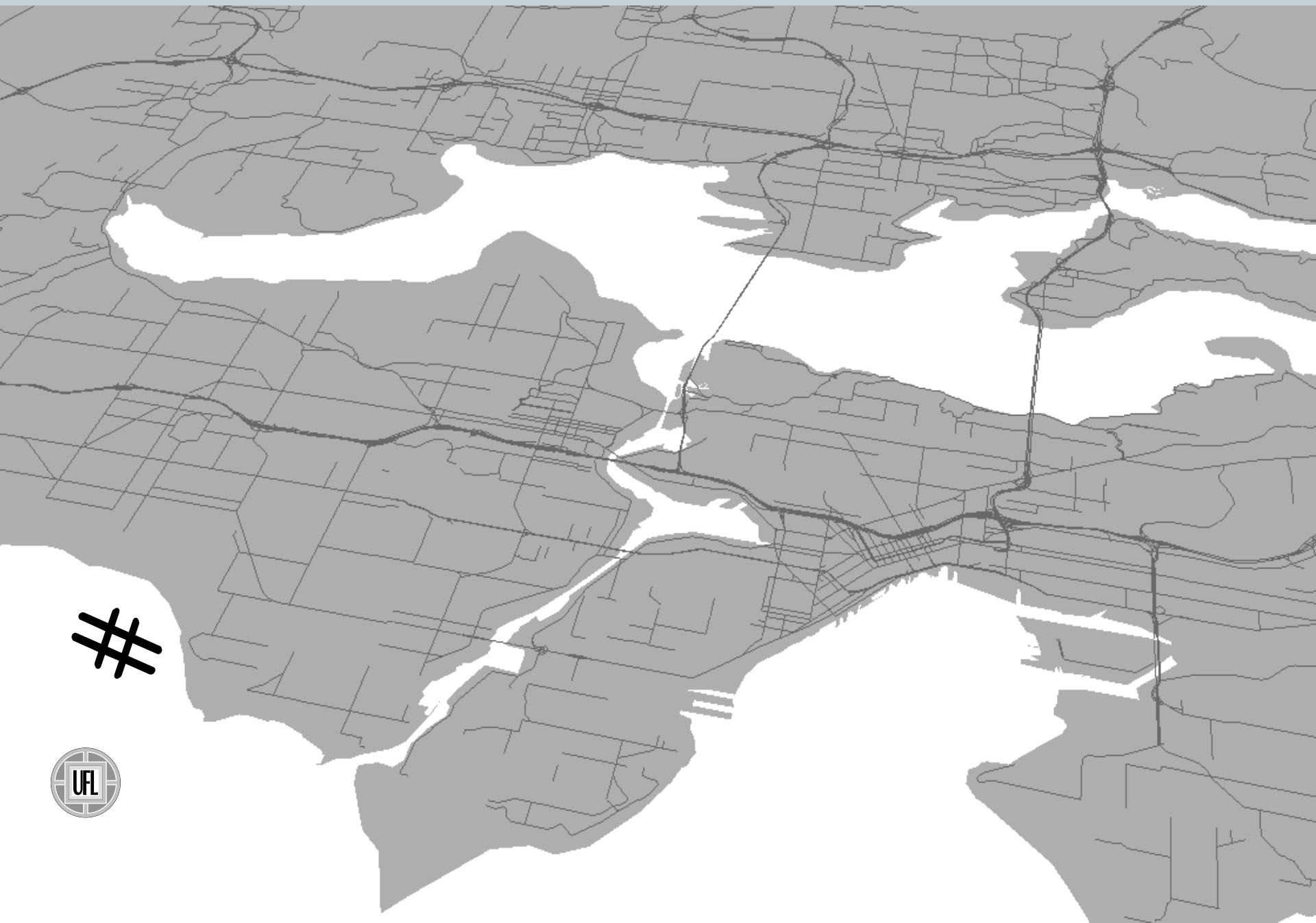
Children's Physical Activity Environments

Location	% of total time at each location	% of time spent at each location engaged in physical activity
Home	48%	18%
School	29%	18%
Others' Homes	7%	22%
Service Locations	6%	17%
Public, Outdoor Parks & Rec.	3%	40%
Shopping	2%	19%
Other Schools	2%	30%
Food Eateries	1%	13%
Private Rec. Facilities	1%	30%
Public, Indoor Rec. Facilities	1%	32%
Neighborhood (non-specific)	1%	42%

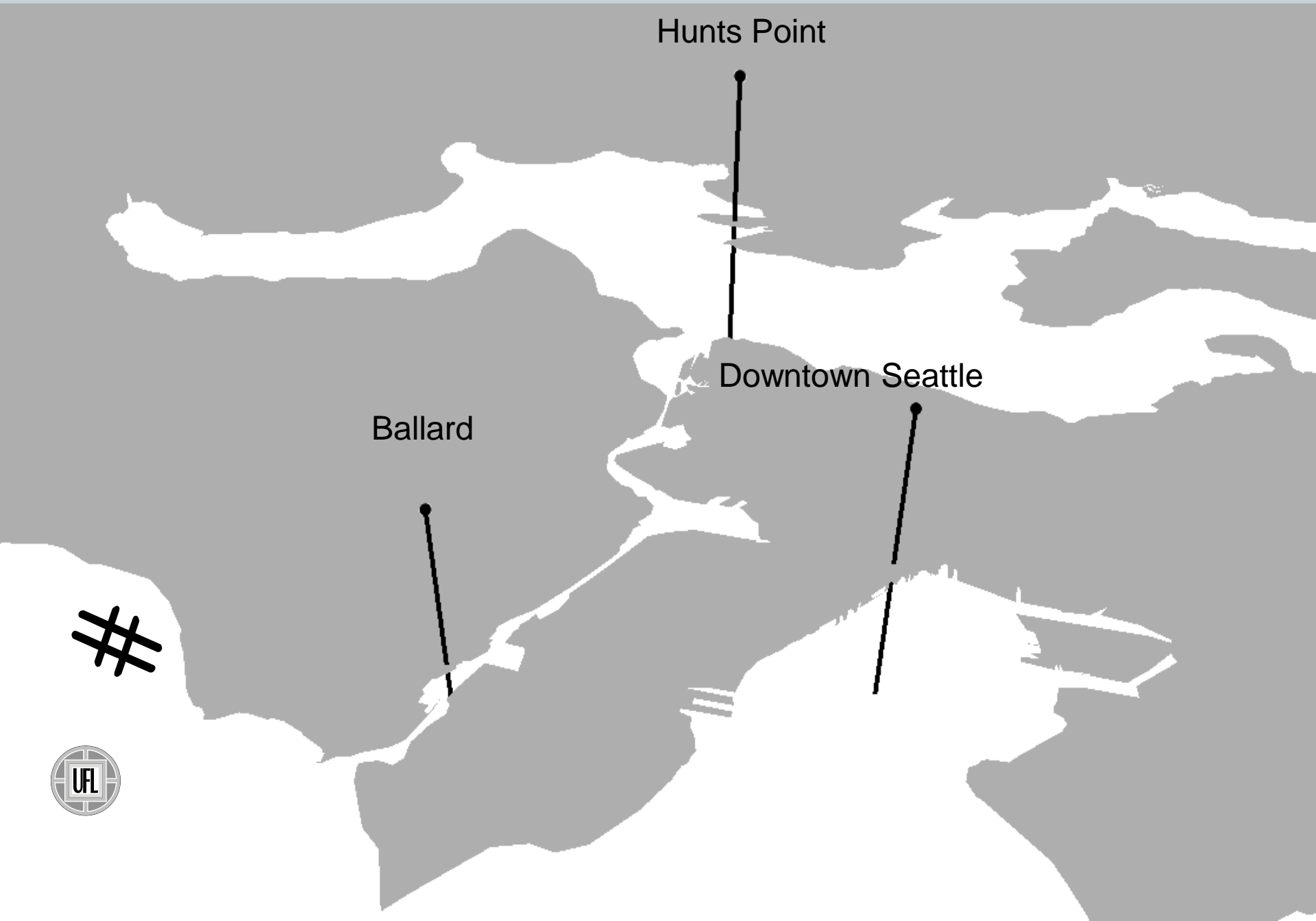




Our environment? Our culture? Our mindset? Our inattention?



three locations



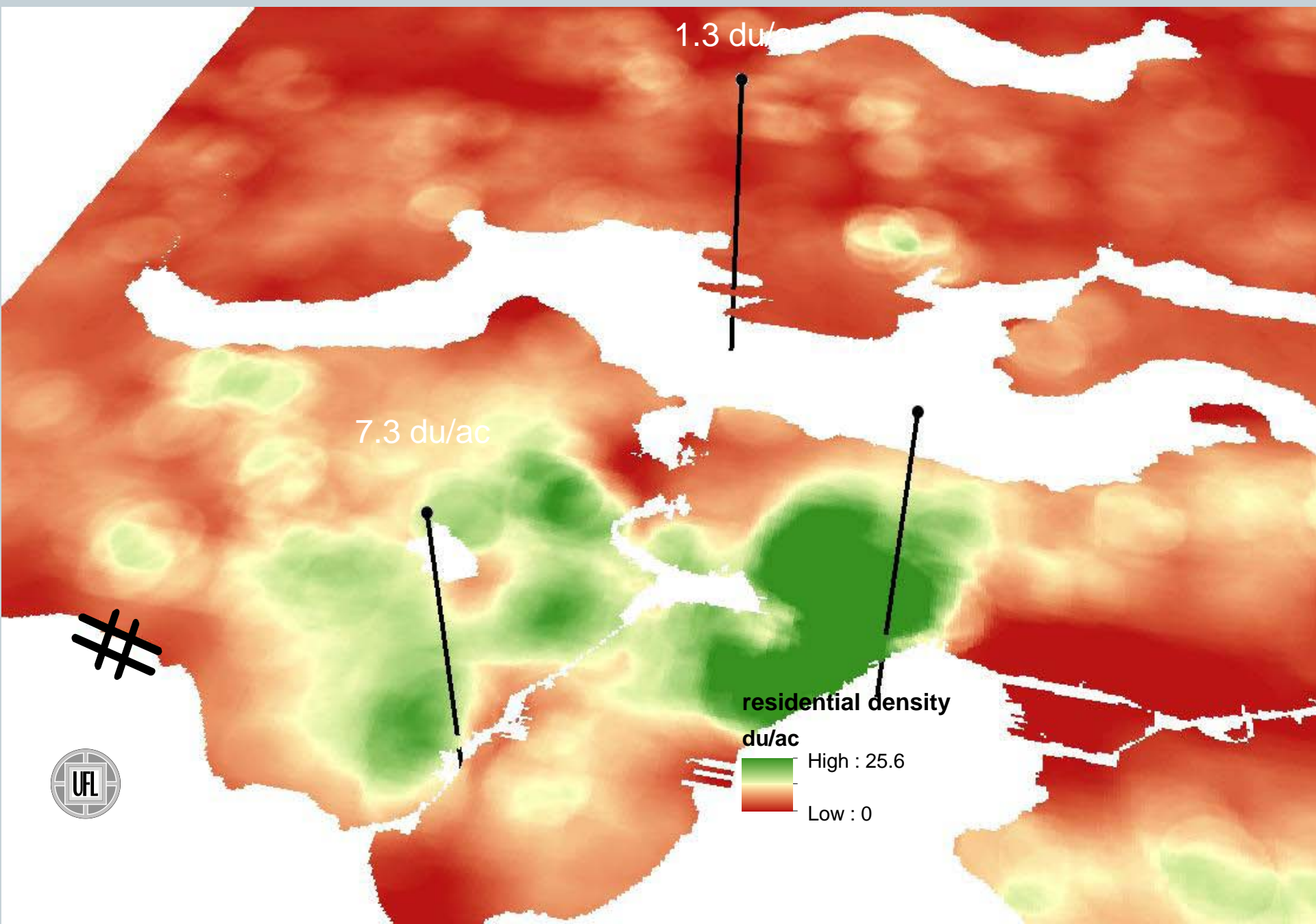
Hunts Point

Downtown Seattle

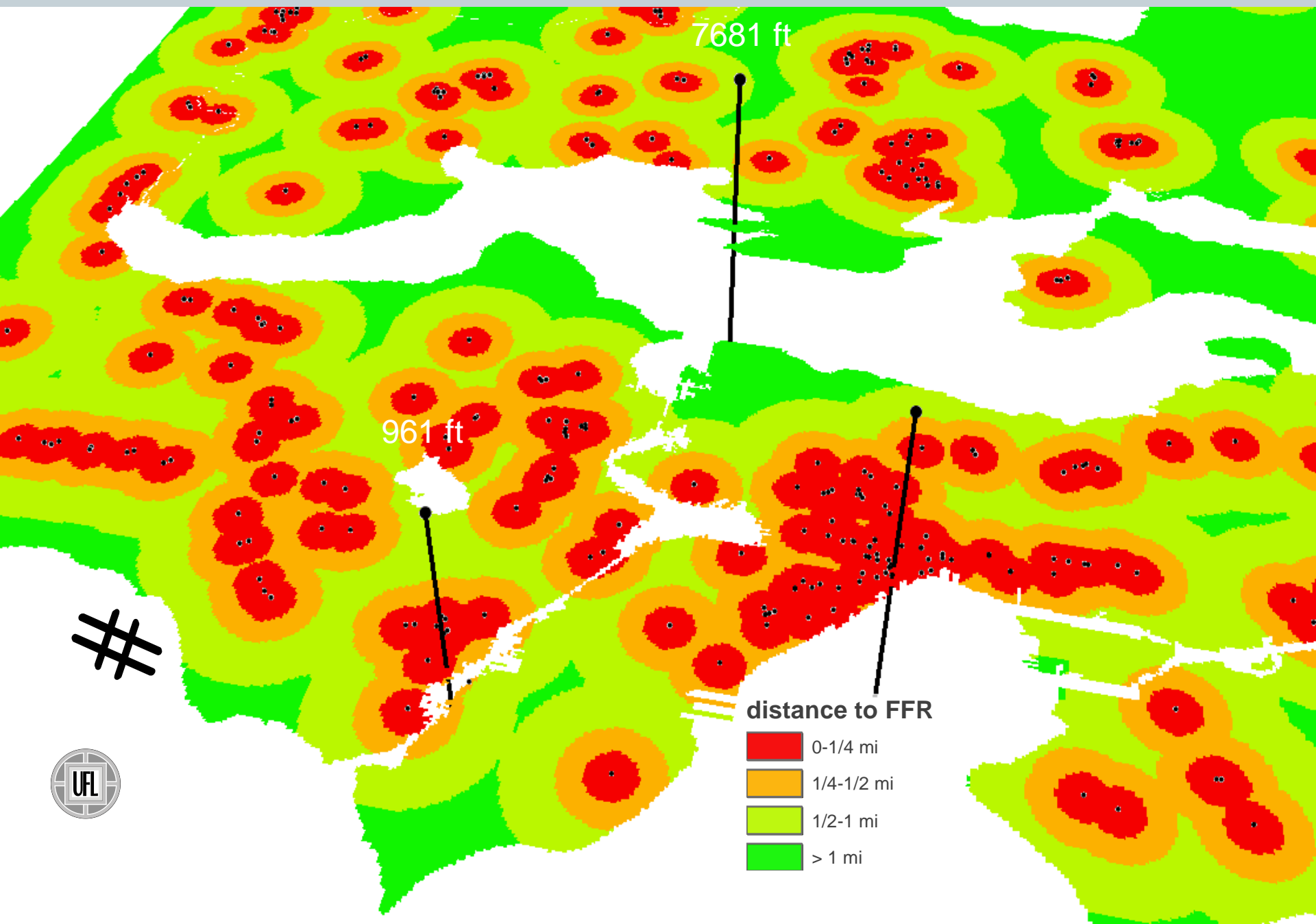
Ballard



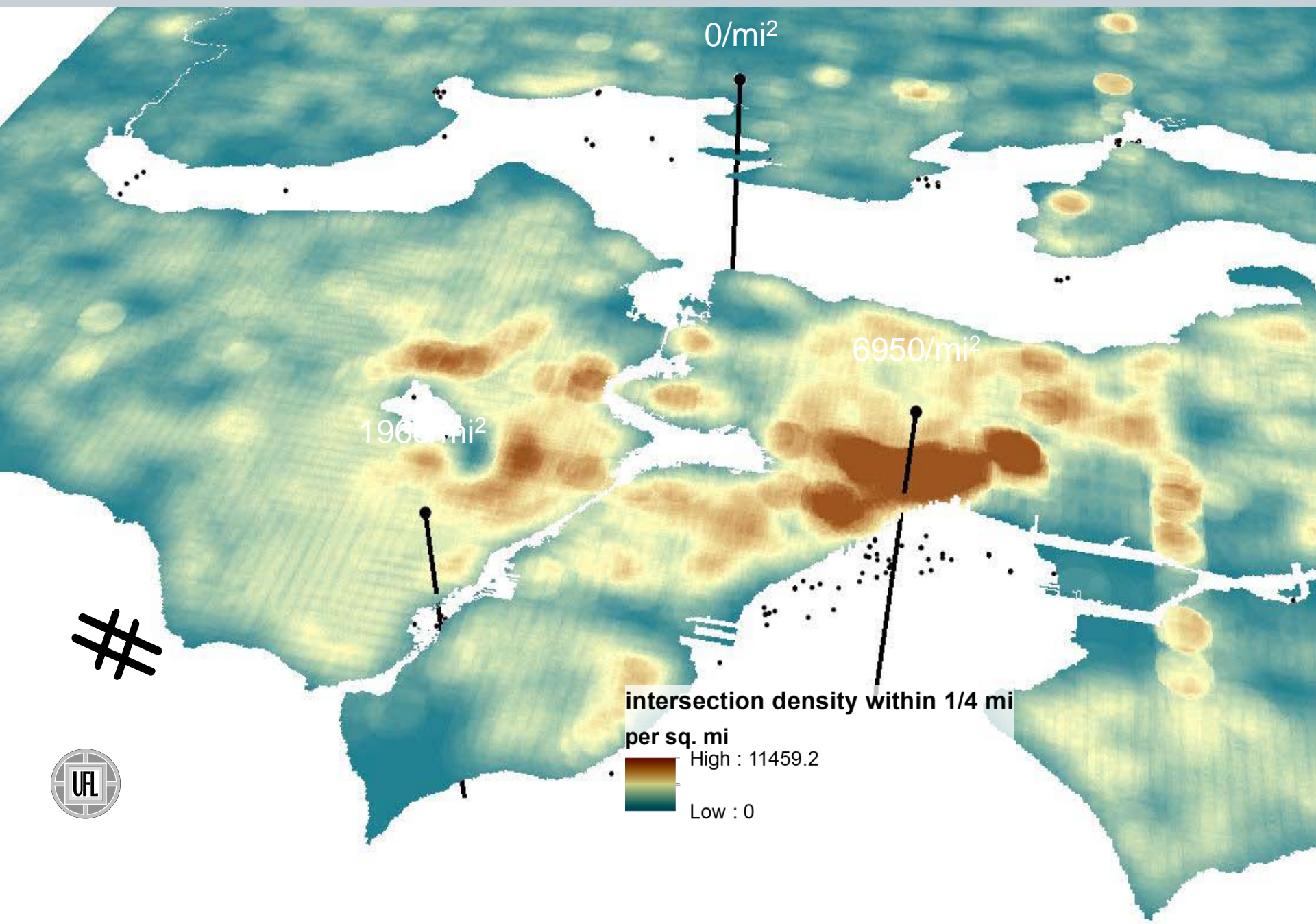
residential density



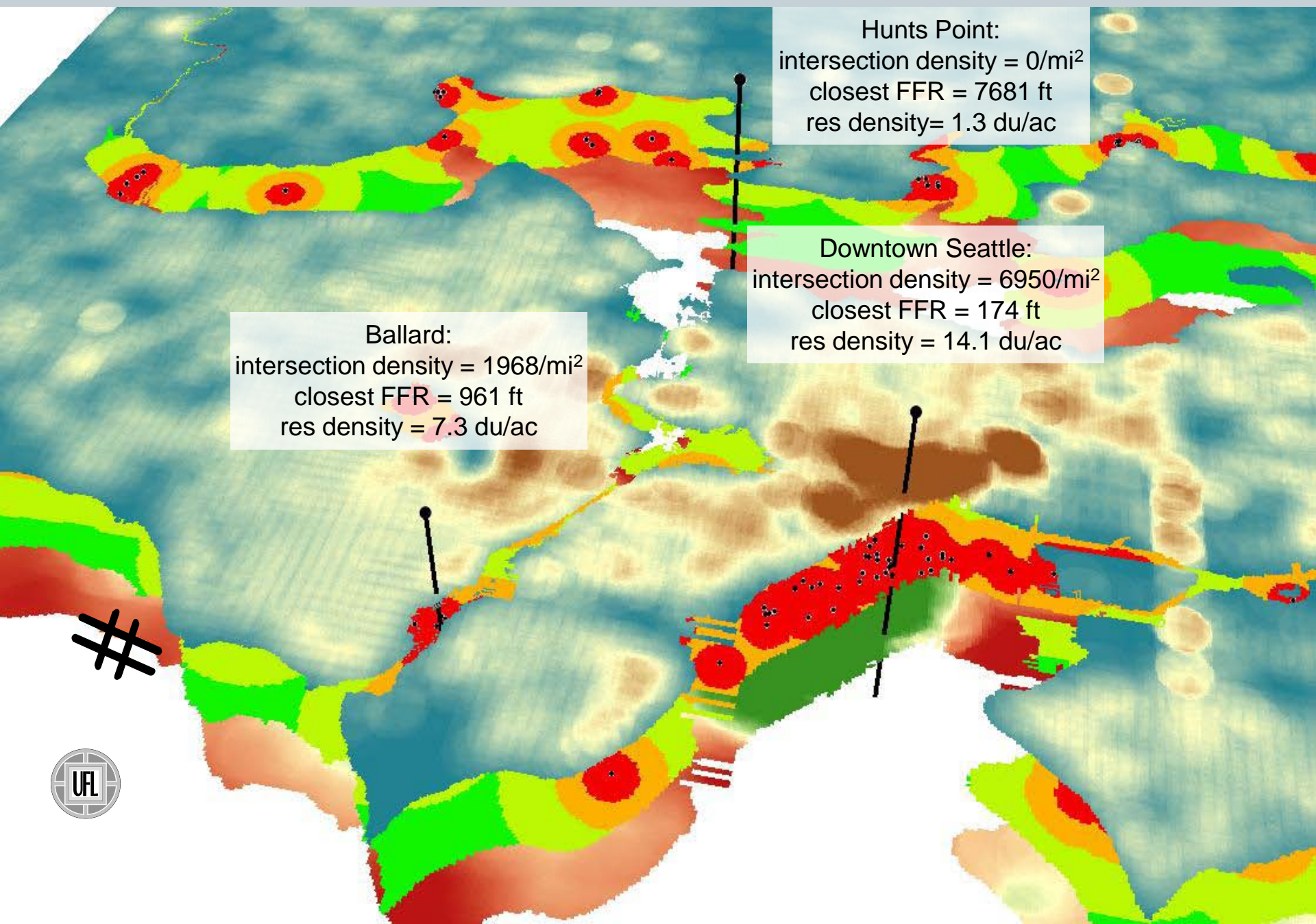
distance to closest fast food restaurant



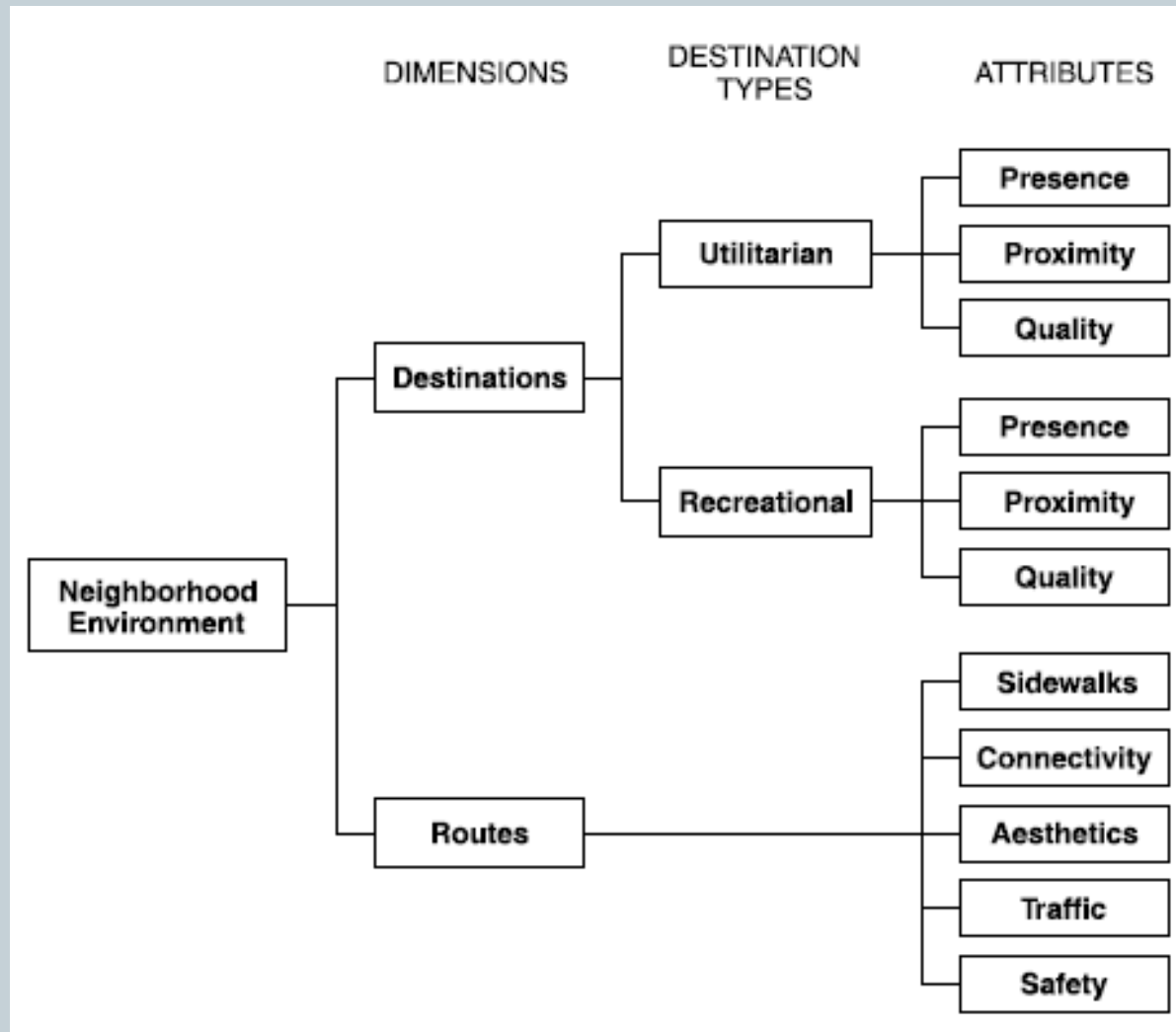
street intersection density



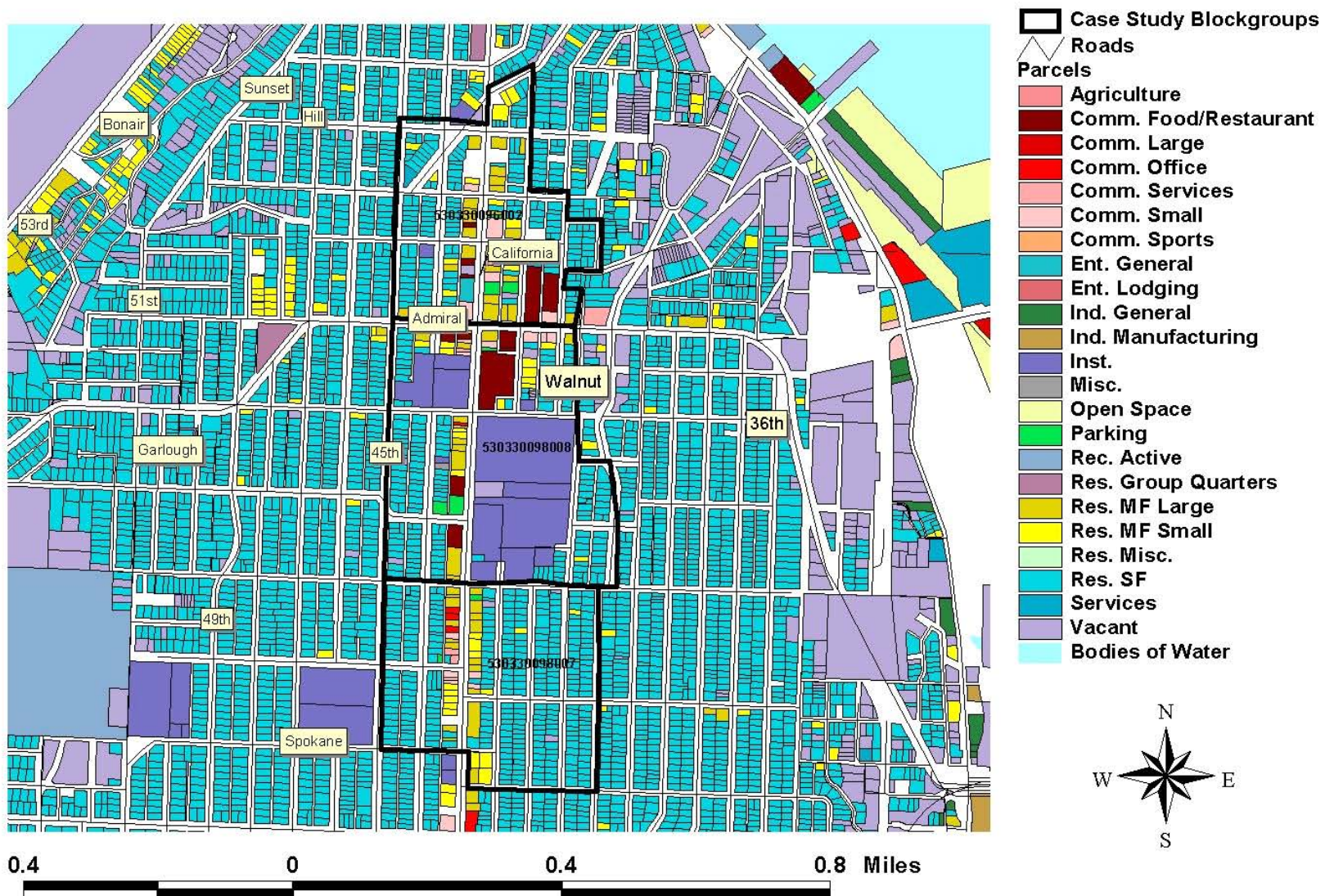
each digital map layer provides its own set of built environment measures



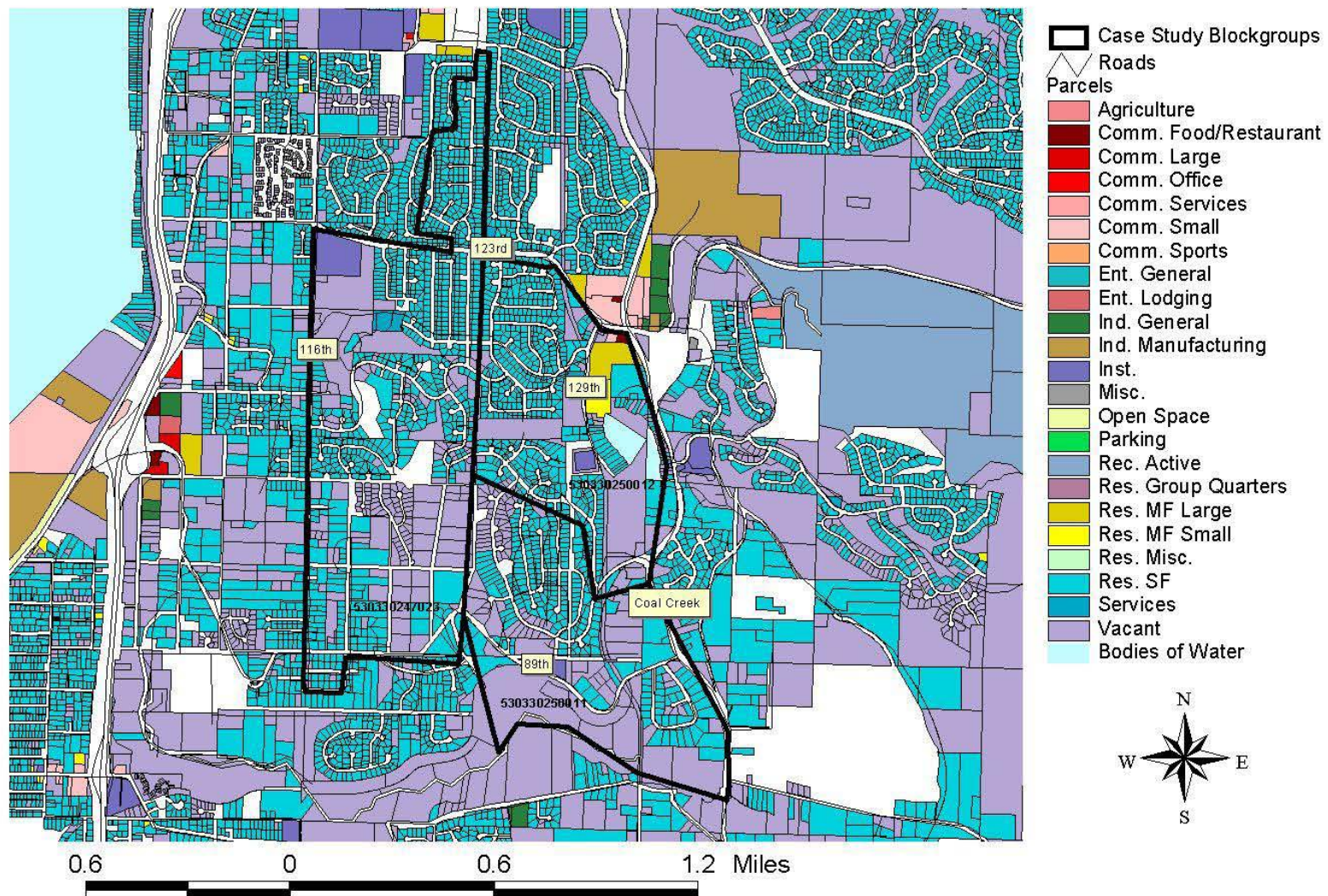
Schematic for Neighborhood Environment



Admiral District (High-High)



Newport (Low-High)



Built Environment - Walking Associations (Adults)

	Transport walking	Recreation walking
Destinations (utilitarian) <ul style="list-style-type: none"> - Presence - Proximity - Quality 	High + (79%) High + (82%) ???	Low (24%) Low (13%) ???
Destinations (recreational) <ul style="list-style-type: none"> - Presence - Proximity - Quality 	Low (17%) Moderate + (50%) ???	Low (21%) Low (38%) Limited High + (100%)
Routes <ul style="list-style-type: none"> - Sidewalk - Connectivity - Aesthetics - Traffic - Safety 	Moderate + (42%) Moderate + (58%) Low (15%) Low (15%) Low (18%)	Low (18%) Low (29%) Low (35%) Low (14%) Low (17%)

NIK Neighborhood Types

		Physical Activity Environment	
		High	Low
Nutrition environment	High	High PAE/High NE environment <ul style="list-style-type: none"> - high walkable - good park availability/quality - healthy food environment 	Low PAE/High NE environment <ul style="list-style-type: none"> - low walkable - poor park availability/quality - healthy food environment
	Low	High PAE/Low NE environment <ul style="list-style-type: none"> - high walkable - good park availability/quality - <u>un</u>healthy food environment 	Low PAE/Low NE environment <ul style="list-style-type: none"> - low walkable - poor park availability/quality - <u>un</u>healthy food environment

Neighborhood Impact on Kids (NIK) and Adult-NIK

- **How do neighborhoods affect a child's weight status and related behaviors**
 - Kids age 6-11 & one parent
 - Over 700 families from King County and San Diego
 - Nearly 600 at the follow-up
 - Assess body composition (height, weight, waist)
 - Child wears activity meter for 7 days
 - Complete survey about eating, home environment, activities, etc.
 - Complete 3 dietary recalls detailing the foods the parent and child eat
 - 2 year follow up
 - Measure change in the child's weight status and behaviors



NIK Environmental Data

- Macro-environmental data (streets, parks, food establishments, etc)
- Over 900 park audits
 - Facilities, amenities, quality of amenities
- Over 1,800 food store and restaurant audits
 - Availability, quality, cost (NEMS-R & NEMS-S audits)
- Pedestrian route audits (reaching 1/4 mile from participants' residence)
 - E.g., sidewalks, incivilities, crossings
- Place-based logs for child locations

NIK Study: Obesity by Neighborhood

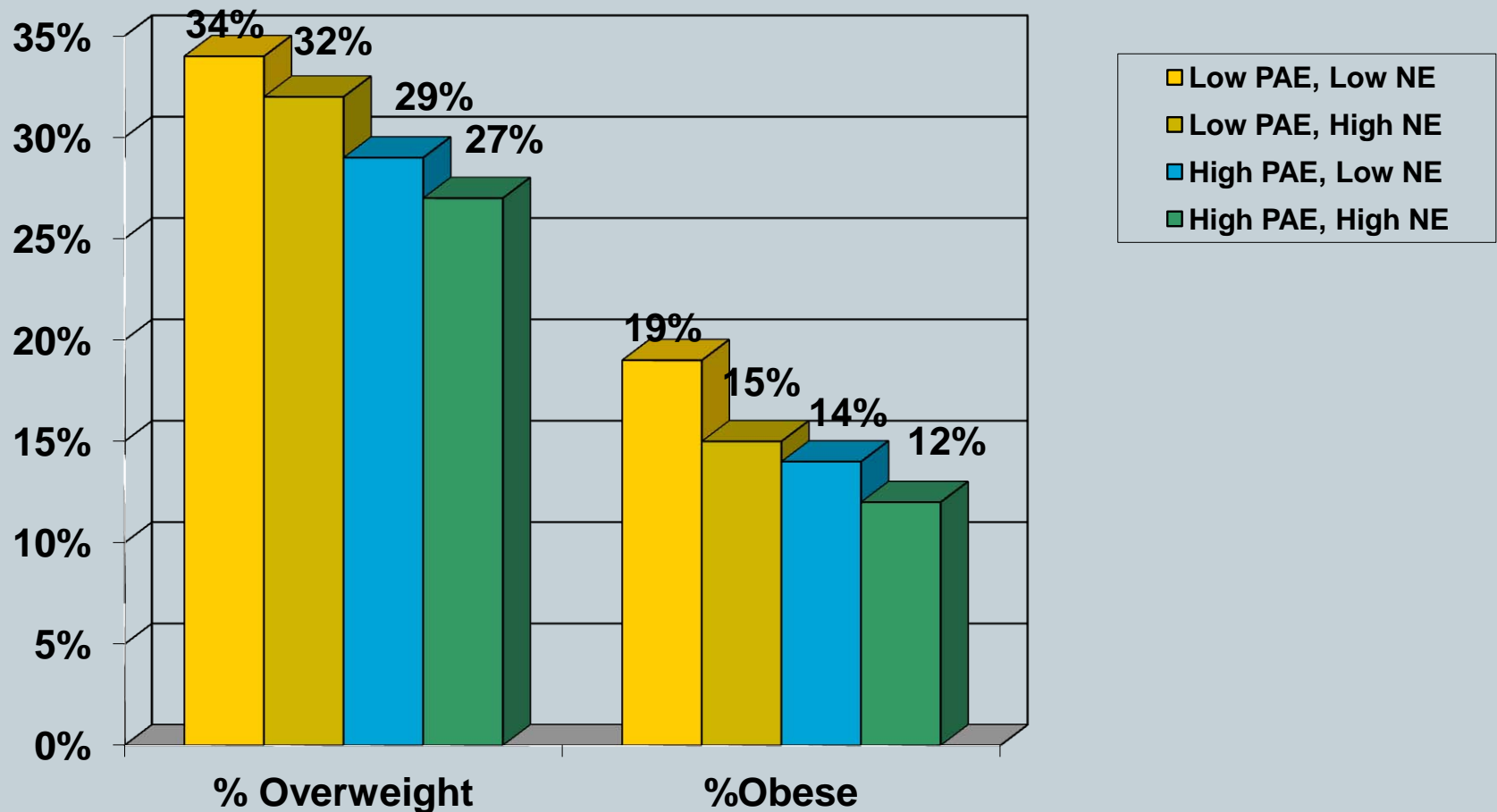


Table 5 Linear regression: prediction of accelerometry-based minutes of MVPA per day from parent-reported demographics and neighborhood environment

Model	Univariate models for 3 MET cut point B	Full model for 3 MET cut point B	Final model for 3+ METs B [95% CI]	Final model using Evenson cut points B [95% CI]
Demographics				
Child Race (White)	-3.25	1.39		
Child Age	-22.38**	-22.60**	-22.44** [-24.24 - -20.64]	-2.57** [-3.51 - -1.63]
Child Sex (F)	-29.40**	-26.80**	-25.64** [-31.26 - -20.01]	-14.23** [-17.19 - -11.27]
Hispanic (Y)	-5.34	-0.93		
Child's BMI percentile	0.03	-0.06		-0.08* [-0.13 - -0.03]
Household income < \$50,000 (Y)	-8.73	-6.64		-4.97* [-9.49 - -0.45]
Household income \$50-100,000 (Y)	-3.60	-3.09		-4.24* [-7.44 - -1.04]
Neighborhood Environment				
Physical activity environment (GIS)	2.94	3.52		
Safety against crime	-0.11	3.70		
Street connectivity	0.13	-0.74		
Neighborhood aesthetics	0.11	0.64		
Traffic safety	1.93	-1.38		
Walk/cycle facilities	-2.43	-1.29		
Proximity to stores	2.74	1.33		
Proximity to play areas	3.54	2.25	4.12* [0.66 - 7.58]	2.12* [0.30 - 3.95]
Barriers to walking/cycling: logistics	-2.17	-2.10		
Barriers to walking/cycling: route factors	-1.08	2.55		
Barriers to activity: perceived lack of appropriate play areas	-5.35	-3.15		
Barriers to activity: crime	-1.27	2.85		
Constant		357.08**	353.85 [334.88 - 372.83]	79.07 [68.22 - 89.93]

TEAN Study: Walking Time and Other Activity

Table 3. Associations among transportation and physical activity variables among adolescents (N = 3659 days from 696 participants)

	Additional minutes/day vs. reference, B (CI) ^a	
	MVPA	Sedentary time ^b
Walking time		
None (reference)	31.0 (29.0, 32.3)	545.2 (540.2, 551.5)
Low	+6.7 (4.5, 9.1)	-14.8 (-21.2, -7.4)
High	+18.2 (16.8, 21.3)	-23.1 (-31.2, -17.6)
Omnibus p for factor	< .001	< .001

TEAN Study: Neighborhood Factors and Walking

Factor	Change in walking time from referent
Age	+11%
Female	-3%
Non-Hispanic White	-3%
Parents married	-31%
# of vehicles	-15%
Neighborhood income	+23%
Residential density	+36%

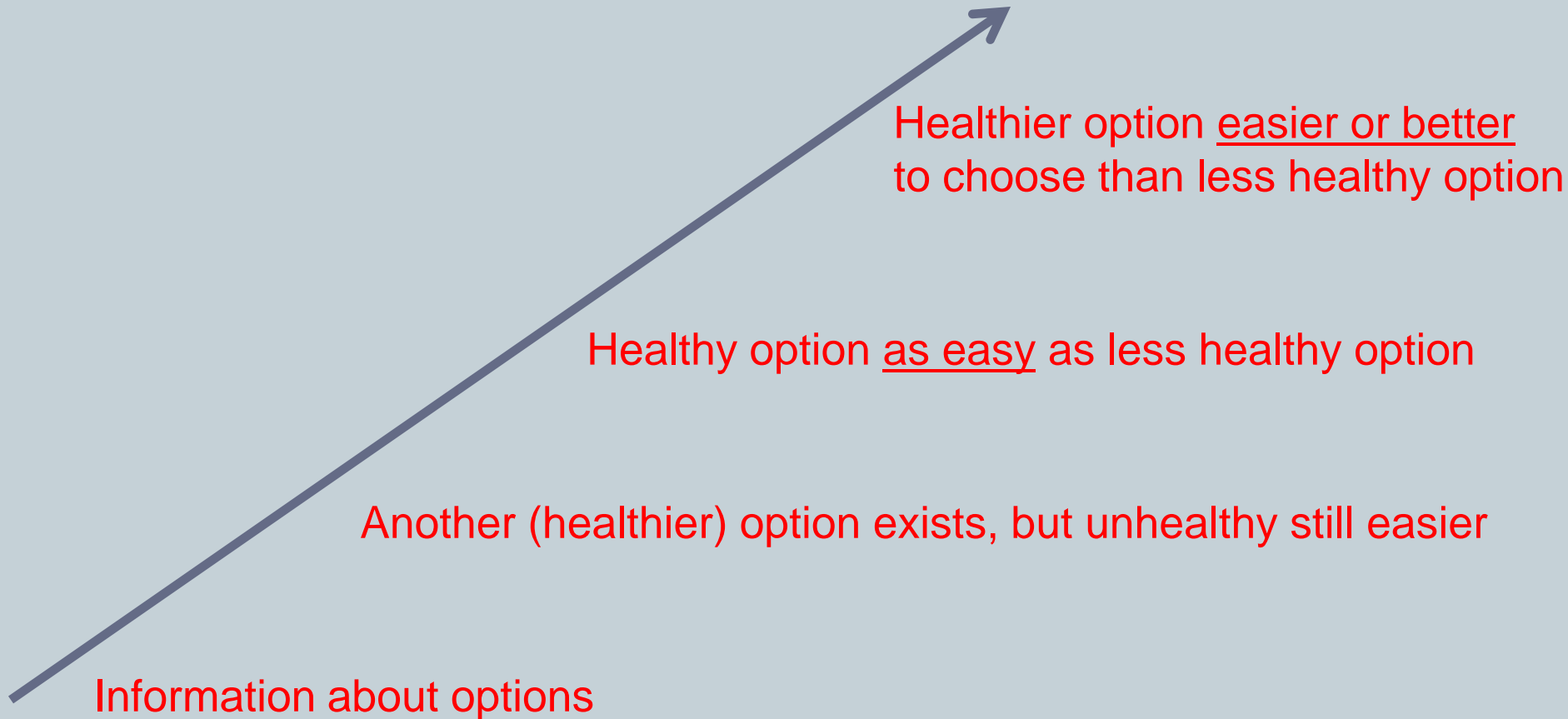
Child PA – Built Environment Associations (3-12 years; objectively Measured PA)

Built environment (BE) characteristic	Objectively measured BE
Destinations <ul style="list-style-type: none"> - Parks - Recreation facilities - Utilitarian - Residential density 	<p>Moderate + (43%) Moderate + (41%) ? Moderate + (44%)</p>
Routes <ul style="list-style-type: none"> - Connectivity - Walk/bike facilities - Traffic safety 	<p>Low/opposite? (19%) Low (33%) ?</p>
Other <ul style="list-style-type: none"> - Crime safety - Incivilities - Vegetation 	<p>Low (19%) Very low (0%) Low (38%)</p>

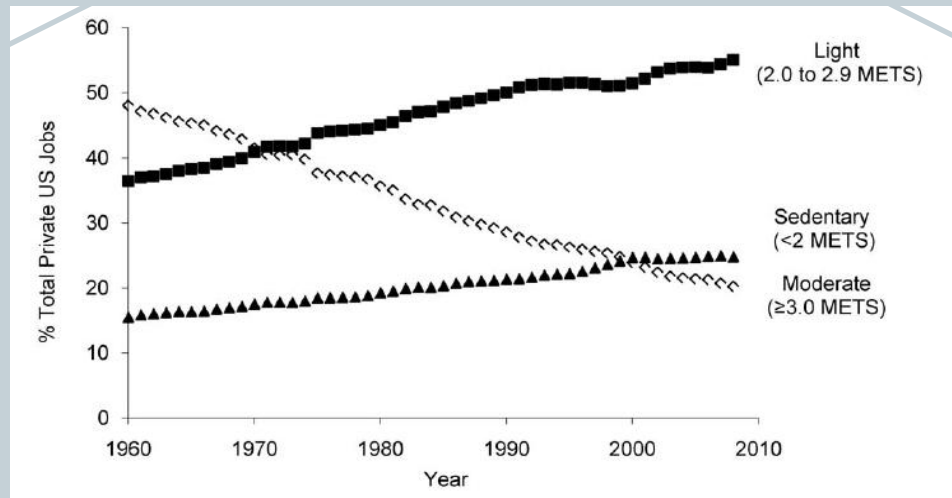
IOM Recommendations for Obesity Prevention

- I. Make physical activity an integral and routine part of life
 - A. Enhance physical and built environment
 - B. Provide/support community programs for PA
 - C. Adopt requirements for child care providers
 - D. Provide support for science/practice of PA

Model & Vision: Likelihood of Making the Healthy Choice



The Health Choice Hill: Physical Activity Example



Church 2011 *PLoS ONE*

Example: Getting to work





August 2012							Print	Help
Sunday	Monday	Tuesday	Wednesday 1	Thursday 2	Friday 3	Saturday 4		
					Building 1 (\$8.50)			
5	6	7	8	9	10	11		
12	13	14	15	16	17	18		
	Building 1 (\$8.50)	Bike	Bike		Bike			
19	20	21	22	23	24	25		
	Building 1 (\$8.50)	Bike	Bike	Public Transit	Bike			
26	27	28	29	30	31			
	Bike	Bike	Building 1 (\$8.50)	Bike				

8/1/12 - 8/31/12		9/1/12 - 9/30/12				
Date	Time	Mode	Lot	Bonus	Charge	
09-04-2012		Bike		\$3.25	-	
09-05-2012	10:09 AM		Building 1	-	(\$8.50)	
09-06-2012		Bike		\$3.25	-	
09-07-2012		Bike		\$3.25	-	
09-10-2012	08:26 AM		Building 1	-	(\$8.50)	

What is the choice now?

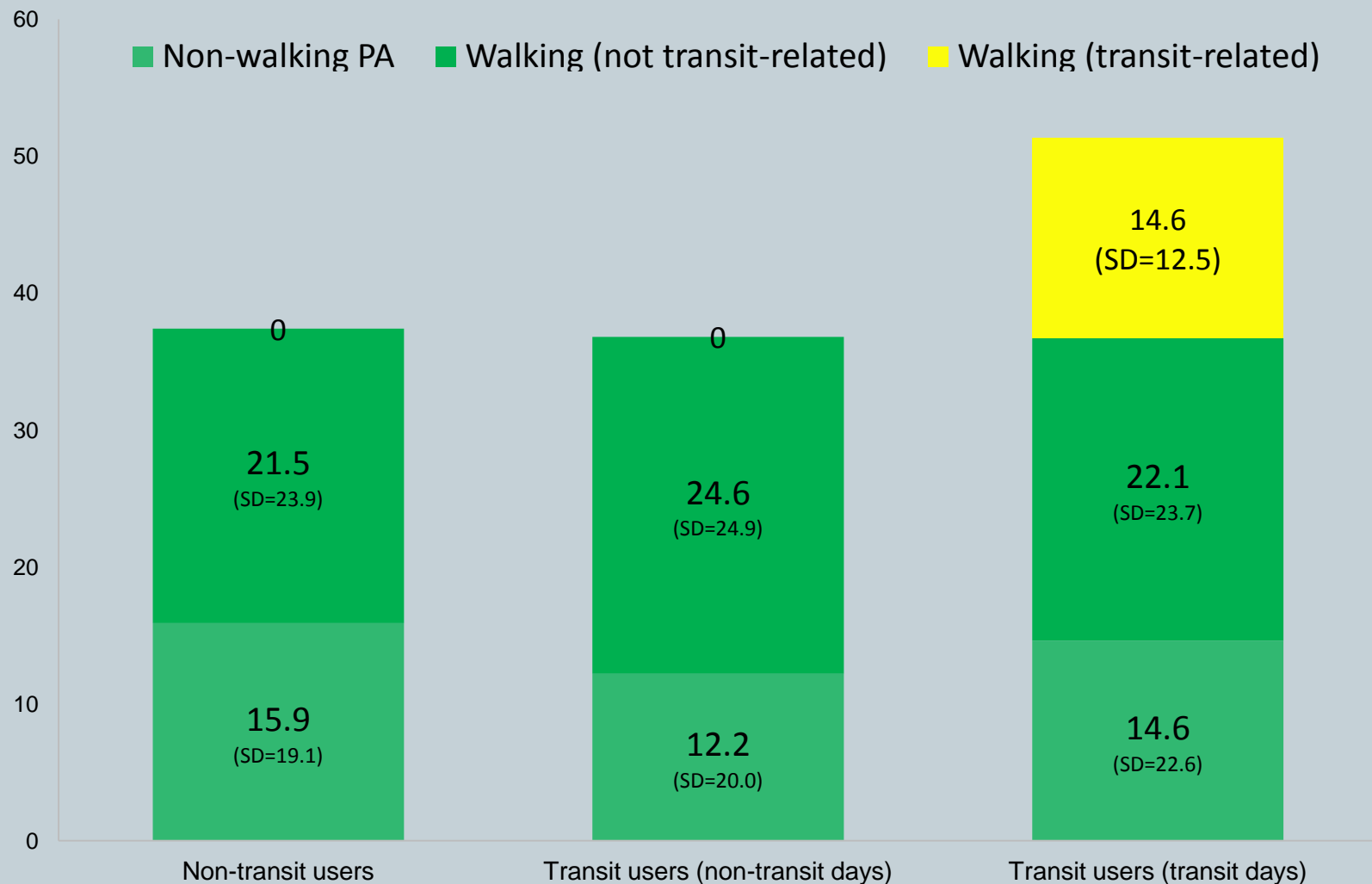
Drive to work

- Time/convenience (25 mins)
- Cost to park (-\$10.00)
- Cost to drive (-\$6.00)
- Perceived safety
- Comfort

Not drive to work

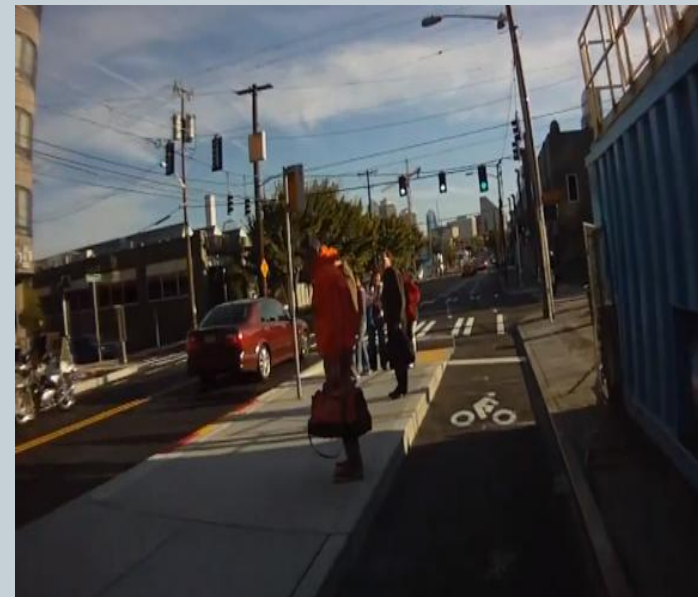
- Convenience (bike – 50 mins)
- Savings from not parking or driving
- Paid for not driving (+\$4.00)
- Similar comfort
- Perceived safety (coming?)

Transit-Related Physical Activity is Additive!

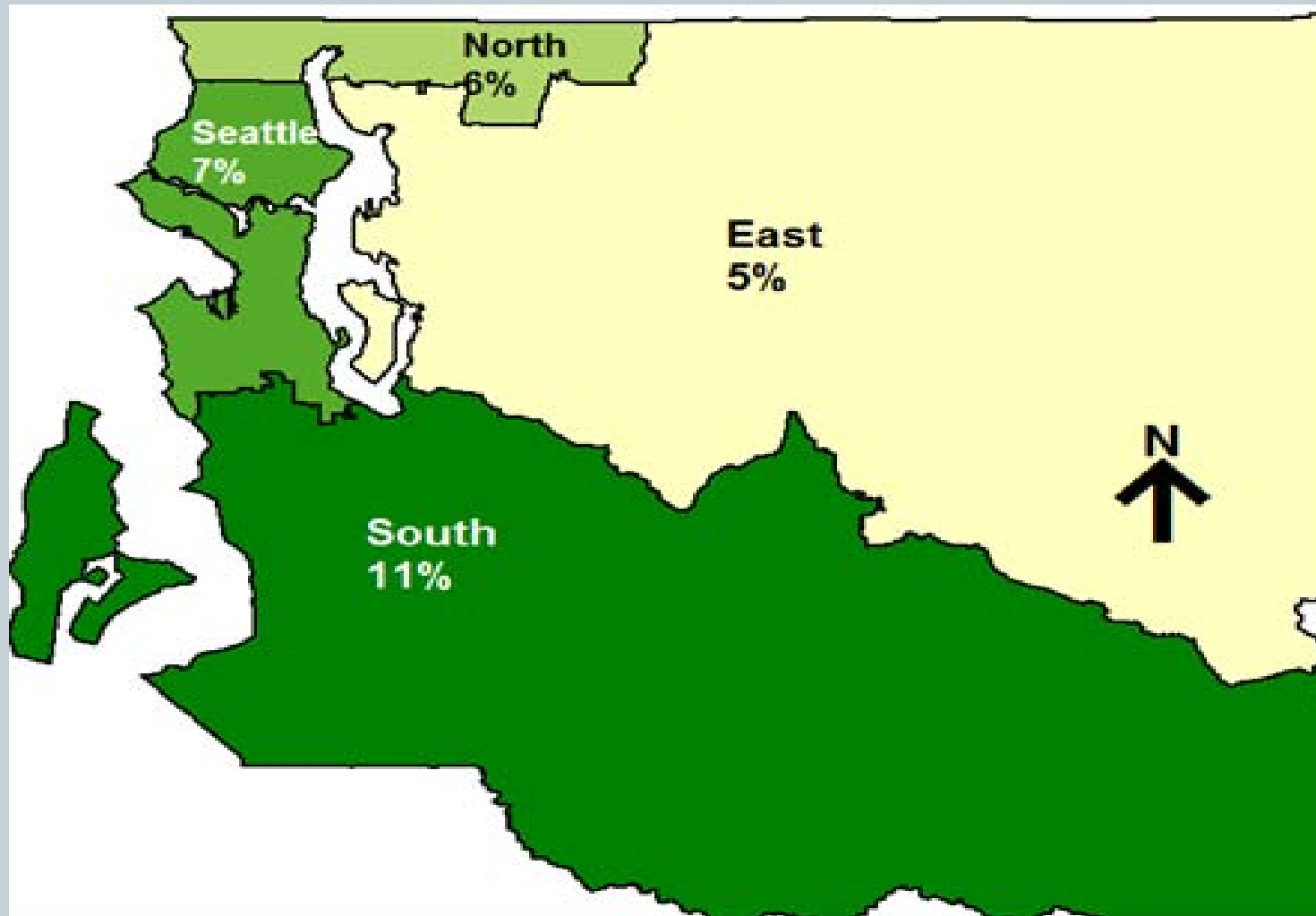




Property of Puget Sound Maritime Historical Society

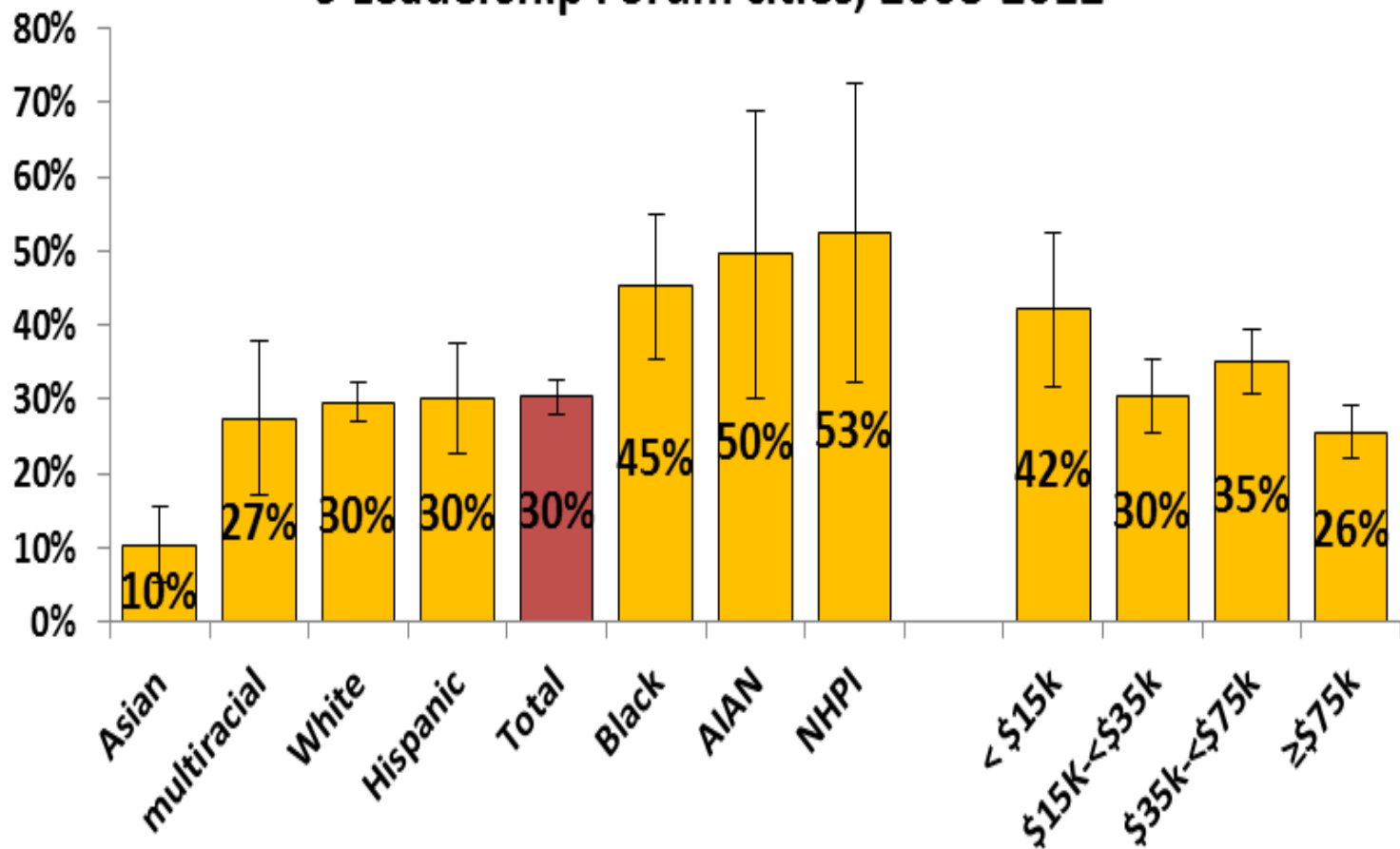


Youth Obesity Rate in King County Regions – 2012



Obesity Disparities in South King County

**Obesity prevalence by race/ethnicity and income,
9 Leadership Forum cities, 2008-2012**



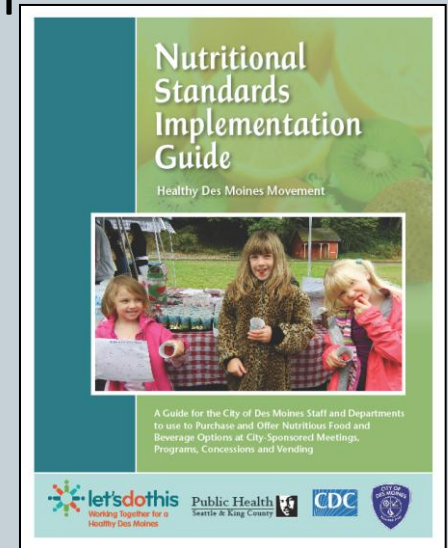
CPPW in Highline (2010-2012)

- Healthy Highline Community Coalition
- Joint Use Agreement between Highline, Burien, Des Moines, Normandy Park and SeaTac
- Recess Before Lunch in 16 elementary schools
- Safe Routes to School in 3 elementary schools
- Cafeteria Point of Sale Marketing in Middle and High School (expanded to elementary schools)
- Coordinated School Health Advisory Council



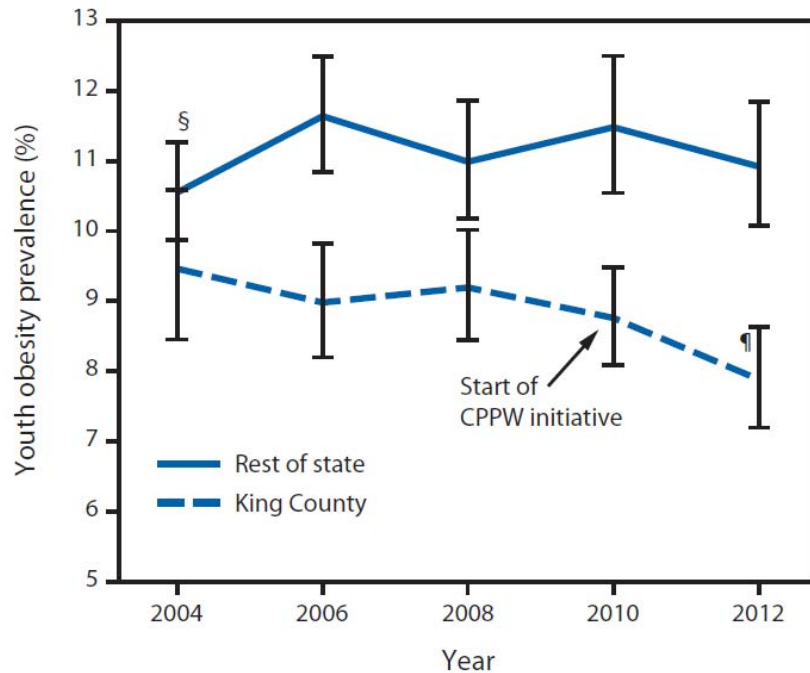
CPPW in Des Moines (2010-2012)

- Leadership from Healthy Des Moines Movement – Council and Technical Advisory Committee
- Health element and goals in comprehensive plan:
 - Nutrition standards for city procurement
 - Safer and easier walking and biking to school
 - Increase fresh food access for low-income residents
 - Community gardens
- Complete Streets Ordinance
- Recognition by CDC as Local Health Champion
- City of Des Moines Outcomes and Partners Report



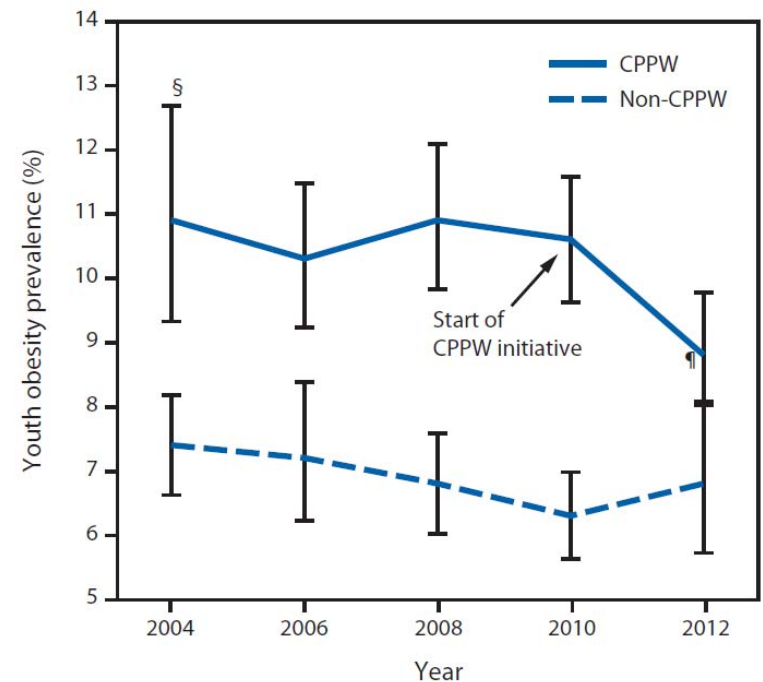
Drop in Youth Obesity During CPPW

FIGURE 1. Prevalence of youth* obesity in King County, Washington, compared with the rest of the state, 2004–2012[†]



Within county

FIGURE 2. Prevalence of youth* obesity, by school district participation in the Communities Putting Prevention to Work (CPPW) initiative — King County, Washington, 2004–2012[†]



Shifting Away from 'Trying to Convince'

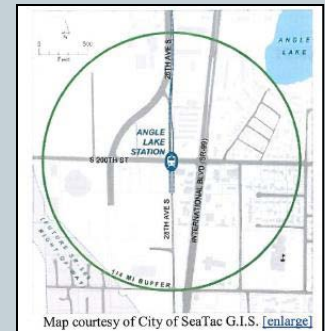
- Environments and policies set the parameters of our behaviors
 - Incentives and influences are already there, but may not be aware of them
- Lack of reliance on call for “healthfulness”
- Focused on everyday behaviors rather than additions
- Multi-level ‘interventions’ (neighborhood, schools, worksites, etc) for synergistic impact
 - Alignment with programmatic interventions

Source	Primary target(s)	Example built environment or policy recommendation for increasing physical activity	Available at:
American Academy of Pediatrics (2009)	Physical activity promotion in children	"Create and maintain playgrounds, parks, and green spaces..[and]...means to access them safely"	http://aappolicy.aappublications.org/cgi/collecion/committee_on_environmental_health
American Heart Association Policy Strategies (2011)	Ideal cardiovascular health	"Implement zoning/building ordinances that encourage... pedestrian-friendly streets and roadways with appropriate crosswalks, sidewalks, traffic lights, etc and slower speed limits in walking/biking areas"	http://circ.ahajournals.org/cgi/content/full/123/7.816
CDC MAPPS interventions	Obesity prevention	"Incentives for active transit"	http://www.cdc.gov/CommunitiesPuttingPreventiontoWork/strategies/index.htm
CDC (2009)	Obesity prevention	"Zone for mixed-used development"	www.cdc.gov/obesity/downloads/community_strategies_guide.pdf
Institute of Medicine (2009)	Childhood obesity prevention	"Adopt community policing strategies that improve safety and security for park use, especially in higher crime neighborhoods"	http://www.nap.edu/catalog/12674.html
National Physical Activity Plan	Physical activity promotion	"Increase accountability of project planning and selection to ensure infrastructure supporting active transportation and other forms of physical activity"	http://www.physicalactivityplan.org/
White House Task Force on Childhood Obesity (2010)	Childhood obesity	"EPA should assist school districts ... in siting guidelines for new schools that consider the promotion of physical activity..."	http://www.letsmove.gov/white-house-task-force-childhood-obesity-report-president

Local CTG Brief Overview of BE Work

Overall Goal: Increase the number of city planning departments that adopt healthy community planning strategies and actions

- City of Auburn
 - Incorporate health and equity policies into the comprehensive plan update through the Health Impact Assessment Process
- Puget Sound Regional Council
 - Develop a web-based Health, Equity and Sustainable Development Toolkit for disseminating actionable planning strategies and policies; sharing ideas for local planning processes that can influence cities' resident health
- City of SeaTac
 - Develop and implement a community engagement process to inform vision and planning around future Angle Lake (Light Rail) Station Area Plan
 - Study and engage community in planning for pedestrian and bicycle connectivity within the Angle Lake Station Area to allow for non-motorized transport in and around the station area



5 SOLUTIONS FOR CHANGING OUR COMMUNITIES

INTEGRATE PHYSICAL ACTIVITY
EVERY DAY IN EVERY WAY.

STRENGTHEN SCHOOLS AS
THE HEART OF HEALTH.

MARKET WHAT MATTERS
FOR A HEALTHY LIFE.

EAT WELL!

ON THEIR OWN, ANY ONE OF THESE FIVE
SOLUTIONS MIGHT HELP SPEED UP PROGRESS
IN PREVENTING OBESITY, BUT TOGETHER, THEIR
EFFECT WOULD BE REINFORCED, AMPLIFIED,
AND MAXIMIZED.

ACTIVATE EMPLOYERS AND
HEALTH CARE PROFESSIONALS.

MAKE HEALTHY FOODS
AVAILABLE EVERYWHERE.

**ANYONE AND EVERYONE CAN BE A LEADER AND PLAY A PART IN IMPLEMENTING THESE FIVE SOLUTIONS.
WHAT CAN YOU DO TO HELP SOLVE OUR OBESITY PROBLEM?**

Acknowledgments

- My excellent research staff
- Other investigators within Seattle Children's
- University of Washington (Vernez Moudon, Hurvitz)
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- University of British Columbia (Frank)
- University of Pennsylvania (Glanz)
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