

Methodology to Estimate Household Emissions

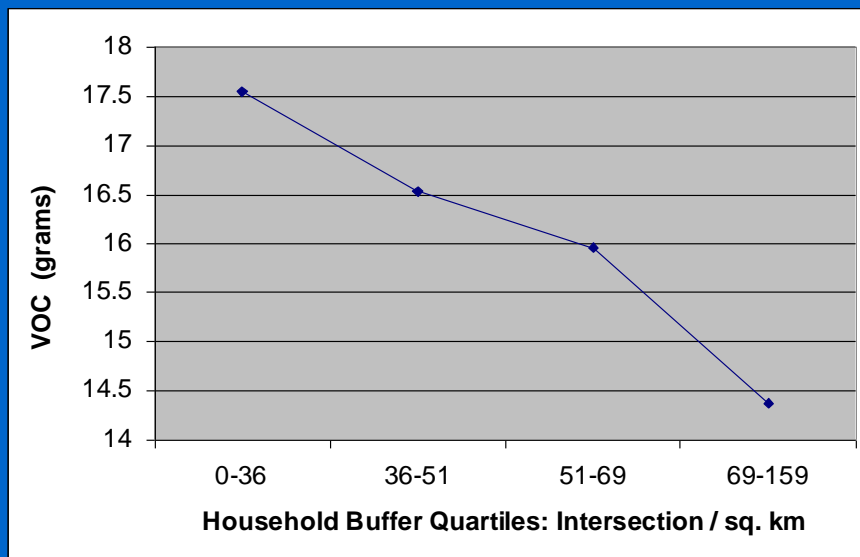


Facility Type	Distance <i>(miles)</i>	AM Peak Speed <i>(mph)</i>	Emission Estimates
Local Road	0.8	20	<i>Using EPA sanctioned models, gram per mile emissions of HC, CO, NOx, and PM will be calculated.</i>
Minor Arterial	0.5	25	
Major Arterial	4	35	
Freeway	7.5	55	
Total	12.8		

The model speed will be used based on the facility type instead of assuming an average trip speed.

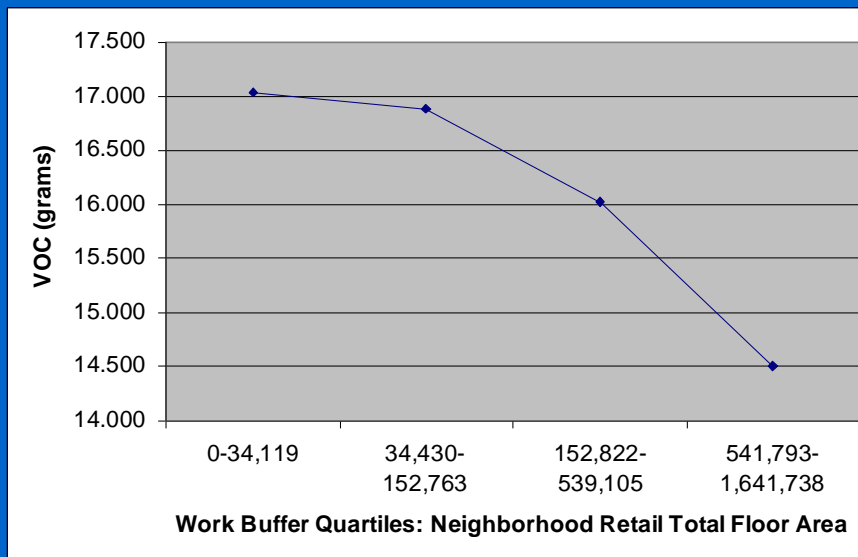
OZONE - AIR POLLUTION

LIVE



Volatile Organic Compounds & Intersection Density Where People Live * (n=2467)

WORK



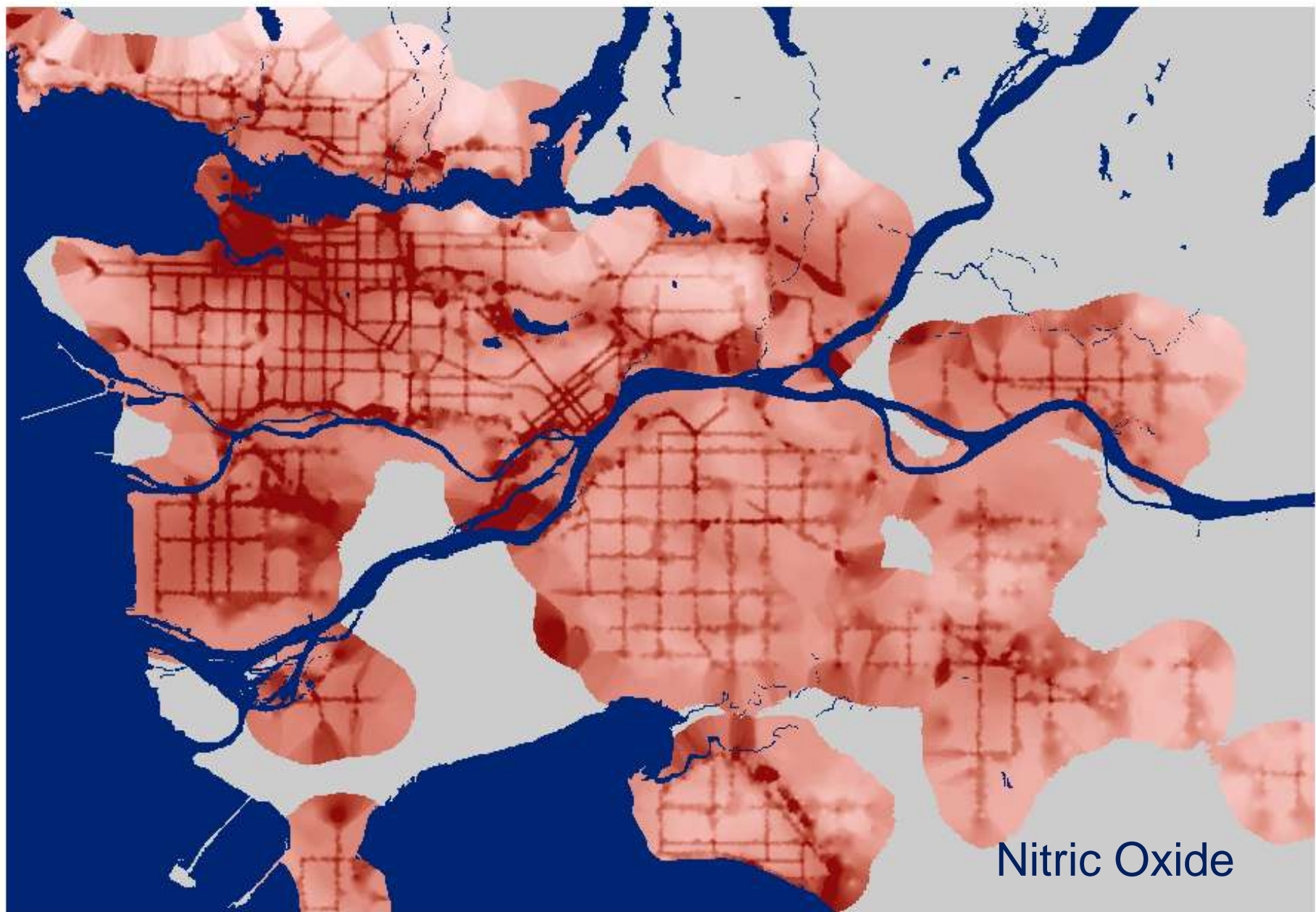
Volatile Organic Compounds and Retail Use Where People Work * (n=2467)

* Controlled for gender, income, age, total number of vehicles in the house

* VOC differences across quartiles significant ($p < 0.001$)

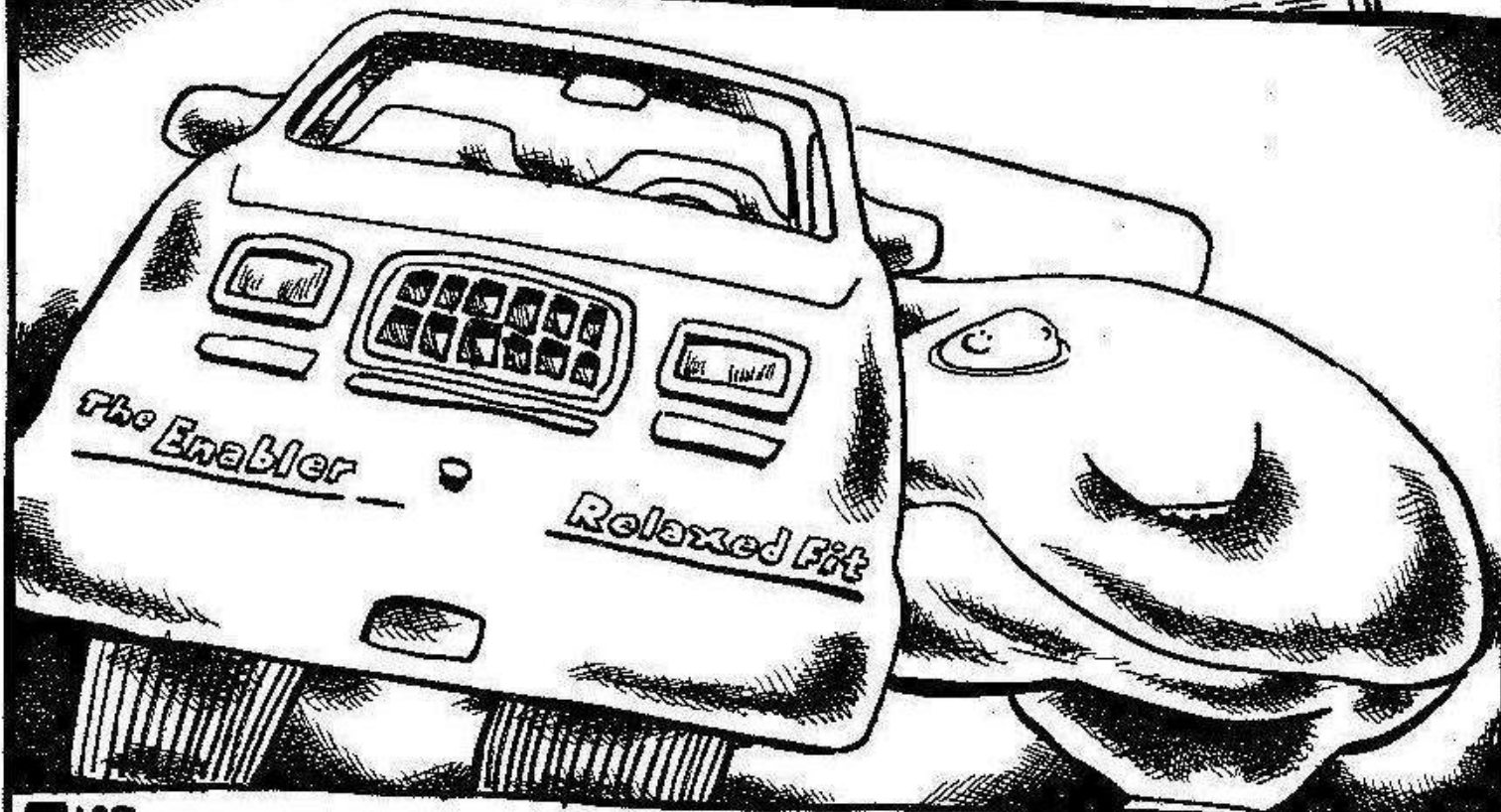
Air Pollution and Walkability

- Concentrating development in smaller areas can lead to increased exposure of harmful air pollutants
 - Small particulates / air toxics
- This is a major concern for elderly
 - Policies are needed to reduce exposure to air pollution in areas where growth is to be focused
- Solving one problem while exacerbating another
 - something we are good at



Marshall, Brauer, and Frank 2008

SUVs Explained!



TALS

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PERHAPS IT'S TIME TO REDEFINE
FOSSIL FUELS AS A CARE. —

I-PLACE³S Uses

Regional to Neighborhood-level applications

The screenshot displays the I-PLACE³S web application interface. On the left is a control panel with the following sections:

- Layers:** A list of map layers with checkboxes. "Parcel Lines" is checked, while "Highways", "Major Roads", and "Minor Roads" are unchecked.
- SUB-AREA LAYERS:** A section with three unchecked options: "CITIES-2", "REGIONAL_SUBAREAS_080904", and "RURAL_NODES_7/22/04_NEW".
- SUB-AREA QUERIES:** A section with a radio button selected for "NONE".
- Map Size:** A dropdown menu currently set to "1X".
- Redraw:** A button to refresh the map data.

The main map area contains the text "CLICK ON THE MAP TO PERFORM THE SELECTED ACTION!" and shows a regional map with a dense grid of parcel lines. To the right of the main map are three zoomed-in views of different areas, showing detailed parcel boundaries and various colored overlays (yellow, red, blue, green, pink) representing different data layers or queries.



King County, WA HealthScape project and the PLACE3S model

Goal:

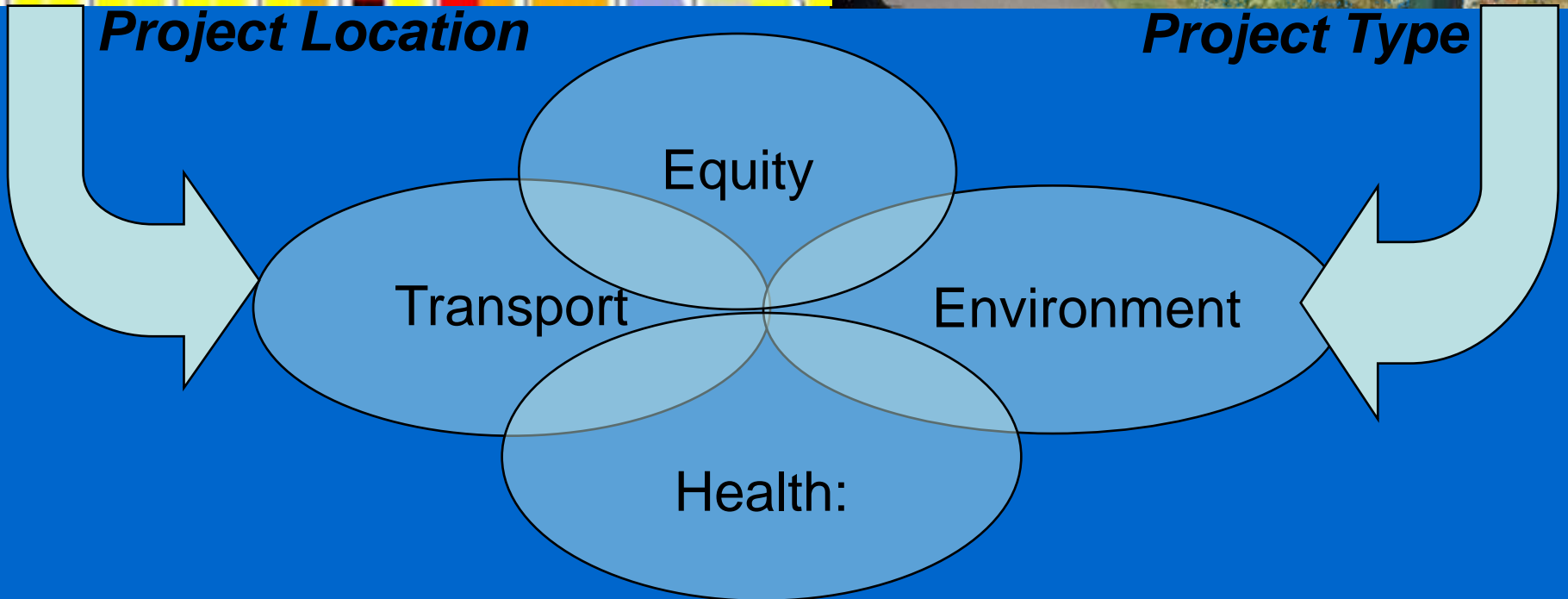
Create a tool that can evaluate potential health and climate change impacts of land development actions

- Comprehensive plans
- Changes in development regulations
- Changes in neighborhood plans
- Transit-Oriented Development



Project Location

Project Type



The PLACE3S Model

- Developed by the Sacramento Area Council of Governments (SACOG) / California Energy Commission
- Web-based application
- Parcel-based modeling structure
- Outputs can be fed back into regional travel model
- Works at a number of scales – neighborhood level to regional
- Already measures impacts on a variety of indicators – energy, transportation, jobs/economic development

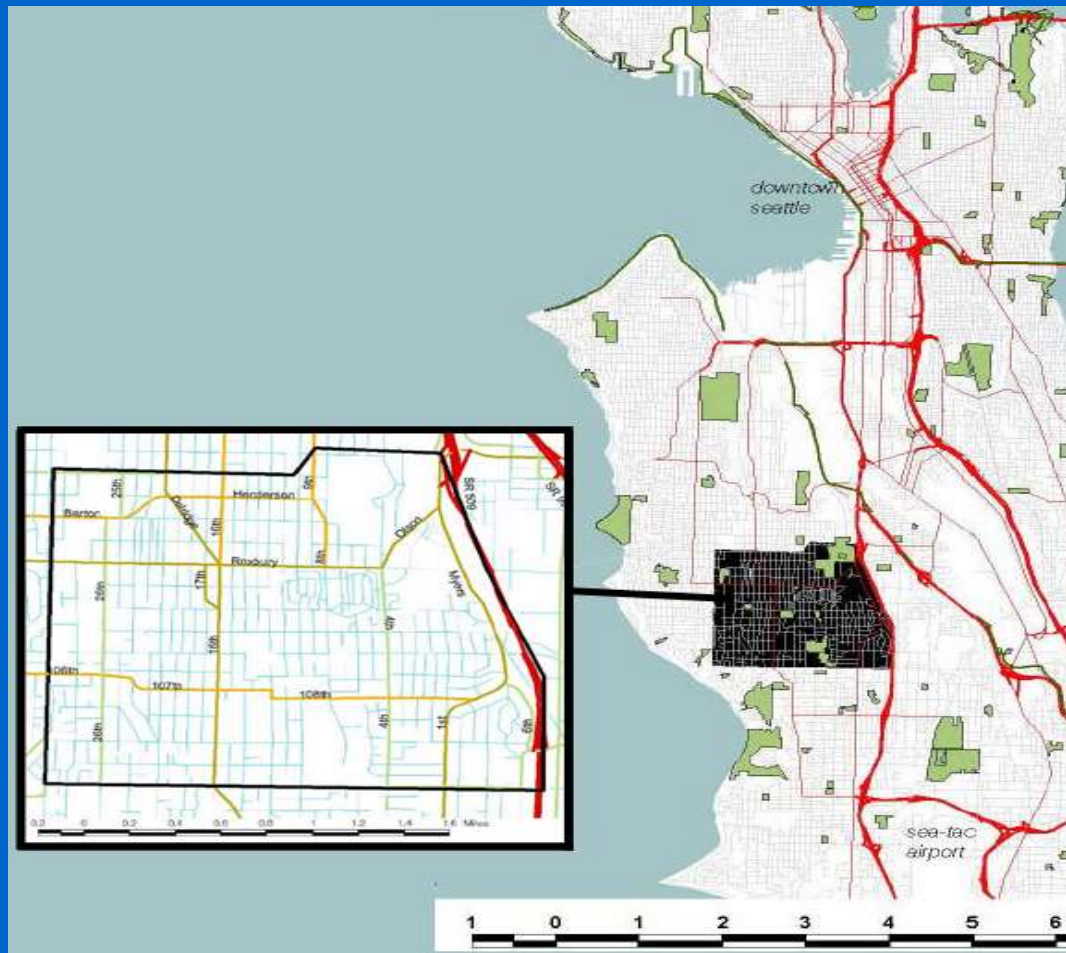
Modeling Physical Activity Outcomes For Contrasting Land Use Scenarios

RESIDENTIAL BUILDING TYPES							
1	Rural Residential			2	1	-	Rural residential includes very large lot residential (1 acre per lot).
2	Large Lot Single Family Residential			1	4	-	Aden Park has mainly large lots in the 1/2 to 1/3 acre size. Gardenland (South Natomas) has grid-streets with 1 acre
3	Medium Lot Single Family Residential			2	6		
4	Small Lot Single Family Residential			2	12		
5(O)	Townhouse (Owner)			3	15		
5(R)	Townhouse (Rental)			3	15		
6(O)	Low-Rise Condos (Owner)			2	24		
6(R)	Low-Rise Apartments (Rental)			2	24		
7(O)	Mid-Rise Condos (Owner)			3	35		
7(R)	Mid-Rise Apartments (Rental)			3	35		
8(O)	High-Rise Condos (Owner)			6	66		
8(R)	High-Rise Apartments (Rental)			6	66		
9(O)	Urban Condos (Owner)			10	105		
9(R)	Urban Apartments (Rental)			10	105		

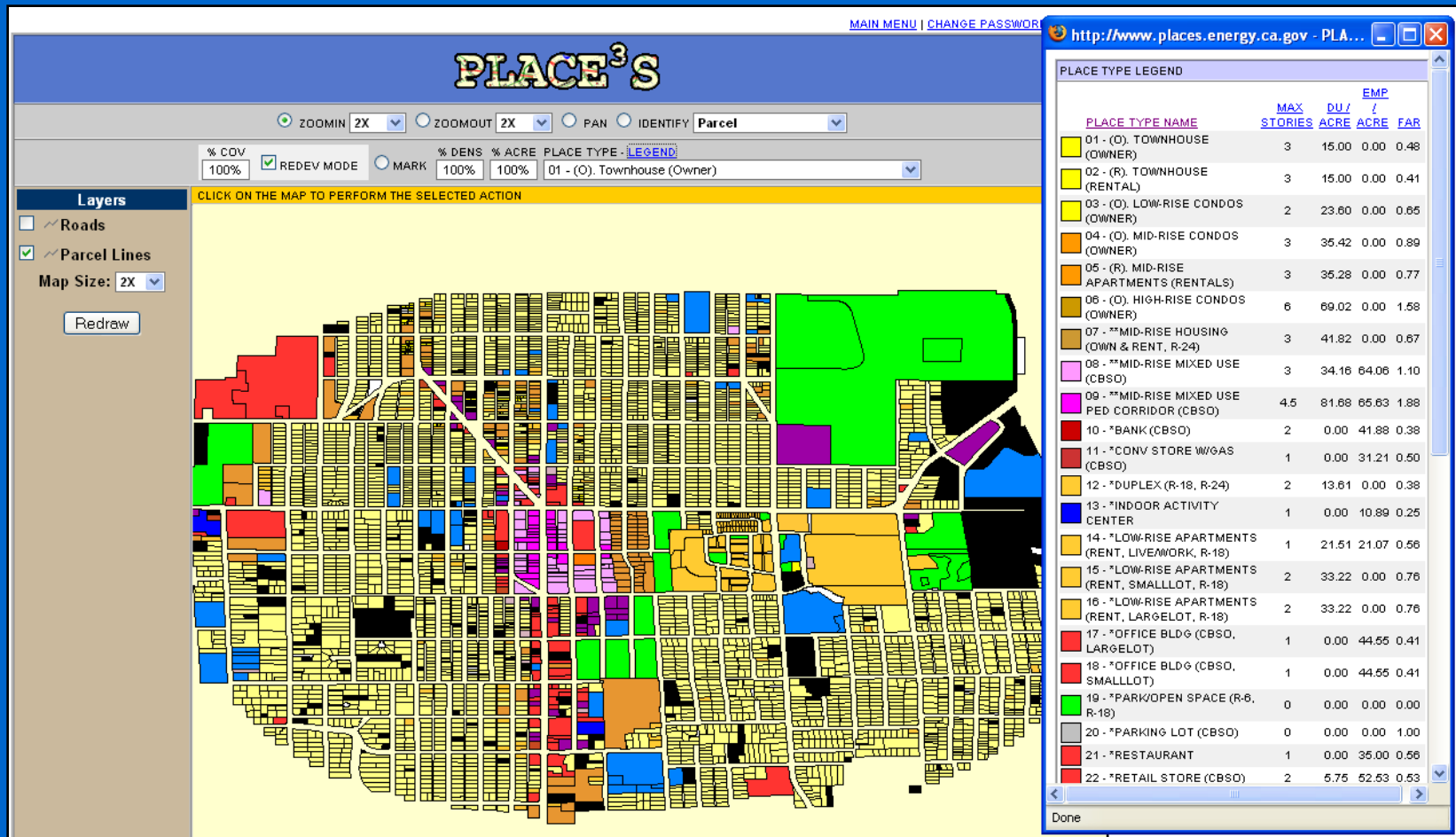
LAND USE CHIP SET												
1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4
5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)	5(O)
5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)	5(R)
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9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)	9(O)
9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)	9(R)
10	10	10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13	13	13



White Center Community



The White Center/ 98th Street Corridor Study



Tool Kit

A Toolkit of Ideas for Safe, Walkable Communities

 Eyes on the Street	 Places to Rest	 Art that Works	 Canopy	 Lighting
 Neighborhood Business	 Pedestrian Scale	 Celebrating Community	 What's in Your Neighborhood	 Educational Opportunities
 Integrating the Natural Environment	 Places for All	 Healthy Environment	 Wayfinding	 Accessibility



- 1 **Central Business District** - enhance wayfinding - support neighborhood retail - build design interest face street - strengthen pedestrian mobility and character - greenway/landscaping
- 2 **Neighborhood Market** - encourage "boutique" business - maintain open space for market between
- 3 **Sidewalk Enhancement** - widened pedestrian zone - street tree and lower curbside plantings - paving to provide "place to be" - enhanced safety and mobility
- 4 **Artist Live/Work Units** - increased density for more "eyes" on the street - transition between commercial to residential - supporting local art and food business
- 5 **Community Plaza** - celebrate the 98th Street high point - platform for community events and events - weather protection
- 6 **Pedestrian Street** - park-like setting zone - celebrating government efforts - specialty paving, art, seating - design reflective of the natural environment
- 7 **Residential Townhomes** - increased density for more "eyes" on the street - enhancing pedestrian scale
- 8 **Pond Overlook & Bridge Connector** - neighborhood meeting space - covered boardwalk overlooking pond - recreational opportunities
- 9 **Corridor Viewpoint** - plaza space at overlook with art, vertical landmarks and interactive features - integrated art pavilion at waterfront pond



SW 98th St. Corridor Enhancement

Plan demonstrates conceptual ideas only and does not represent a final or constructible design. Community input, technical analysis, detailing and engineering of these concepts will need to be completed during the design process.

December 2005

Region of Peel Council

- Endorsed “State of the Region’s Health Report 2005 – Focus on Overweight, Obesity and Related Health Consequences in Adults”
- Adopted Resolution 2005-1395, providing scientific direction to Peel Public Health regarding Public Health’s role in planning processes that contribute to the prevention of obesity
 - “. . . the Commissioner of Health, the Medical Officer of Health and the Commissioner of Planning work with the Planning Commissioners and the Commissioner of Community Services of the three area municipalities to study and make recommendations for planning policies and processes that provide greater opportunities for active living”
 - “. . . **Health staff be requested to comment on any development applications that come to the Region for comment**”

Association Vs Causation

- About 14 studies show a significant association between community design, physical activity, and obesity
 - When adjusting for demographic factors
- Only limited evidence of a causal connection
- We “self-select” neighborhoods based our preferences for travel patterns and neighborhood environments
 - New evidence suggests that the built environment also influences travel patterns and health and environmental outcomes

Prefers a Walkable
Community Design

Maximum

1

2

Preferences

Built Environment

High Walkability

3

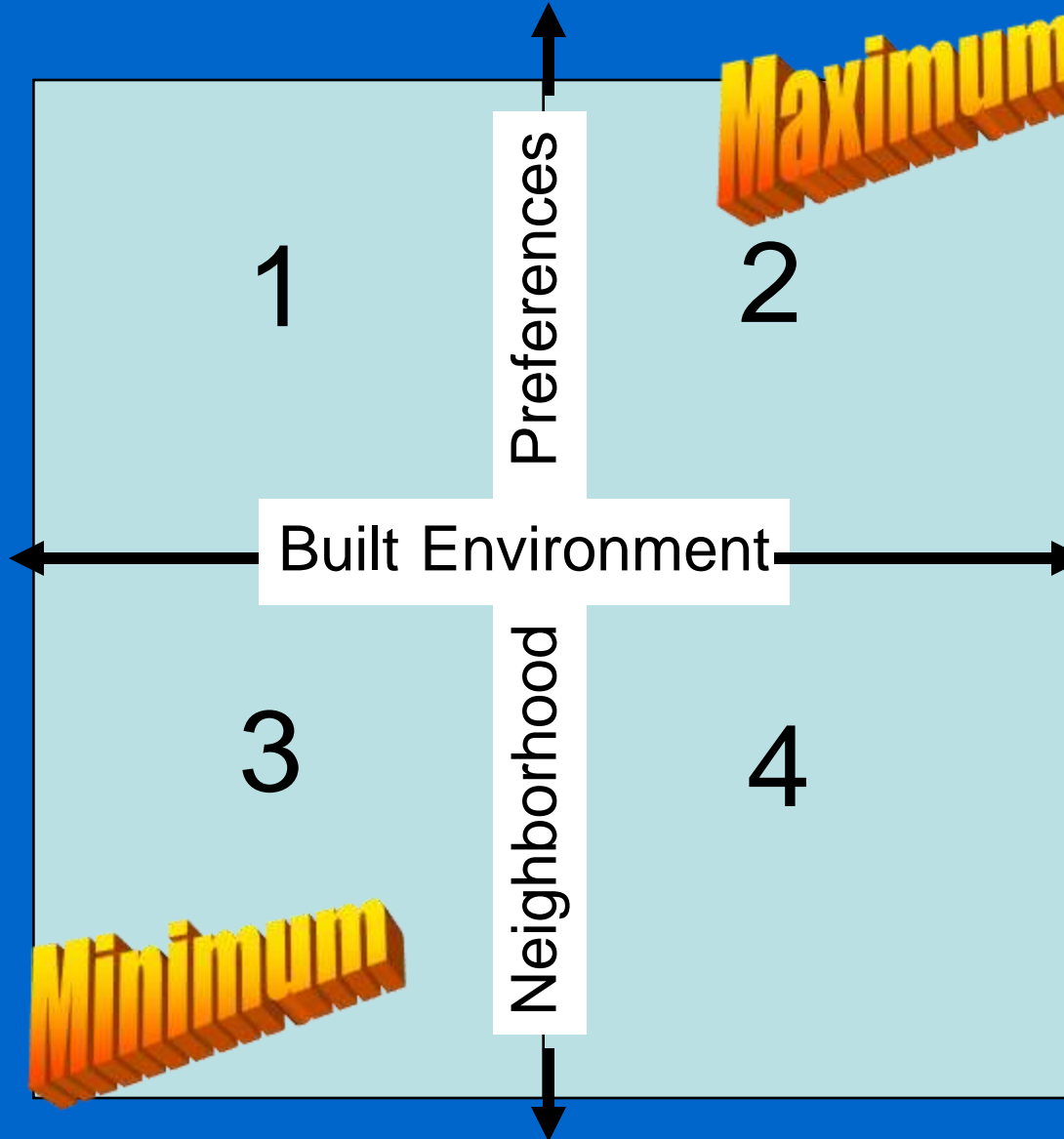
4

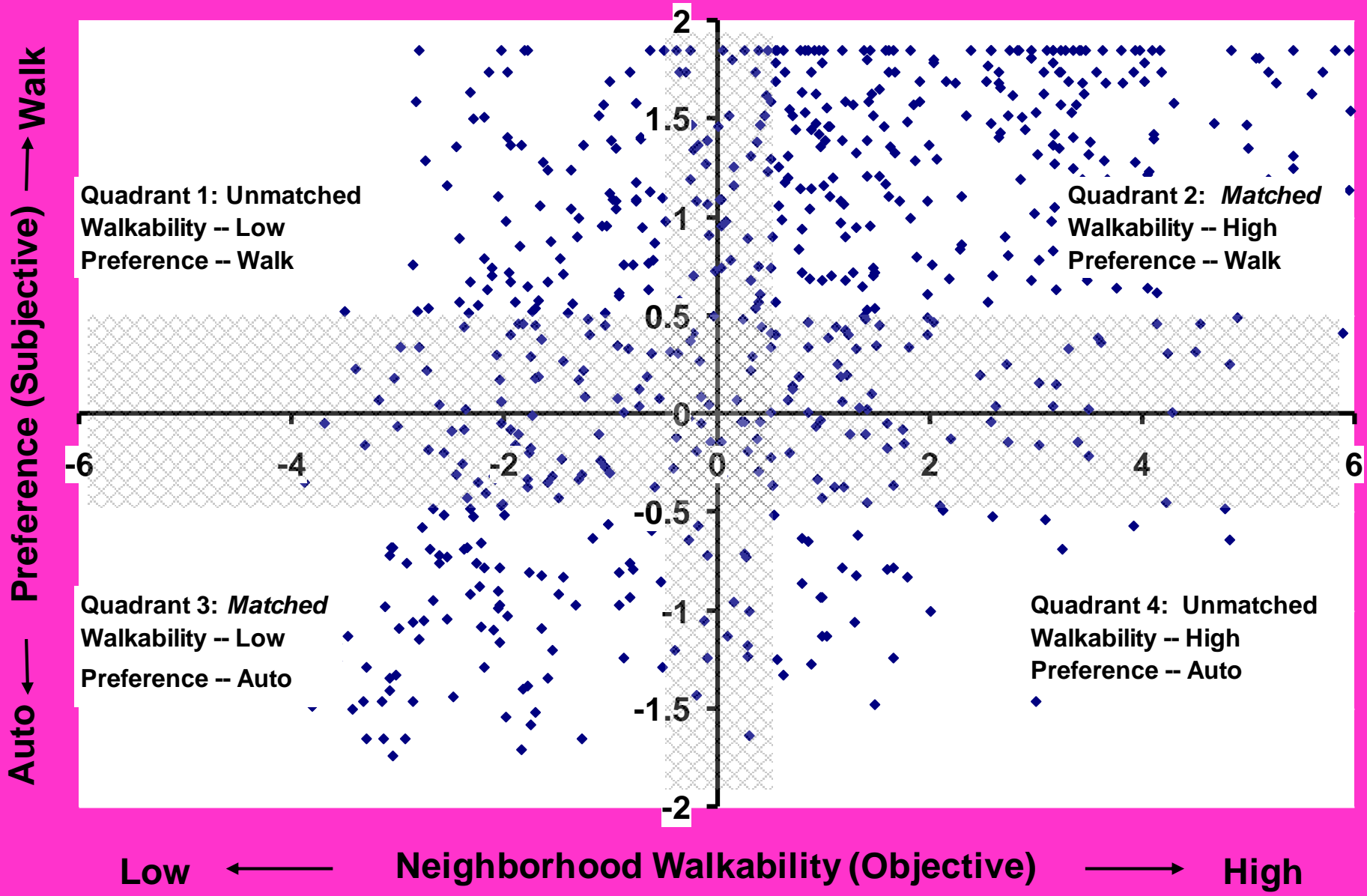
Neighborhood

Minimum

Prefers Auto - Based
Community Design

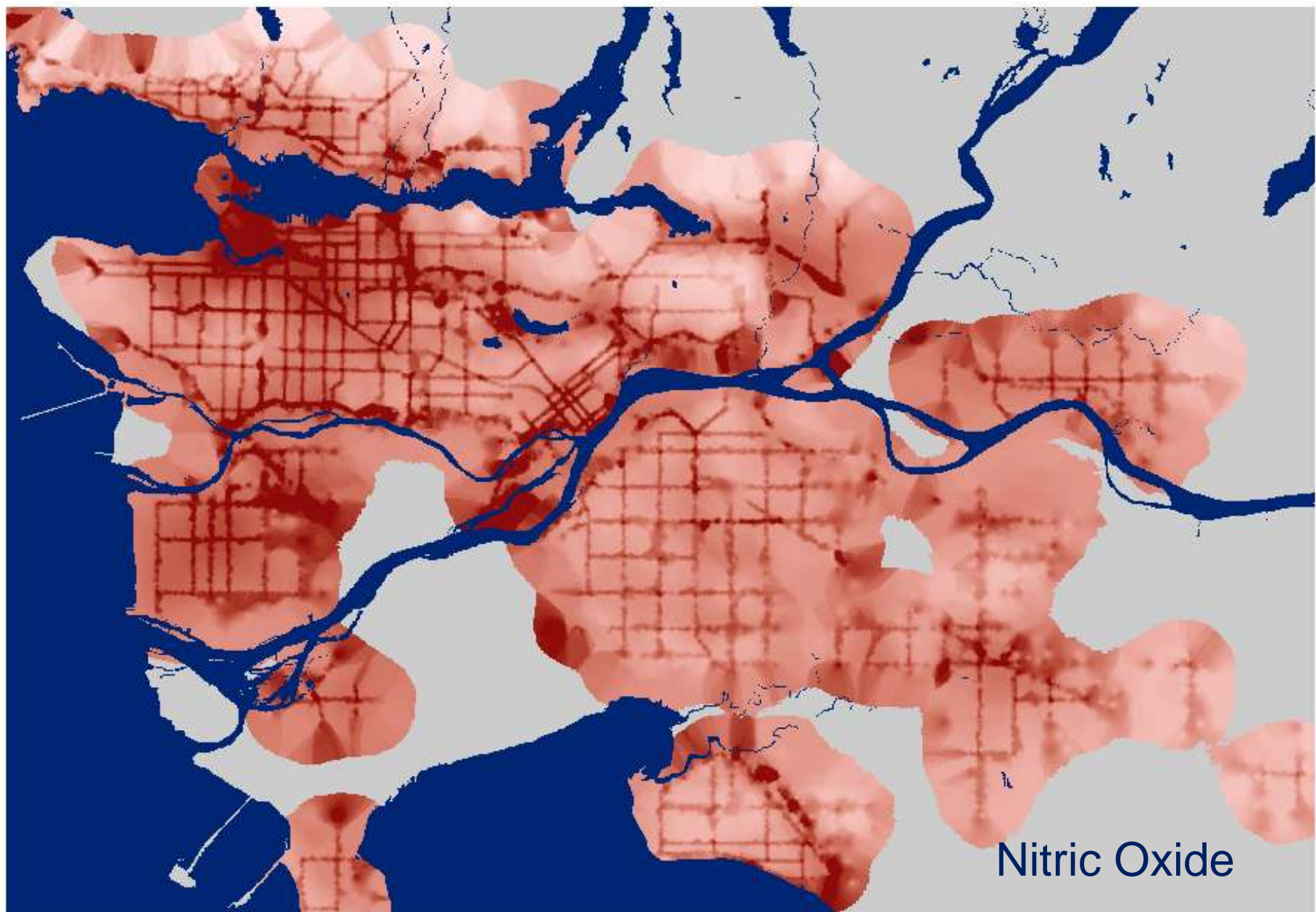
Low Walkability





PREFERENCE VS NEIGHBORHOOD DESIGN

	Walkability & Preference Groups		Percent Taking a Walk Trip (n)	Average Daily Vehicle Miles Traveled (n)
	Preference for Neighborhood Type	Walkability of Current Neighborhood		
I	High	Low	16.0% (188)	36.6 (188)
II	High	High	33.9% (446)	25.8 (446)
III	Low	Low	3.3% (246)	43.0 (246)
IV	Low	High	7.0% (43)	25.7 (43)



Marshall, Brauer, and Frank 2008

Quality of Life

Environmental Quality
Air Quality and Greenspace

Human Behavior
Travel Patterns and Physical Activity

Built Environment
Transportation Investments and Land Use

Development Cost Charges

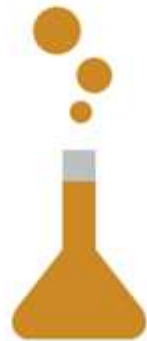
- Estimating the Environmental and health impacts of Proposed Development
- Both **Where** Growth Goes and **How** it is designed matter
- Not all locations are created equal
 - Development at the fringe generates more CO₂ per capita
 - Infill development needs to be transit supportive
- Mitigation strategies include compact development, mixed land uses, interconnected street networks, sidewalks & bike paths, transit-oriented project design/location.

CO2 and Retail Availability



Source: LUTAQH final report, King County ORTP, 2005

THE GLOBAL WARMING GAMBLE



FUEL MIX



VEHICLE
EFFICIENCY



DEMAND

Policy Levers to Reduce
Transportation - Related CO₂ emissions

