The Coming Era of Compact Development

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GROWING COOLER

THE EVIDENCE ON URBAN DEVELOPMENT AND CLIMATE CHANGE

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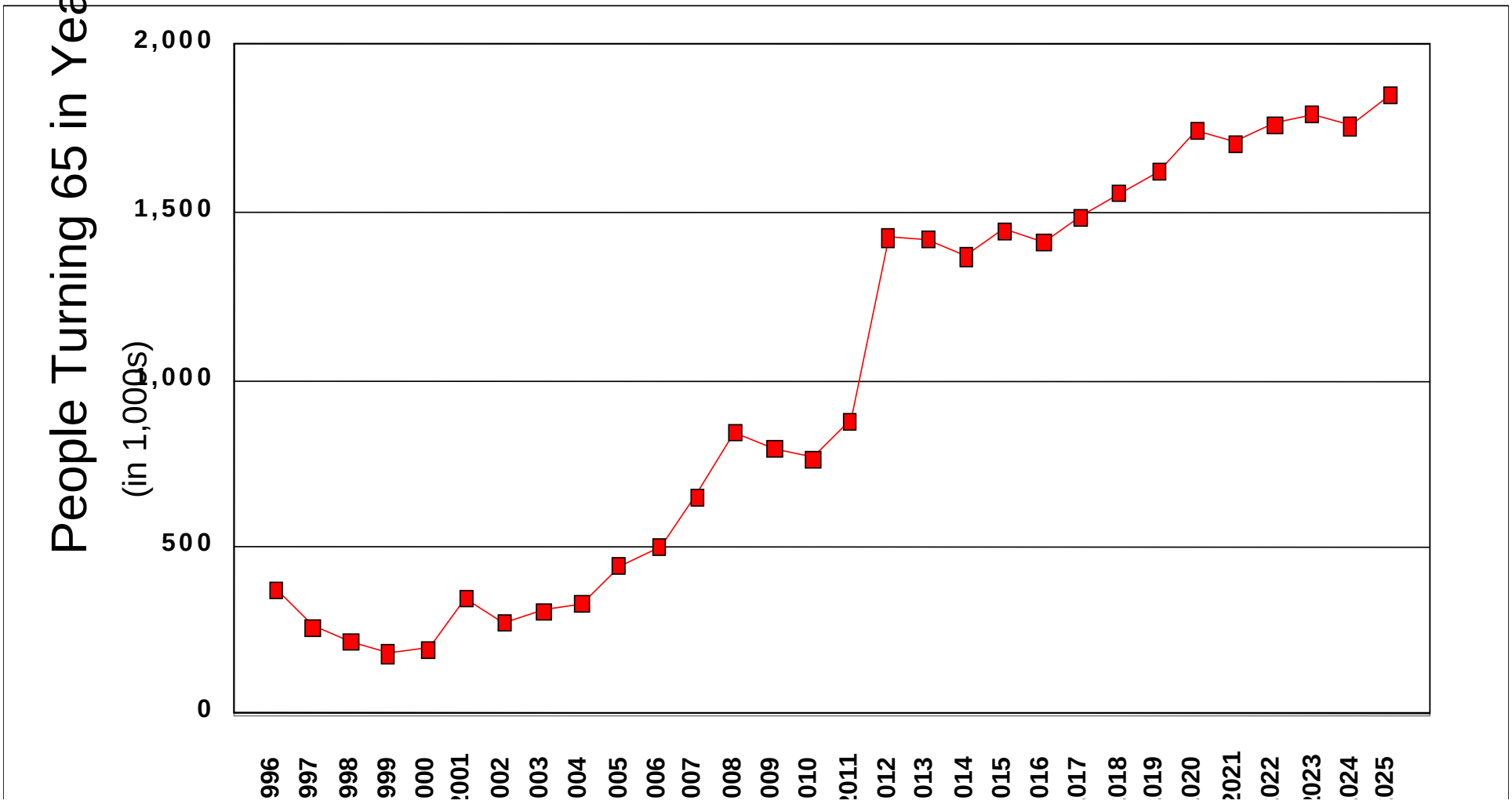
Factors Moving U.S. Toward Compact Development

- Demographic Transformation
- Oil Production Peaking
- Global Warming
- Obesity Epidemic
- Infrastructure Crisis

Silver Tsunami

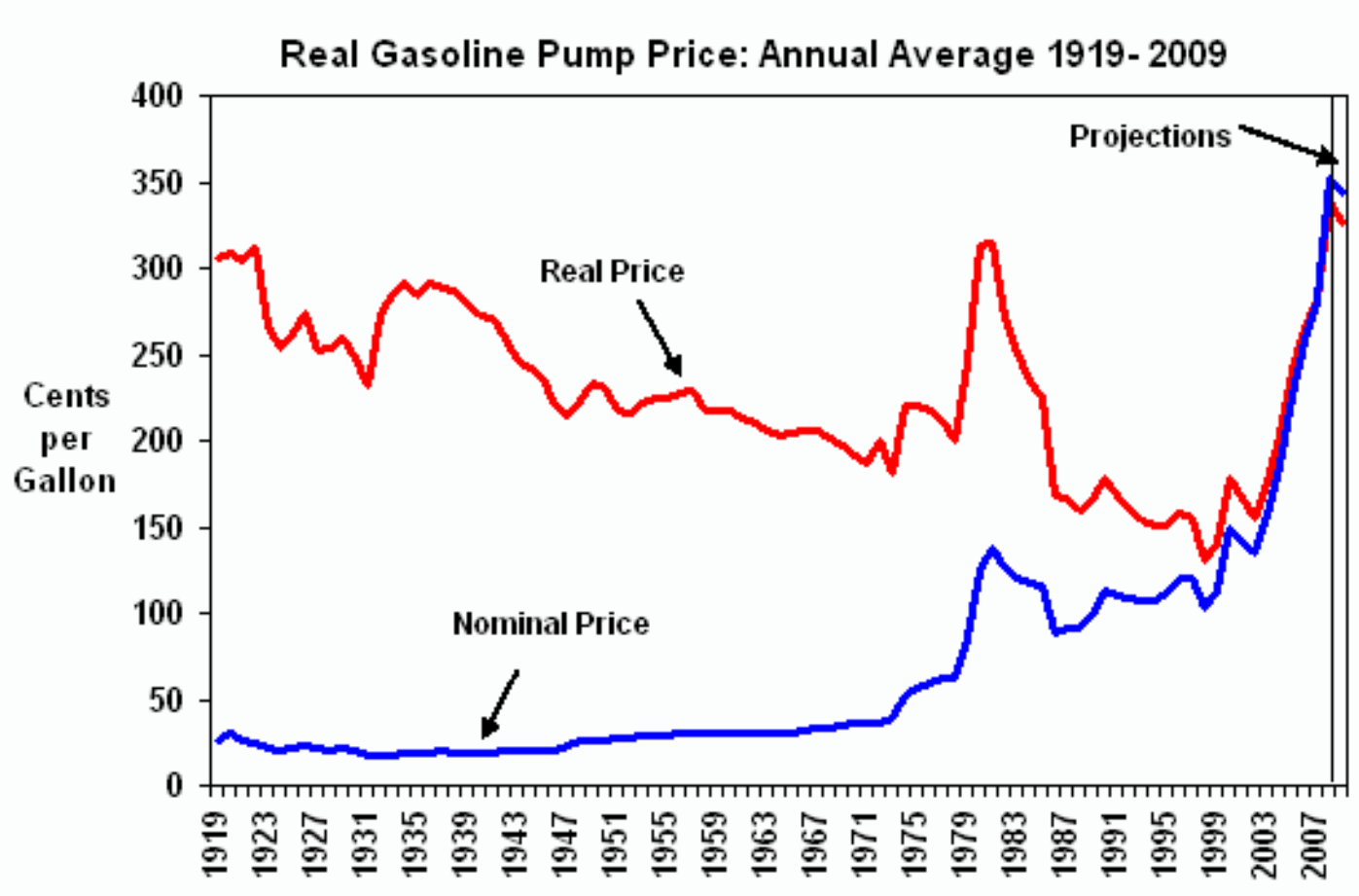


Decline in Households with Kids

Household	1960	2000	2025
With Children	48%	33%	28%
Without Children	52%	67%	72%
Single	*13%*	*26%*	*28%*

Source: Census for 1960 and 2000, 2025 adapted from Martha Farnsworth Riche, How Changes in the Nation's Age and Household Structure Will Reshape Housing Demand in the 21st Century, HUD (2003).

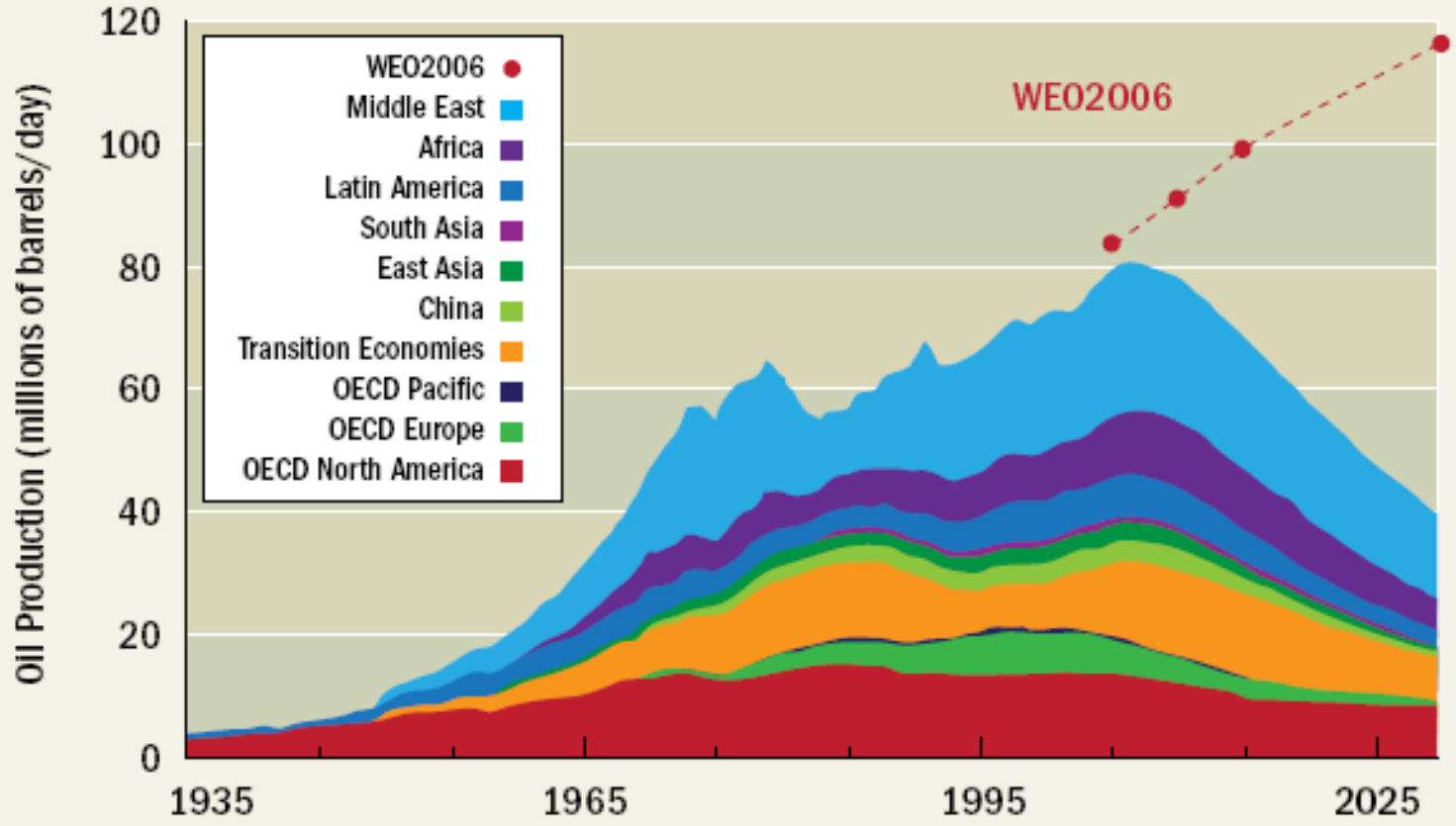
Gas Price Bubble?



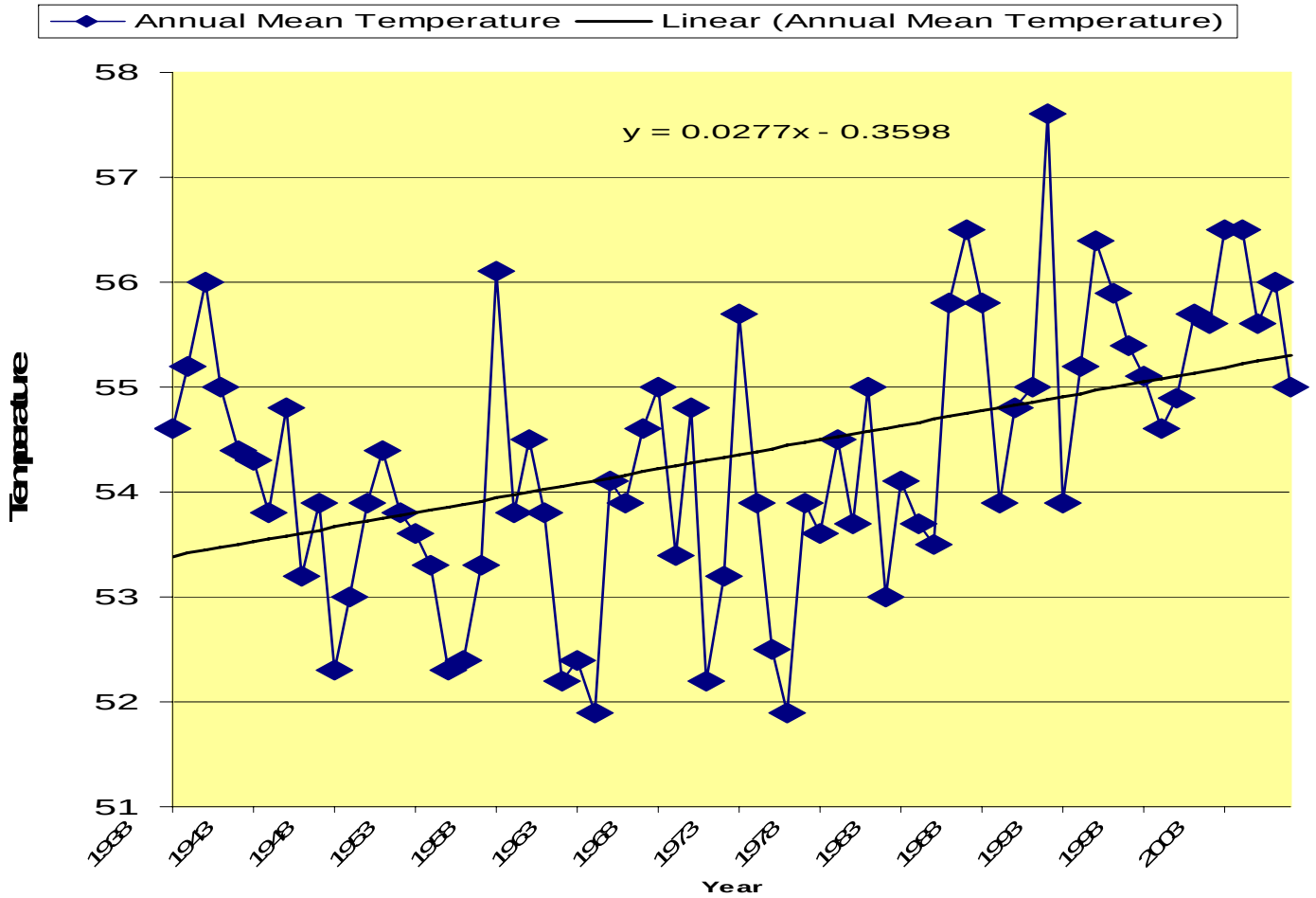
Peak Oil

FIGURE 1-6

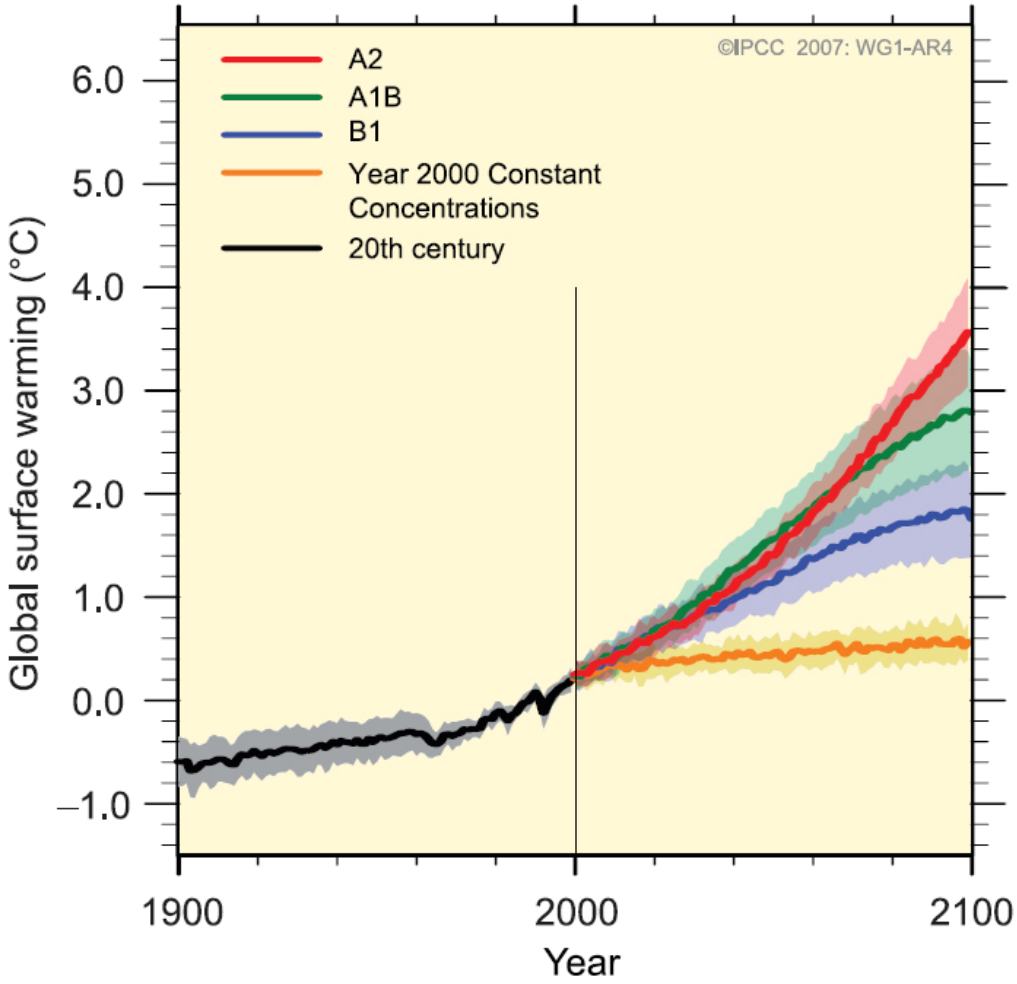
World Oil Production in the Best and Worst Cases*



Medford Annual Mean Temperature



2º to 3º C Rise at Best



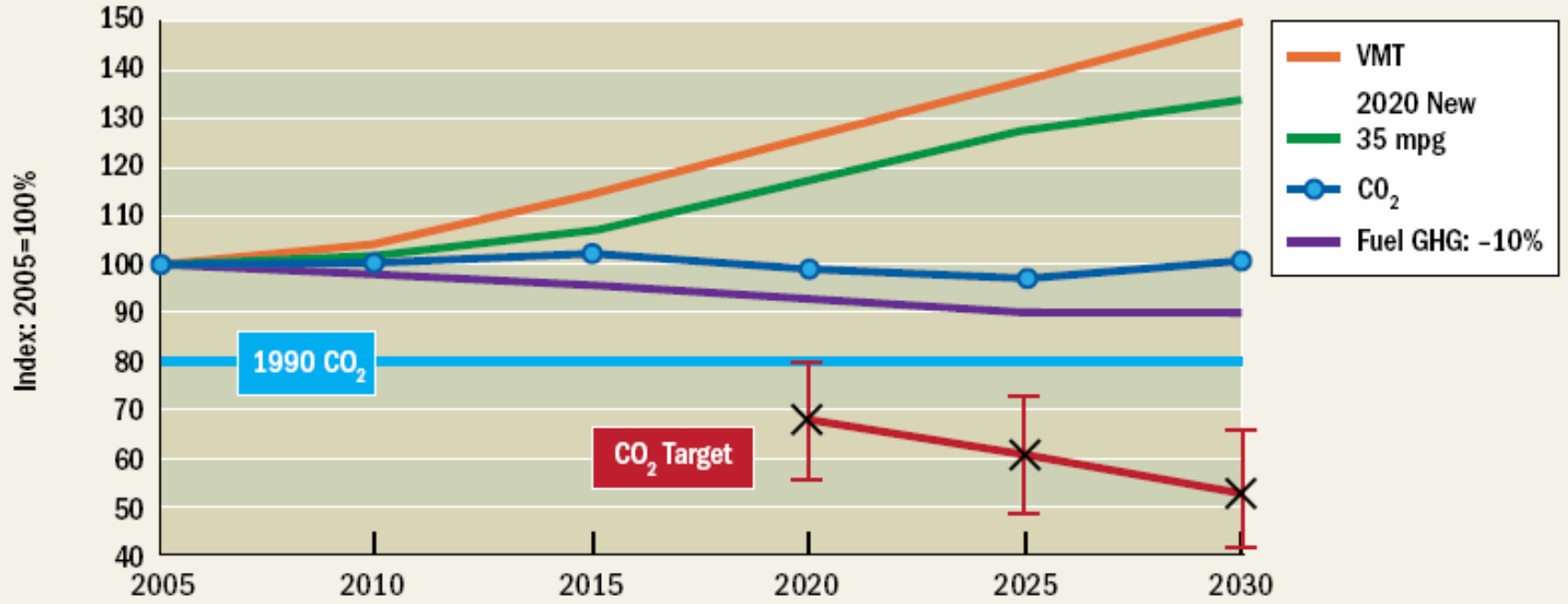
Climate Change Impacts at 2 to 3°C

- More than 1/3 of species at risk of extinction (corals, polar bears…)
- Amazon rainforest & Great Lakes ecosystem at risk of collapse
- Hundreds of millions displaced from coastal areas, at risk of hunger
- Partial deglaciation of Greenland Ice Sheet expected to begin: sea level to increase 4-6 meters over centuries to millennia

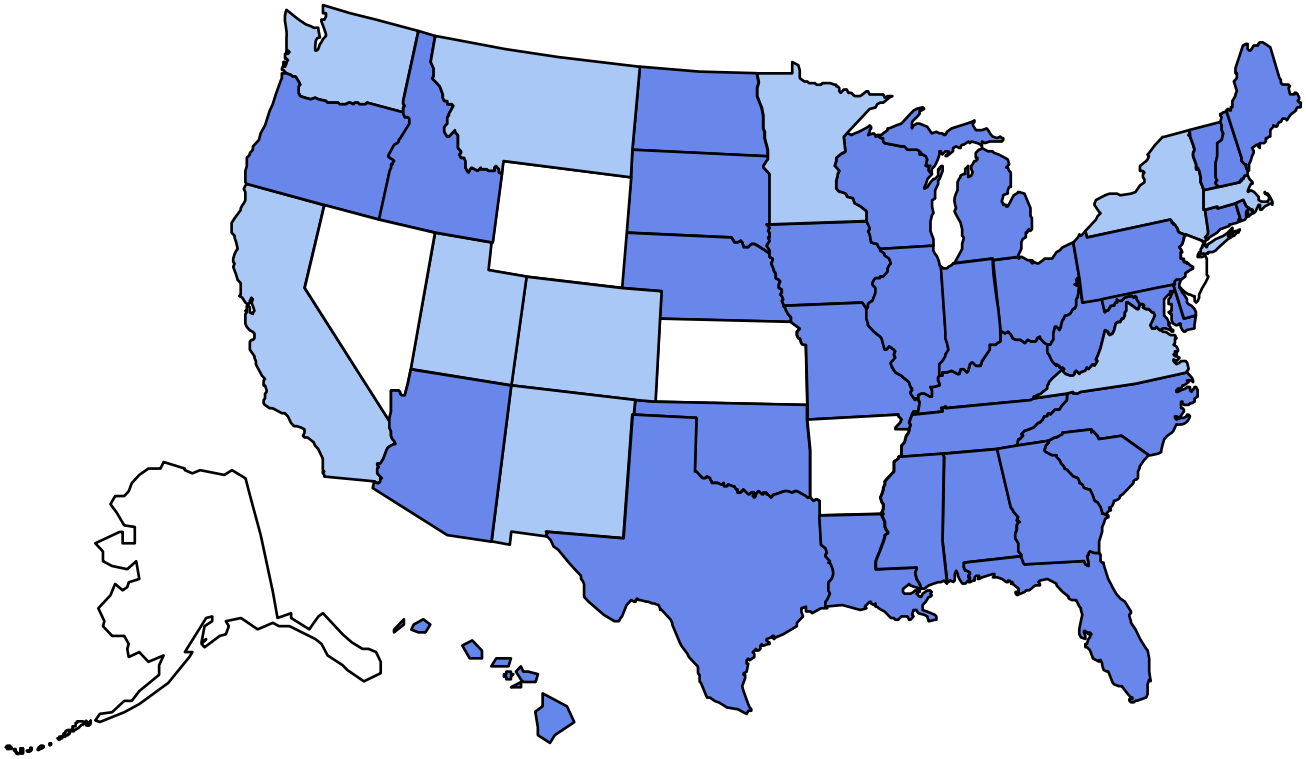
Technology Won't Save Us

FIGURE 1-2

Projected Growth in CO_2 Emissions from Cars and Light Trucks

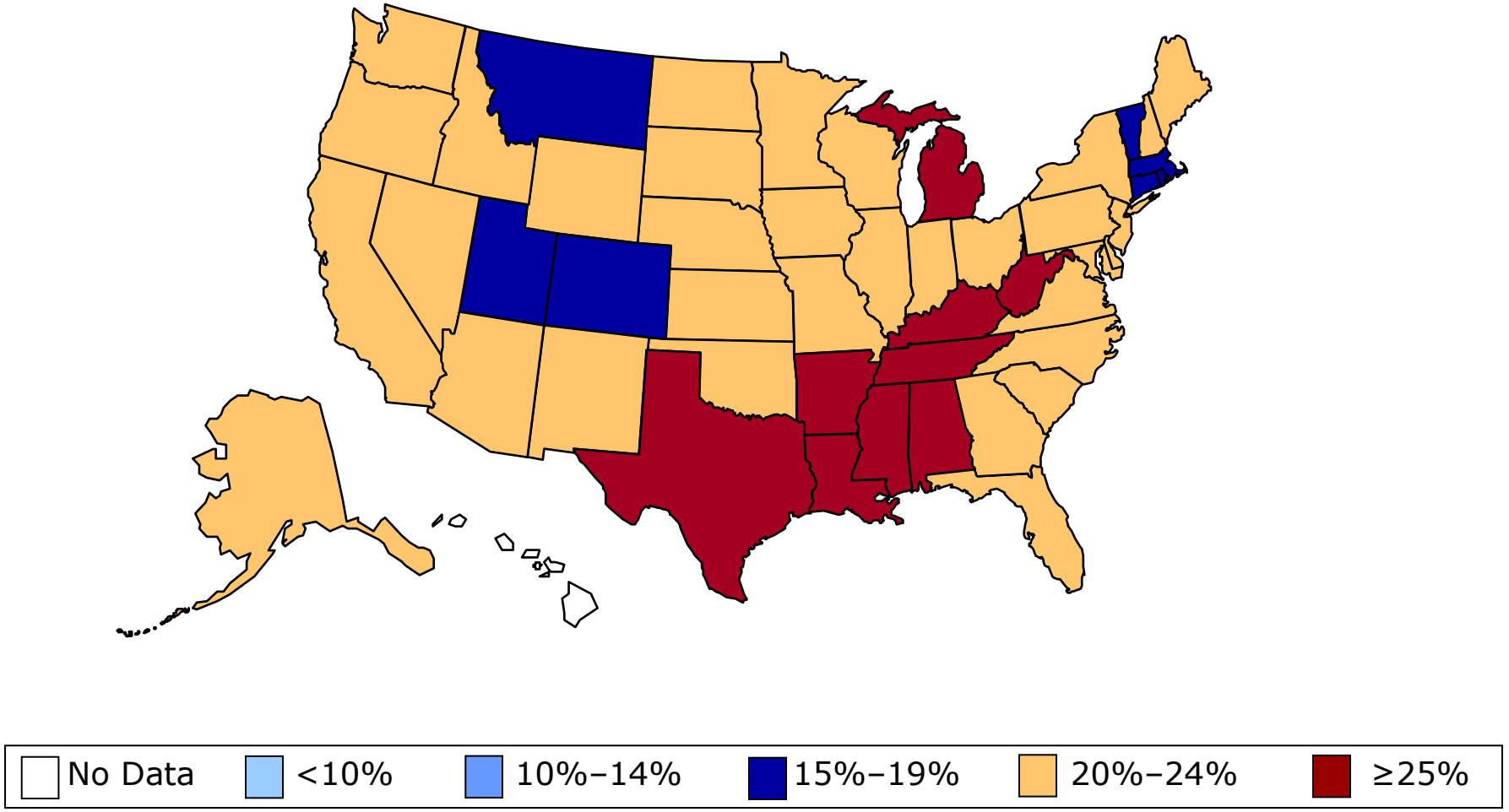


Obesity Trends Among U.S. Adults
1990

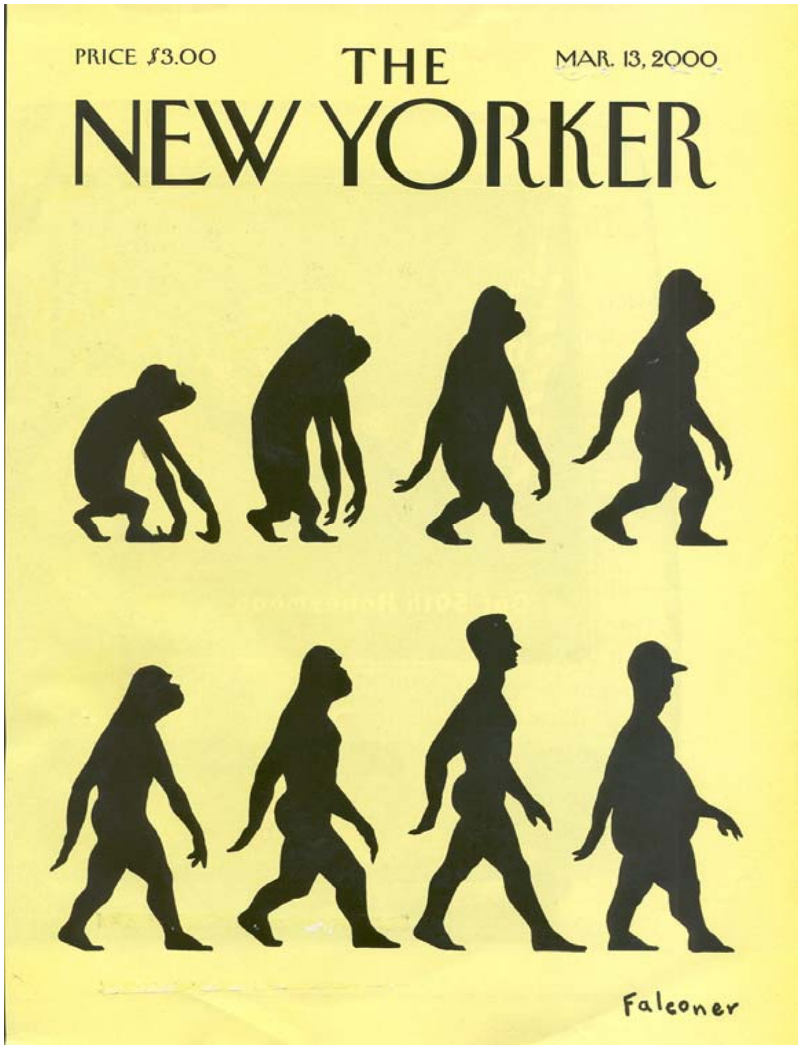


No Data | <10% | 10%–14% | 15%–19% | 20%–24% | ≥25%

Obesity Trends Among U.S. Adults 2004



It's Not Genetic



The Washington Post

MD VA

FRIDAY, AUGUST 29, 2003

Suburbia USA: Fat of the Land?

Report Links Sprawl, Weight Gain

By ROB STEIN
Washington Post Staff Writer

Suburban sprawl appears to be contributing to the nation's obesity epidemic, making people less likely to walk and more likely to be overweight, researchers reported yesterday.

In the first comprehensive examination of whether suburbs spreading across the U.S. landscape are affecting Americans' health, the researchers studied more than 200,000 people in 448 counties, producing the first concrete evidence supporting suspicions that sprawl is aggravating the nation's growing weight crisis.

People who live in the most spread-out areas spend fewer minutes each month walking and weigh about six pounds more on average than those who live in the most densely populated places. Probably as a result, they are almost as prone to high blood pressure as cigarette smokers, the researchers found.

"There are lots of other reasons why we should work to contain sprawl," said Reid Ewing of the University of Maryland's National Center for Smart Growth, who led the

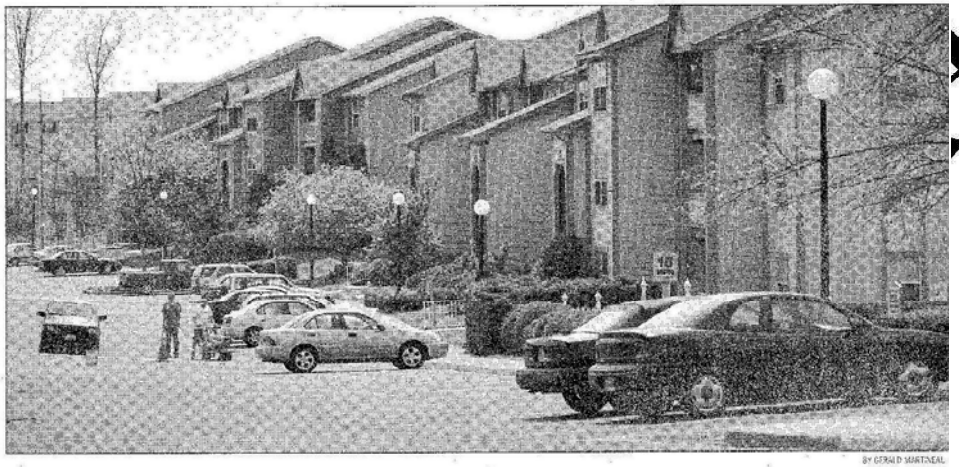
dence and no national data. The new findings are likely to be used by advocates of tightly controlled growth around the country, including locally.

"There is a lot of circumstantial evidence that sprawl is related to health," Ewing said in a telephone interview. "This is certainly the first national study to make the direct connection between the built environment and health."

Ewing and his colleagues analyzed data collected about 206,992 U.S. adults between 1998 and 2000 by the Behavioral Risk Factor Surveillance System, an ongoing federal survey. Using data from the Census Bureau and other federal sources about population density, block size, street patterns and other factors, the researchers calculated a "sprawl index" for 448 counties in the largest metropolitan areas nationwide, where two-thirds of the population reside, including the Washington region.

The index ranged from a low of 63 for the most sprawling county—Geauga, Ohio, just outside Cleveland—to a high of 352 for the densest—New York City.

Frederick County in Maryland,



BY GERALD MARTINEAU

People who live in the most spread-out areas were found to weigh about six pounds more on average than those in the most densely populated p

25 densest counties.

People in more sprawling counties are also likely to have a higher body mass index (BMI), a standard measure of weight. A 50-point increase in the degree of sprawl was associated with an average weight gain of a little more than one pound per person, researchers found.

While researchers found no association between sprawl and diabetes or heart disease, they did find that people who live in the least sprawling areas had a 29 percent lower risk of developing high blood pressure than those in the most sprawling areas.

Sprawl and Obesity

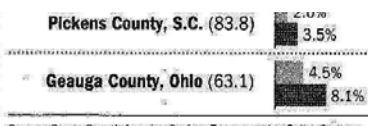
New research links suburban sprawl to obesity. You are more likely to be overweig live in an area with low population density and a more expansive street grid.

STATE/COUNTY	The lower the sprawl index score, the greater the amount of sprawl. SPRAWL INDEX SCORE	More sprawl means you are more likely to have a higher body mass index, ... EXPECTED BMI*	... the more pounds you are likely to weigh, ... EXPECTED WEIGHT**	...the higher your risk of high blood pressure ... PERCENT DIFFERENCE FROM AVERAGE RISK	... high risk bein DIFFE AVE
Maryland					
Anne Arundel	107.75	26.07	166.47	-0.92%	-1
Calvert	90.84	26.13	166.84	1.10	1
Charles	89.72	26.14	166.87		2

at the University of Maryland.

The study also looked at heart disease and diabetes, but didn't find any statistically relevant relationship between sprawl and these diseases.

The study did find that the



Source: Smart Growth America Surface Transportation Policy Project

on weight, obesity, hypertension and other health factors were gleaned from a continuing phone survey of more than 200,000 adults by the CDC.

The study found that for every 50-point increase in sprawl

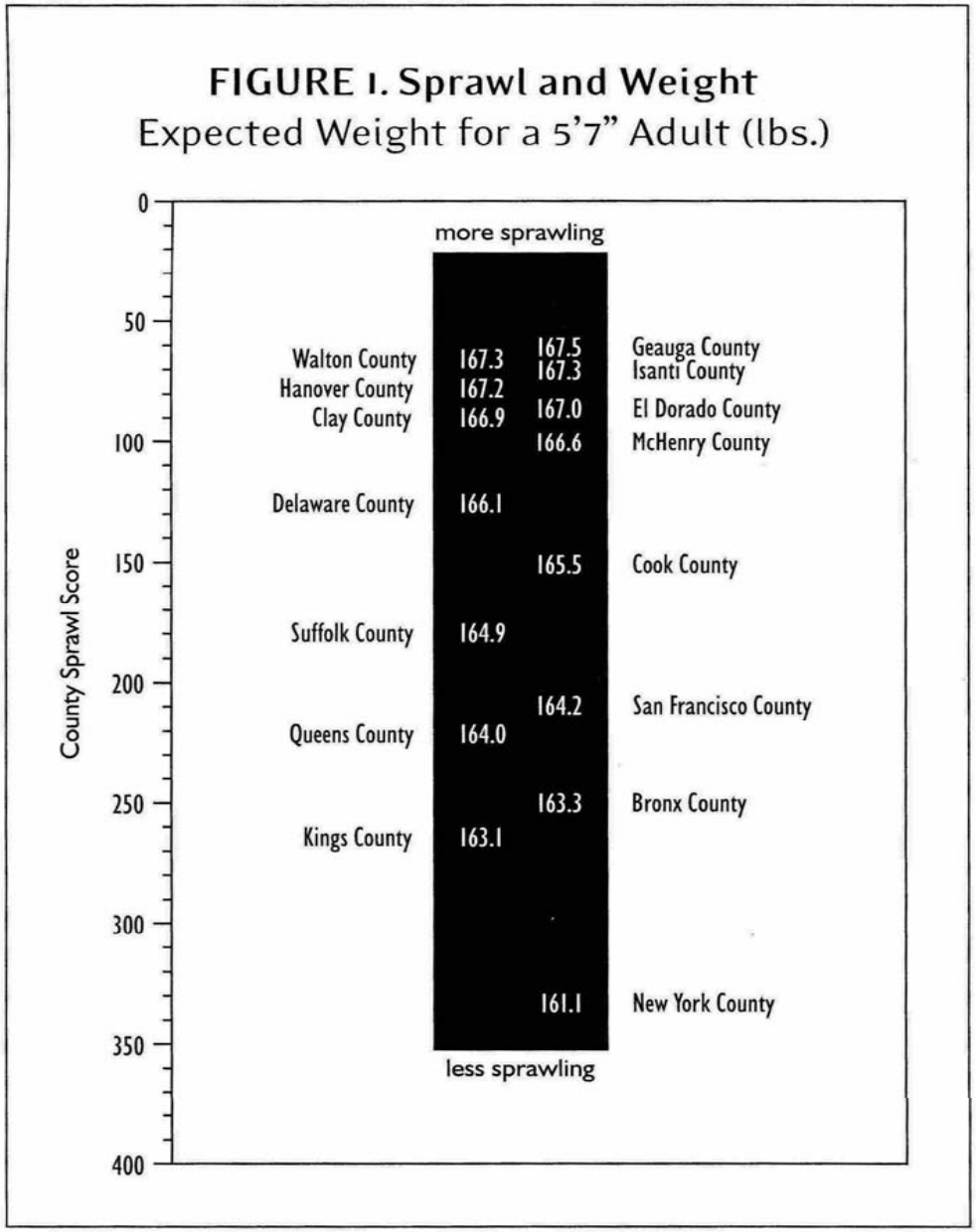
Findings

People living in counties marked by sprawling development:

- Walk less in their leisure time
- Have higher body mass indexes
- Are more likely to be obese
- Are more like to have high blood pressure.

Difference between most and least sprawling counties:

6.3 pounds



ASCE's Infra Report Card 2001

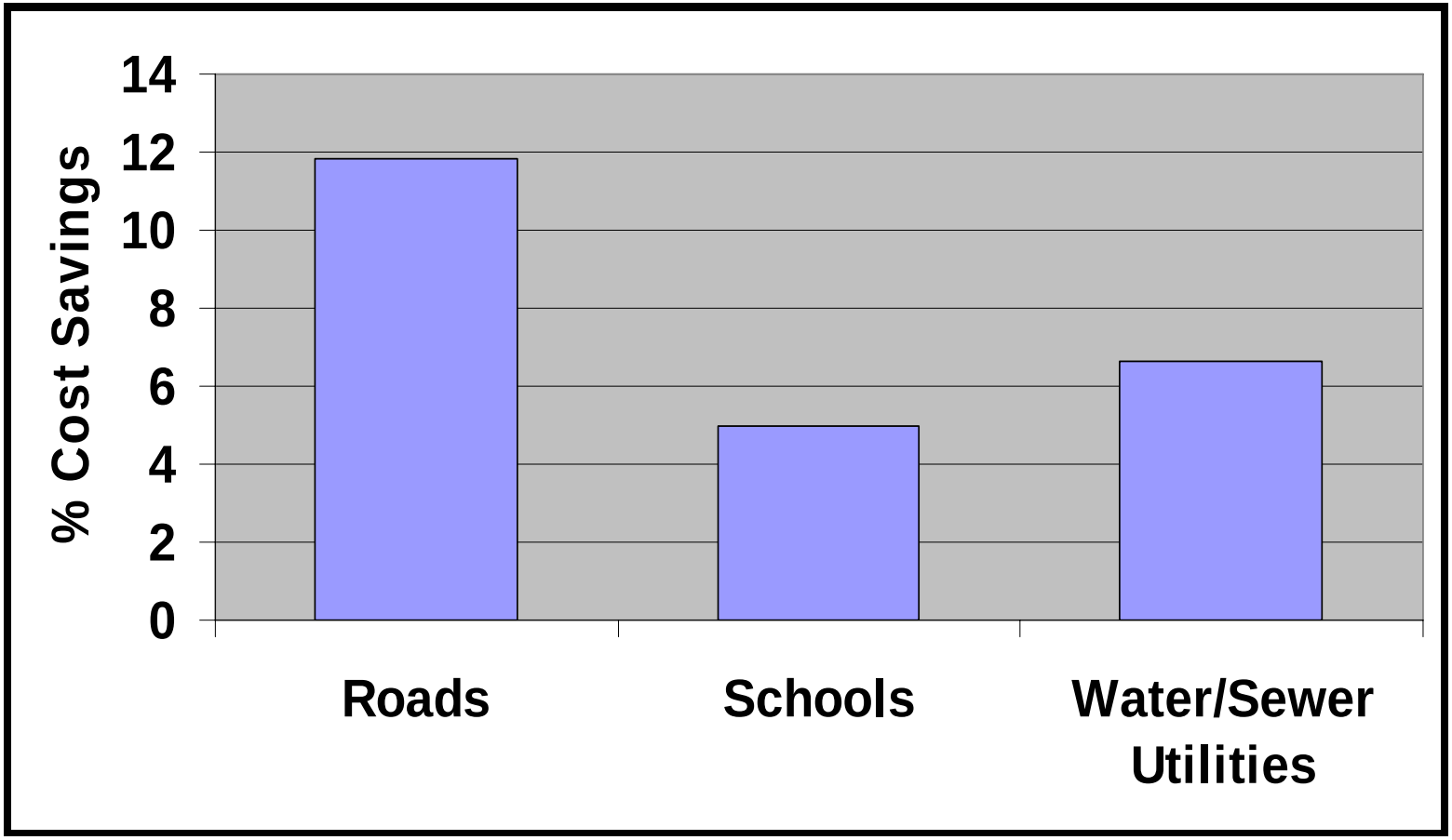
System	Grade	Comments
Roads	D+	27% of freeways congested
Bridges	C	29% structurally deficient/obsolete
Transit	C-	Ridership up, Spending not
Wastewater	D	$12 billion annual shortfall
Solid Waste	C+	Amounts of SW on the decline
Hazardous Waste	D+	Backlog of SF sites on the rise
Drinking Water	D	$11 billion annual shortfall
Dams	D	Over 2,100 unsafe dams in US
Aviation	D	Air traffic up 37%, Capacity up 1%
Energy	D+	Capacity lags behind demand
Schools	D-	75% of school buildings inadequate
OVERALL	D+	

TOTAL 5 YEAR INVESTMENT NEED: *$1.3 TRILLION*

Goals of Smart Growth

- Support and enhance existing communities.
- Permanently preserve our most valuable natural and agricultural resources.
- Save taxpayers the cost of new and often redundant infrastructure needed to support sprawl development.

Savings with Compact Development



Fortunately the Market Is Moving in Same Direction

National Survey on Communities

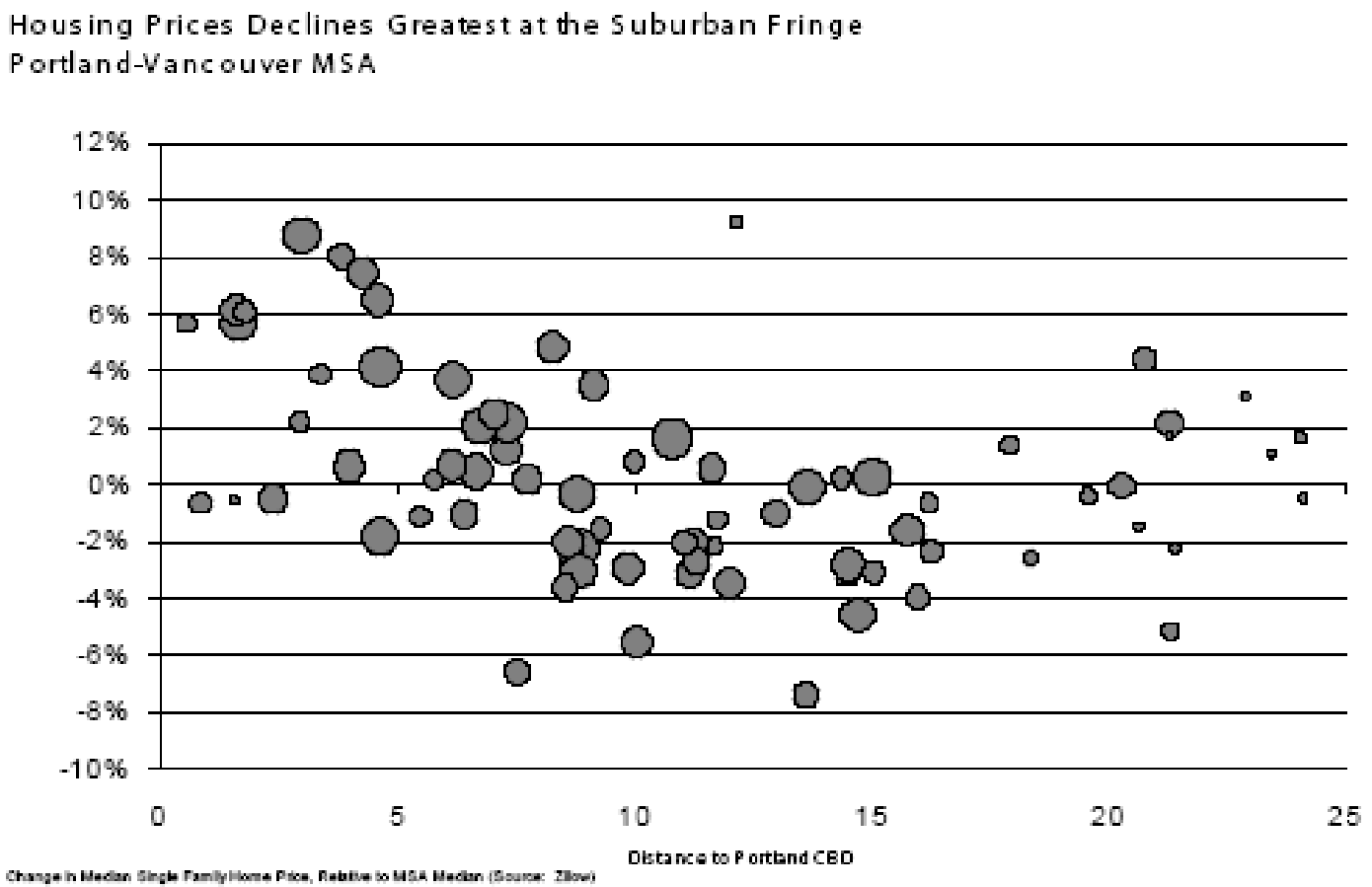
Community A	Community B
There are **only single family houses** on one acre lots	There is a **mix** of single family detached houses, townhouses, apartments and condominiums on various sized lots
There are **no sidewalks**	Almost all the streets have **sidewalks**
Places such as shopping, restaurants, library, and a school are within a **few miles** of your home and you **have to drive** to most	Places such as shopping, restaurants, library, and a school are within **a few blocks** of your home and you can **either walk or drive**
There is enough parking when you drive to local stores, restaurants and other places	Parking is **limited** when you decide to drive to local stores, restaurants and other places
Your one-way commute is **45 minutes or over**	Your one-way commute is less than **45 minutes**
Public transportation, such as train, bus, and light rail, is **distant or unavailable**	Public transportation, such as train, bus, and light rail, is **nearby**

More than Half of Americans

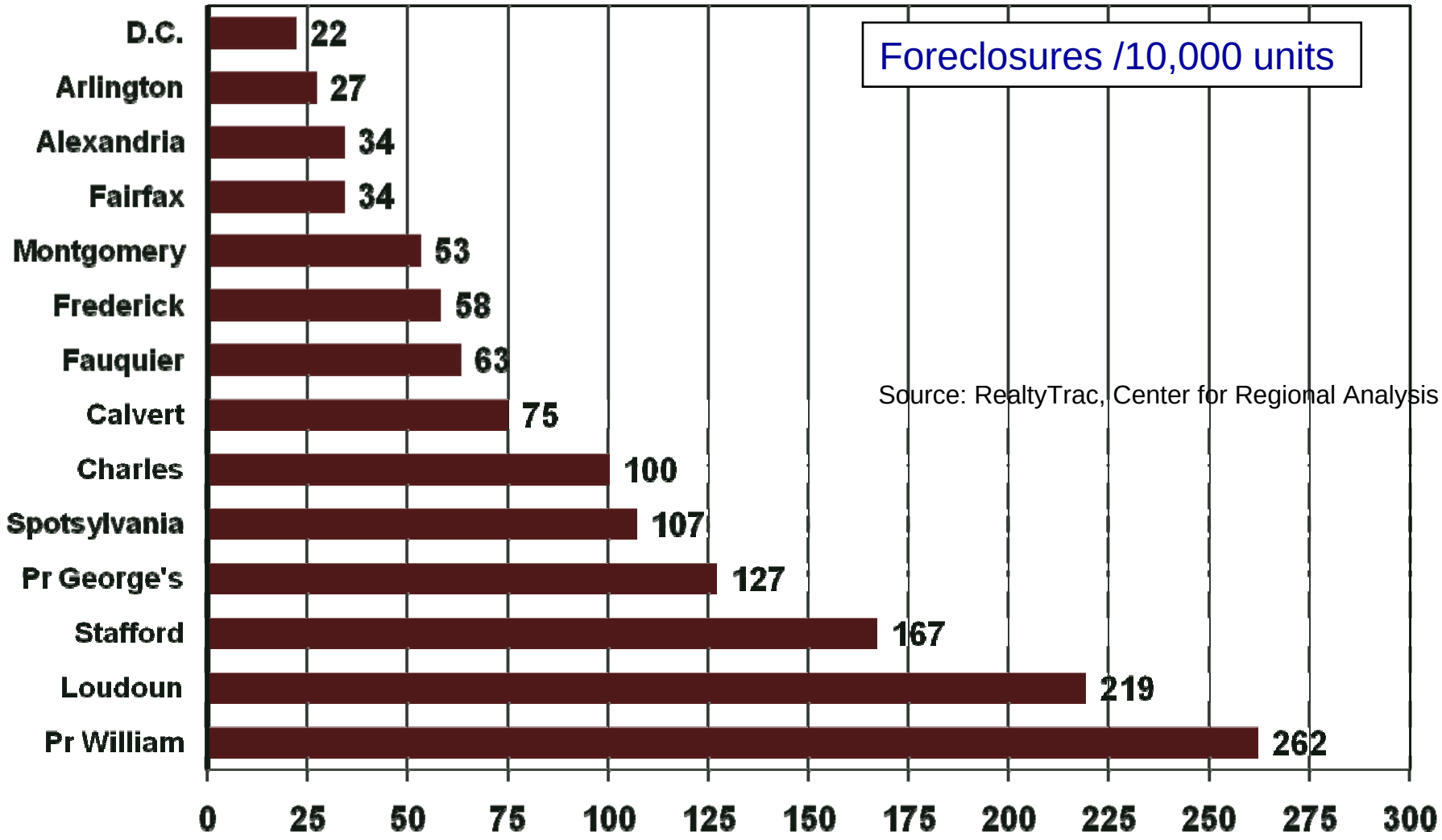
- 55% of Americans select the smart growth community and 45% select the sprawl community.

- 61% who think they will buy a house in the next three years are more likely to look for a home in a smart growth community rather than a sprawl community 39%.

Price Declines Greatest at Fringe (2006 vs. 2007)



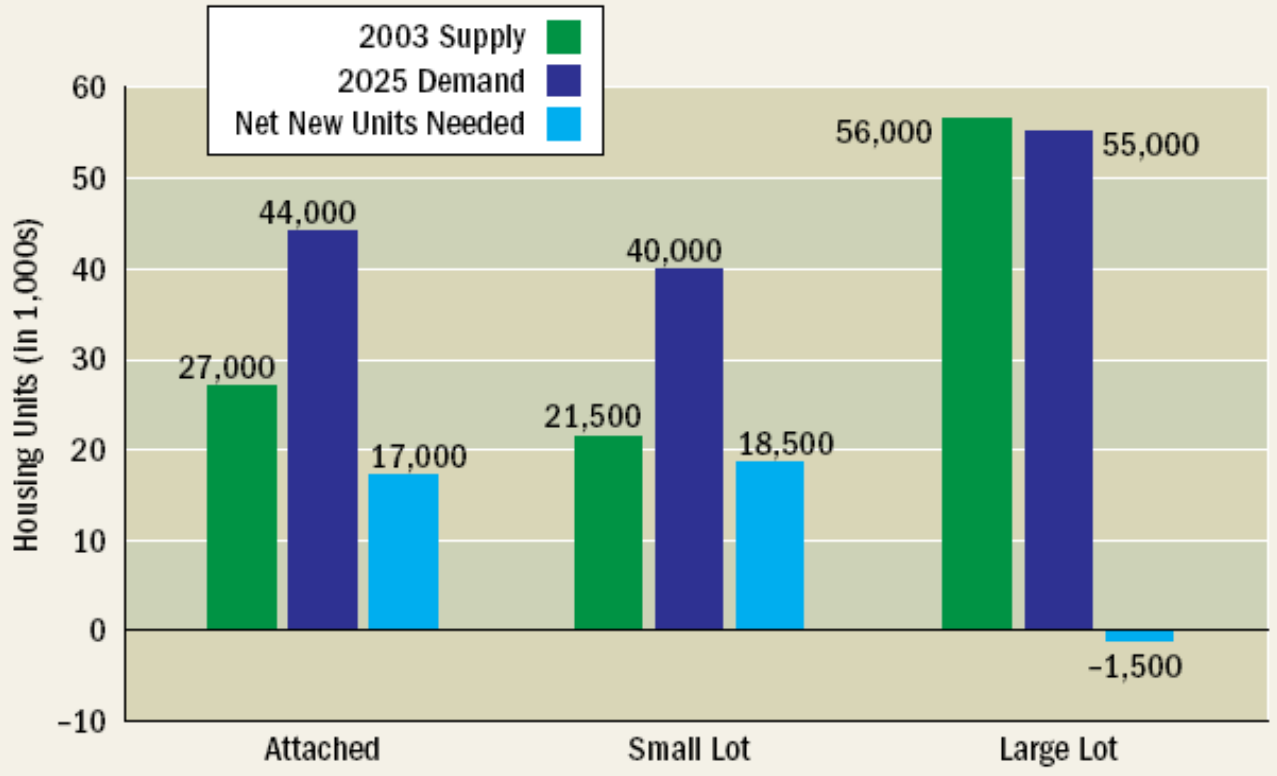
Mortgage Foreclosure Rates by County – Nov 30, 2007



Enough of the Big Stuff Already

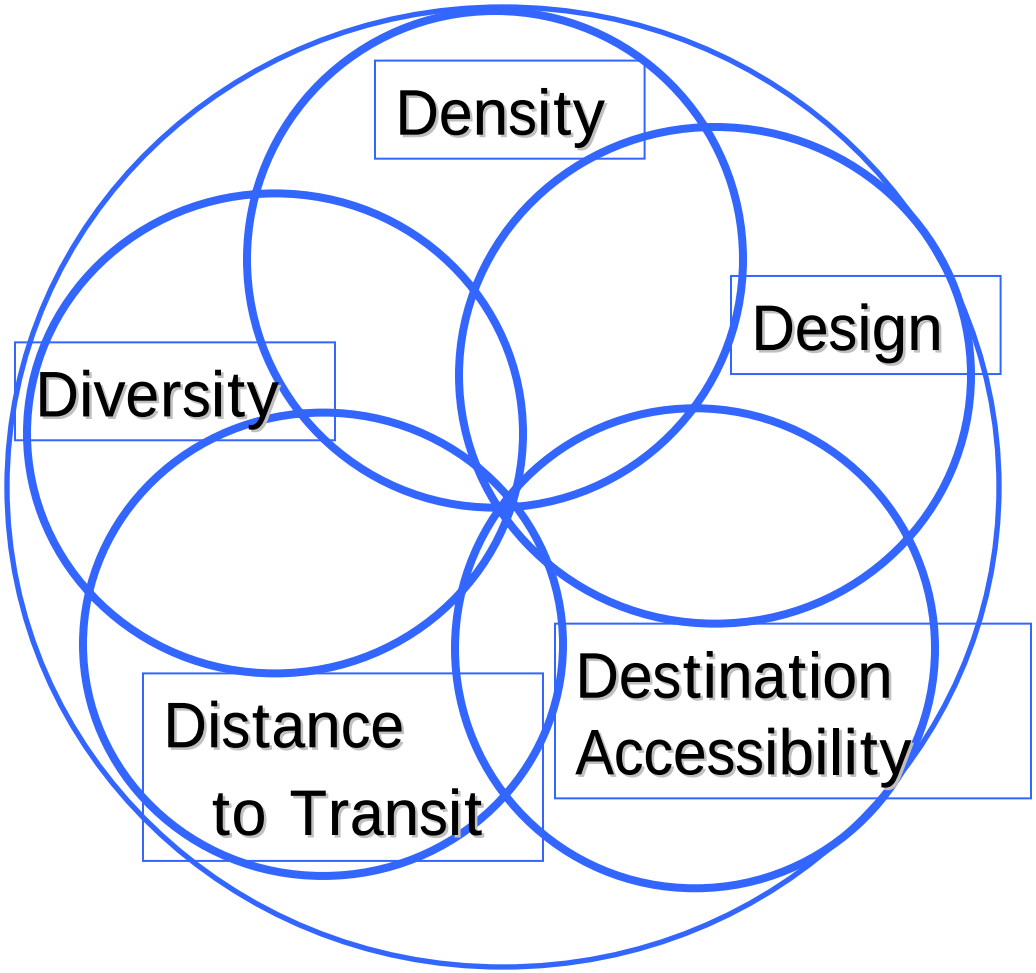
FIGURE 1-5

2003 Housing Supply versus 2025 Housing Demand

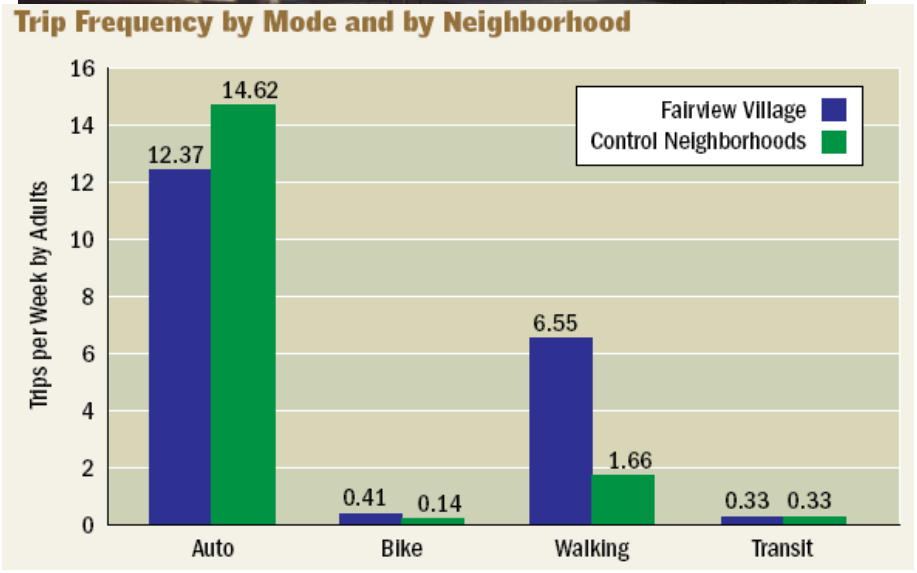


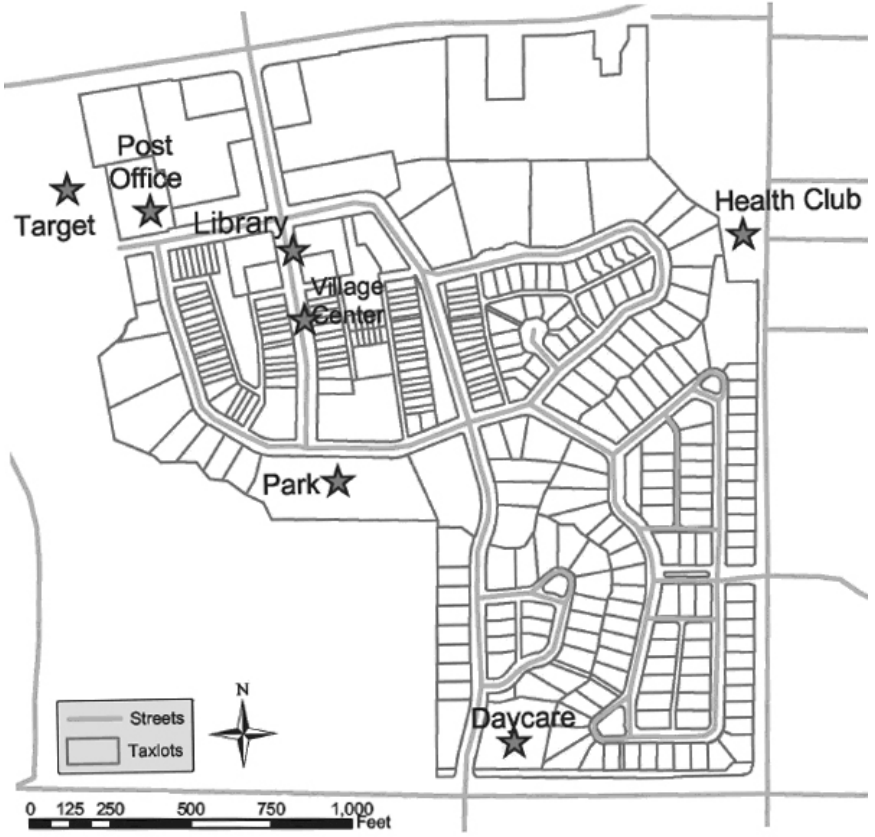
SOURCE: A.C. Nelson. "Leadership in a New Era." *Journal of the American Planning Association.* Vol. 72, Issue 4, 2006, pp. 393–407.

5Ds of Compact Development

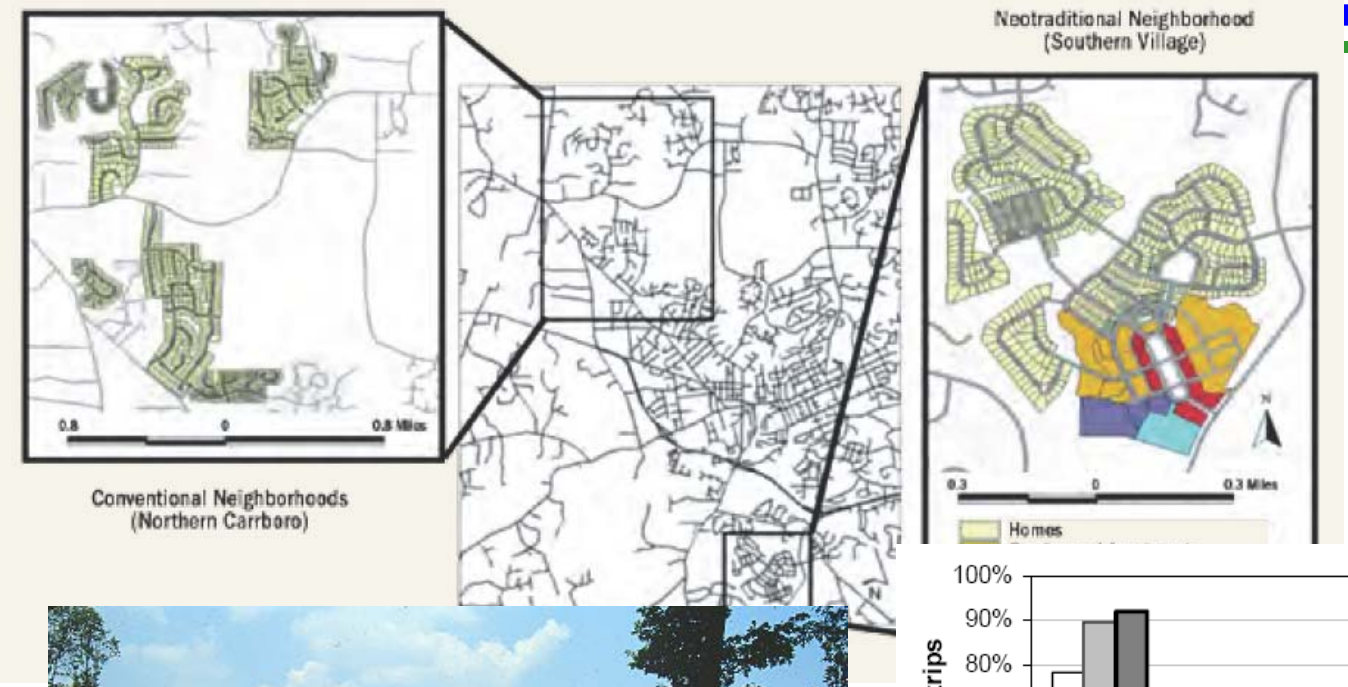


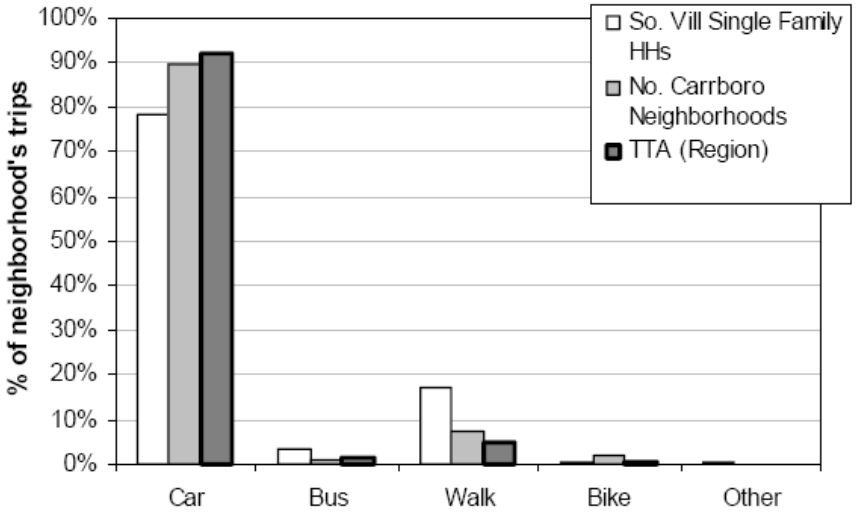
Fairview Village (20% Lower)



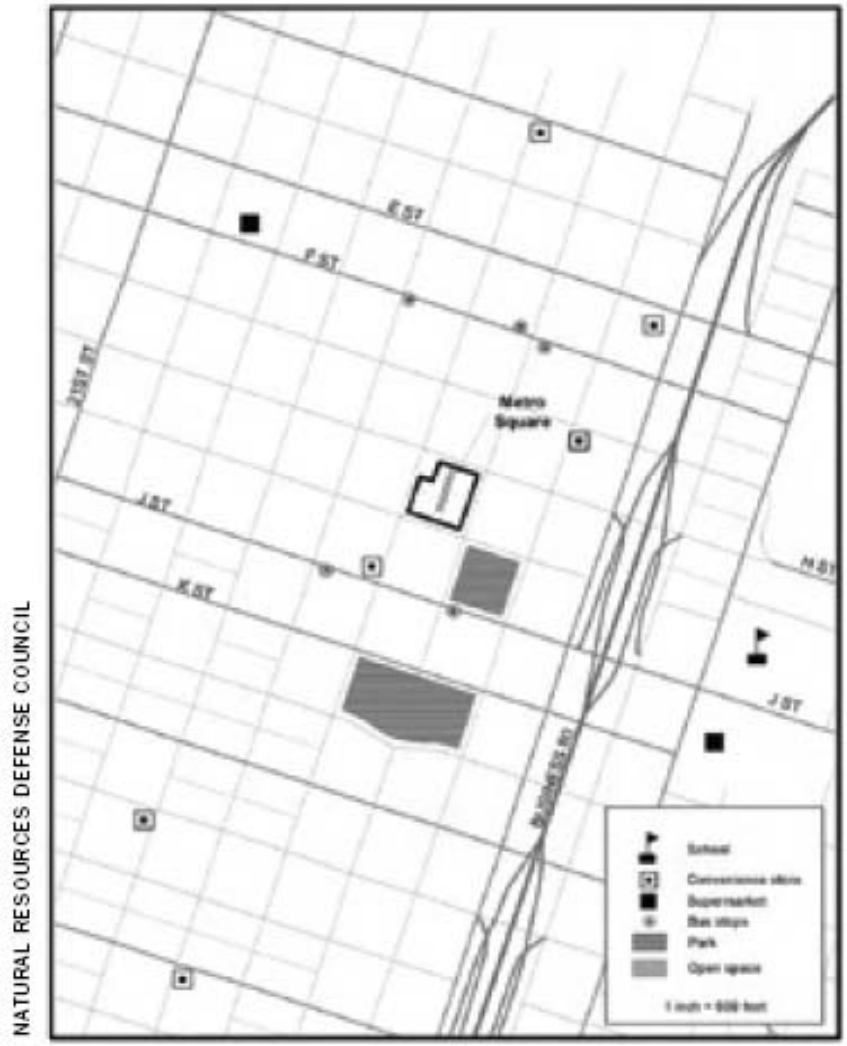


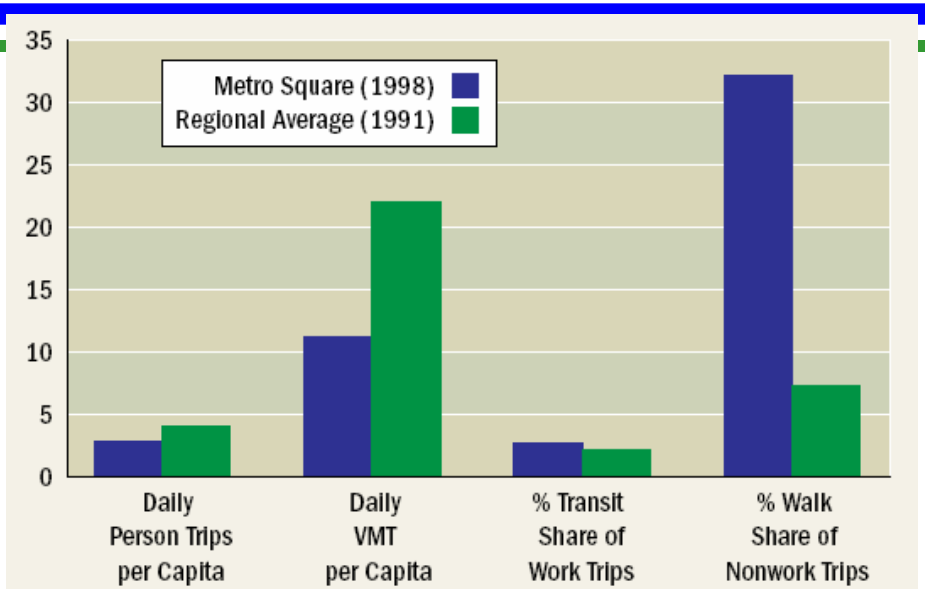
Southern Village (40% lower)





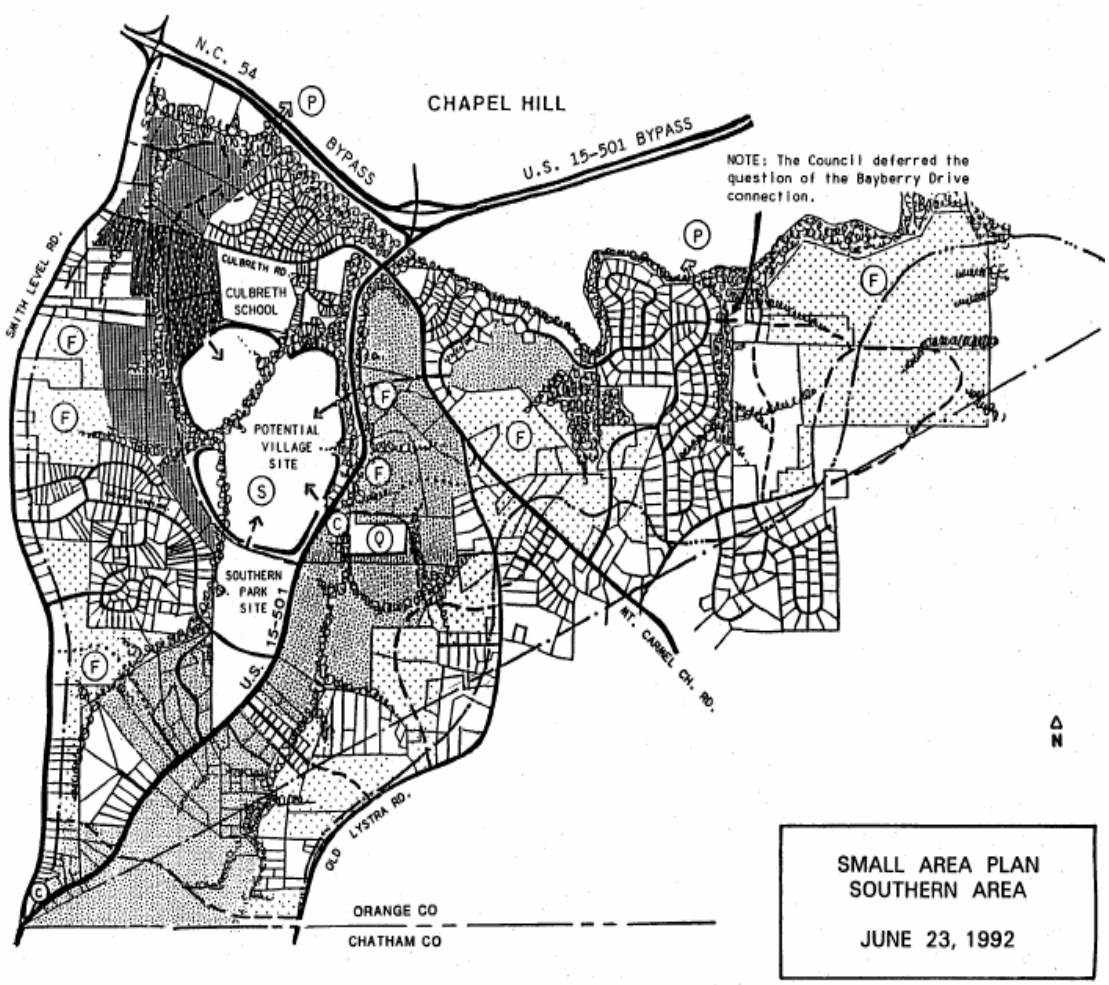
Metro Square (50% lower)





Southern Village

Downzoning to Direct Growth to the Village



Baldwin Park

Transferred to City Under the Base Closure Act

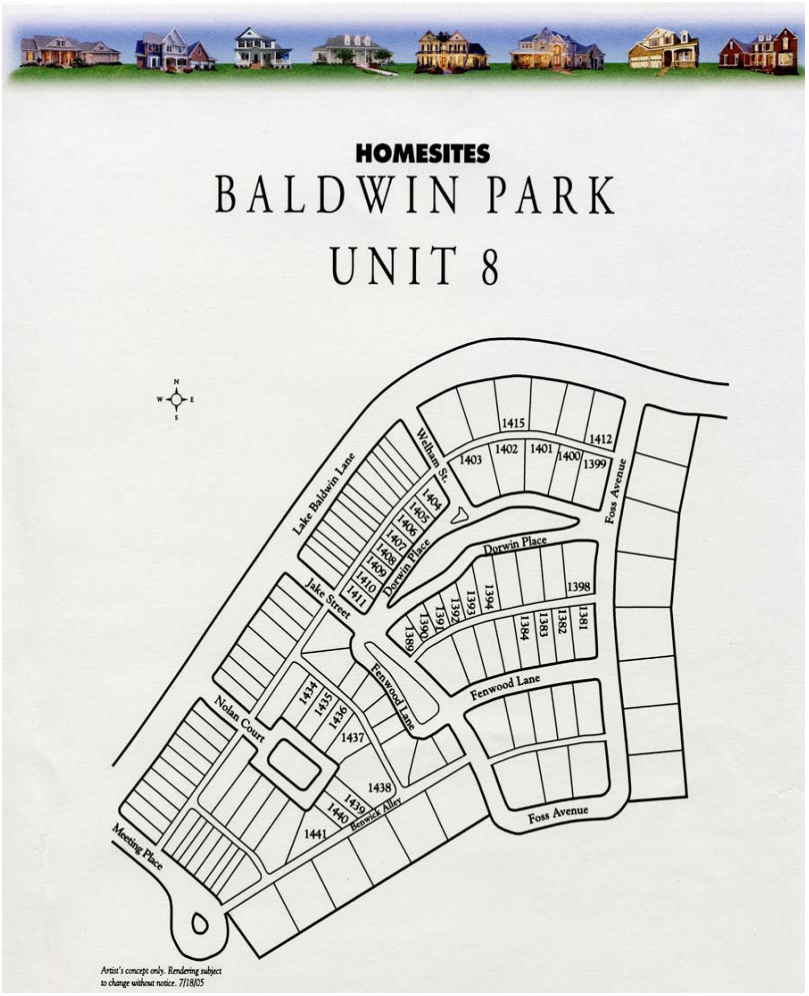
Orlando Comprehensive Plan

Housing Practice 2

Achieve an average net residential density of six to seven units per acre (without the appearance of crowding).

9 Units per Acre

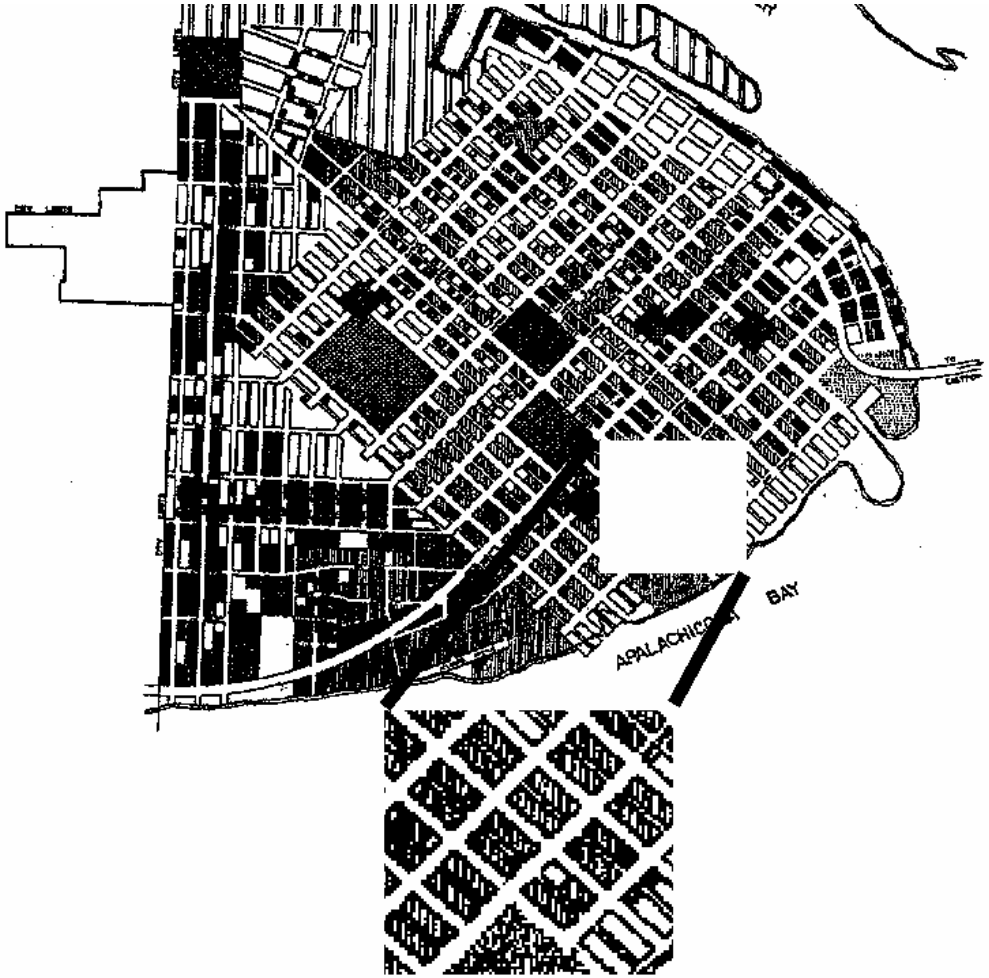
13 Units per Acre



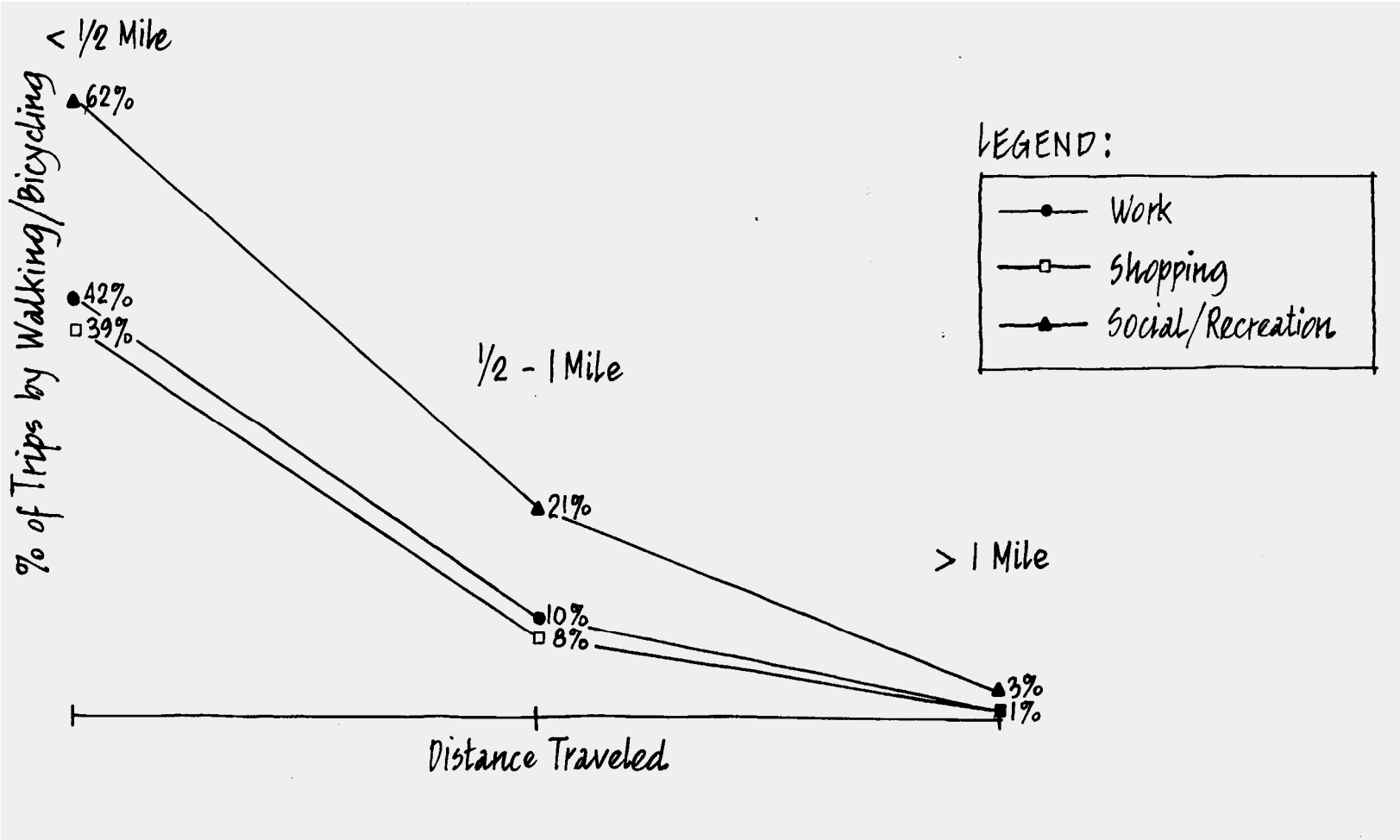
Land Use Practice 3

Mix land uses at the finest grain the market will bear and include civic uses in the mix.

Traditional Fine-Grained Land-Use Mix

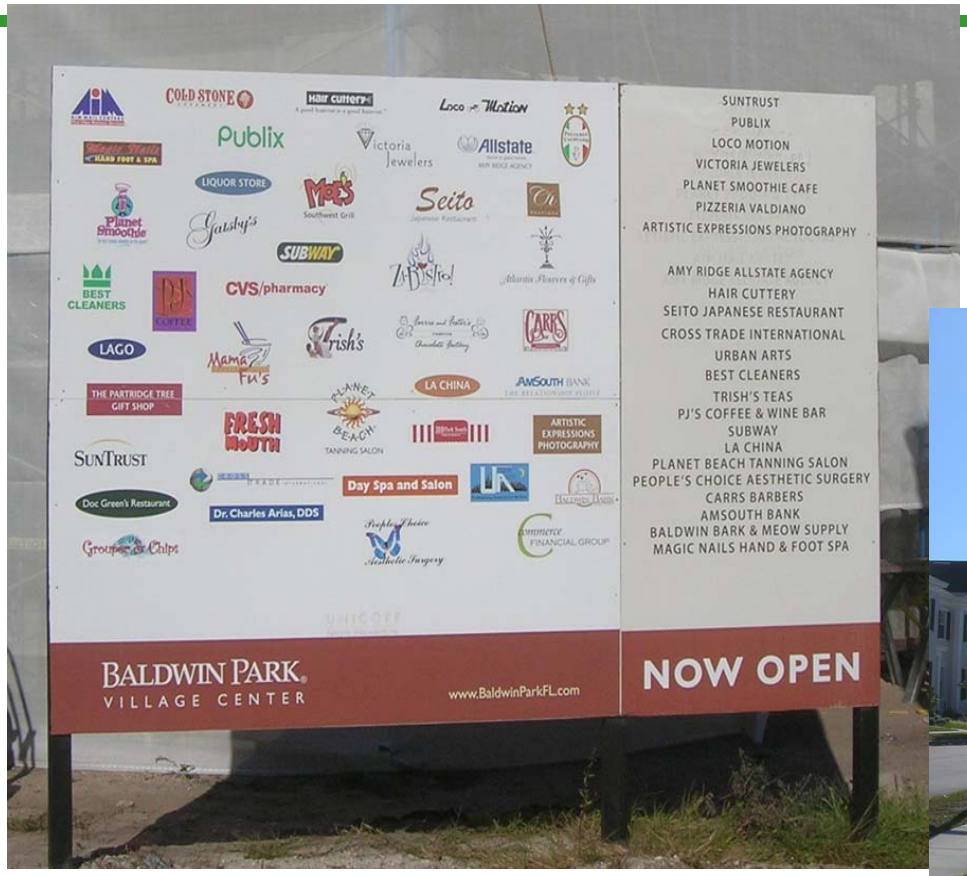


Walking/Bicycling as a Function of Trip Distance



Neighborhood and Village Commercial

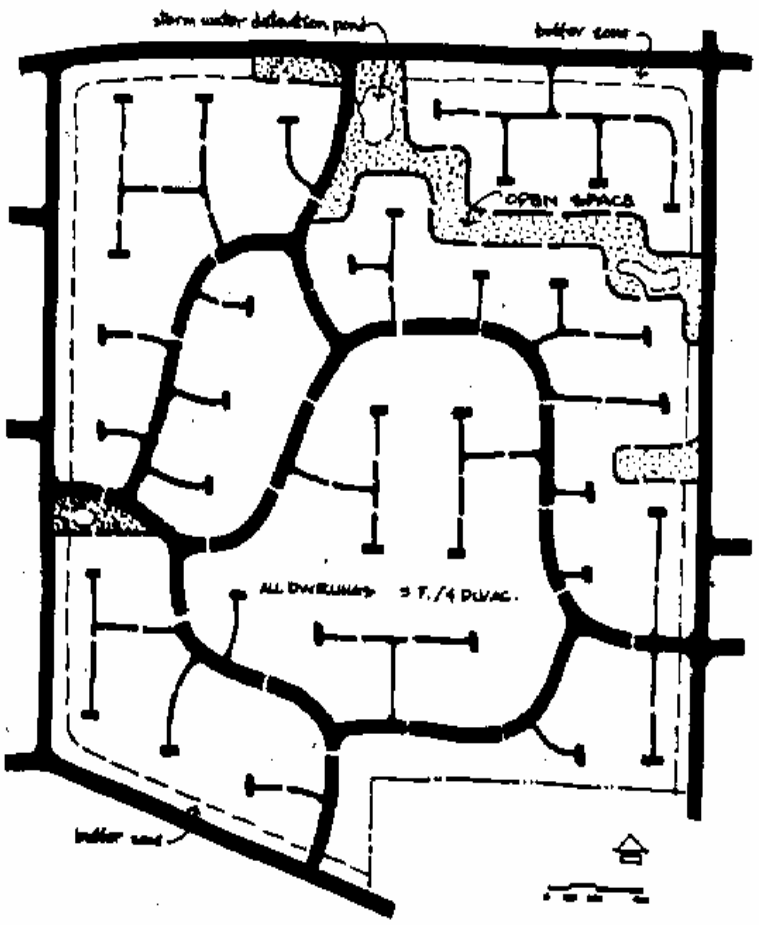
Hybrid Center with Dispersed Civic Uses

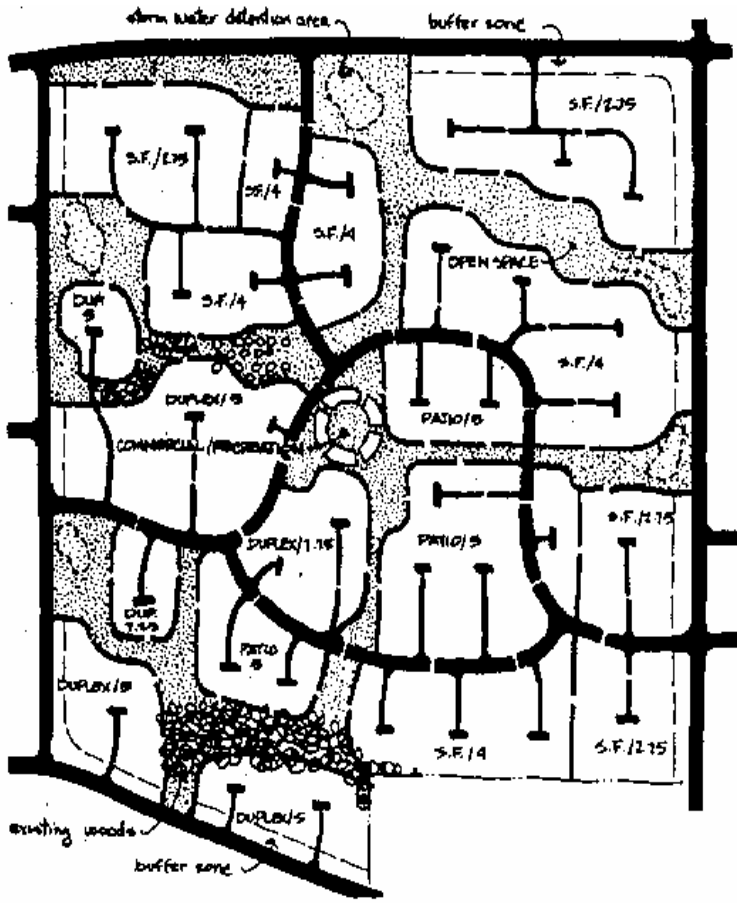


Land Use Practice 4

Develop in clusters and keep the clusters small.

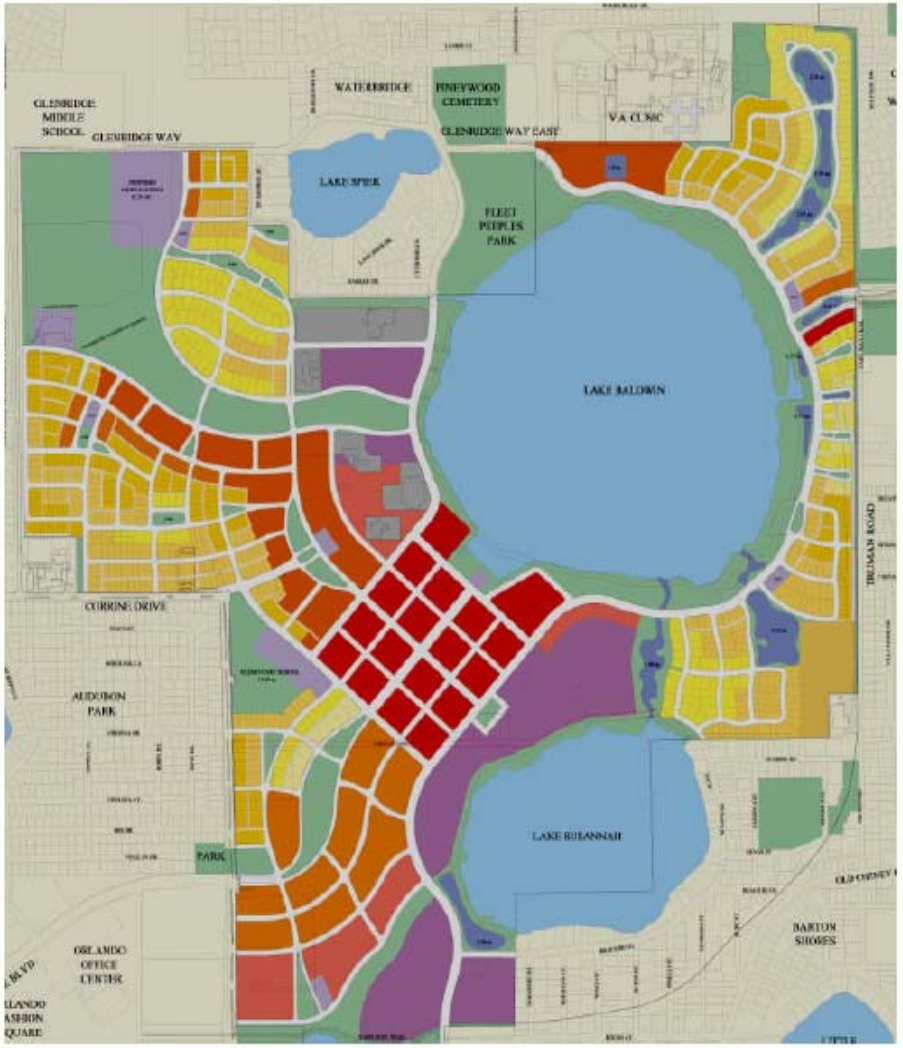
Conventional vs. Cluster Development





Public Space Offsets Density and Complements Mixed Use

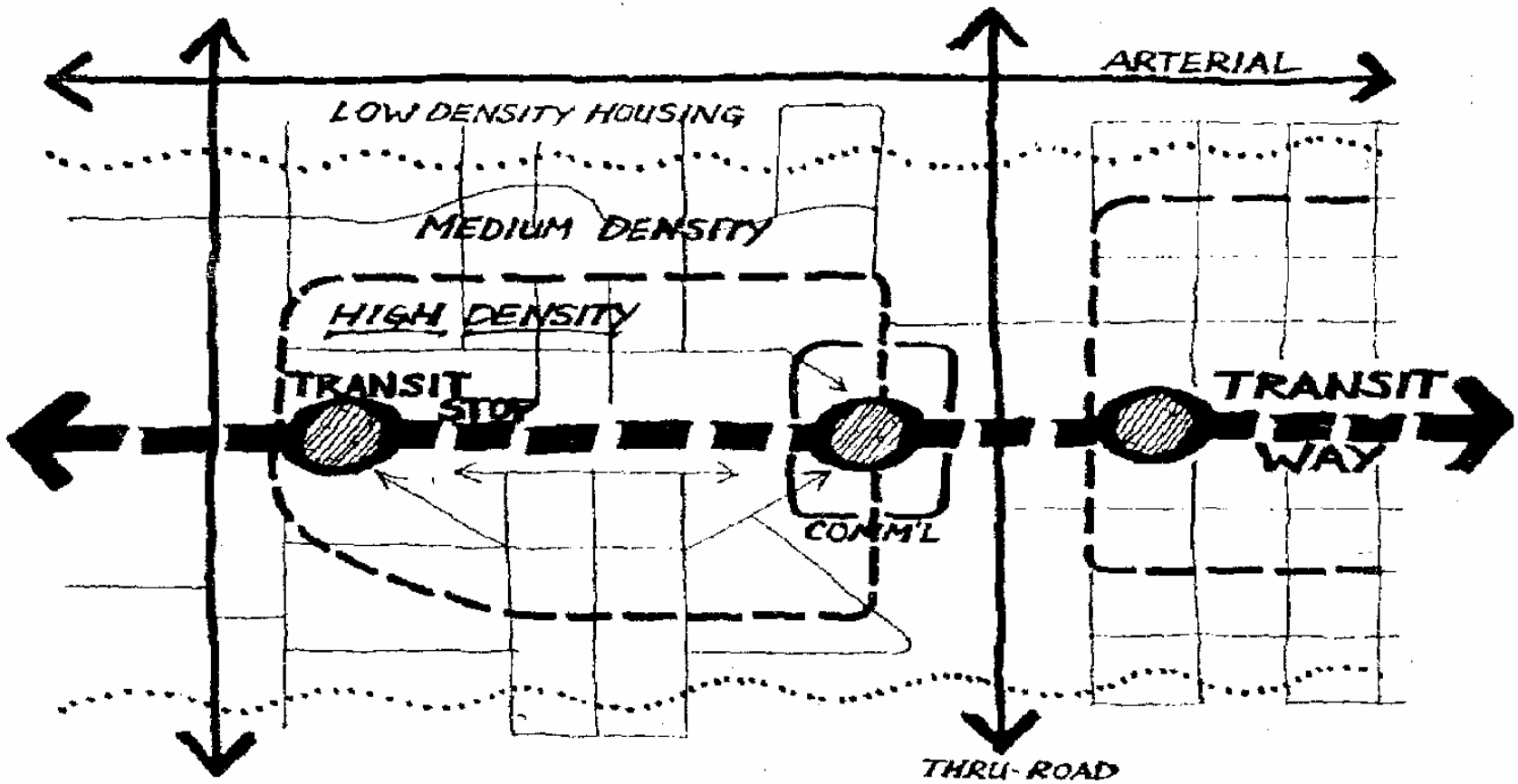
Public Space as Unifier



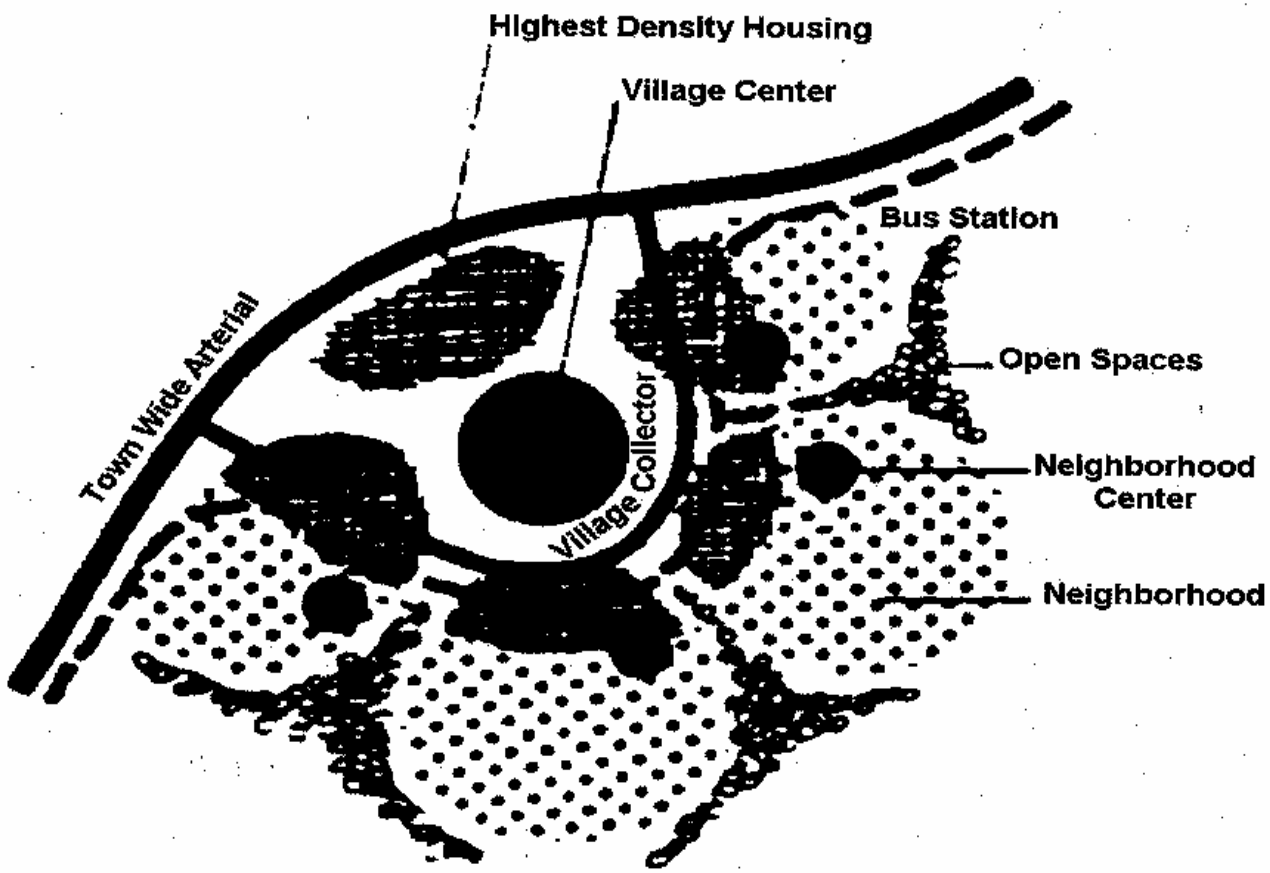
Land Use Practice 5

Place higher density and senior housing near commercial centers, transit lines, and community facilities.

Step-Down Densities Along a Transit Line



Step-Down Densities Around a Center

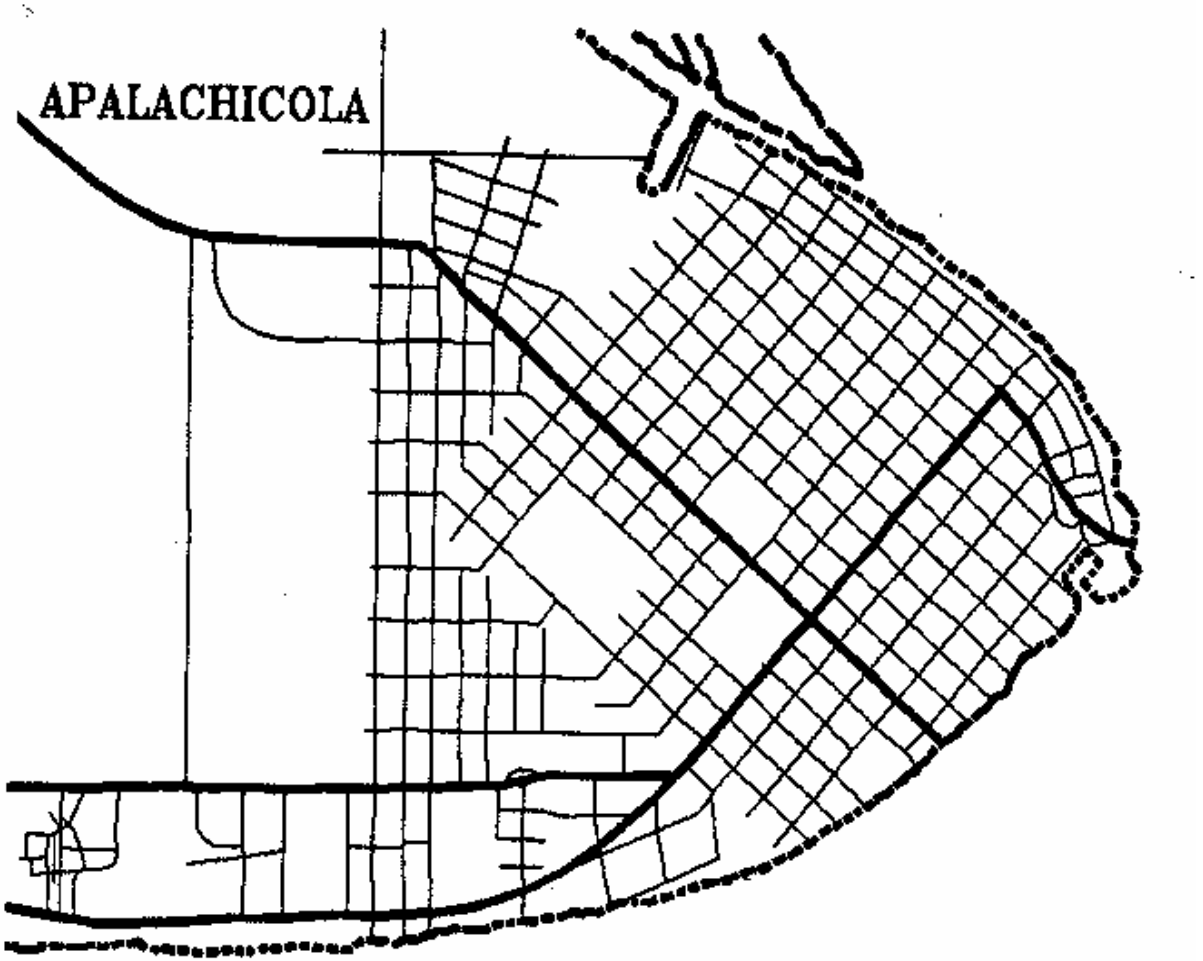


Classic Stepdown Pattern

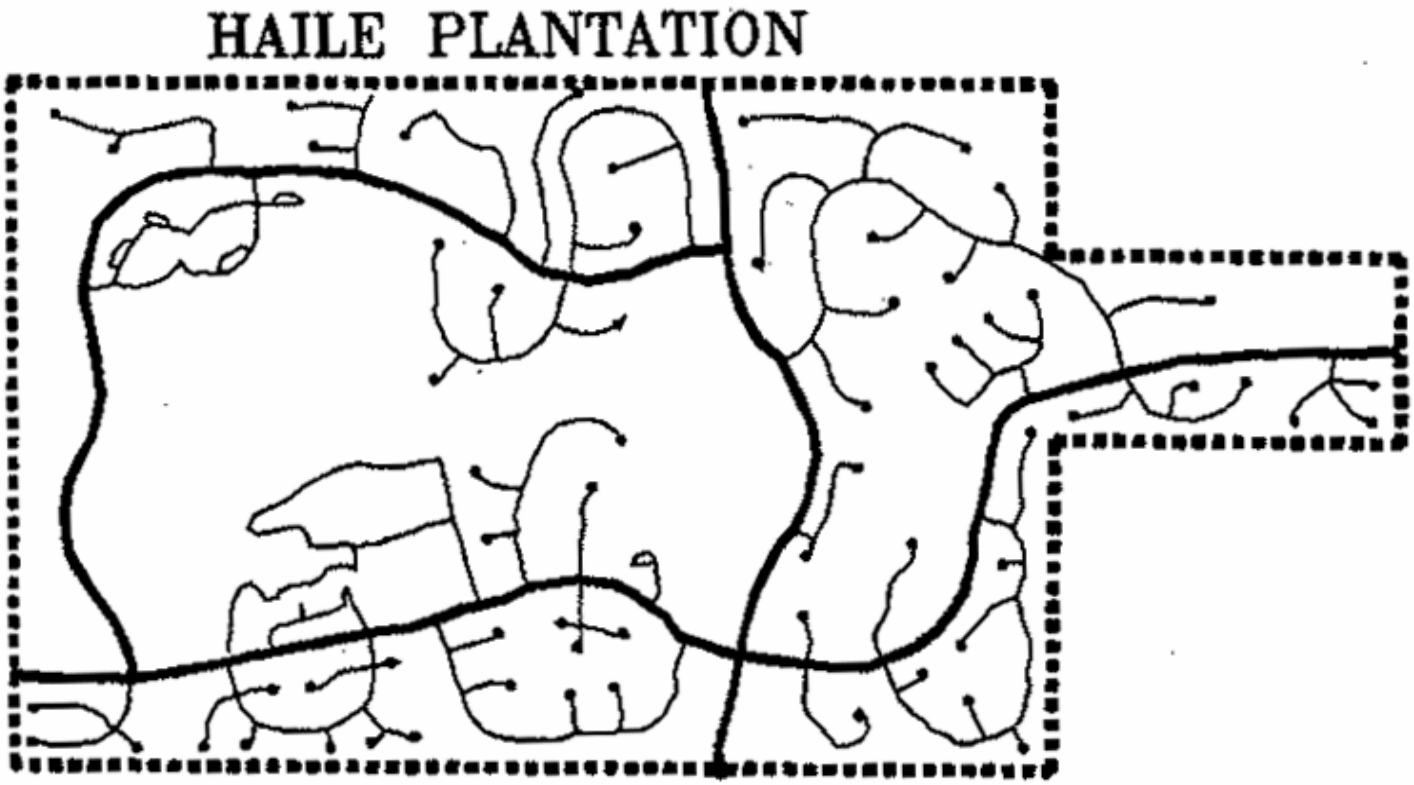
Transportation Practice 1

Design the street network with multiple connections and relatively direct routes.

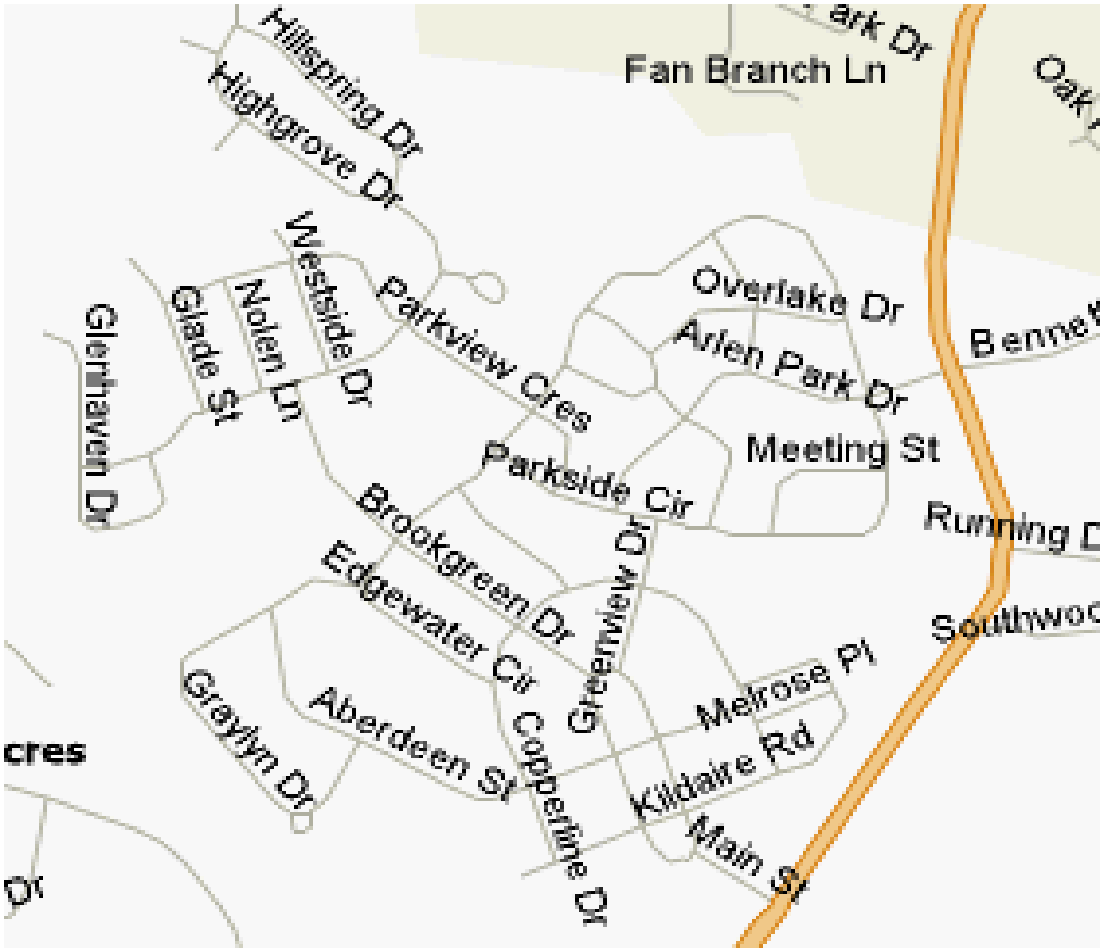
Traditional Grid -- Connectivity Index of 1.69



Contemporary Network -- Index of 1.19



Southern Village – Index of 1.50



Orlando Adopted Connectivity Index

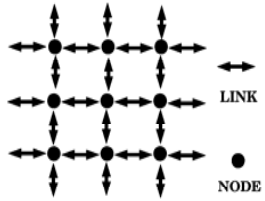
Network Connectivity

The Transportation Element of the Growth Management Plan recognizes the importance of an enhanced transportation network where developments are adequately interconnected.

The development "connections" include internal, to adjacent land uses, to the external network, and where adequate pedestrian, bicycle and transit facility connections are provided to promote alternatives to the automobile.

The Transportation Element of the Growth Management Plan requires the establishment of a Connectivity Index Standard. The Standard ensures adequate internal and external connections in single-family and multi-use developments, as well as to enhance the city's overall transportation network.

Multi-use developments include combinations of residential and/or non-residential uses.



Calculating a Connectivity Index

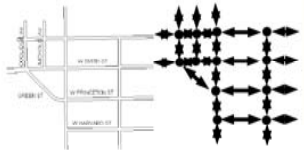
The Connectivity Index is an indicator of how efficient a transportation network is. The Connectivity Index can be evaluated for existing areas or for proposed developments.

- **Select the area.** The Connectivity Index is specific to an area or to a development, and it will be sensitive to the size of the area evaluated. A single city block in a grid network will produce a higher Connectivity Index than multiple city blocks being evaluated simultaneously.
- **Count the number of Nodes.** Nodes are any point of intersection between two roadways. A cul-de-sac end is also a Node while a stub-out end is not. New developments may include stub-outs instead of cul-de sacs, providing multi-directional access opportunities to adjacent areas, improving their Connectivity Index and promoting sustainable communities.
- **Count the number of Links.** Links are road segments interconnecting the Nodes. Count all of the internal Links within the area evaluated. Also count the external Links connecting to the Nodes within the area evaluated. Do not include a Node at the external Link ends.
- **Divide the Links by the Nodes.** The number of Links divided by the number of Nodes as defined above will produce the Connectivity Index.

CONNECTIVITY INDEX = LINKS / NODES

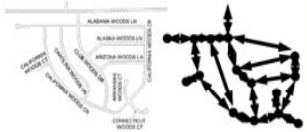
Connectivity Examples

- **Existing urban areas:**



Connectivity Index = 2.58

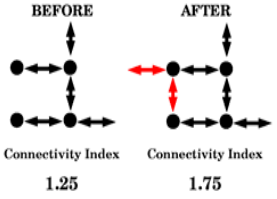
- **Suburban areas:**



Connectivity Index = 1.33

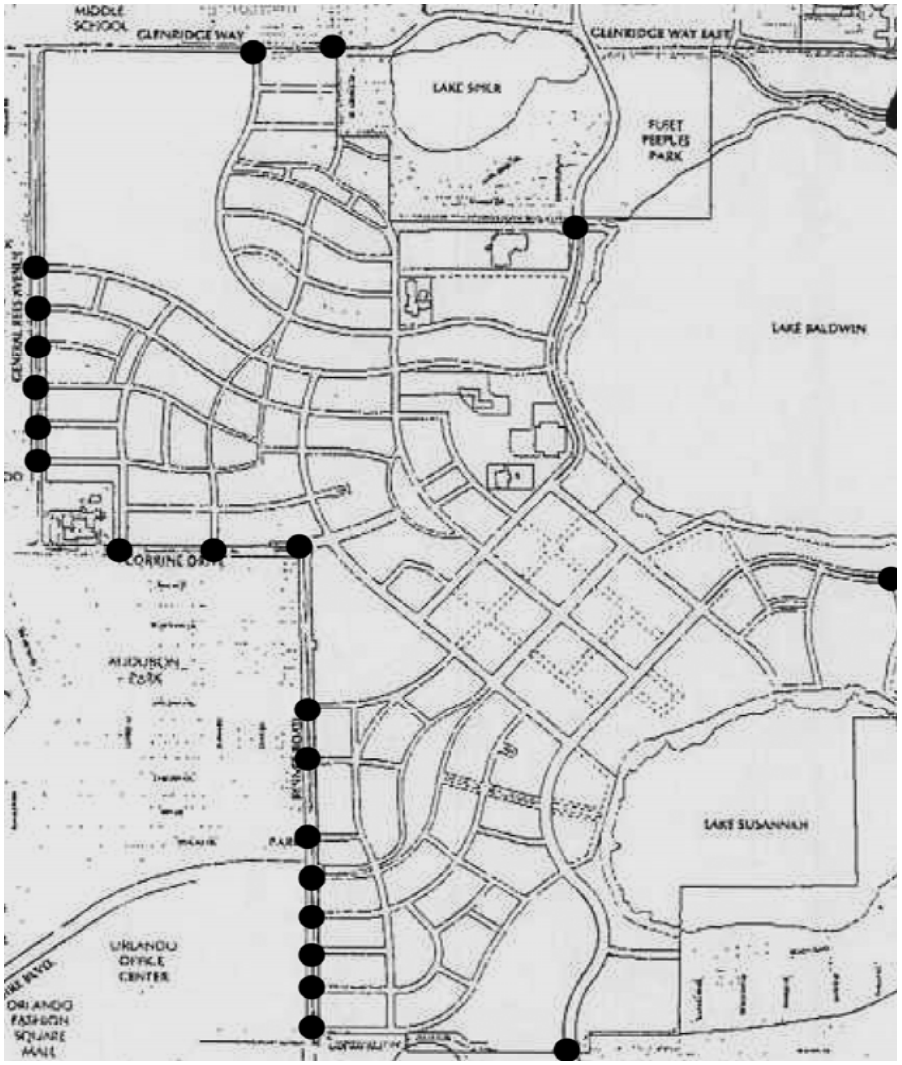
Improving Connectivity

The Connectivity Index can be improved by removing the cul-de-sacs and connecting the street-ends to other streets. Simple changes in street design can bring about significant changes in Connectivity Index scoring.



Baldwin Park – Index of 1.62

28 Connections But No Through-Street



Tried to Put Compact Development in Perspective