

Beyond LEED-ND

Response by Doug Farr

Philadelphia, PA

May 19, 2007



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Stated Legal Purpose of Comprehensive Plan

1. Protect the health, safety and welfare of the residents of the metropolitan area,

and to
2. Ensure coordinated, orderly and economic development.”



Our country today



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Sustainable Urbanism

Traditional urbanism integrated with high performance buildings and infrastructure.



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Thesis

Sustainable urbanism needs to become the normative pattern of development in the U.S. in a generation.



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Implementation Strategy

Establish weights and measures.
(Commodifying urbanism).

Dismantle petroleum-era regulations.

Make the campaign for S.U. this generation's
moonshot.



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Land Use/Transportation Linkage

(by Family)

	AVERAGE LOT SIZE	UNITS PER SQ. MILE	AVG. # OF AUTOS	AVG. ANNUAL VEHICLE MILES
CITY	.02 ACRES	32,000	<1	8,000
INNER-RING SUBURB	0.125 ACRES	5,120	1-2	15,000
OUTER-RING SUBURB	1 ACRE	640	2-3	27,500
EXURB	5 ACRES	128	3+	30,000



The Wealth of Cities, John Norquist

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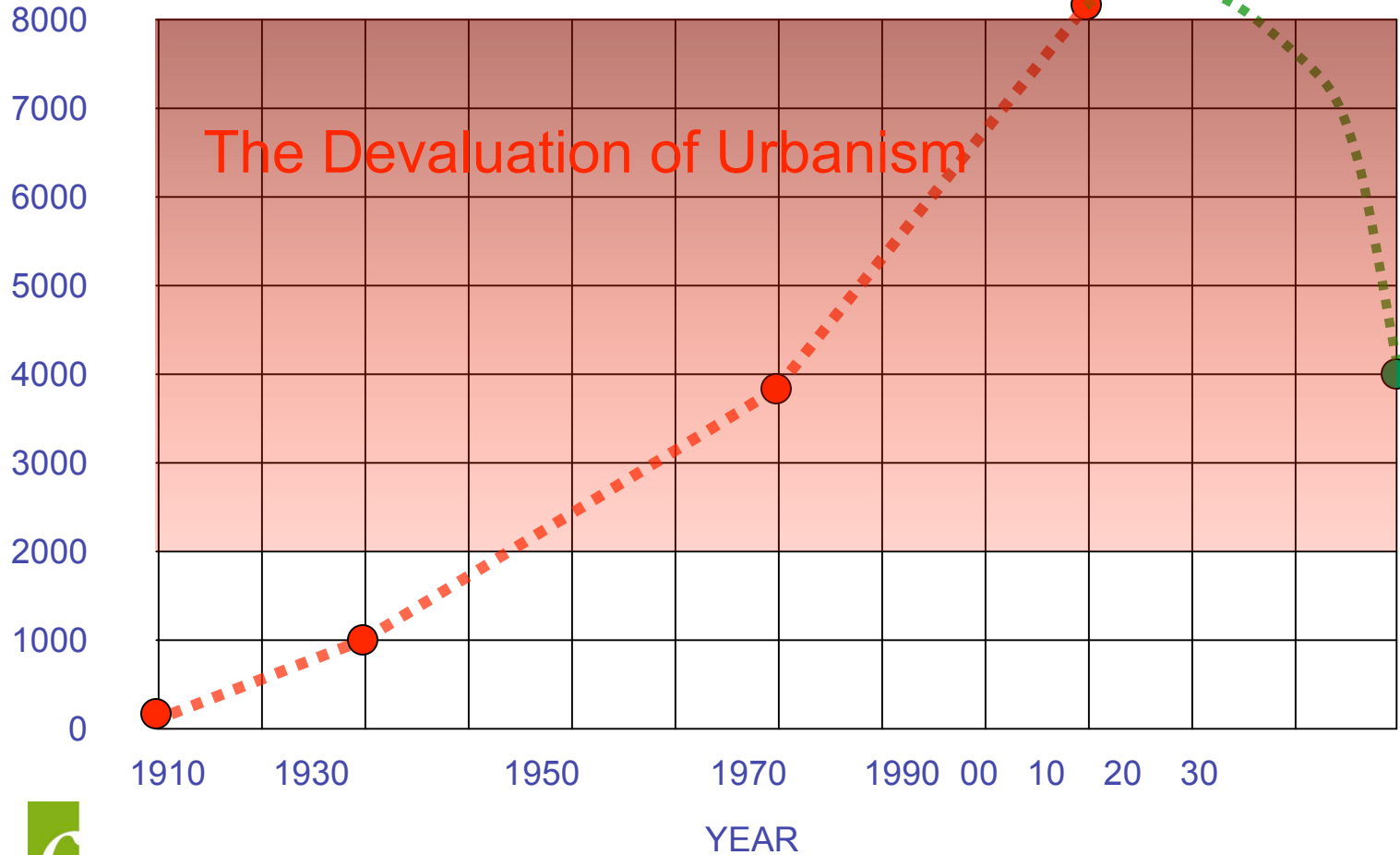
2030 Architecture Challenge

Year	Energy Reduction
2005	50%
2010	60%
2015	70%
2020	80%
2025	90%
2030	Carbon Neutral



2030 Community Challenge

Per Capita Vehicle Miles Travelled



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2030 Community Challenge

Year	% of Current	Per capita VMT	2005
	100%	8000	2010
	90%	7200	2015
	80%	6400	
2020	70%	5600	2025
	60%	4800	2030*
	50%	4000	

***Roughly 1970 levels**



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LEED® for Neighborhood Developments



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LEED-ND Pilot

371 Applications
40% by CNU members

42 States and DC
8 Foreign Countries

Covers an area of 500+/- sq mi.
Rhode Island: 1044 sq. mi.



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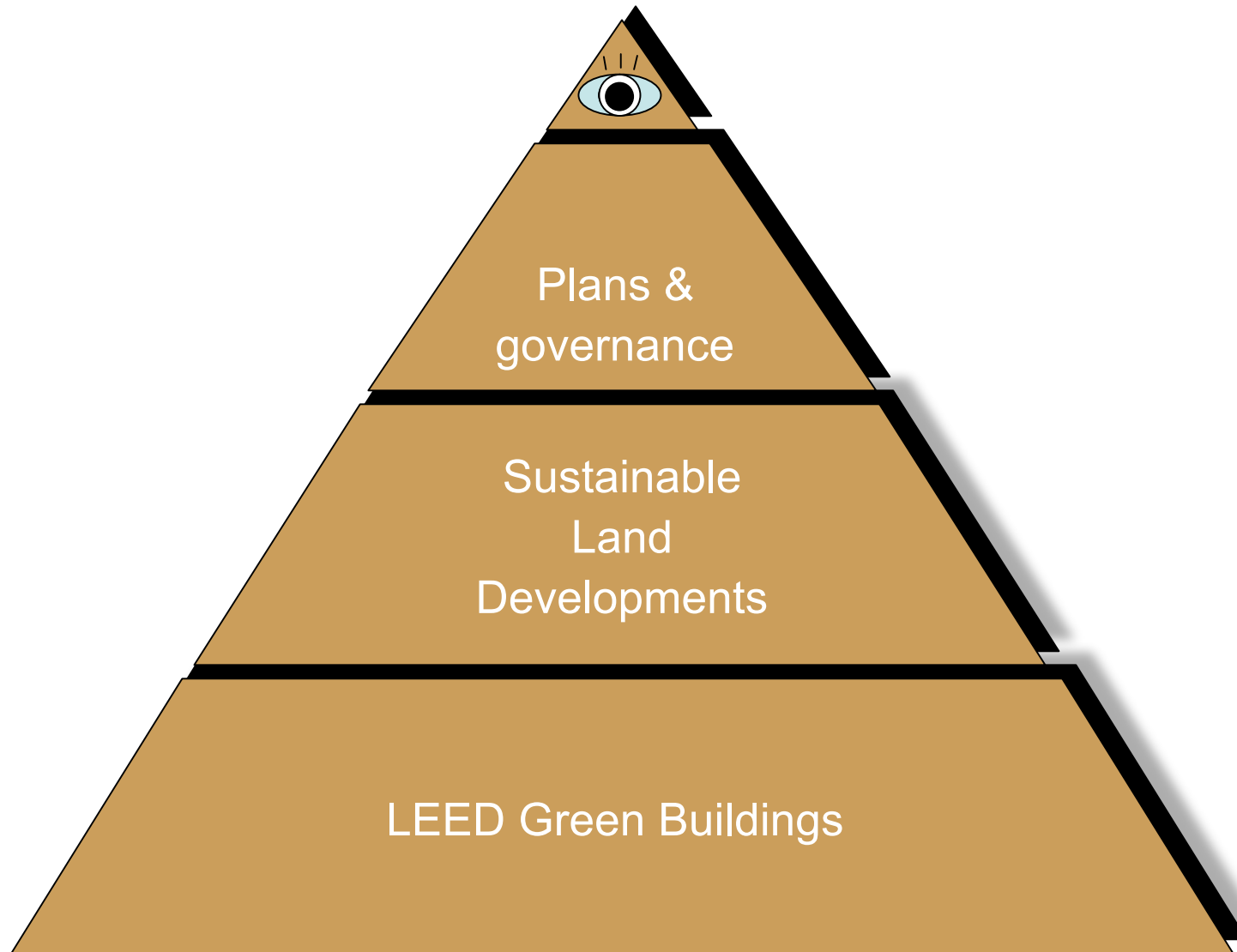
2030 Community Challenge

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*Roughly 1970 levels



The Sustainability Pyramid



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The Sustainability Pyramid

LEED Green Buildings

New Construction (NC)
Existing Buildings (EB)
Commercial Interiors (CI)
Core and Shell (CS)
Homes (H)



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The Sustainability Pyramid

“SMART” NEIGHBORHOOD DEVELOPMENT

LEED-Neighborhood development

Existing neighborhood (EN)

District (d)

Landscape (l)

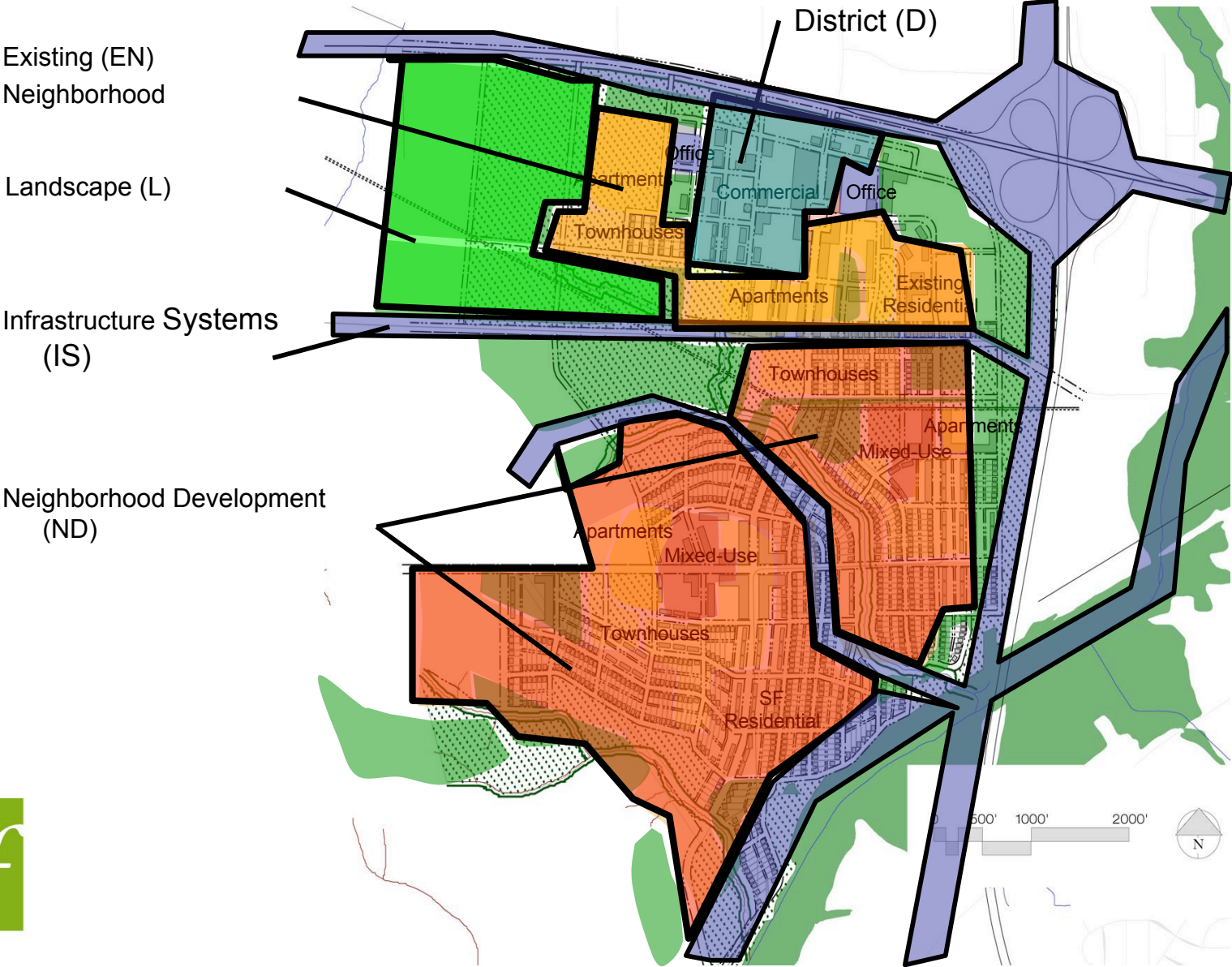
Infrastructure systems (IS)



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Proposed Certification Products for Sustainable Land Developments



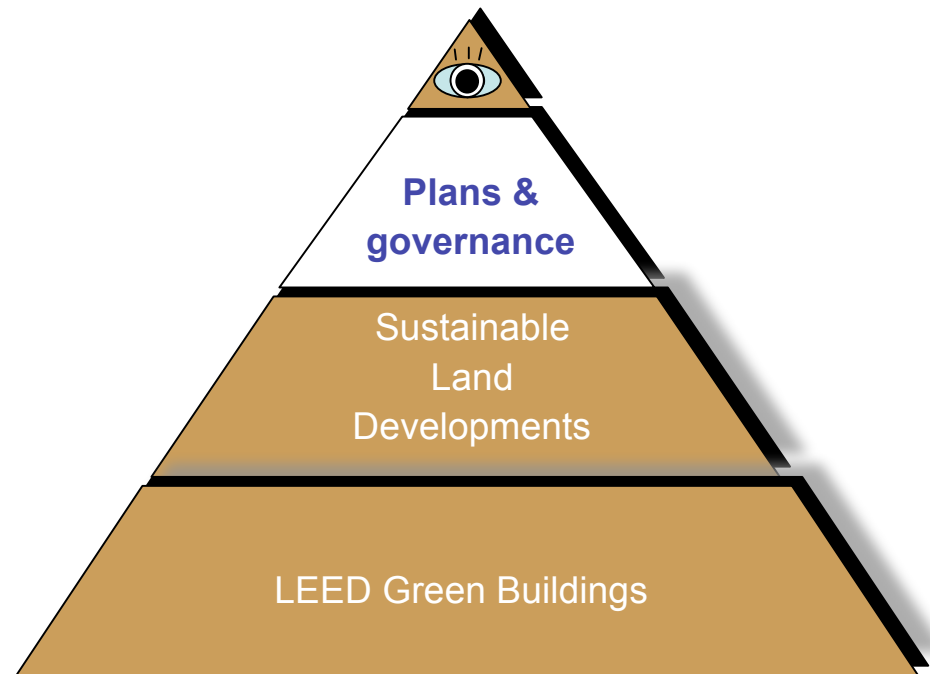
The Sustainability Pyramid

Plans and Governance

Regional plan (RP)

Municipality (M)

State (S)

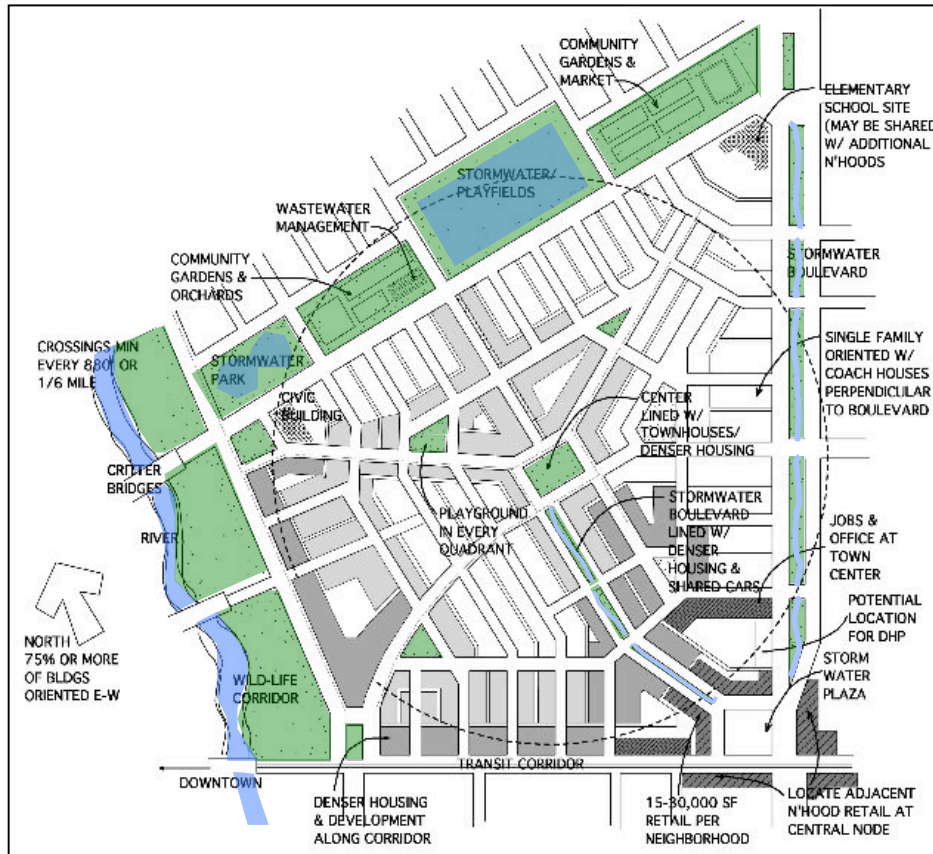


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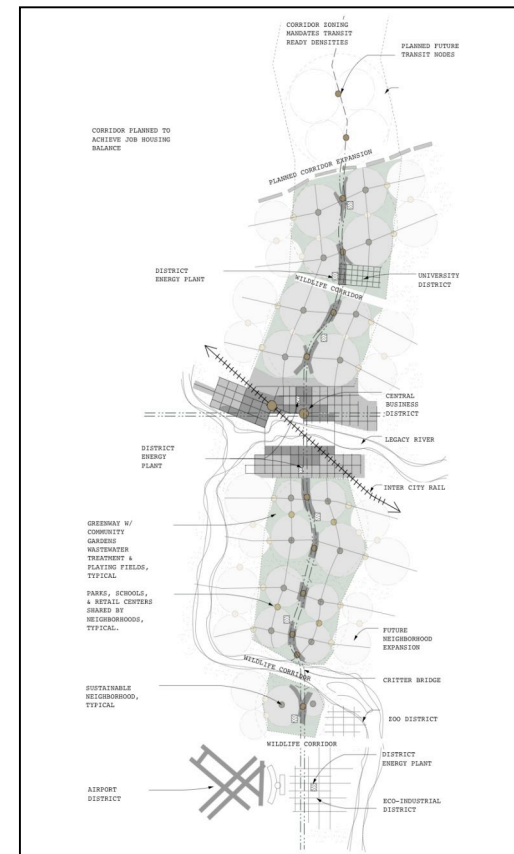
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Urbanist Strategy: Transport/land use integration

Walking in the neighborhood



Transit in the corridor



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Goal for this session

Refine techniques regarding the neighborhood and corridor to make them useful to the masses.

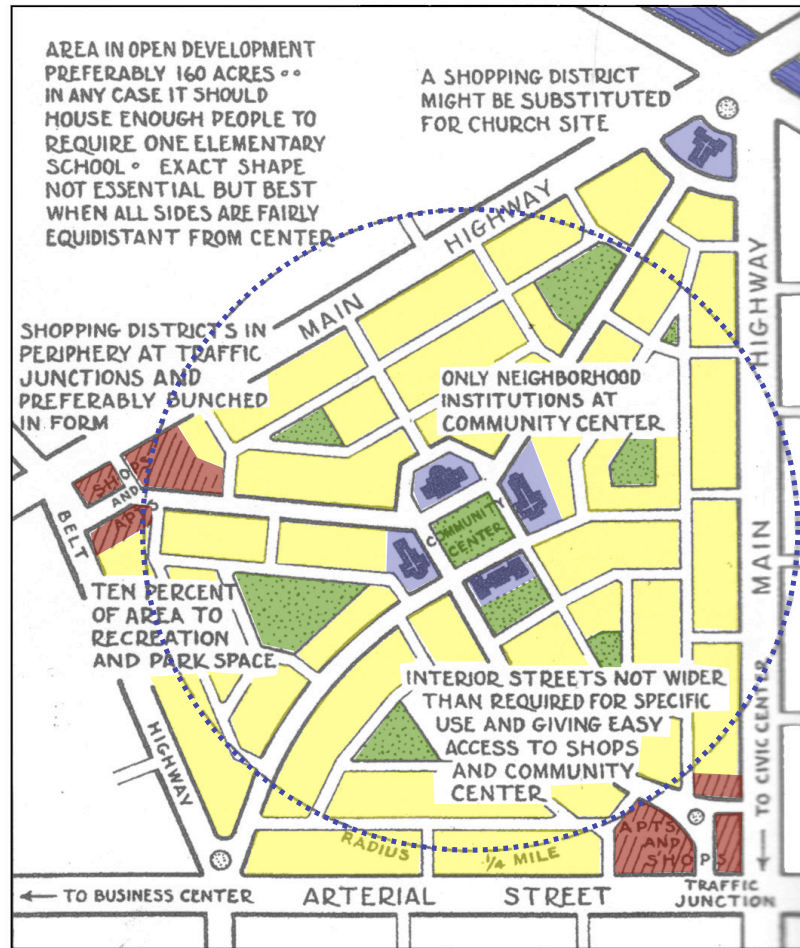
1. Put the neighborhood into ND
2. Is Perry poetry or technique?
3. Define weights and measures
4. How many dwellings are required?



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The Neighborhood Unit



Clarence Perry 1929



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Neighborhood (Pedshed) Timeline

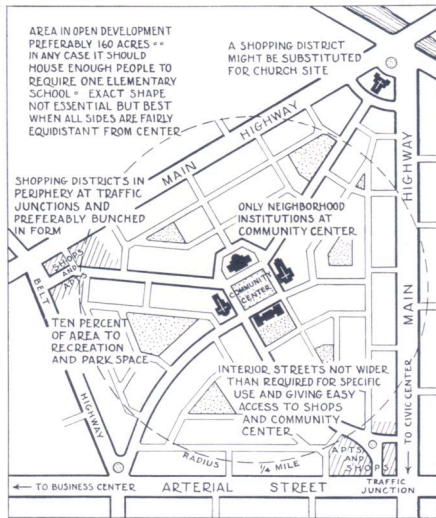
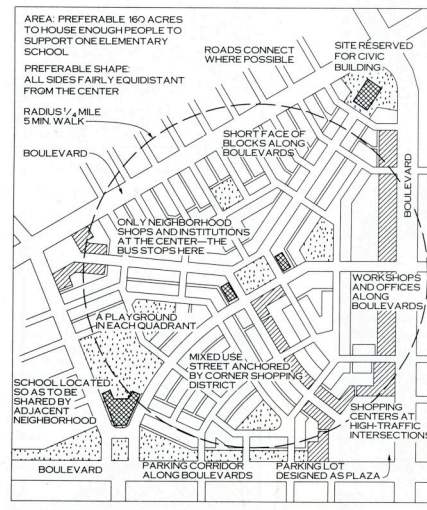


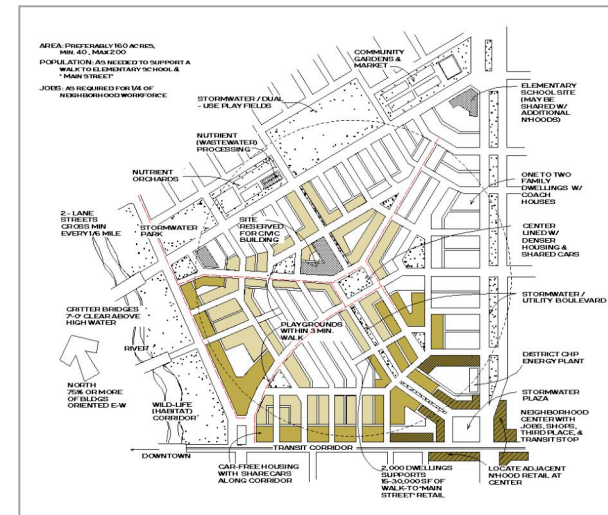
FIG. 33 NEIGHBORHOOD-UNIT PRINCIPLES

Perry



AN URBAN NEIGHBORHOOD (PART OF A TOWN)

DPZ



Sustainable Neighborhood



Neighborhood Definition

1. Identifiable center and edge
2. Walkable size (40 - 200 acres)
3. Mix of land uses and housing types - (oppy's to shop and work close to home.)
4. Integrated network of walkable streets
5. Special sites set aside for civic buildings.

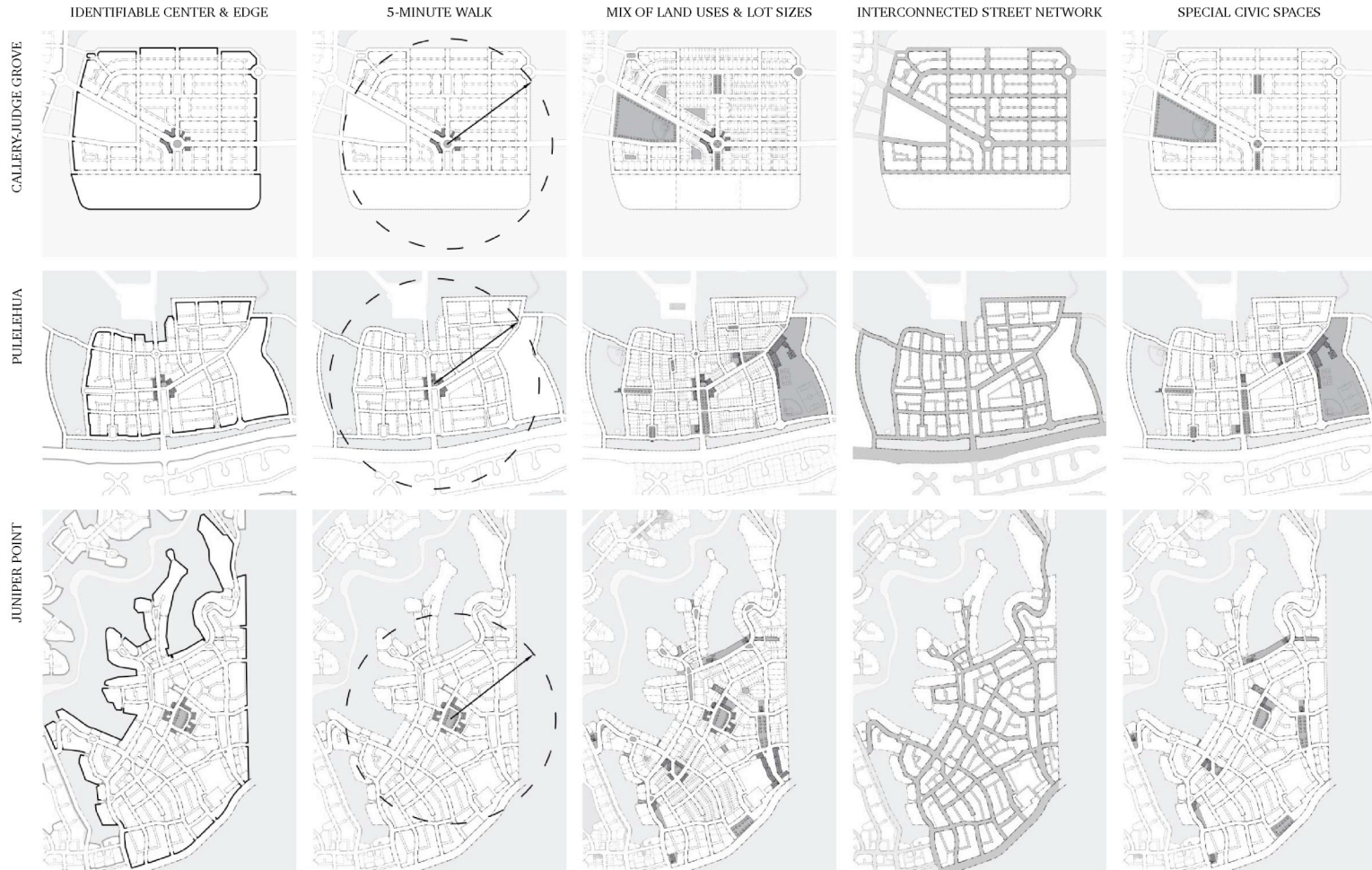


Dover Kohl & Partners 2007

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Neighborhood Definition



Dover Kohl Associates 2007



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Neighborhood Definition

Neighborhood Definition		Size (Acre)	% Area Devoted to Center	Number of Primary Dwellings	Number of Accessory Dwellings	Net Residential Density (DU/Acre) ²	S.F. of Commercial Space	Net Commercial Area (S.F./Acre)
Name	Location							
Historic City of Charleston	Charleston, SC	1,015	9% (88 acres)	5,428 ¹	UNKNOWN *	7.6	UNKNOWN *	UNKNOWN *
Four wards in Historic Savannah ⁵	Savannah, GA	50	9% (4.5 acres)	320 ¹	UNKNOWN *	9.1	180,200 ³	3,604
Seaside (Original 80 Acres)	Seaside, FL	80	5% (4.1 acres)	330 ¹	UNKNOWN *	8.2	153,034 ³	1,912
The North End Neighborhood	Boston, MA	148	7% (10.3 acres)	6,600 ¹	UNKNOWN *	82.6	708,319 ⁶	4,785
Forest Hills Gardens	Queens, NY	142	2.8% (4.1 acres)	800 ¹	UNKNOWN *	7.2	7,500 ³	52
Callery Judge Grove	Palm Beach County, FL	89	3% (2.7 acres)	460	350 ⁷	9.96	18,000	390
Pulelehua	Maui, HI	108	6.4% (6.9 acres)	438	101 ⁷	11	62,768	1,586
Juniper Point	Flagstaff, AZ	151	9.5% (14.4 acres)	1739	342 ⁷	20	116,200	1,417
Optimun Range		40-200	3-10%	Min_ Max_		Min_ Max_		100-400



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Trip Reduction

	Residential (1)	Non-Residential
Physical Measures		
Net Residential Density	Up to 55%	N/A
Mix of Uses	Up to 9%	Up to 9%
Local-Serving Retail	2%	2%
Transit Service	Up to 15%	Up to 15%
Pedestrian/Bicycle Friendliness	Up to 9%	Up to 9%
<i>Physical Measures subtotal</i>	<i>Up to 90%</i>	<i>Up to 35%</i>
Demand Management and Similar Measures		
Affordable Housing	Up to 4%	N/A
Parking Supply (2)	N/A	No limit
Parking Pricing/Cash Out	N/A	Up to 25%
Free Transit Passes	25% * reduction for transit service	25% * reduction for transit service
Telecommuting (3)	N/A	No limit
Other TDM Programs	N/A	Up to 2%, plus 10% of the credit for transit and ped/bike friendliness
<i>Demand Management subtotal (4)</i>	<i>Up to 7.75%</i>	<i>Up to 31.65%</i>

Notes:

- (1) For residential uses, the percentage reductions shown apply to the ITE average trip generation rate for single-family detached housing. For other residential land use types, some level of these mitigation measures is implicit in ITE average trip generation rates, and the percentage reduction will be lower.
- (2) Only if greater than sum of other trip reduction measures.
- (3) Not additive with other trip reduction measures.
- (4) Excluding credits for parking supply and telecommuting, which have no limit.



Nelson/Nygaard 2007

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Dwelling Types in New TND's

	Rental Lofts/ Apartments		For-Sale Lofts/ Apartments		For-Sale Rowhouses/ Townhouses/ Duplexes		For-Sale Small-Lot Detached Houses		For-Sale Mid-Range Detached Houses		For-Sale Urban Large-Lot Detached Houses	
	Range:	Average:	Range:	Average:	Range:	Average:	Range:	Average:	Range:	Average:	Range:	Average:
Younger Singles & Couples	20% - 72%	43%	15% to 75%	41%	15% to 75%	33%	3% to 33%	14%	0% to 30%	11%	0% to 31%	11%
Traditional & Non-Traditional Families	18% to 56%	33%	0% to 55%	25%	0% to 62%	37%	30% to 76%	54%	28% to 81%	60%	15% to 84%	55%
Empty Nesters & Retirees	7% to 44%	24%	16% to 62%	34%	0% to 47%	30%	14% to 61%	32%	14% to 67%	29%	11% to 64%	34%
		100%		100%		100%		100%		100%		100%

	Rental Lofts/ Apartments	For-Sale Lofts/ Apartments	For-Sale Rowhouses/ Townhouses/Duplexes	For-Sale Small-Lot Detached Houses	For-Sale Mid-Range Detached Houses	For-Sale Urban Large-Lot Detached Houses	
Range	15% to 31%	4% to 17%	2% to 16%	5% to 35%	13% to 34%	4% to 30%	Total %
Average	23%	9%	9%	24%	22%	13%	100%

Zimmerman Volk Associates 2007



*Based on 30 market TND market studies (400 to 4500 du)

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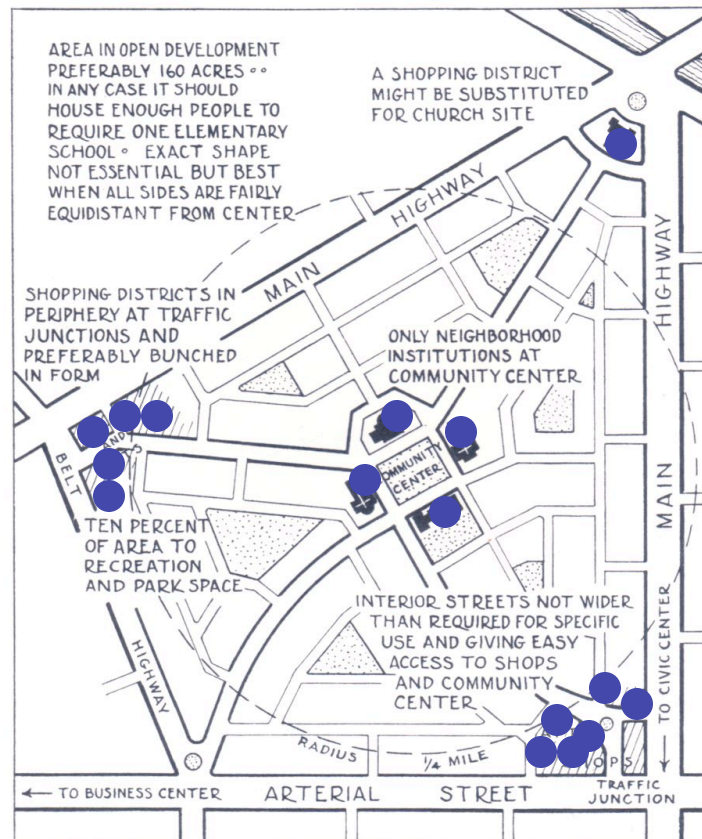
Received wisdom from ZVA

1. On average one third of housing demand in new TND is for multi-family.
2. On average forty percent of demand is for attached (higher density) building types.



LEED-ND Diversity of Uses

Include a residential component in the project that constitutes at least 25% of the project's total building square footage and design or locate the project such that at least 50% of the dwelling units are within 1/2 mile walk distance of at least two, four, seven or ten uses defined in Appendix A. Uses may either be in nearby areas or be built within the development.



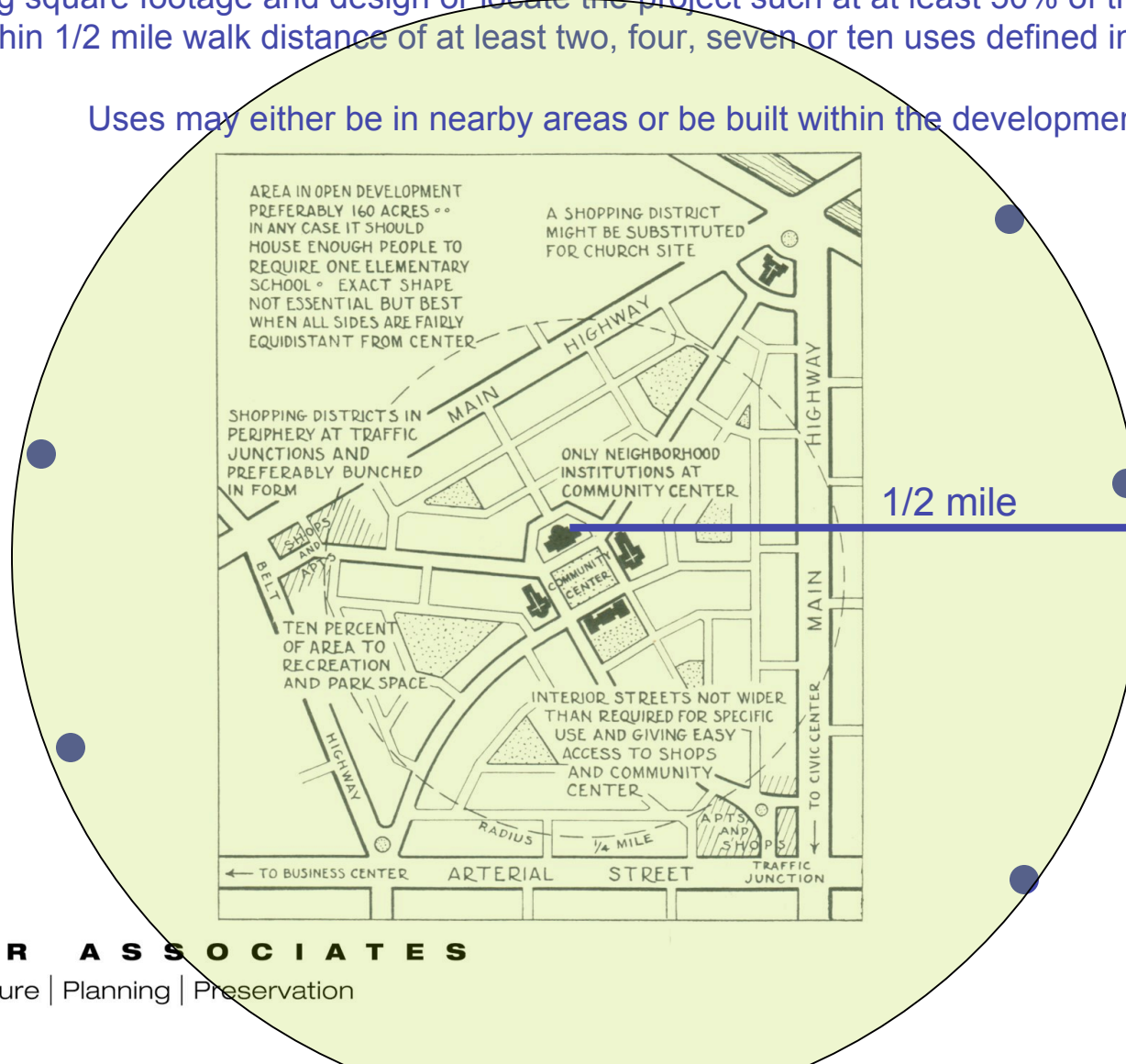
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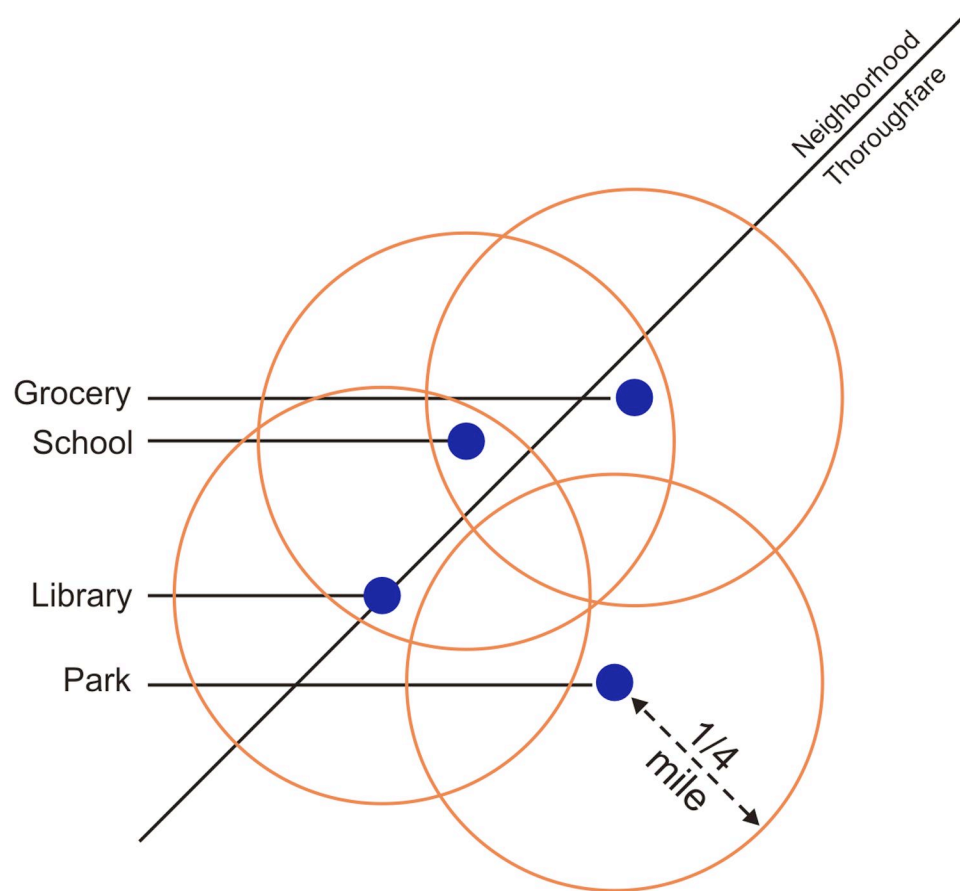
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Neighborhood Completeness

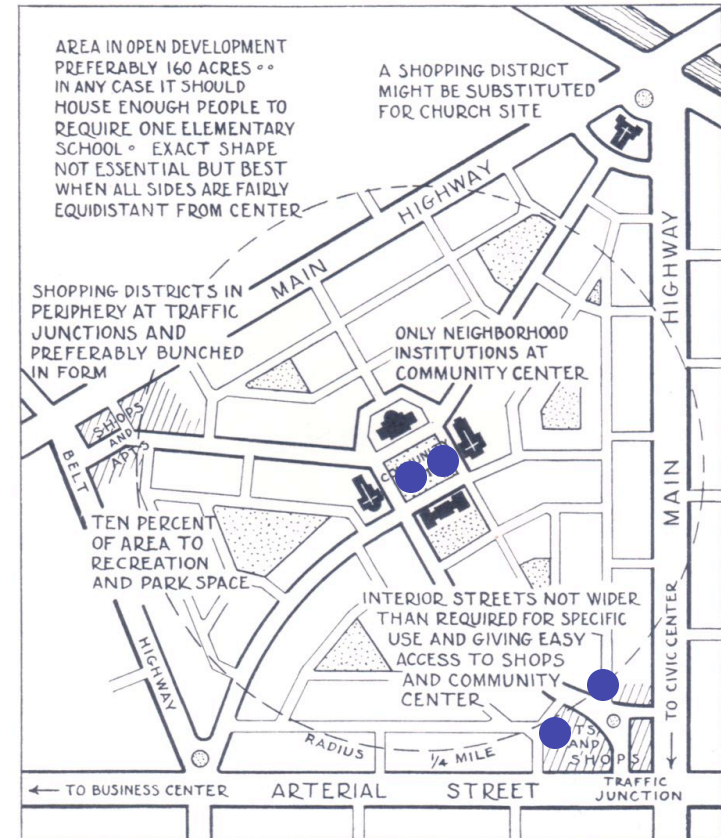
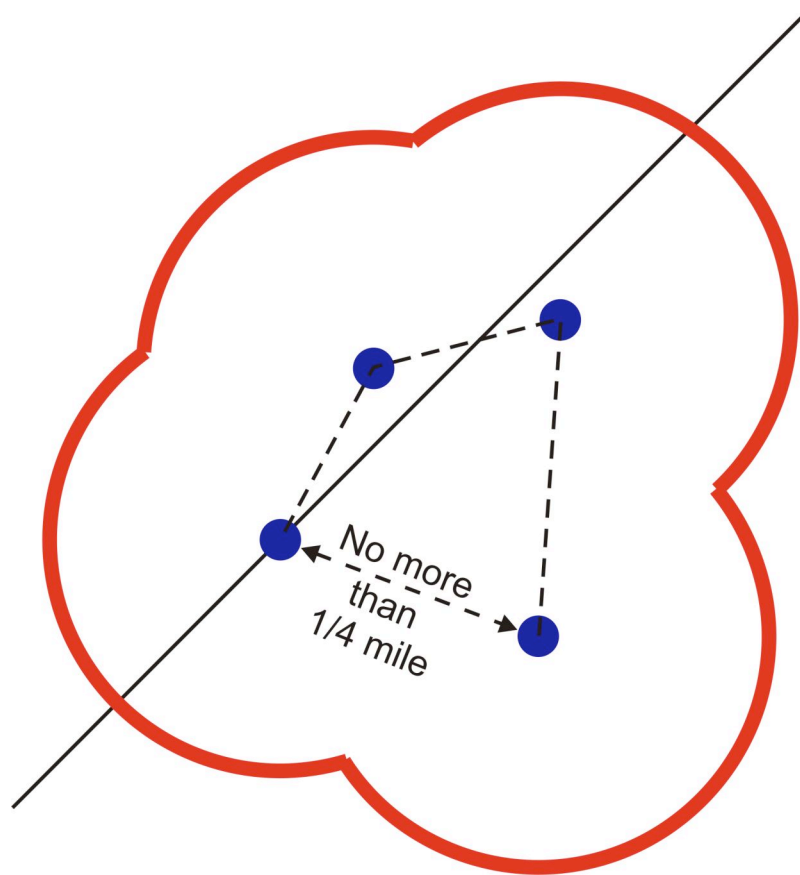


Criterion Partners 2007

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Neighborhood Completeness

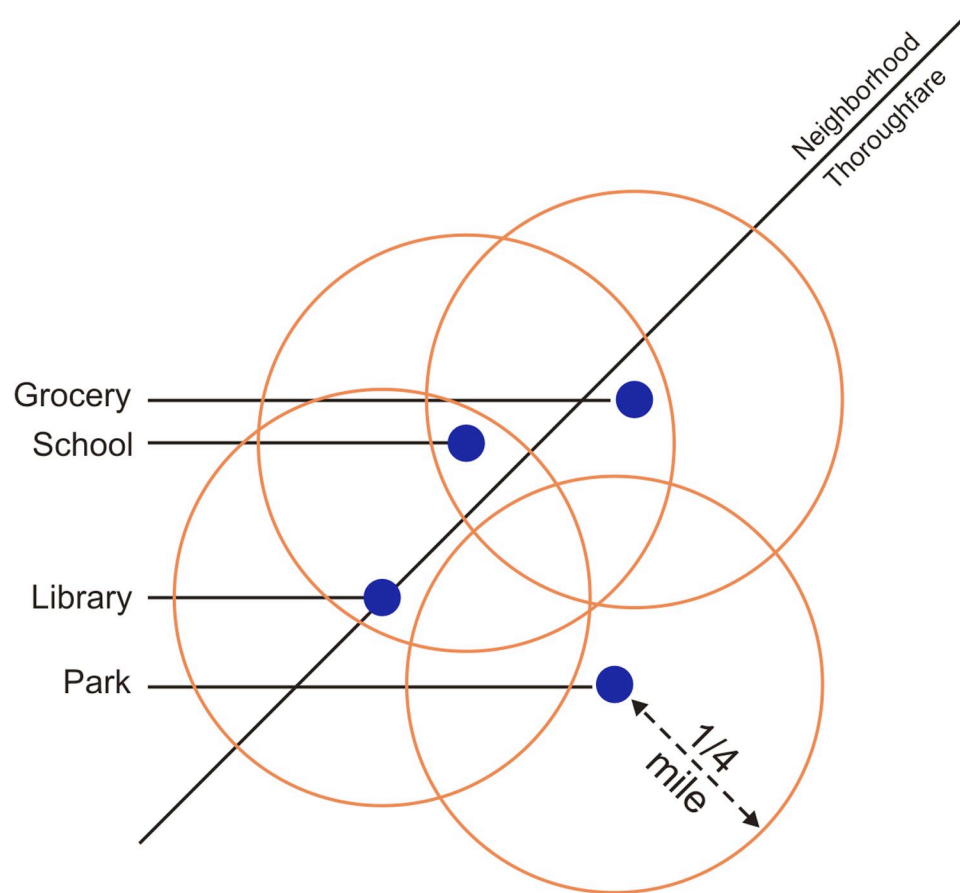


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Wisdom from N'hood

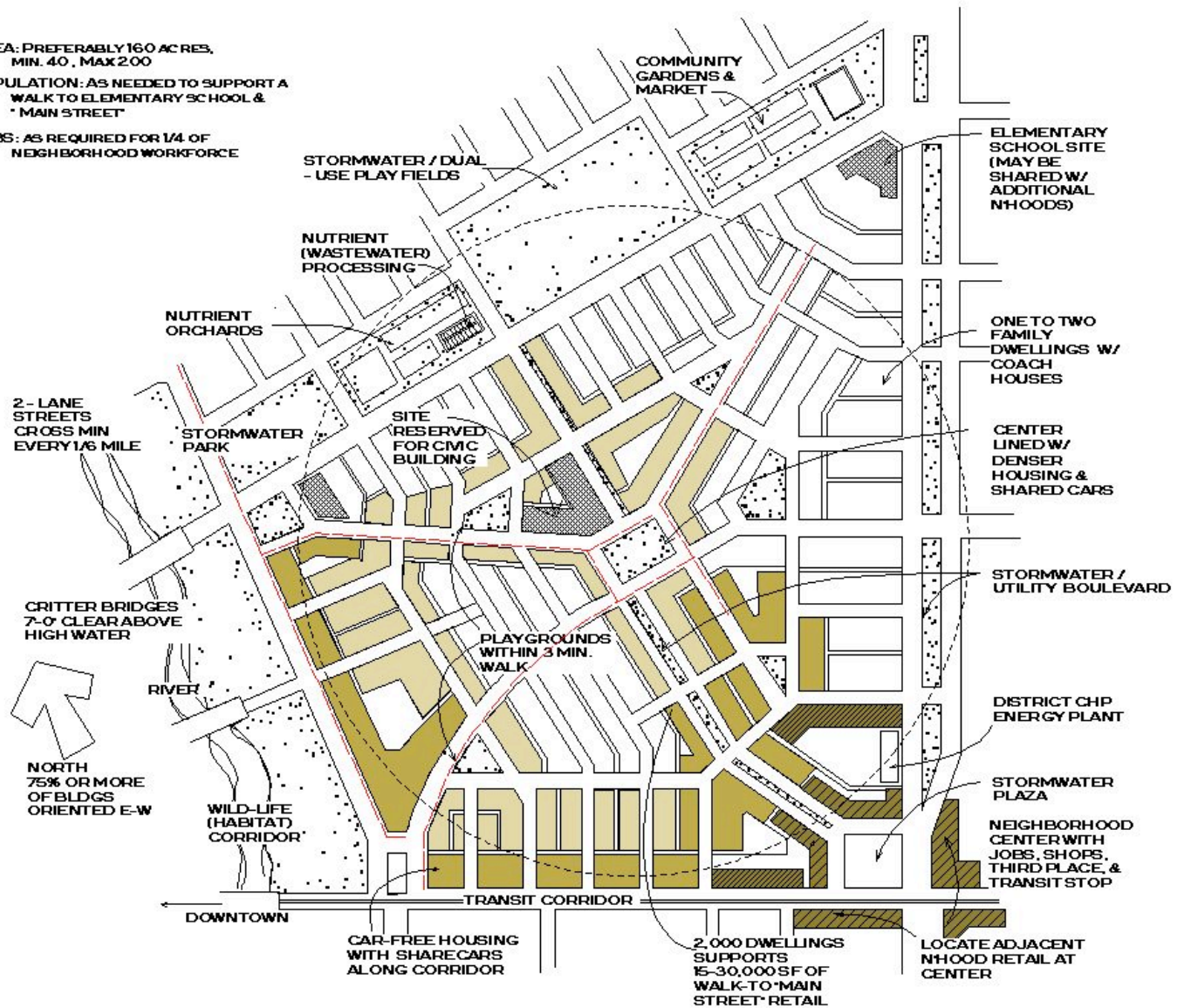


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AREA: PREFERABLY 160 AC RES,
MIN. 40, MAX 200
POPULATION: AS NEEDED TO SUPPORT A
WALK TO ELEMENTARY SCHOOL &
"MAIN STREET"
JOBS: AS REQUIRED FOR 1/4 OF
NEIGHBORHOOD WORKFORCE



A Sustainable Neighborhood

Rooftops (#) to support n'hood retail?

	Gross Retail Area (S.F.)	Dwellings Necessary to Support Retail*	TND's Necessary to Support Retail (6 DU/Gross Acre)	Sales (S.F.)	Avg. Annual Rent pr S.F	Avg. Trade Area
Corner Store	1,500-3,000	1,000	1	\$210	\$14-16	1 Neighborhood (5 Minute Walk)
Convenience Center	10,000-30,000	2,000	2	\$225	\$12-18	1 Mile Radius
Neighborhood Center	60,000-80,000	6-8,000	6 to 8	\$245	Highly varied from \$7.25 to \$40.00	1-2 Mile Radius

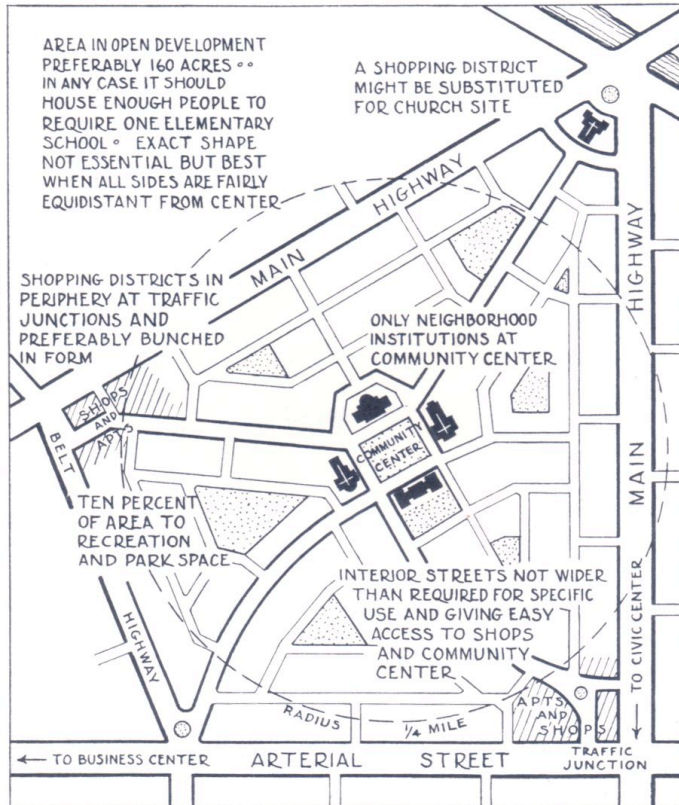


Gibbs Planning Group 2007

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Rooftops (#) to support n'hood retail?



160 acres Gross

100 or so acres Net

ND is min 7du/acre Net

ND 'hood has 700 du.

At ND minimum densities we cannot support one walk-to retail store!



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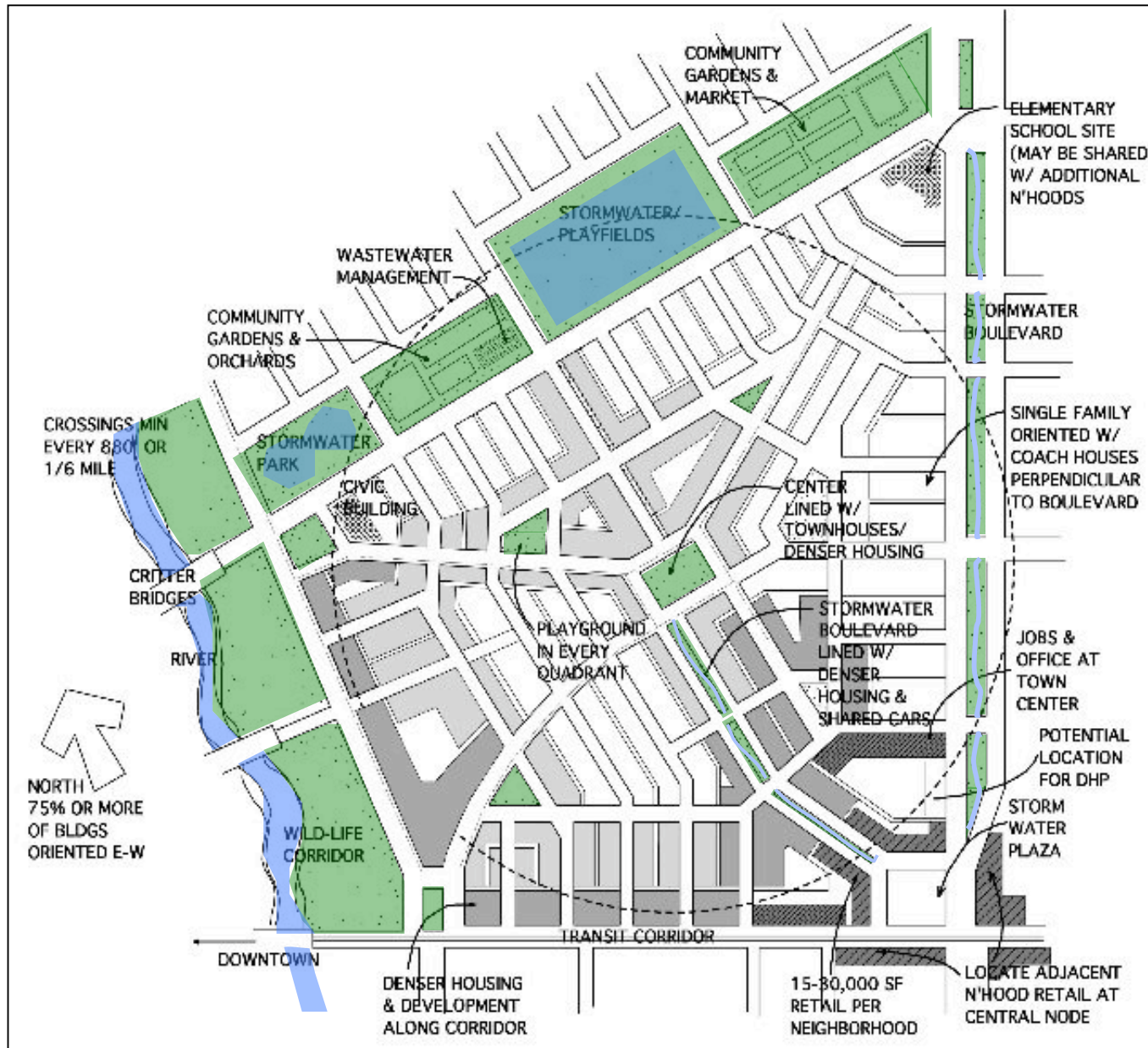
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Received wisdom from Gibbs

	Gross Retail Necessary to Support Retail Sales (\$/S.F.)	Density (Units/Acre)	Time to Build (Years)	Avg. Annual Rent pr S.F.	Avg. Trade Area
4. Kill Gibbs	1,500-3,000	1,000	1	\$210	\$14-16 1 Neighborhood (5 Minute Walk)
Convenience Center	10,000-30,000	2,000	2	\$225	\$12-18 1 Mile Radius
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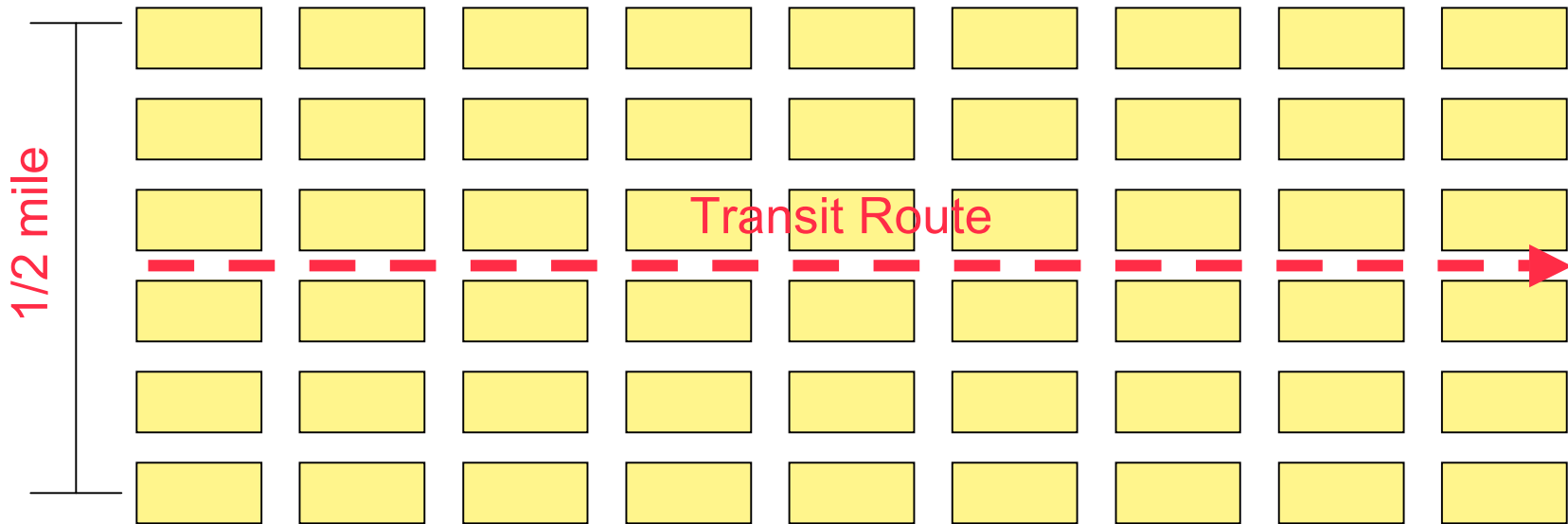


The Sustainable Neighborhood Unit



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Minimum Transit Corridor Densities



Bus
7 D.U./gross acre



Trolley/Light Rail
14-25 D.U./gross acre




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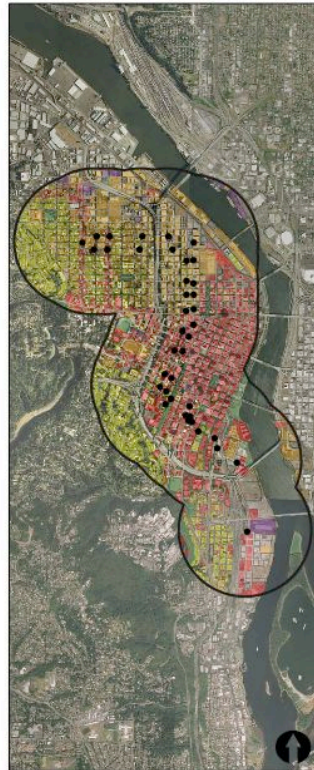
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Source: G.B. Arrington, Parsons Brinkerhoff

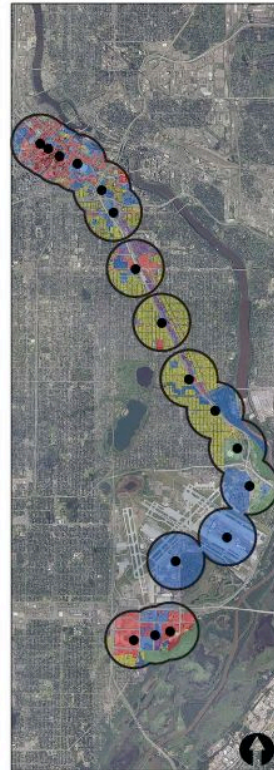
Transit Corridor

Comparing Corridors

- LEGEND**
- Existing Or Proposed Rail Station
- Land Use
- Residential
 - Commercial
 - Industrial
 - Civic
 - Mixed Use
 - Vacant/Misc.
-  The Circle on Each Map Represents the Half Mile Radius from the Station



Portland Streetcar



Minneapolis Hiawatha Line



Boston Fairmount Line



Charlotte South Corridor



Shelley Poticia

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Minimum Transit Corridor Densities

Mode	Service	Minimum Necessary Residential Density (dwelling units per acre)	Remarks
Dial-a-bus	Many origins to many destinations	6	Only if labor costs are not more than twice those of taxis
Dial-a-bus	Fixed destination or subscription service	3.5 to 5	Lower figure if labor costs twice those of taxis; higher if thrice those of taxis
Local bus	"Minimum," ½ mile route spacing, 20 buses per day	4	
Local bus	"Intermediate," ½ mile route spacing, 40 buses per day	7	Average, varies as a function of downtown size and distance from residential area to downtown
Local bus	"Frequent," ½ mile route spacing, 120 buses per day	15	
Express bus —reached on foot	Five buses during two hour peak period	15 Average density over two square mile tributary area	From 10 to 15 miles away to largest downtowns only
Express bus —reached by auto	Five to ten buses during two hour peak period	3 Average density over 20 square mile tributary area	From 10 to 20 miles away to downtowns larger than 20 million square feet of non-residential floorspace
Light rail	Five minute headways or better during peak hour.	9 Average density for a corridor of 25 to 100 square miles	To downtowns of 20 to 50 million square feet of nonresidential floorspace
Rapid transit	Five minute headways or better during peak hour.	12 Average density for a corridor of 100 to 150 square miles	To downtowns larger than 50 million square feet of nonresidential floorspace
Commuter rail	Twenty trains a day	1 to 2	Only to largest downtowns, if rail line exists

Source: Regional Plan Association



RPA. Zupan 2006

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Emerging Thresholds of Sustainable Urbanism

Transit Technology

Technology	Heavy Rail	Commuter Rail	Light Rail	Modern Streetcar	Heritage Streetcar	Bus Rapid Transit	Express Bus
Example Cities	Washington DC New York Subway Chicago	Boston Chicago San Francisco	Denver Portland Minneapolis	Portland Tacoma Seattle	New Orleans San Francisco Kenosha	Los Angeles Pittsburg Eugene	Most Cities Served by Bus Systems
Approximate Cost Per Mile (Millions)	\$50-\$250	\$3-\$25	\$20-\$60	\$10-\$25	\$2-\$12	\$4-\$50	\$1-\$2
Service Type	Regional/Urban	Regional/ Interurban	Regional/ Urban	Urban Circulator	Urban Circulator	Regional/Urban	Regional/Urban
Station Spacing/Type (Miles)	Urban Core <1 Periphery 1-5 Station/Platform	2-5 Station/Platform	.25-2 Sidewalk Sign/ Station/Platform	.25 Sidewalk Sign/ Platform	.25 Sidewalk Sign/ Platform	.25-2 Sidewalk Sign/ Station/Platform	Limited Stops Along Normal Bus Routes
Peak Service Frequency (Minutes)	5-10	20-30	5-30	8-15	8-15	3-30	10-30
Operating Speed (MPH)	30-80	30-60	20-60	8-12	8-12	8-12	30-80
Alignment/ROW Width	Separate ROW 25-33 Feet	Existing Freight ROW/ 37+ Feet	Street Running or Separate ROW/11-33 Feet	Street Running 11-24 Feet	Street Running 11-24 Feet	HOV or Separated Median/28 Feet	Street Running
Typical Power Source	Electric	Diesel/Hybrid	Electric	Electric	Electric	Diesel/Hybrid	Diesel/Hybrid
Photos							



Urbanism's Benefit to Stormwater

EXHIBIT 11: Summary of Findings

Scenario	Number of Acres Developed	Impervious Cover (%)	Total Runoff (ft ³ /yr)	Runoff Per Unit (ft ³ /yr)	Savings Over Scenario A: runoff per unit (%)
<i>One-Acre Level: Different densities developed on one acre</i>					
A: One house/acre	1	20.0	18,700	18,700	0
B: Four houses/acre	1	38.0	24,800	6,200	67
C: Eight houses/acre	1	65.0	39,600	4,950	74
<i>Lot Level: Eight houses accommodated at different density levels</i>					
Scenario A	8	20.0	149,600	18,700	0
Scenario B	2	38.0	49,600	6,200	67
Scenario C	1	65.0	39,600	4,950	74
<i>Watershed Level: 10,000 houses accommodated in one 10,000-acre watershed</i>					
Scenario A	10,000	20.0	187 M	18,700	0
Scenario B	2,500	9.5	62 M	6,200	67
Scenario C	1,250	8.1	49.5 M	4,950	74
Scenario	Summary of Build-out Examples				
<i>Watershed Level: Time Series Build-out Analysis: Build-out in 2000</i>					
Scenario A	10,000 houses built on 10,000 acres: 1 watershed is consumed				
Scenario B	10,000 houses built on 2,500 acres: ¼ of 1 watershed is consumed				
Scenario C	10,000 houses built on 1,250 acres: ⅛ of 1 watershed is consumed				
<i>Watershed Level: Time Series Build-out Analysis: Build-out in 2020</i>					
Scenario A	20,000 houses built on 20,000 acres: 2 watersheds are consumed				
Scenario B	20,000 houses built on 5,000 acres: ½ of 1 watershed is consumed				
Scenario C	20,000 houses built on 2,500 acres: ¼ of 1 watershed is consumed				
<i>Watershed Level: Time Series Build-out Analysis: Build-out in 2040</i>					
Scenario A	40,000 houses built on 40,000 acres: 4 watersheds are consumed				
Scenario B	40,000 houses built on 10,000 acres: 1 watershed is consumed				
Scenario C	40,000 houses built on 5,000 acres: ½ of 1 watershed is consumed				



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A

Thesis:



details of
image



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Designing Sustainable Human Environments



Corridor Planning

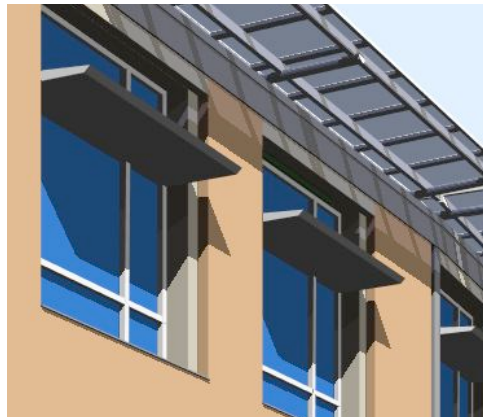
**Neighborhood
Planning**

Urban Design

Form-Based Coding

Green Architecture

Historic Preservation



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On the move, traveling at light speed



VMT increase 1980 to 1997: 68%

2000 U.S. VMT: 2,700,000,000,000 Miles

One Light Year: 5,800,000,000,000 Miles

Year U.S. Drivers will drive a light year 2025

SOURCE: FHWA, HIGHWAY STATISTICS 2000

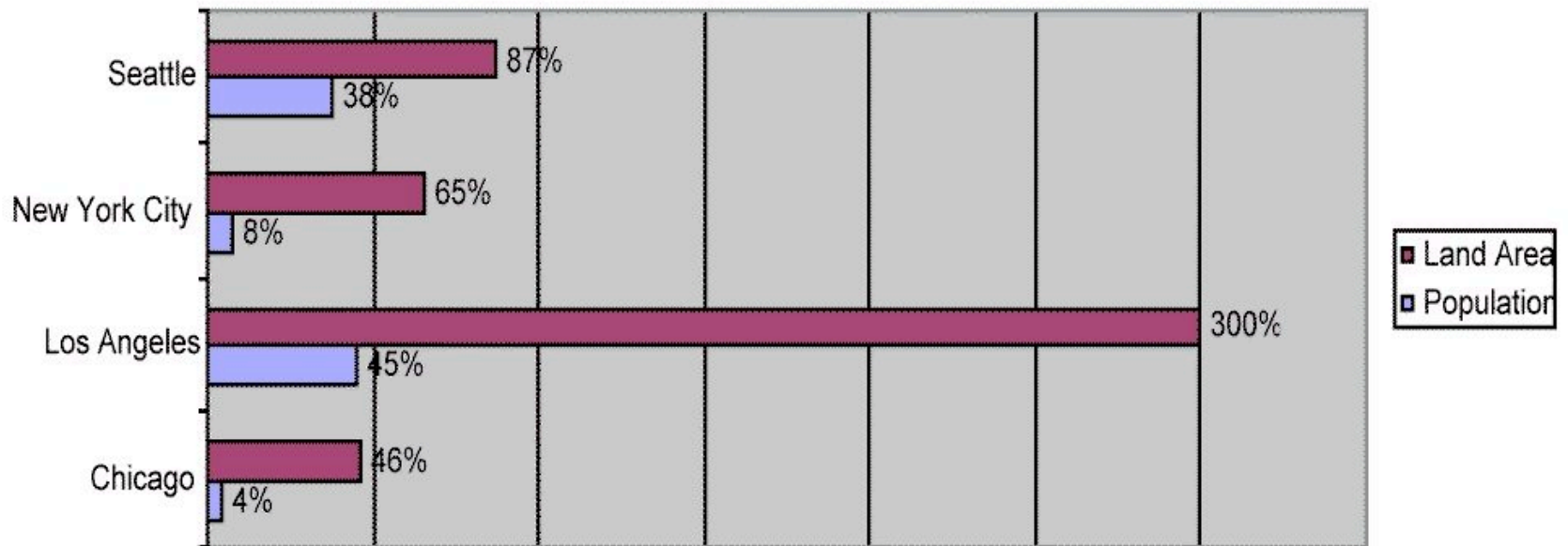


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We like to cover a lot of ground in a day

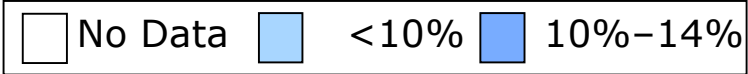
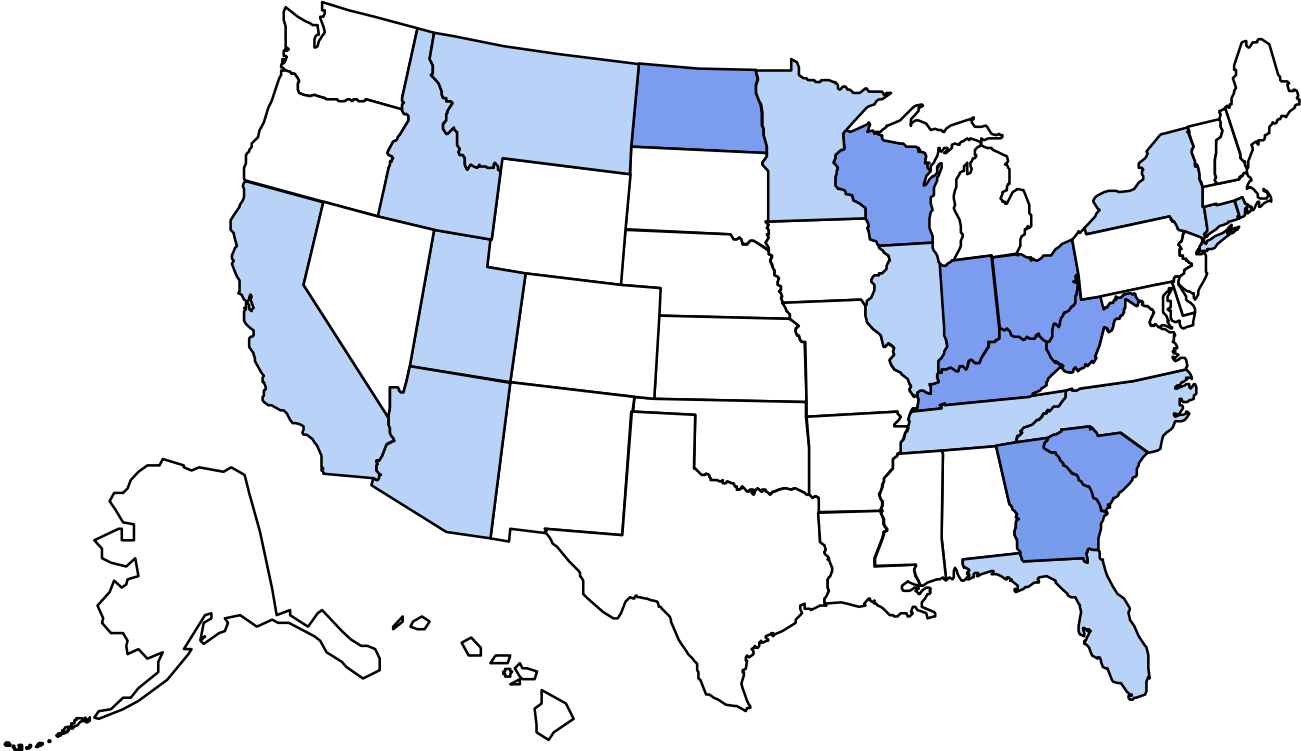
Expansion in Population and Land Area for Selected Metropolitan Areas, 1970 to 1990



A Big Country

Obesity Trends* Among U.S. Adults (BRFSS, 1985)

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)

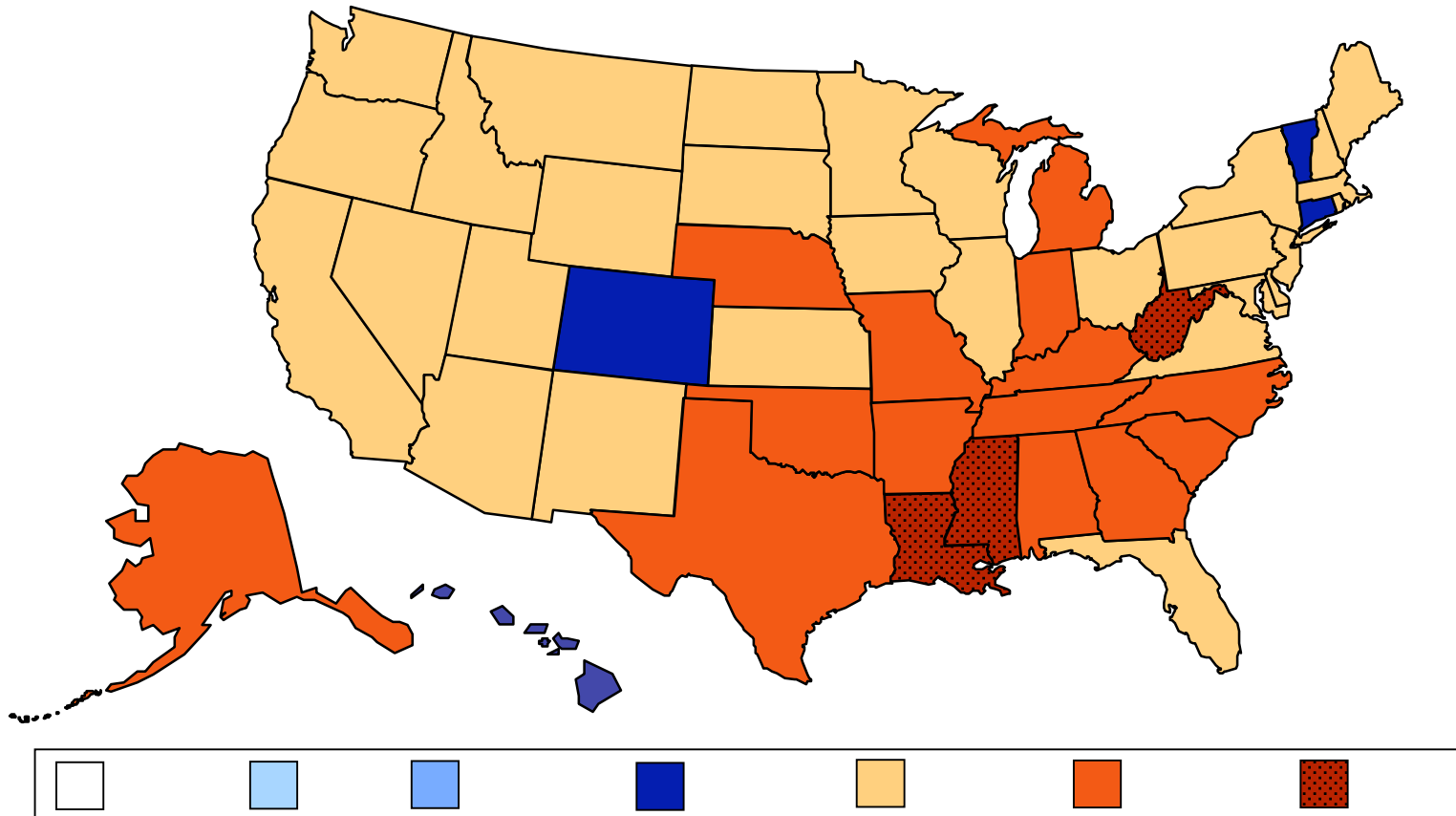


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And Growing . . .

Obesity Trends* Among U.S. Adults (BRFSS, 2005)

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)



No Data <10% 10%–14% 15%–19% 20%–24% 25%–29% ≥30%

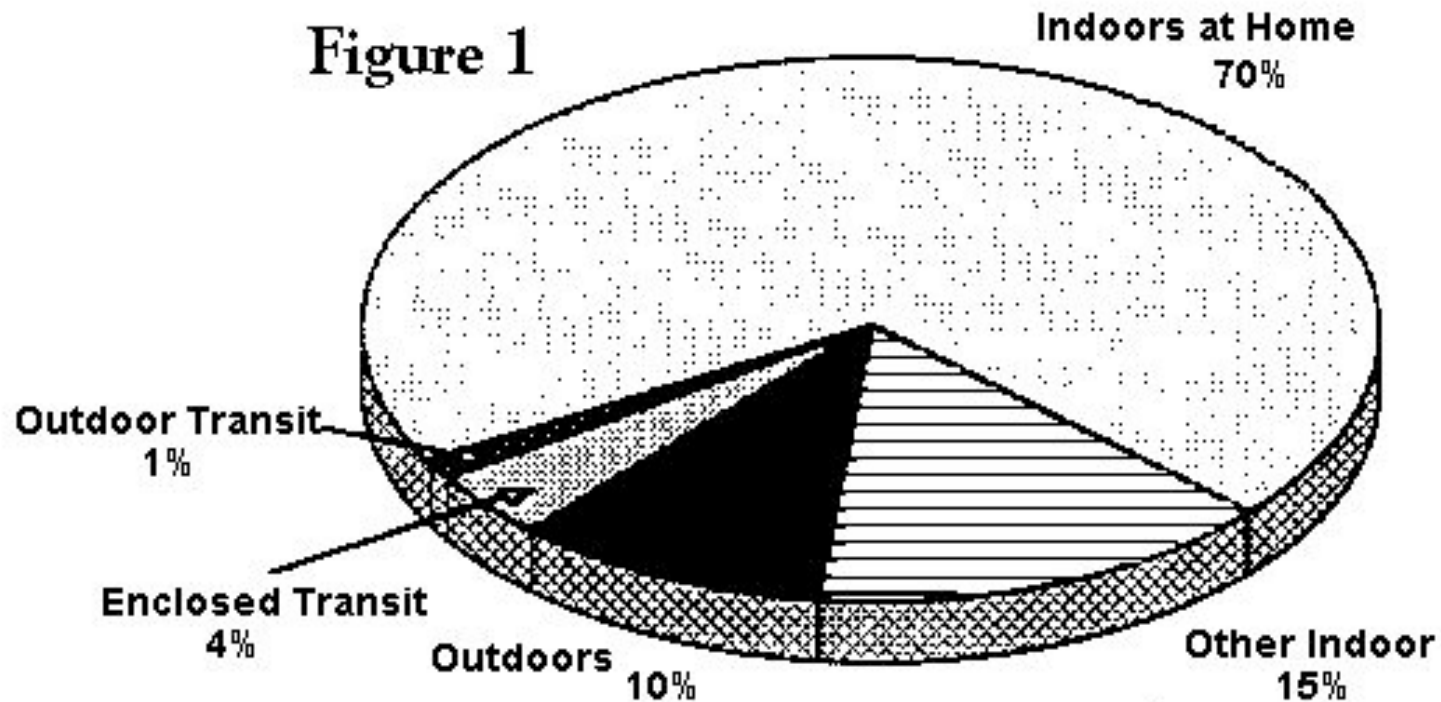
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Architects are good at indoor comfort

Time Spent Indoors - English speaking Californians 11 and younger

English speaking Californians 11 and younger



Indoor Air is 2 to 10 times more polluted than outdoor air



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We love to walk



Chicago, IL

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We Love the Fresh Air

Outdoors

Country



Base Case

City



10-50%
Dirtier

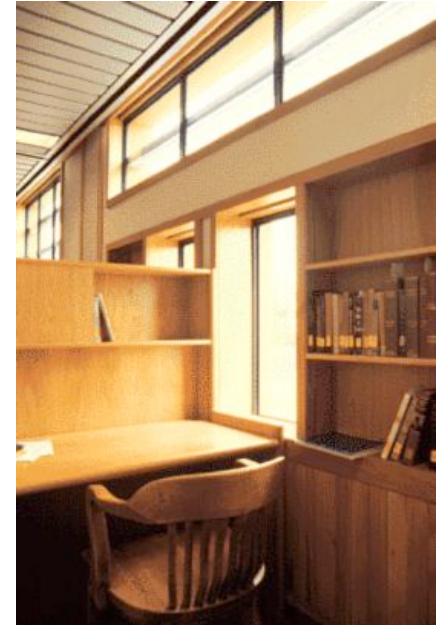
Indoors

Car in Traffic



200-1200%
Dirtier

In Building



200-1000%
Dirtier

11%

4%

85%



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We are just 5 minutes from there



1960's to present

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We love “running” errands



1960's to present

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We also support Public Transit

the ONION ***

VOLUME 36 ISSUE 43 AMERICA'S FINEST NEWS SOURCE 30 NOVEMBER-6 DECEMBER 2000

Report: 98 Percent Of U.S. Commuters Favor Public Transportation For Others

WASHINGTON, DC—A study released Monday by the American Public Transportation Association reveals that 98 percent of Americans support the use of mass transit by others.

"With traffic congestion, pollution, and oil shortages all getting worse, now is the time to shift to affordable, efficient public transportation," APTA director Howard Collier said. "Fortunately, as this report shows, Americans have finally recognized the need for everyone else to do exactly that."

Of the study's 5,200 participants, 44 percent cited faster commutes as the primary reason to expand public transportation, followed closely by shorter lines at the gas

automobile.

"When public transportation is not practical, commuters should at least be carpooling," Collier said. "Most people, unlike me, probably work near someone they know and don't need to be driving alone."

Collier said he hopes the study serves as a wake-up call to Americans. In conjunction with its release, the APTA is kicking off a campaign to promote mass transit with the slogan, "Take The Bus... I'll Be Glad You Did."

The campaign is intended to de-emphasize the inconvenience and social stigma associated with using public transportation, focusing instead on the positives.

Above: Traffic moves slowly near Seattle, WA, where a majority of drivers say they support other people using mass transit.




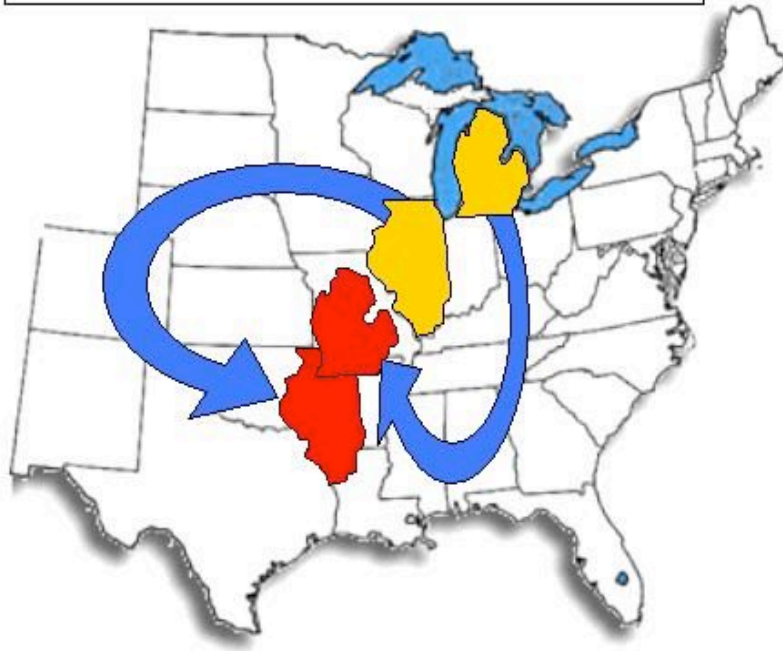
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

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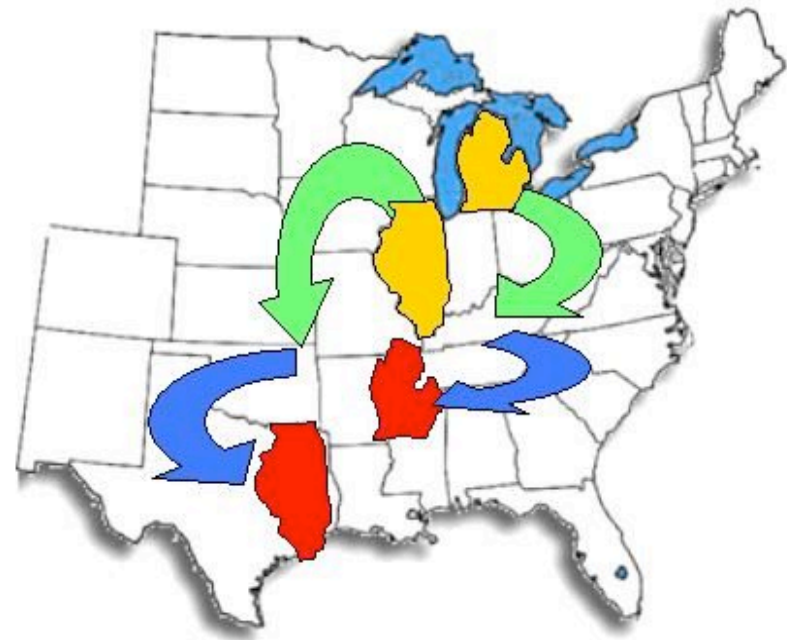
We love the Lone Star State

Projected Midwest Climate Change
(Union of Concerned Scientists)

Changing IL and MI Winters (DJF)
By 2030 – no change By 2095 



Changing IL and MI Summers (JJA)
By 2030  By 2095 



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Future (Insert Your State Here) Plant



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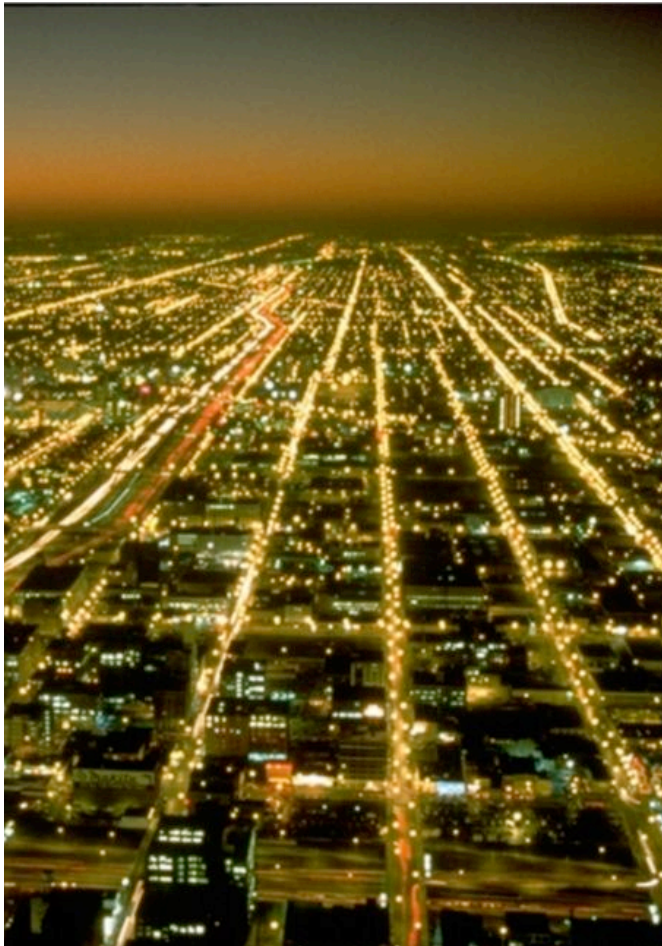
Living in harmony with nature



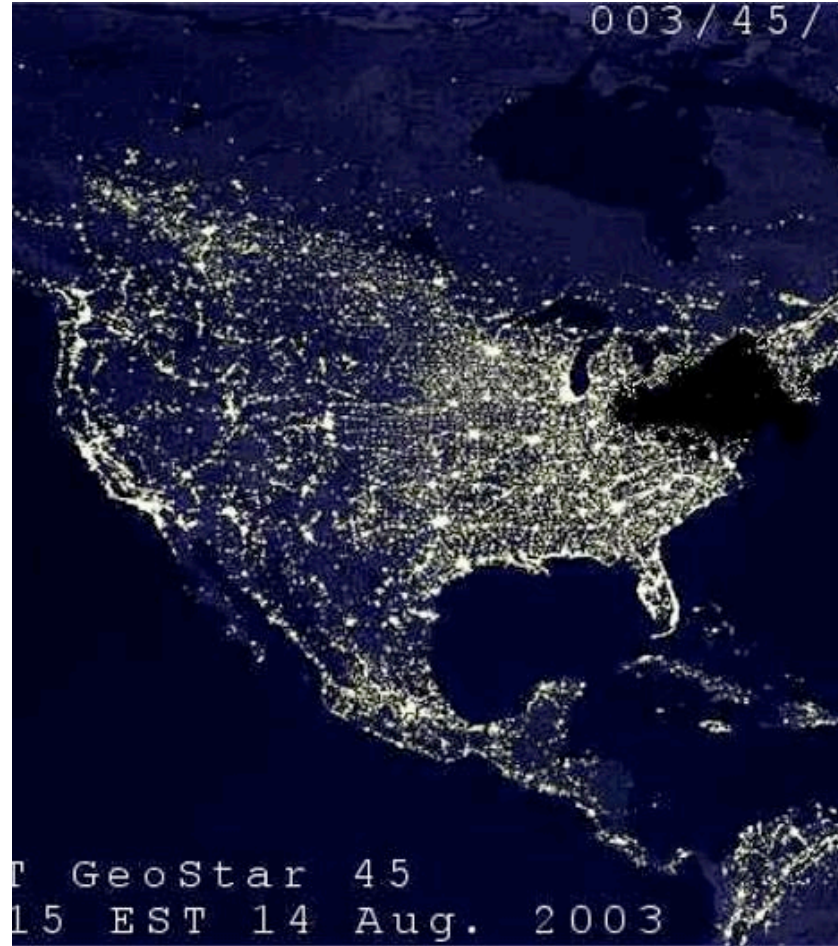
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We like to leave on a night light



View from Sears Tower



2003 Blackout?



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Our Motto: Live Hard, Die Young



“Over the next few decades, life expectancy for the average American could decline by as much as 5 years unless aggressive efforts are made to slow rising rates of obesity”



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We Elect Great Sustainability Leaders



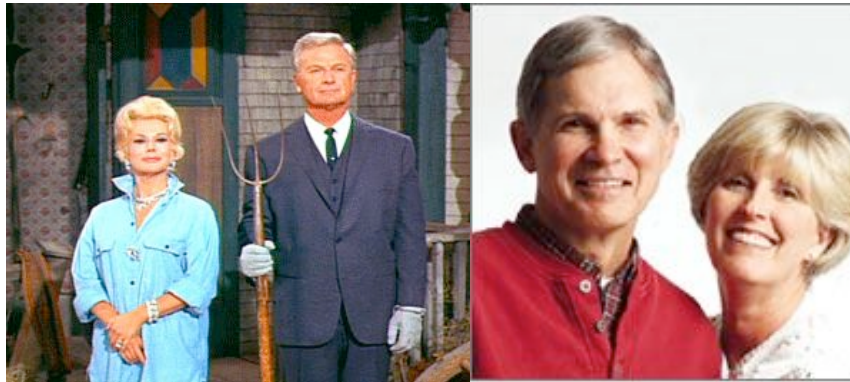
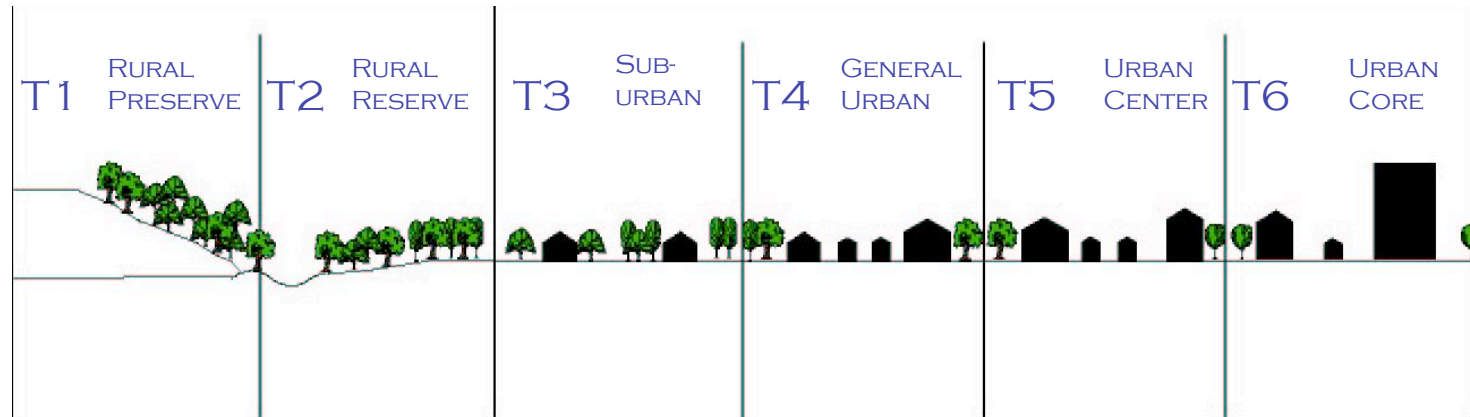
1968-1975

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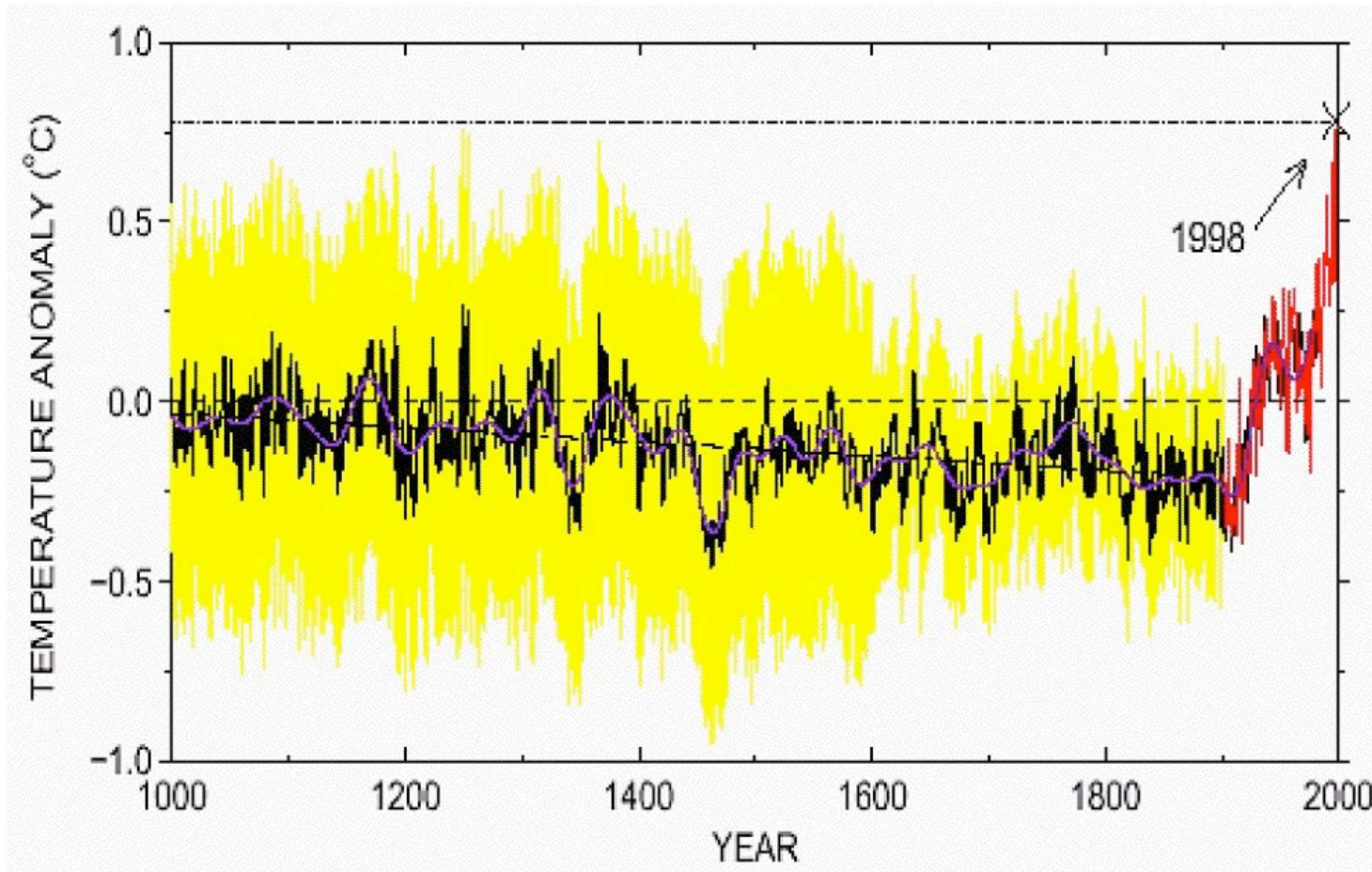
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We like to sink our roots

Average American Moves 7 Times



We Love Sports Analogies



1000 years of proxy weather data indicating 1998 is hottest



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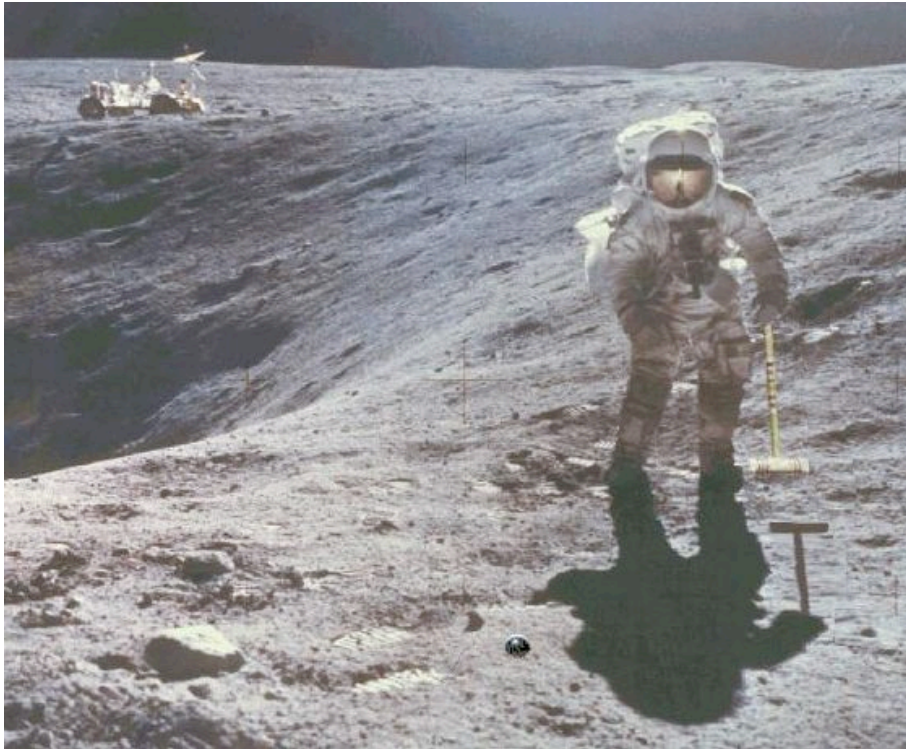
So what does all this have to do with the practice of architecture?



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Reforming the built environment is the moonshot of our times,



And architects can help lead



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Sustainable Urbanism: Urban Design with Nature

Publisher: John Wiley and Sons, October 2007

Walkable urbanism integrated with green buildings
and high performance infrastructure



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Book Thesis

By 2030, Sustainable Urbanism needs to become the dominant pattern of development in the U.S.



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Pioneering Reforms of Sustainable Urbanism 1996

The Ten Principles of Smart Growth

Congress for New Urbanism Charter

LEED invented



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