What If Sound Matters Too: Revisiting the Potential for Healthy Soundscapes

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September 21, 2011

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Chicago Tribune

18 Section 1 Sunday, June 4, 2000

Skip the car, buy a house

"There's a lot of hand-wringing nowadays about suburban sprawl and the need for "smart growth."

But like the weather, nobody's doing much about it.

Much of the home-buying public still opts for wide-open spaces along the metropolitan fringe. And despite thoughtful warnings from civic and regional groups, political realities in Illinois militate against significant governmental action.

Now comes a modest but innovative pilot program that just might make a small difference. Maybe even a big difference—*if* it educates the public about the true cost of living "out there."

It's called the Location Efficient Mortgage, or LEM, and it has been developed by environmental groups such as Chicago's Center for Neighborhood Technology along with Fannie Mae, the government-chartered, stockholder-owned repurchaser of home mortgages.

It works like this: Participating lenders, in evaluating applicants, take into consideration how close the dwelling is located to public transportation. If it's so close the applicant can live without a car, or a working couple can get by with just one, the estimate of disposable income is increased, and with it, the size of the mortgage for which they qualify.

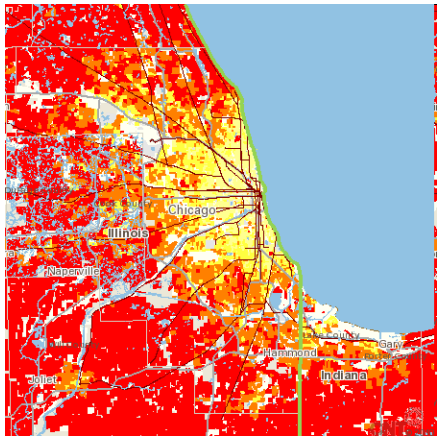
A couple jointly earning $60,000 and buying into Chicago's transit-rich Edgewater neighborhood, for instance, would qualify for a home selling for $212,218. Out in the boonies, under traditional guidelines, the limit would be $158,364.

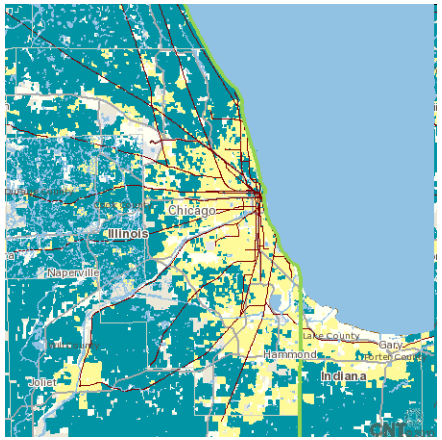
And there are sweeteners. LEMs are not subject to income limits and they offer more flexibility, including lower down payments, than conventional mortgages. The City of Chicago, moreover, is offering vouchers worth $900 toward the purchase of energy-efficient appliances to the first 100 LEM borrowers.

Downsides? There's mandatory counseling. And for now it's limited to Chicago and three West Coast cities.

The ultimate value of LEM, however, may be to show, in ways people readily understand, that sprawl does impose costs. Some of that cost is paid, knowingly and gladly, by those who choose to live "out there." Much of it, however, is hidden, and paid indirectly by those who live "back here."

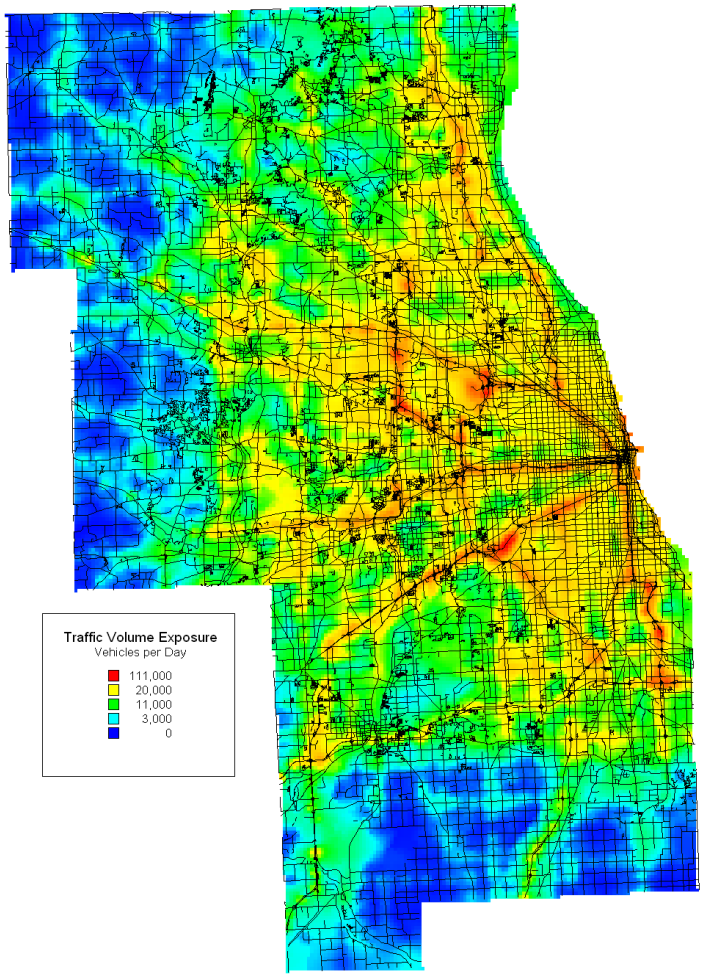
For more information about LEMs call 1-800-733-6643.





Health Risk from Living Near "Busy Roads"—Over 100 domestic and international studies find significant risk of morbidity and mortality from ultra-fine particles within 300 meters of traffic>=10,000 ADVT

- Within 50 meters of 10,000 average daily vehicles live 1.13 million persons or 14 percent of the region's population;
- Within 100 meters reside 2.12 million persons or 26 percent of the regional population;
- Within 200 meters reside 3.77 million persons or 47 percent of the regional population; and
- Within 300 meters reside 5.01 million persons or 63 percent of the regional population, respectively



But What About Health Risk and Annoyance from Living Near Noisy Roads

- Background noise in metro areas is dominated by traffic
- Health impacts range from distraction to heart attacks
- Variation is with traffic speeds, intensities, equipment, height, surface permeability, sound propagation path
- Traffic levels grew continuously until a few years ago, starting leveling then dropping even before the recession
- Function of cost, choice
- So we have a natural experiment

Profile of a Region of 1 Million Households—Is Money the Problem or…

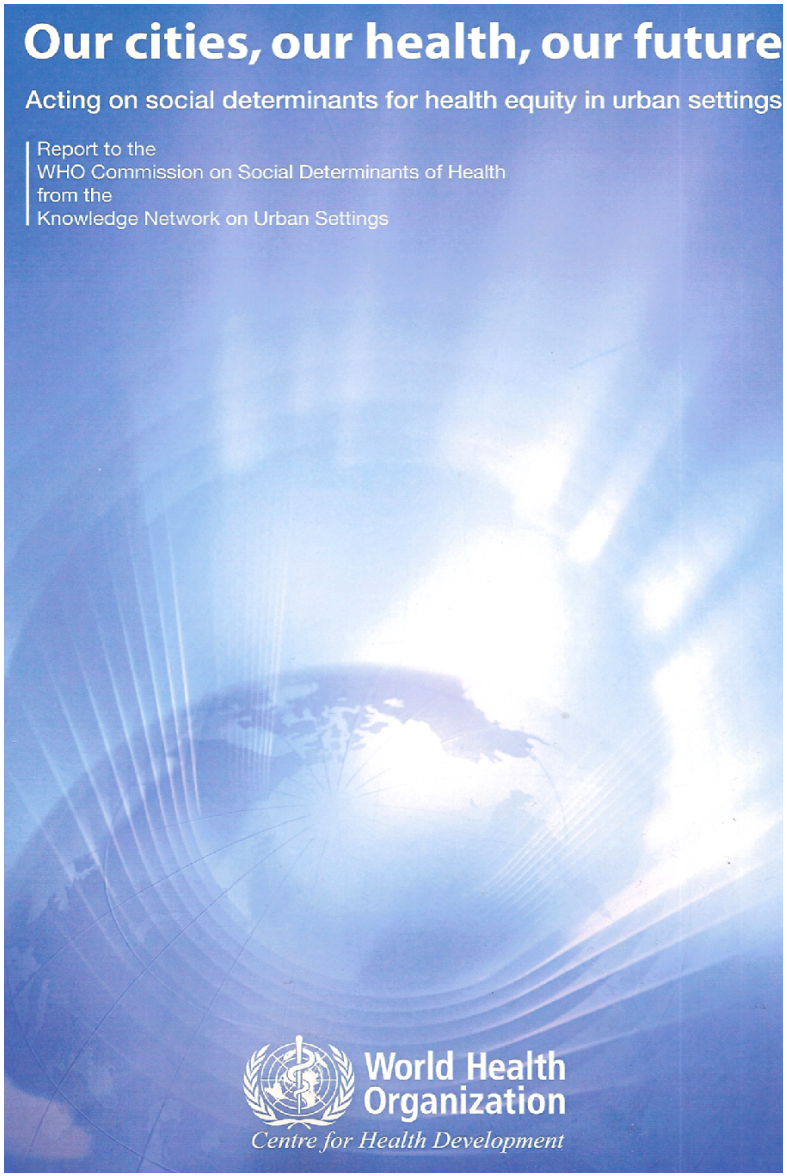
- Direct spending by households of $13 B
- Direct spending by businesses of $4 B
- Additional $2 Billion spent by local, state and federal government
- $19 total annual outlays
- Over half a trillion dollars over 30 year period
- 12 percent by government, roughly one-third each federal-state local
- 88 percent by users
- Greatest potential leverage is on the 88 percent
- Current focus is on the 12 percent

Purpose and Outline

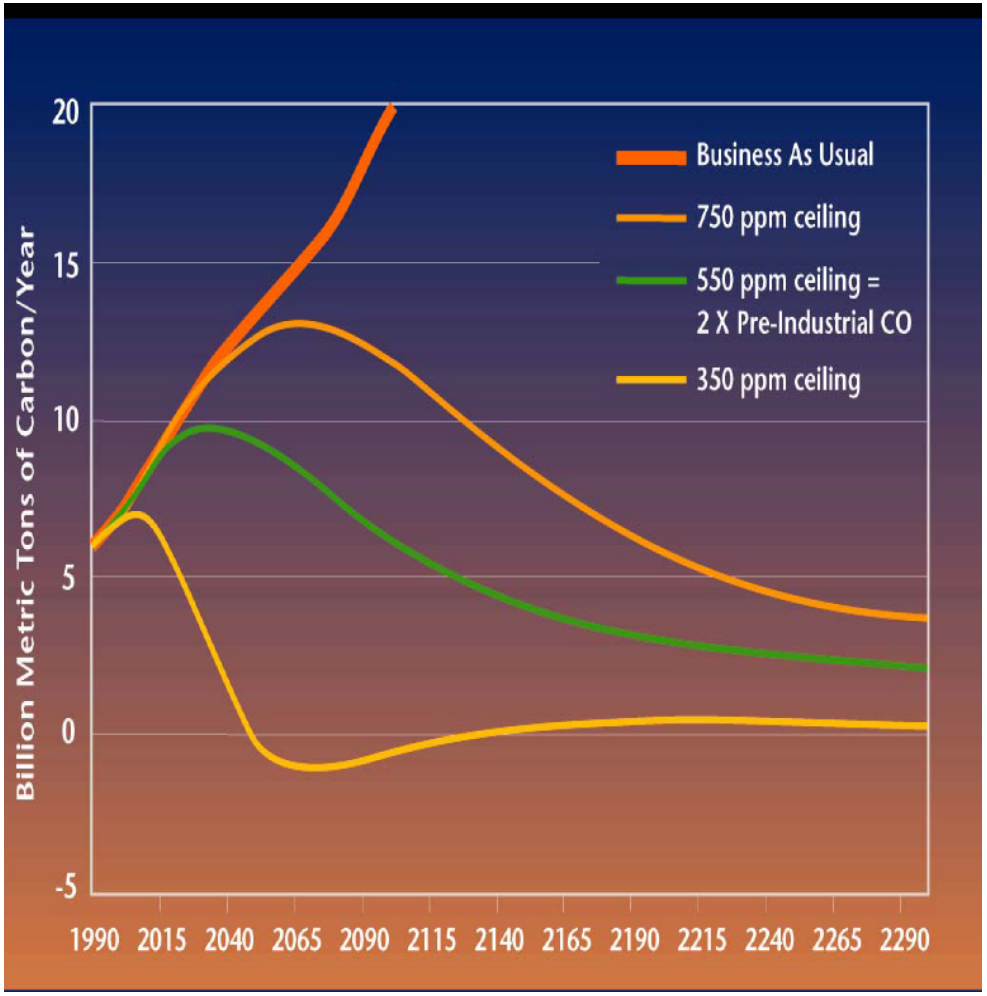
- Review some history of how our cities came to be built the way they are
- Review recent knowledge and tools used to help re-plan existing urban environments
- Explore ways in which both noise control and soundscapes can be seen as essential
- Suggest some next steps for exploring a useful synthesis of research and action here in Chicago

The Problem or the Solution?

- Henry Ford—"We will solve the problems of the city by leaving it"
- Frederick Ackerman—"Our Stake in Urban Congestion"
- Anna Tibaijuka—Cities are where 75% of the problem is
- Ban Ki-Moon—History demonstrates that integrated urban policy can be a solid path towards development



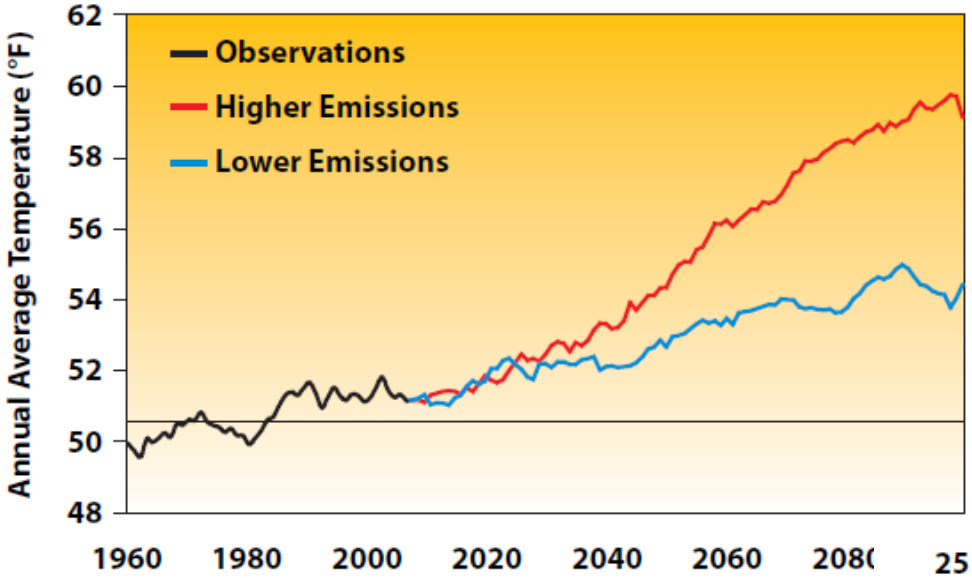
Time is Running Out

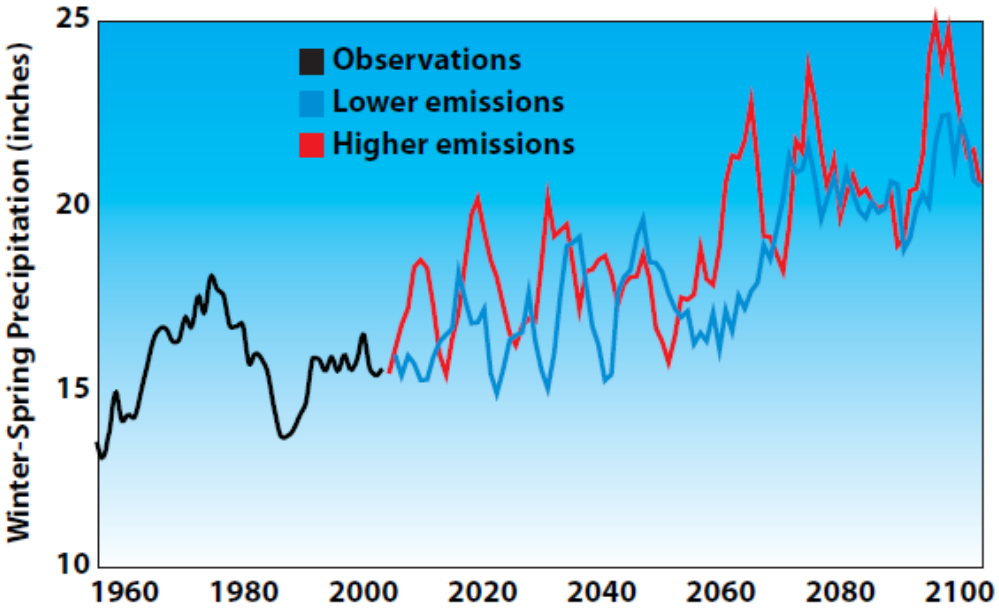


- Every ton counts
- Learning rates and deployment at least as important as invention
- A leaner world where "nothing and no one is wasted"
- Where we build and live is as important as what we build
- "No ton left behind"

Some Observations from Local Climate Protection

Impacts—Warmer, Wetter, Crazier





Riskier and Deadlier—Replication of 1995 Heat Deaths Frequently

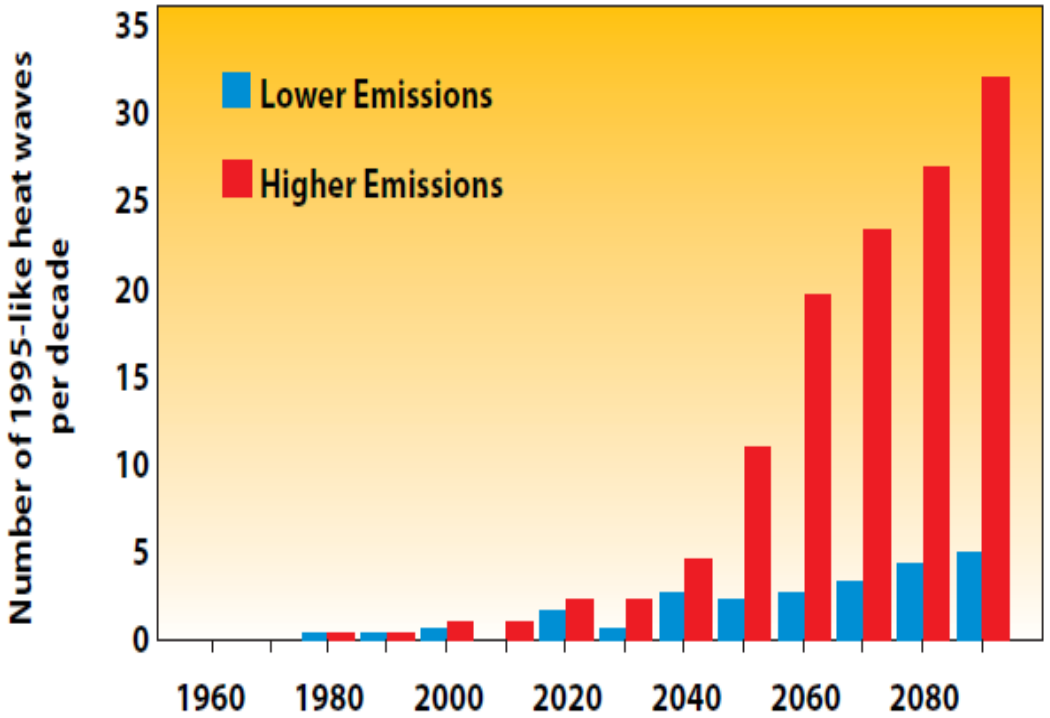
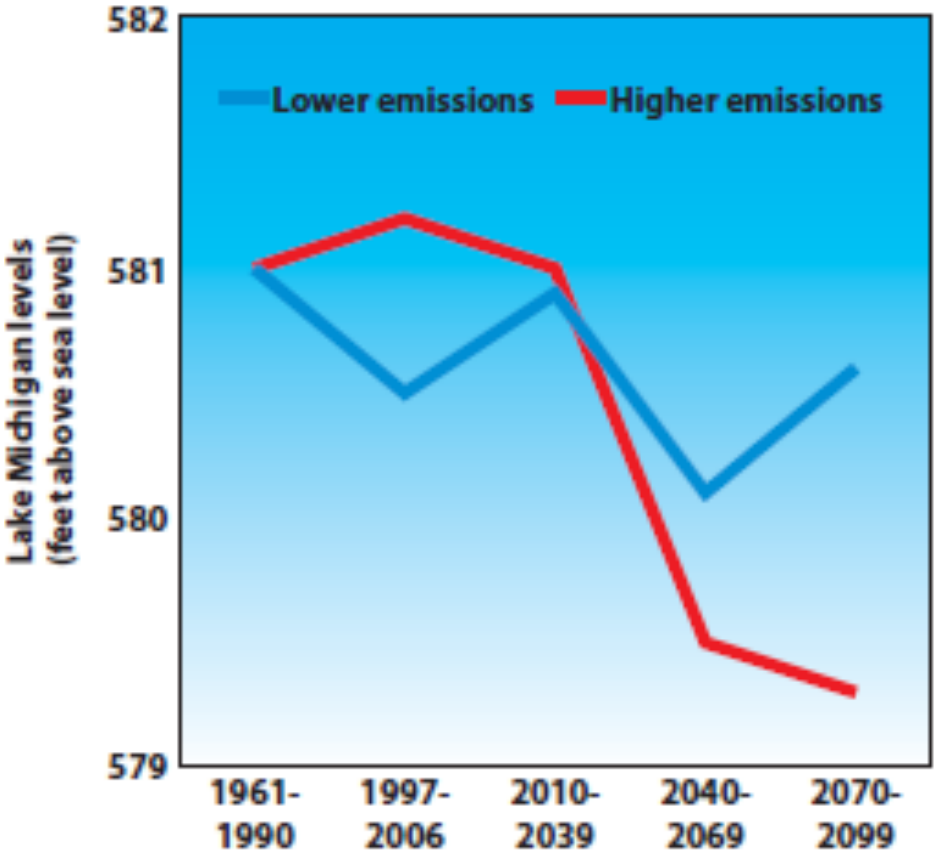


Figure 2 Average number of summers per decade with a Chicago heat wave similar to the 1995 heat wave.

Less Available Water & Riskier Quality



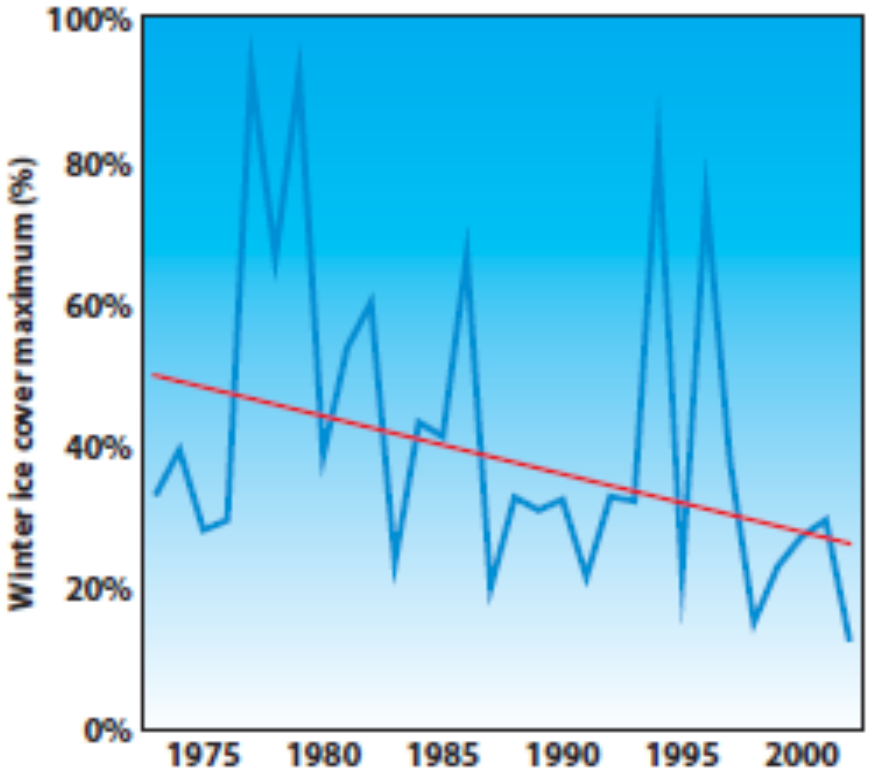


Figure 3 Decreases in winter ice cover on Lake Michigan *(Source: Assel, 2003)*. The red line represents the average.

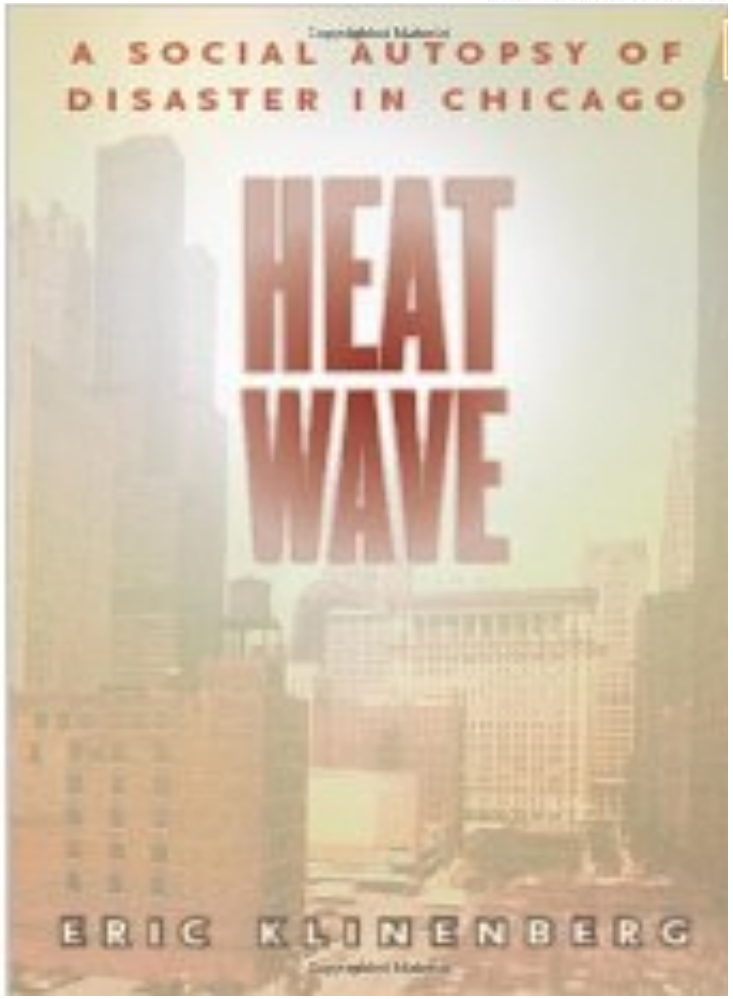
What Really Happened in 1995 Chicago Heat Wave?

- Dehydration, some alcoholism & older population at risk

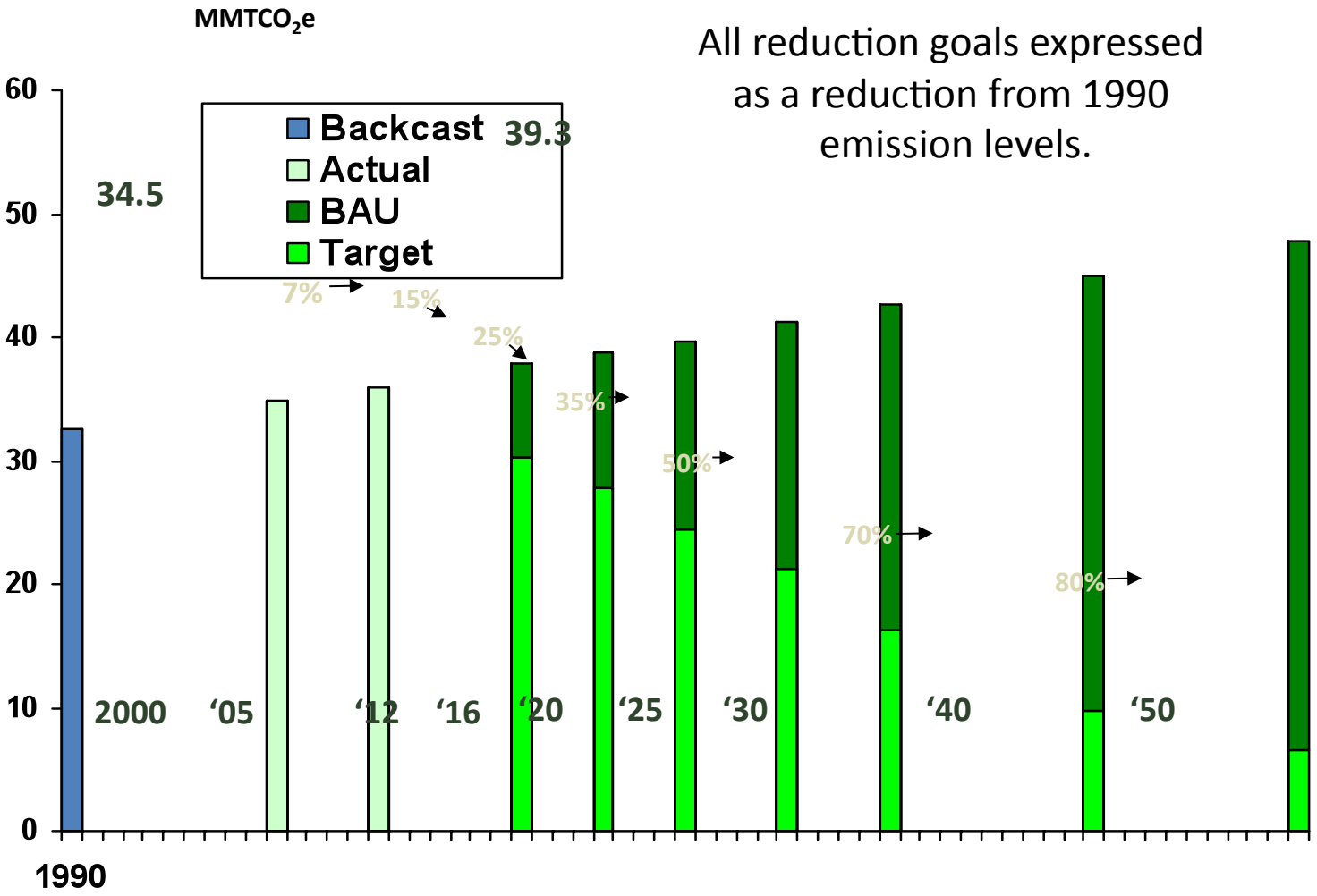
- ***Social exclusion—majority of deaths were people living alone, in SROs, in neighborhoods disconnected and without strong local organizations***

- City simply wasn't ready to connect the dots

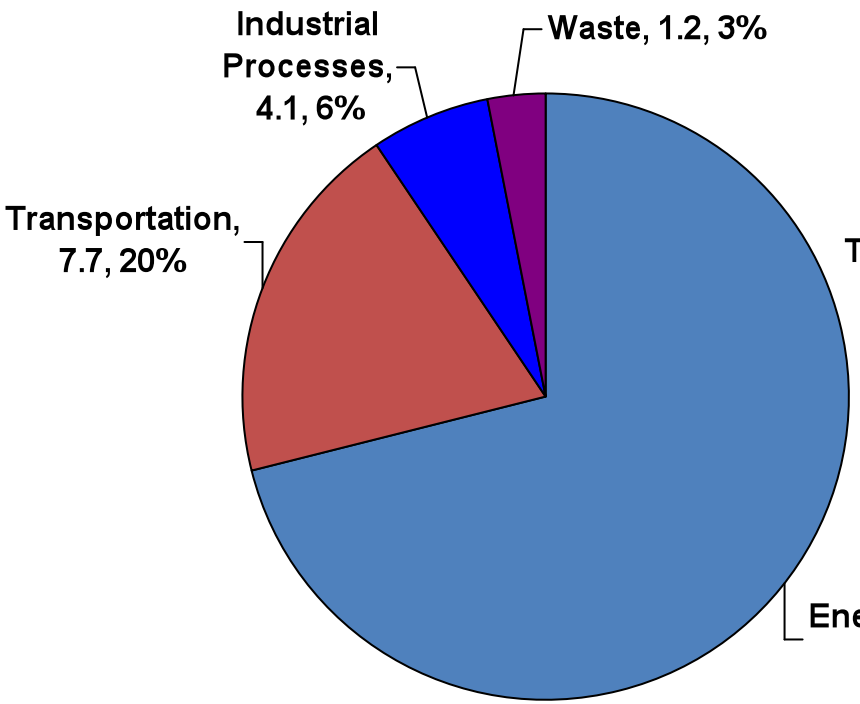
- Quickly turned this around in the same year—designated facilities as cooling centers—made communities more "porous"

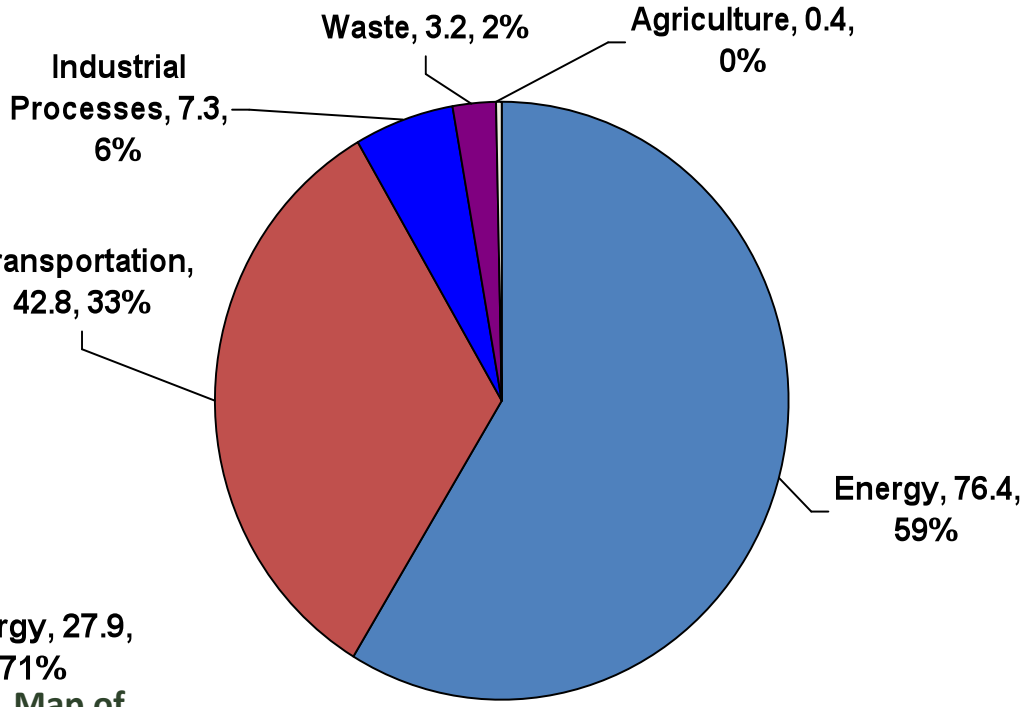


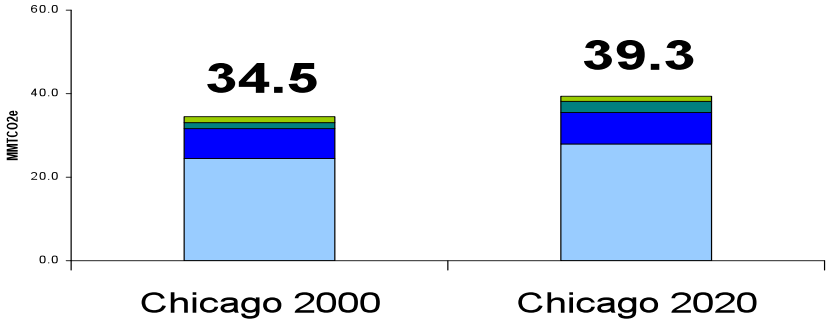
Chicago Climate Action Plan Reduction Goals

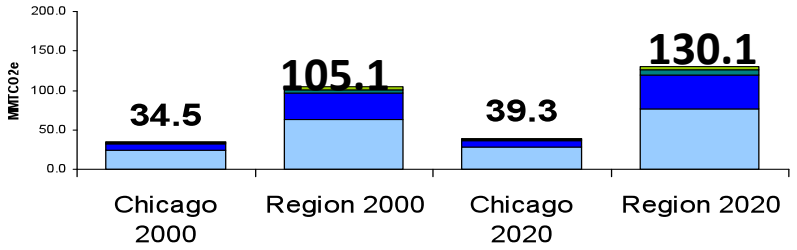


2020 Chicago vs. Metro Region Transportation GHGs Grow Twice as Fast in Suburbs



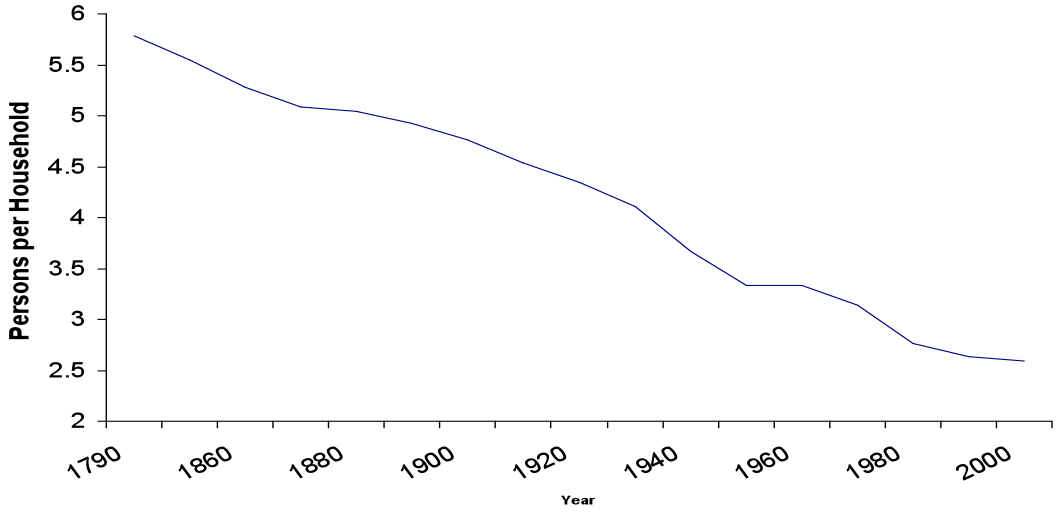


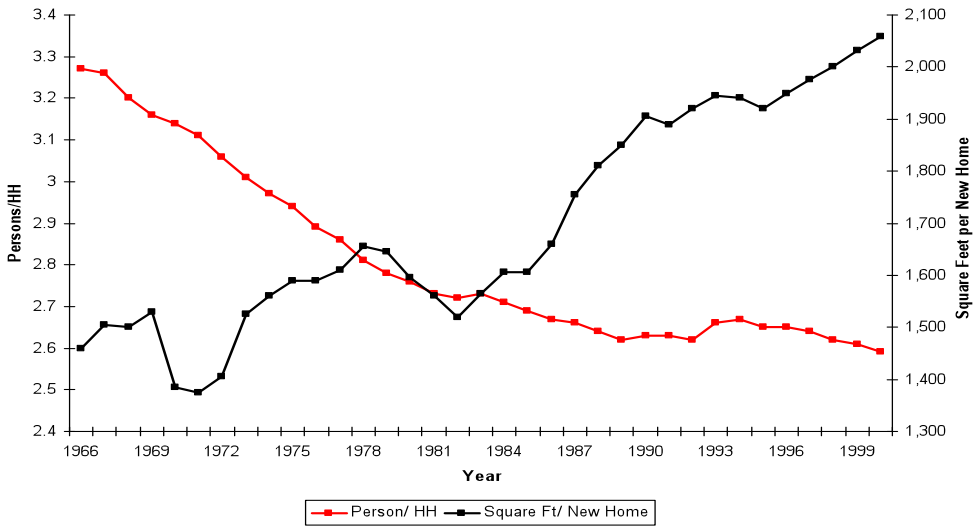




Demographic & Price Trends Promote Urbanism and Demand Reduction

- Continuous drop in household size since 1790
- HH Size dropped from 3.3 to 2.6 1960-2000 while home size built increased 1400-2100 square feet
- Aging in place
- "Married w/kids" only 23% of total
- Rising energy and gas prices
- Limited public funds to keep sprawling

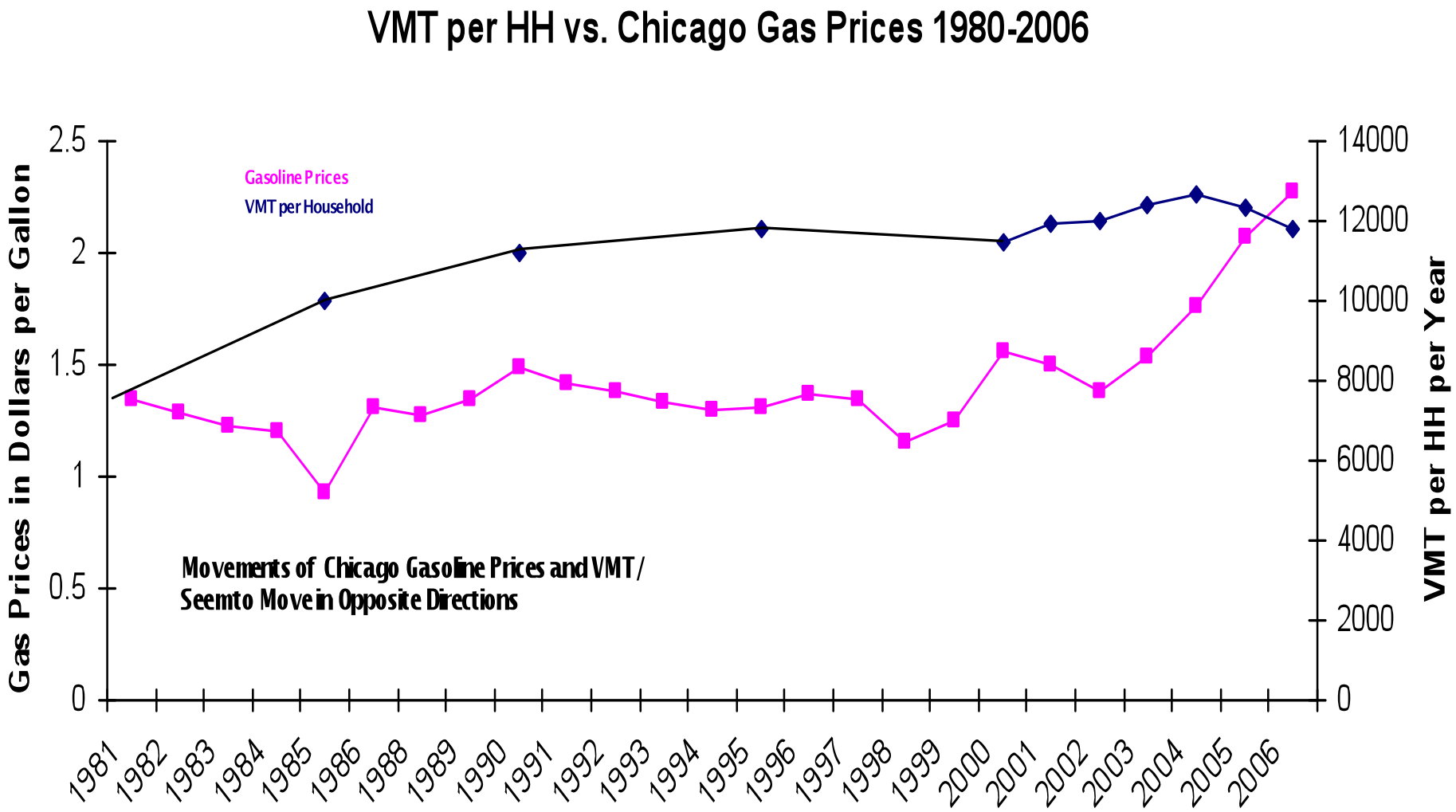




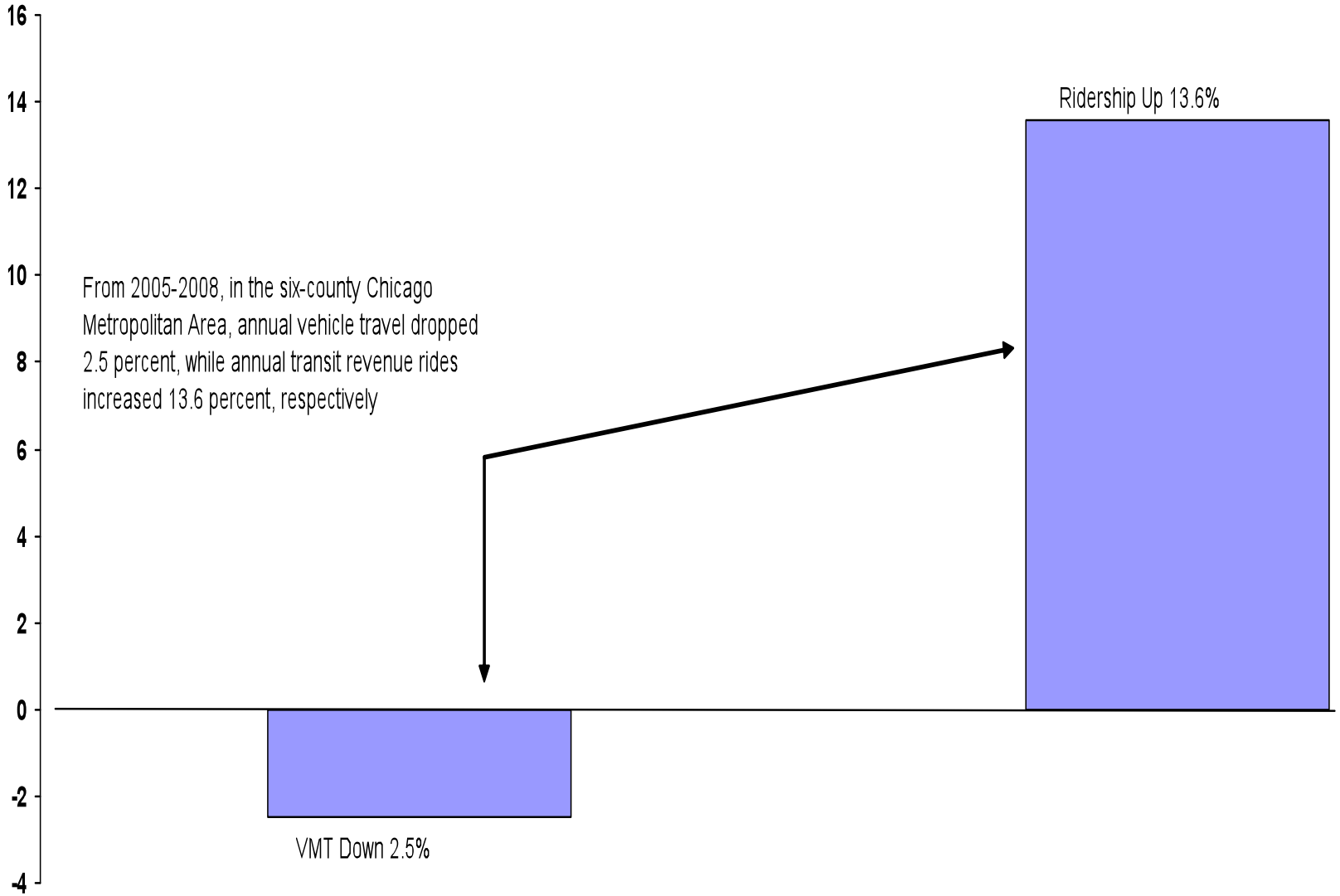
Economic Risk— Sprawl is Slowing in Chicago MSA—But Still Happening

- 1970-1990, land consumption up 55% vs population increase 4%; *14 to 1*
- 1982-1997, land consumption up 25.5% vs population increase 9.6%; *2.7 to 1*
- 1990-2001, land consumption up 11% vs population increase of 33 %; *0.33 to 1*

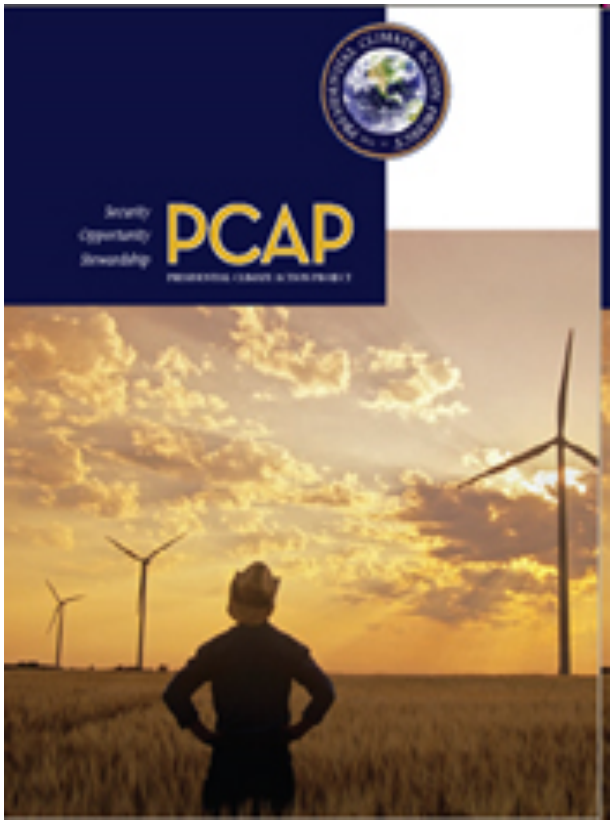
Chicago Household Demand Does Respond to the Cost of Driving…

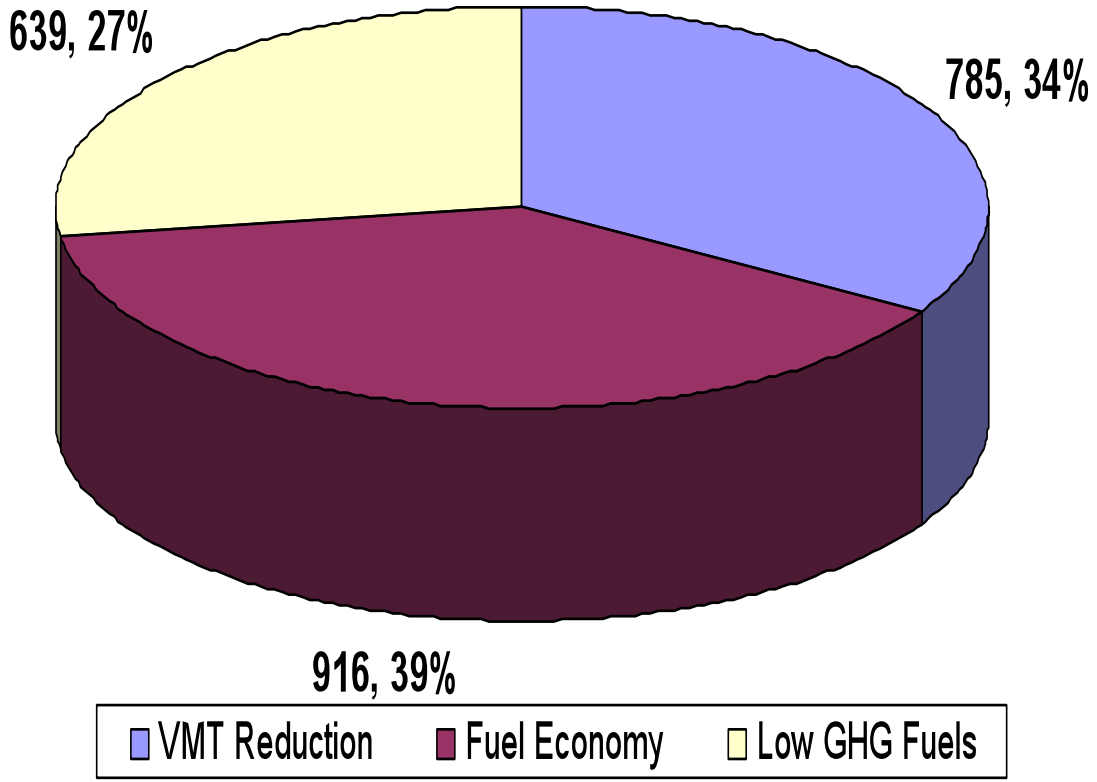


And Also to Better Choices: From 2005-2008, VMT Down 2.5%, Ridership up 13.6%; Annual VMT/HH Down 1%, Transit Up 4%



Passenger CO2 Savings from Reducing 1% Annual VMT, 4% Annual Fuel Economy— A 1.25% annual VMT reduction == fuel economy





What Is Infrastructure & Why Is It Important

- Shared area-wide assets that provide essential services to a common standard
- Involve tangible networked distribution to neighborhoods and communities
- Generally currently delivered through regional governments or utilities
- Starting to be delivered through distributed networks
- The cost of land + infrastructure == ½ the full cost of delivering the built environment

- Natural gas, electricity, water, sewerage, stormwater, local roads, highways, mass transit, telecommunications and fire/ school/police
- $50-$100k/unit + land

Similar Choices Comprise a Vision:

- Bottling Rainstorms and "Treating" Them
- Streets to Maximize Traffic & Speed
- Bypass Communities with Long-Distance Highways & Aviation
- Expand Electric Utility Capacity
- Expand Car Ownership
- Invest to Promote Consumption

Catching Raindrops Where They Fall

Streets to Connect People and What They Do Routinely

Reconnect Communities with Inter-City Rail

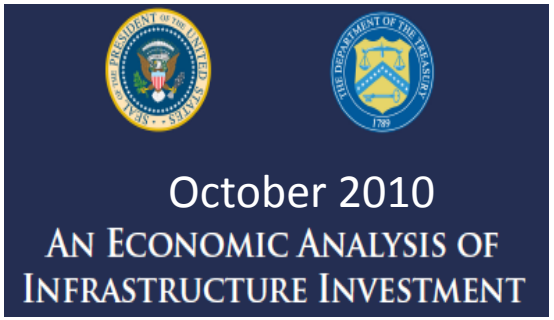
Increase Buildings & Community Efficiency

Communities that Come with Local Amenities and Shared Vehicles

Invest to Increase Productivity and Reduce Cost of Living

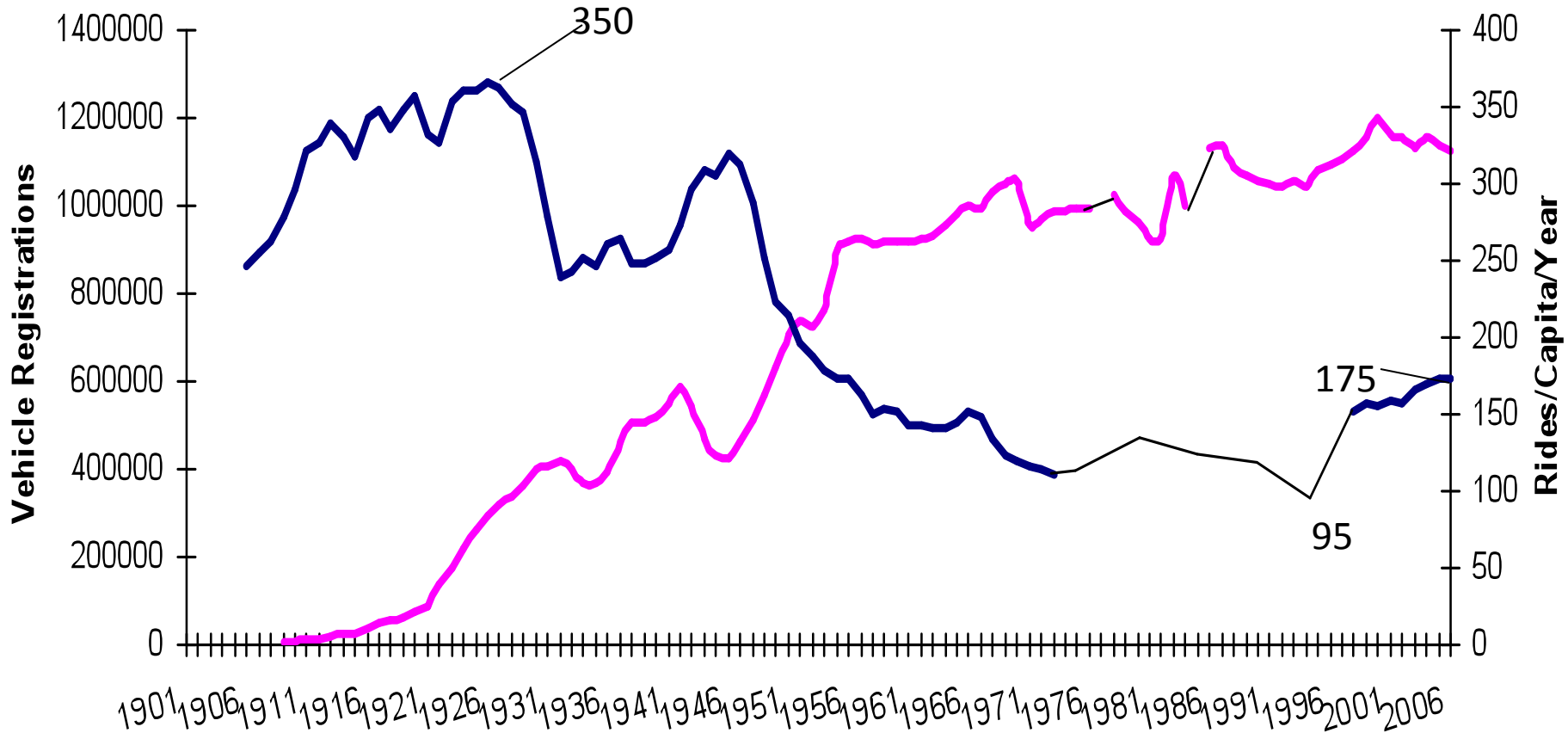
The Challenge Ahead—
National and Regional Readiness

- Inter-Agency Partnership for Sustainable Communities- Redefining Affordability
- HUD—New Office Of Sustainable Communities—both EE and Location Efficiency or LE
- USDOT—Likely New Program in Livable Communities
- Congress—Transportation authorization will include goals and performance measures, including affordability; five bills introduced to date to facilitate infrastructure finance
- New Funds Will Be Regionally Focused and Competitive
- October 2010—President Obama announced intent to pursue $50 Billion infrastructure investment, white paper includes affordability performance measure
- September 2011—American Jobs Act proposes National Infrastructure Bank, essentially the Kerry-Hutchison AIFIA



"Affordability, Value Creation + Capture, Job Creation +Support"

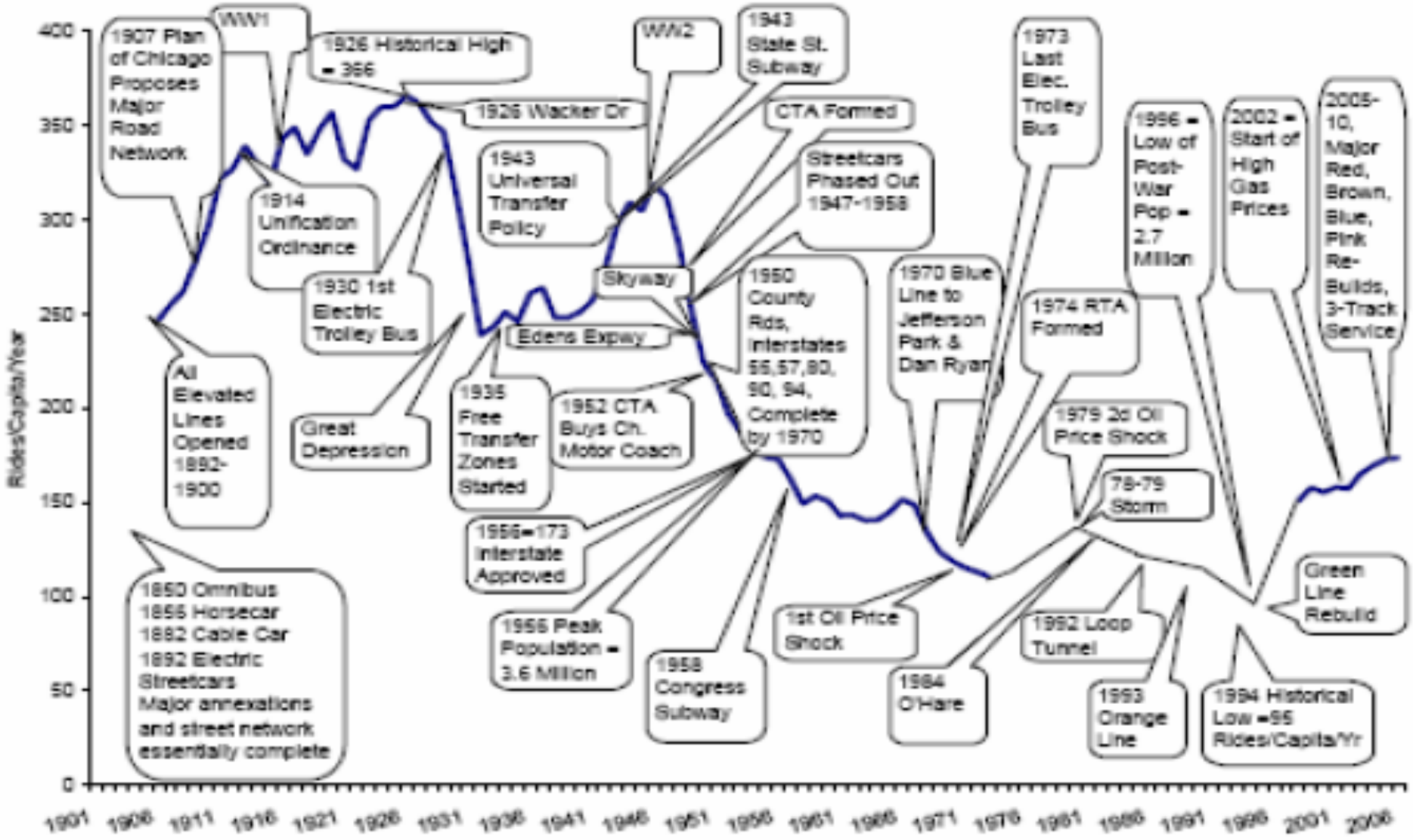
A Century of Mode-Shifting:
Chicagoans Respond to Level and Quality of Service
But We Still Haven't Caught Up to Our Potential



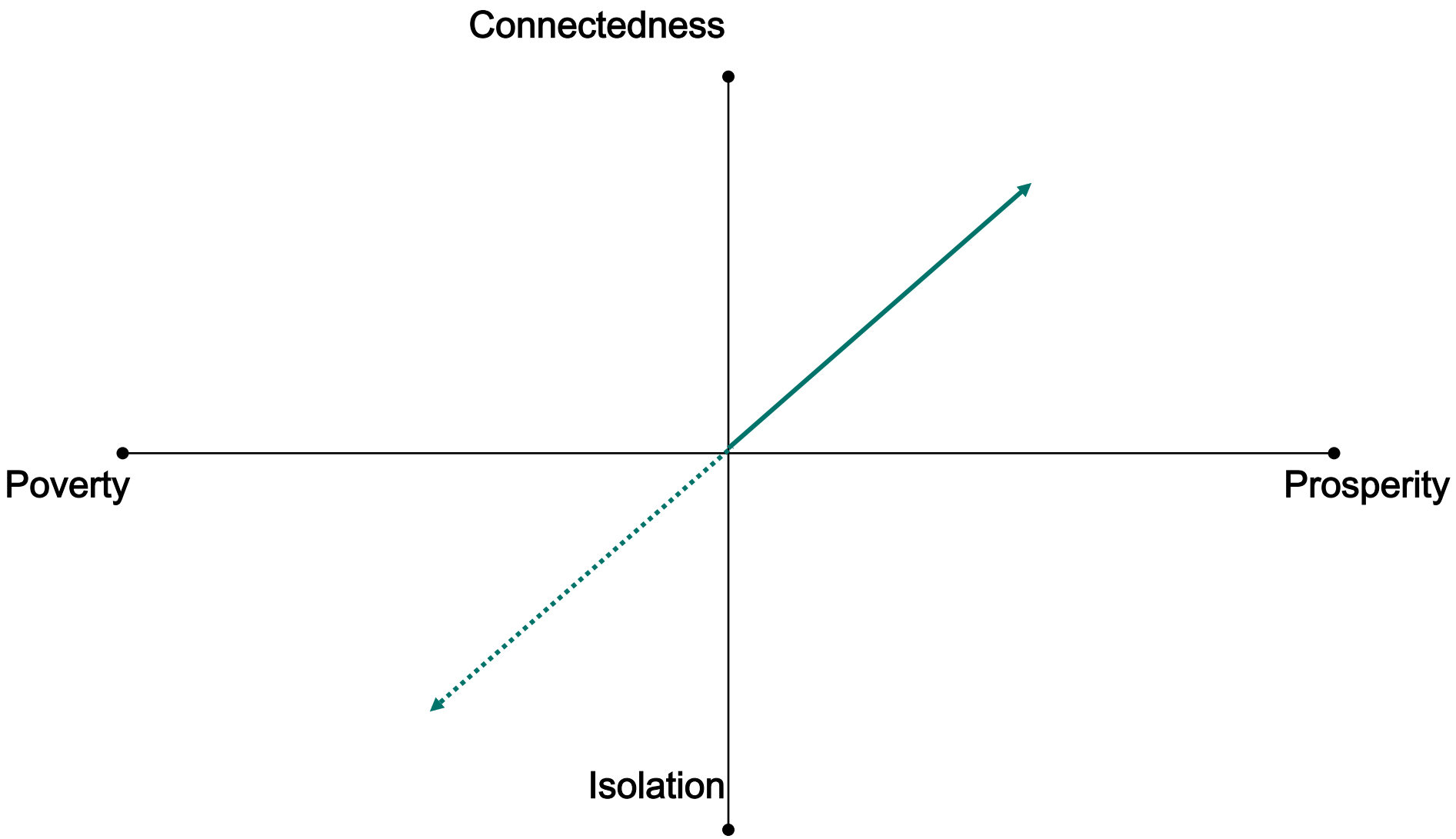
Transit Revenue Rides per capita per year

Vehicle registrations

A Century of Policies, Events and both Good and Bad Decisions



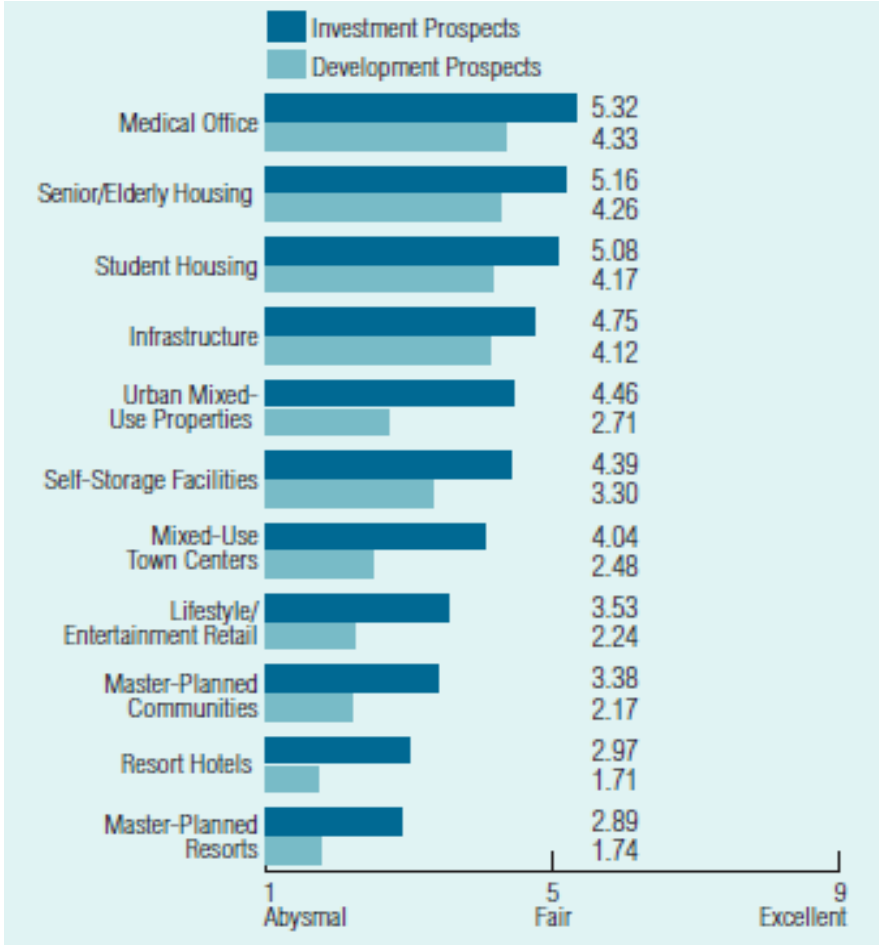
What a Nourishing Economy Does—Reduces Risk, Increases Gain



What a Nourishing Economy Does and Does Not Look Like

PriceWaterHouseCoopers and ULI 2012 Investor Survey Priorities in Synch with this View— Promote High-Density, Mixed-Use, Transit-Oriented

- Promote higher density infill markets near mass transit
- Underserved markets could pick up by 2011
- Multi-family still best residential bet
- Focus on 24-hour markets
- Stronger niches in medical office, elderly housing, student housing, infrastructure, urban mixed use



What Do State and Regional Transportation Goals Say About the Economy? Too often out of synch…

MnDOT Statewide Transportation Plan 2009-2028

- Maintaining infrastructure
- Minimize travel time delays through expanded highways and transitways
- Expand networks for safe biking and walking
- Connect to national high-speed rail network
- Link to cost-competitive high-speed rail network
- Provide access to all persons & businesses w/ no undue burden on one community
- Maintain consistency with State energy & environmental goals

Met Council Regional Development Framework

- Accommodate growth in a flexible, connected & efficient manner
- Slow the growth in traffic congestion while improving mobility
- Encourage expanded choices in housing locations and types

Summary of Suggested Strategies to Enhance Revenue for America's Transit Systems

Making Performance Count

- Cost of living reduction
- Value creation and value capture
- Linking investment to job creation and local economic development
- Linking investment to climate protection and livability

Partnering to Acquire New Revenue

- City-county tax elections
- Structured partnerships with energy & water utilities + real estate investors
- Use tax code ETB to anchor local campaigns
- Design a new financial system that can make infrastructure banking work

A Century Ago

- Home economics movement taught household budgeting and cost of living reduction
- “Keep your carfare at 3-5 percent of income”
- “Don’t ever go into debt for an automobile”
- Auto companies countered with installment loans and palm cards to help sell
- Home ec was squeezed out by Drivers Ed
- Kids today are taught exactly how to go into debt at age 15

Historical Precedent for Rapid Change— From 1885 to 1902

- America went from 1 electric street railway to 1 in every city of 10,000
- Rate of growth =to the Internet
- Similar reason for growth: provided economy of scope
- Demand boosted by important social movements—e.g. home economics
- Thousands of miles of streets + local and inter-urban statewide connecting in turn to the national inter-city rail networks

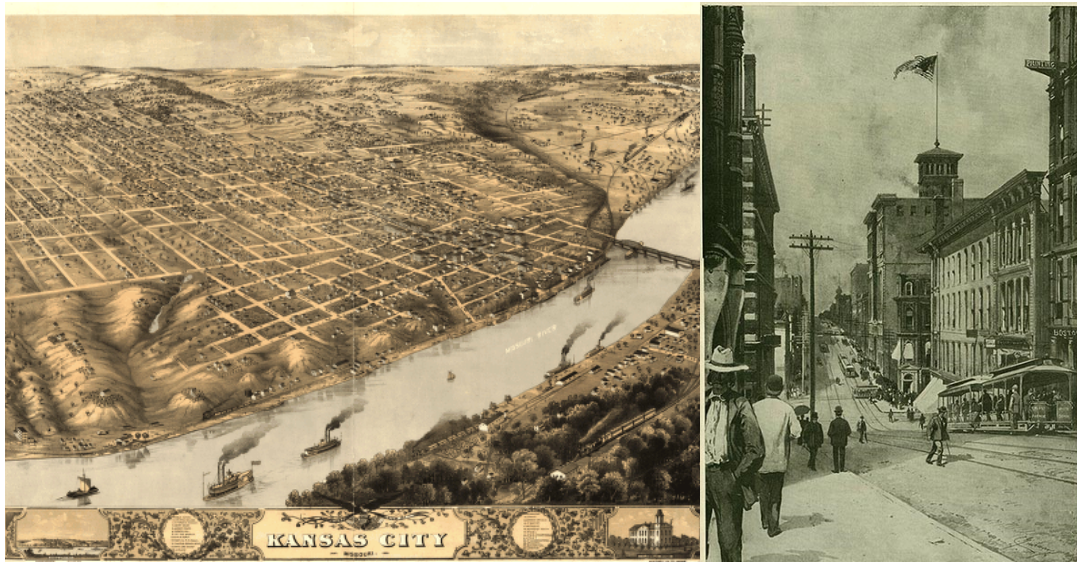
Getting to scale through network economies—when a large number of connected small investments are worth more than a few big ones

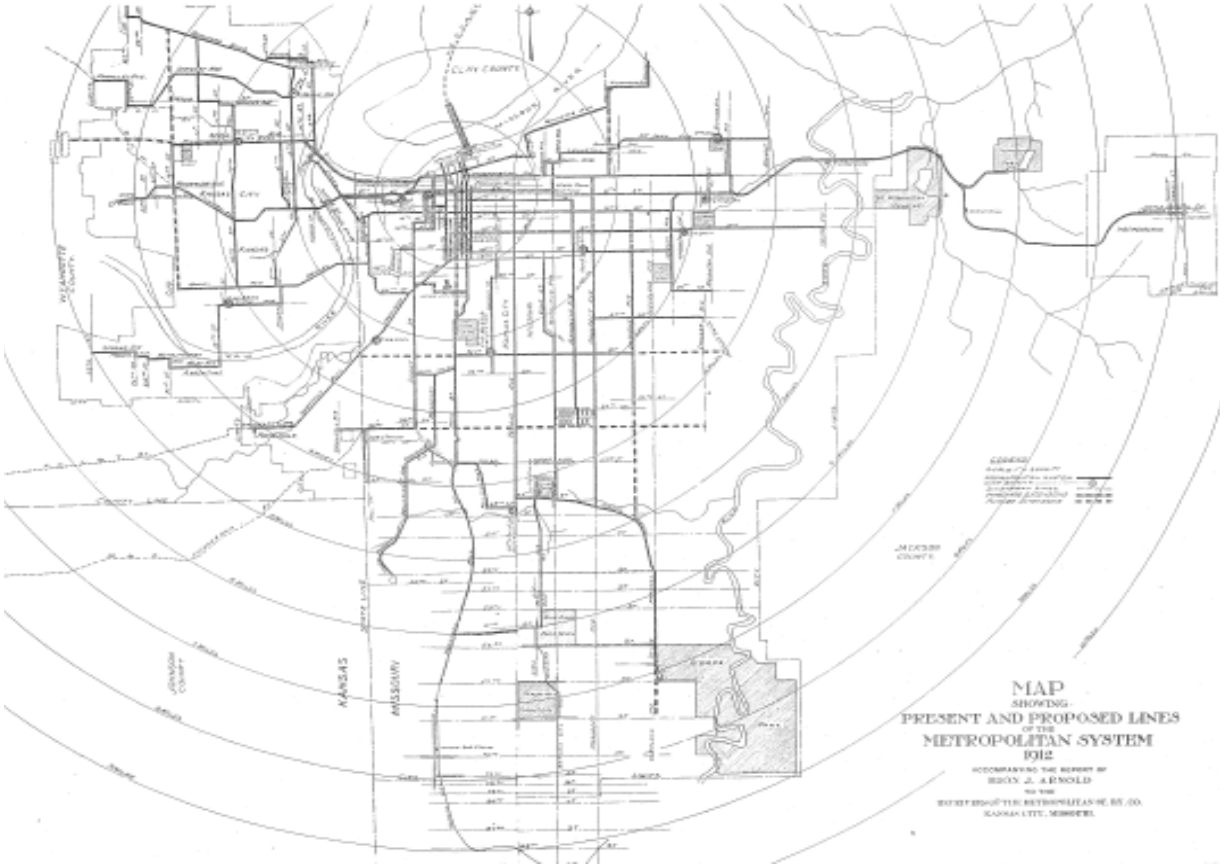
Hidden DNA of Street Railway Partnerships

- Franchise agreements covered designated special service districts
- Exclusive ROW granted to private operators
- Operators split cost of paving and maintenance with cities and adjacent property owners
- Standardized agreements, track gauge, regulatory provisions
- Often augmented by electric utility investment approved in rate base regulation by State PUCs
- Meant that all cities could and did implement entire networks

Your Region Had Significant Service

- Note 19th C street grid, steam RR, river and 1890 cable cars on 9th & Walnut
- 1924 served by six systems
- 910 passenger and 31 freight cars on 440 miles of line
- Connected KC, Clay & St. Joseph Counties… Rosedale, Independence… South Park, Merriam, Overland Park, Leavenworth, North Kansas City
- Provided location efficiency that still exists today

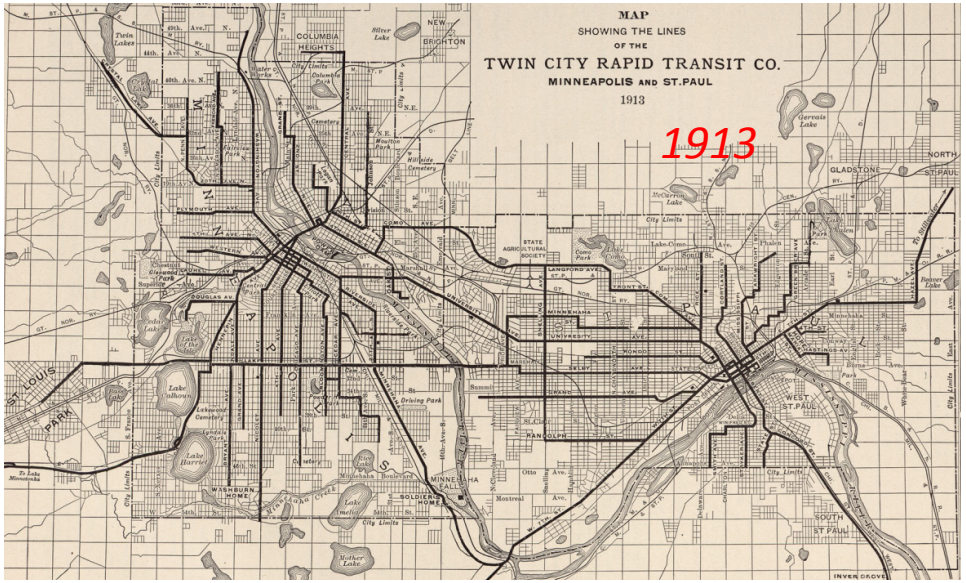




We Had It Right Once-

Twin Cities

- Transportation only 3-5 percent of HH expenditures
- Every city of 10000+ had streetcars and interurban, more had steam RR service
- High household savings rate
- Twin City Rapid Transit Co., Minneapolis Anoka & Cuyuna Range Ry .Co., Minneapolis Northfield & Southern Ry., St. Paul Southern Electric Ry. Co., Great Northern Ry. Co.
- 1064 pass cars, 2 buses, 2 trackless trolleys, 45 freight + 7 Lake Minnetonka steamboats
- 636 miles, connected St. Paul to S. St. Paul, Inver Grove, Hastings, White River; Minneapolis to Anoka, to St. Louis Park, Savage, Lakeville, Eureka Center, Northfield, Faribault; to Stillwater, Excelsior & Lake Minnetoka; St. Cloud to Waite Park & Sauk Rapids
- Thousands of miles of scheduled service each on fixed guideway and eventually by motor coach
- Provided economy of scope—unit costs were lowered the more the number of network routes connected

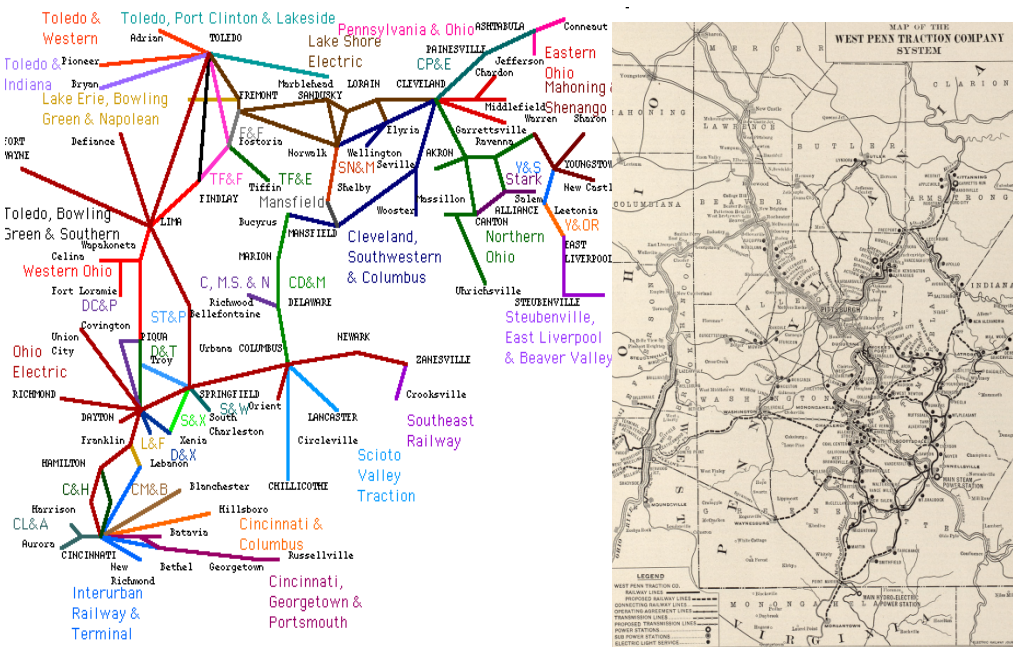


Similar Story in Salt Lake City—

- Transportation only 3-5 percent of HH expenditures
- Every city of 5000+ had streetcars and interurban, more had steam RR service
- High household savings rate
- Note the high density, mixed use, relatively uncongested scene
- SLC region had 272 miles of local street railway & interurban electric service (1924 McGraw Directory)
- 245 passenger and 247 freight cars
- High patronage— 166 revenue rides/capita per year (1920 Federal Electric Railway Commission)
- Provided economy of scope—unit costs were lowered the more the number of network routes connected
- Small blocks & streets that came with transit attracted investment from around the US and around the world

Or in Youngstown Ohio

- Transportation only 3-5 percent of HH expenditures
- Every city of 5000+ had streetcars and interurban, more had steam RR service
- High household savings rate
- Penn-Ohio Electric Co: Penn-Ohio Power & Light; Youngstown Municipal Railway; all sub of Republic Railway & Light Co; Youngstown & Suburban
- 231 pass cars, 61 interurban buses, 16 freight
- 102 miles of Youngstown Service plus 119 miles of interurban connecting with Girard, Niles, Mineral Ridge, Warren, Leavittsburg, E. Youngstown, Struthers, Lowellville, Poland, & Hubbard OH; Edenburg, New Castle, New Bedford, Sharon, Sharpsville, Farrell, Wheatland, W. Middlesex PA; N. Lima, Leetonia
- Multiple connections to Pittsburgh at New Castle
- Thousands of miles of scheduled service each on fixed guideway and eventually by motor coach
- Provided economy of scope—unit costs were lowered the more the number of network routes connected



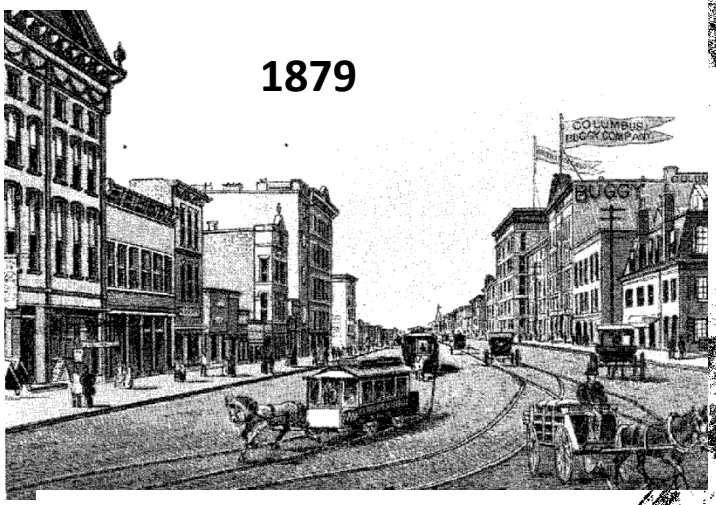
Columbus, Ohio
Broad & High
Peak-Value at Streetcar Intersection

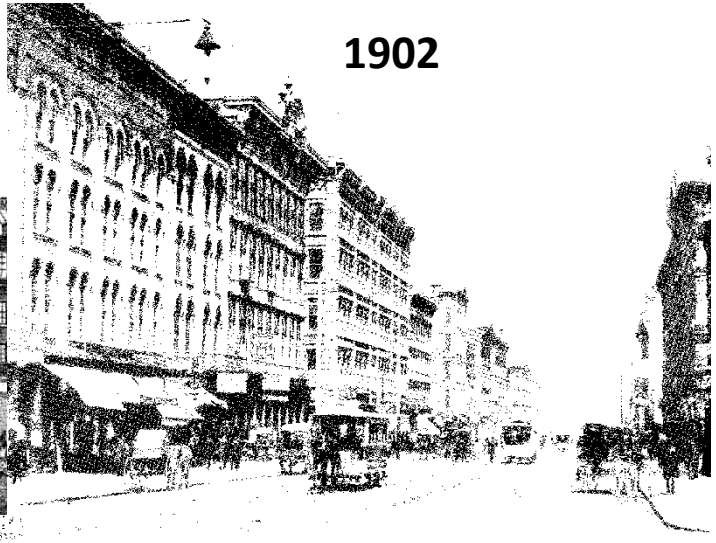
Note

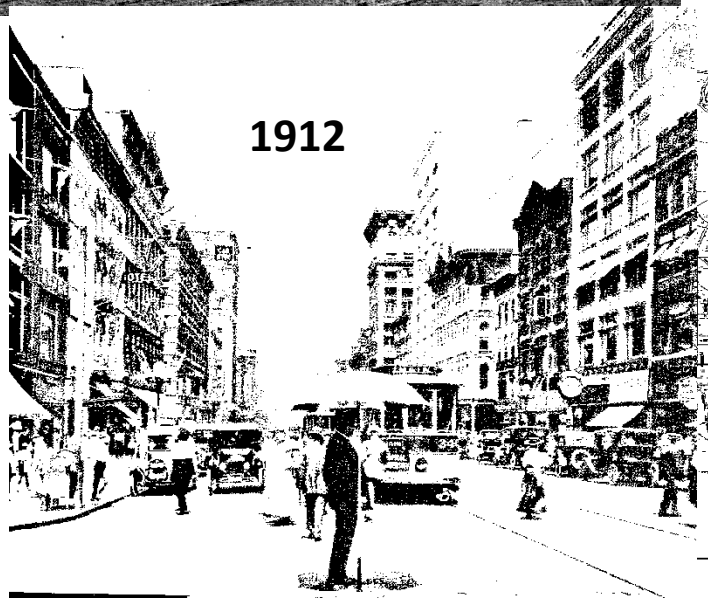
- **Increasing Density,**
- **Mixed-Use Development,**

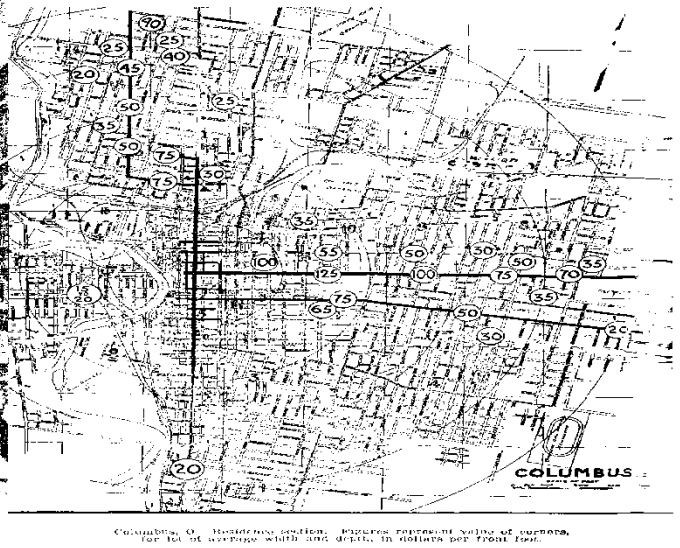
and

- **Human Traffic Control Umbrella**



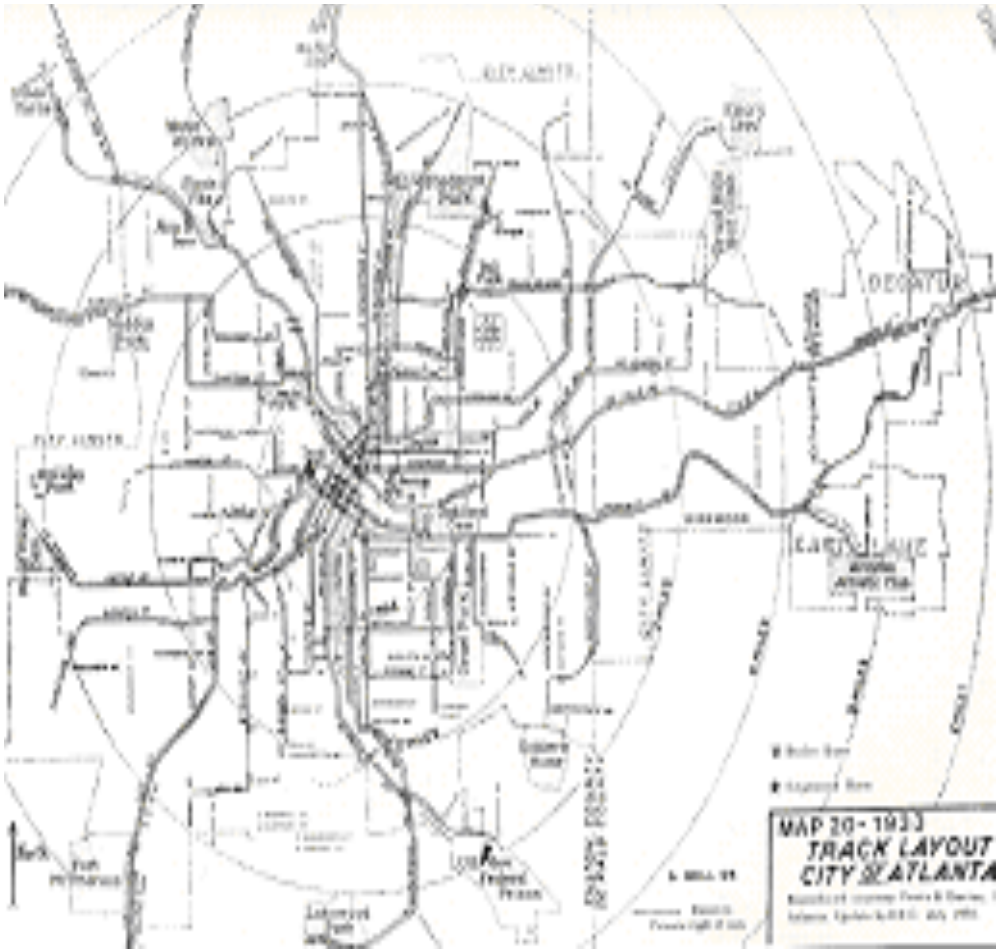


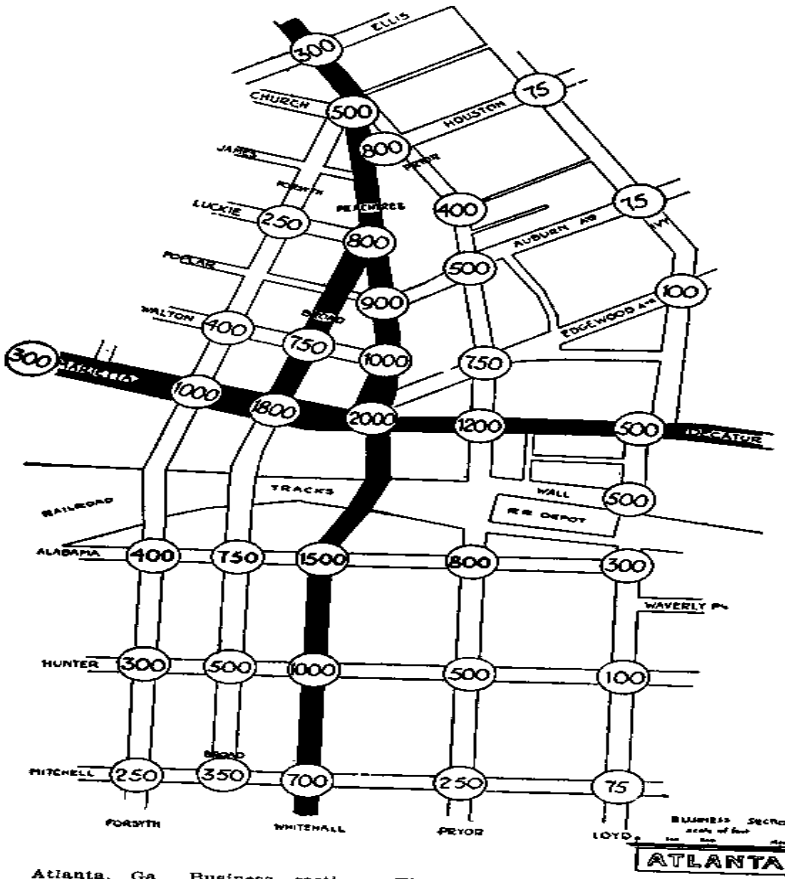




Transparency Drove the Market Through 1930, Note Peak-Value at Peachtree, Marietta & Decatur

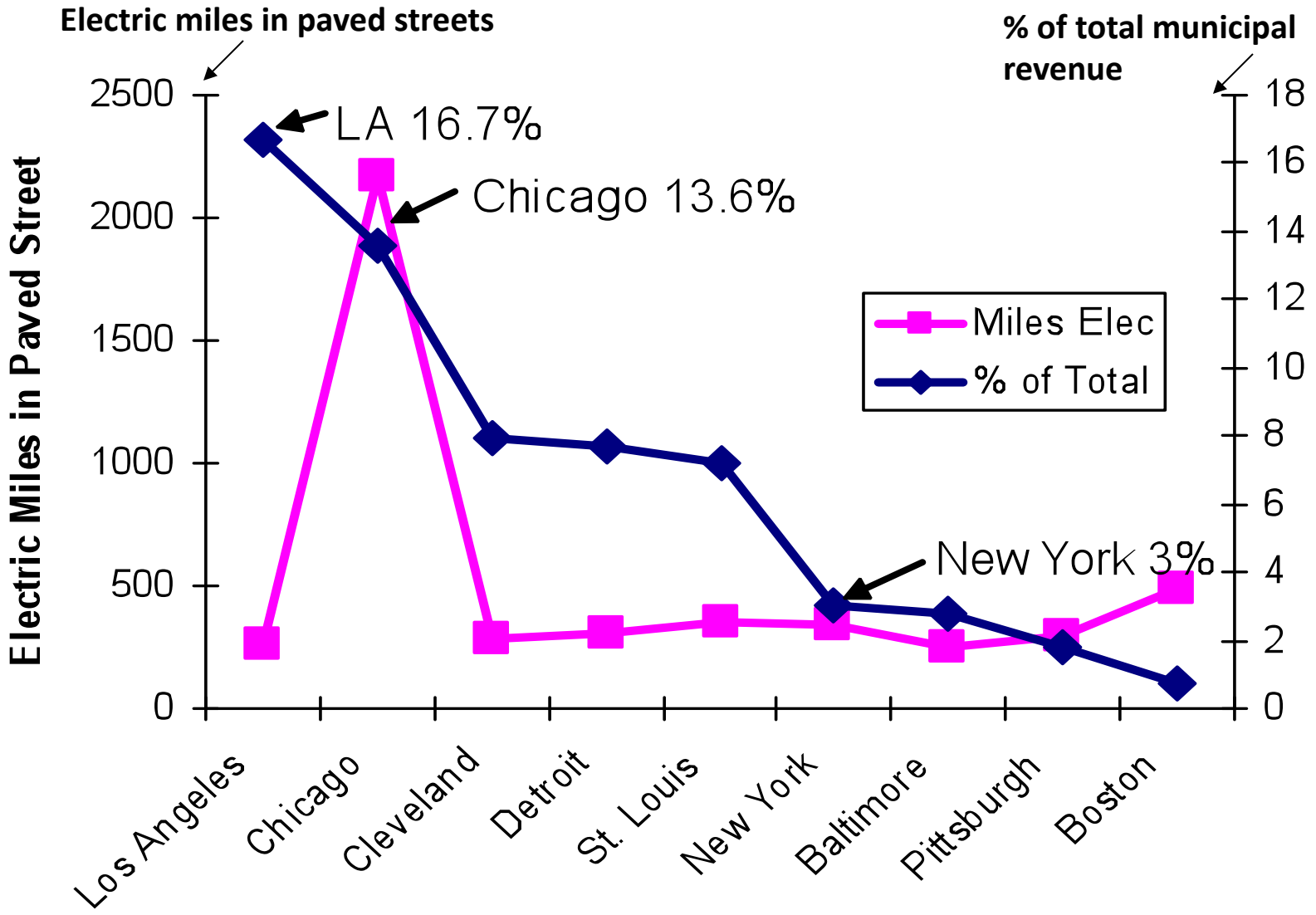
- Transit-Oriented Atlanta
- Economically Legible Atlanta





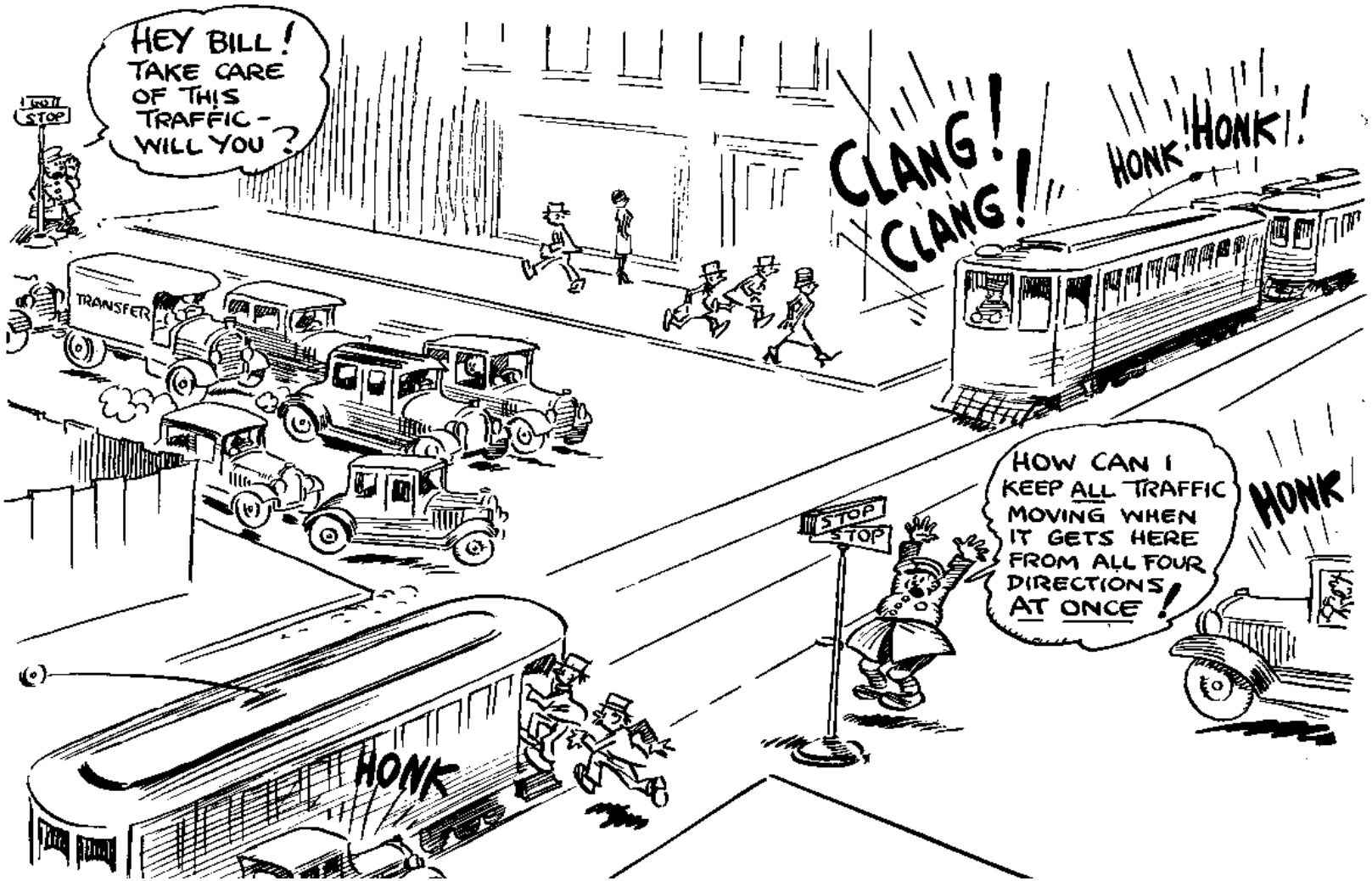
Atlanta, Ga. Business section. Figures represent value of corners for lot of average width and depth, in dollars per front foot.

Street Benefit Districts Helped Cities Pay the Tab: "A Machine to Mine the Land"—Early Value Capture



There Was Competition for Public Space

AAASPS 1926



Most Places Abandoned Their Transit Systems

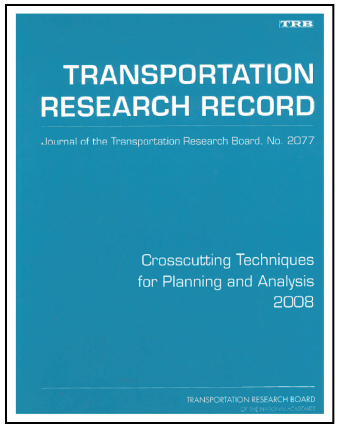
And Public Policy Favored a Different Vision

Sample Performance Measure: What Is Location Efficiency and How Can It Help Address the Perfect Storm of Climate Change and Economic Recession?

How is Location Efficiency Determined- Explain Using Regression? (Memorize This…Or…..)

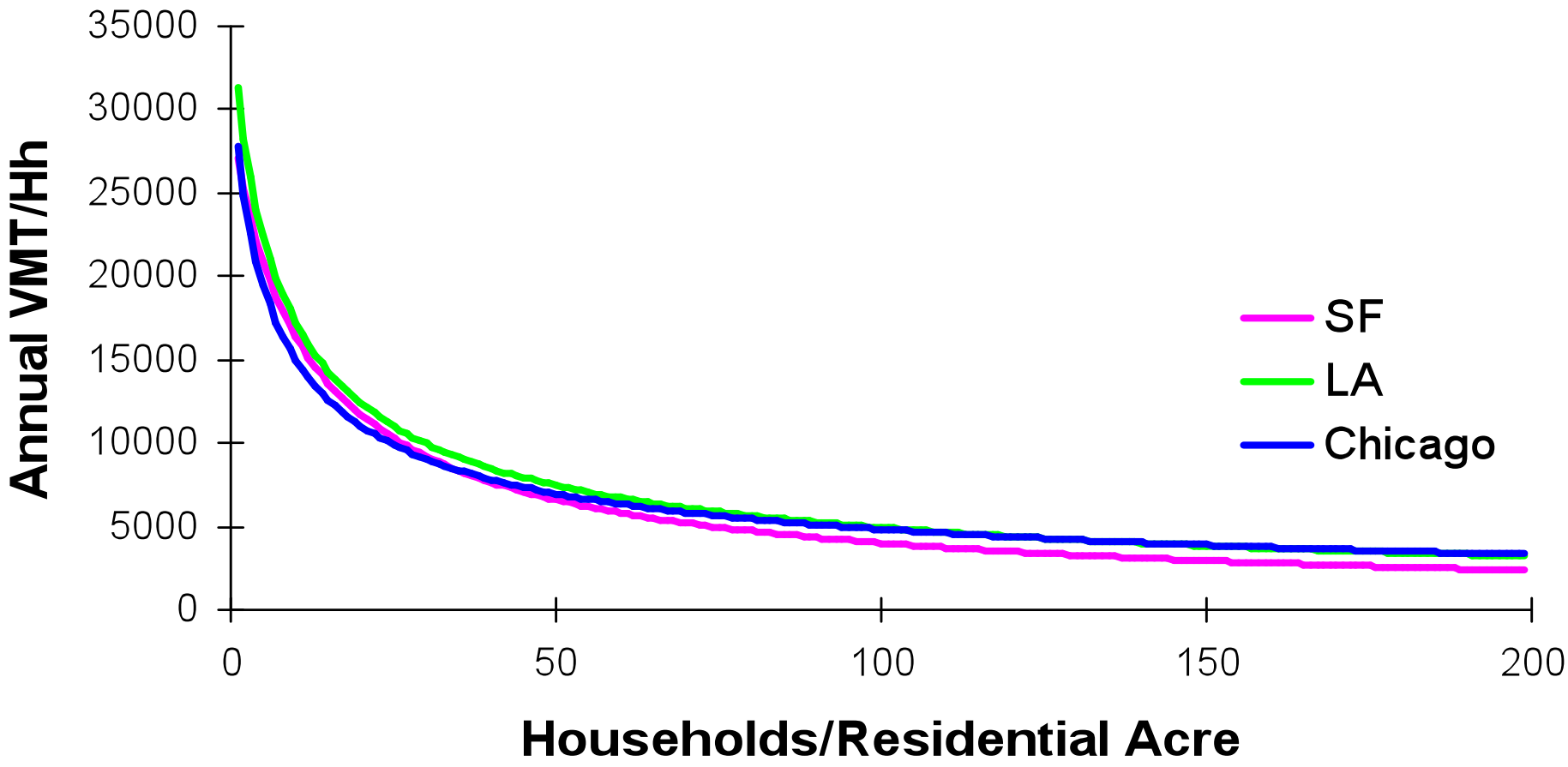
$$\frac{Veh}{Hh} = 4.722\left(22.520 + \frac{H}{RA}\right)^{-0.3471}\left(1 - e^{-\left(0.000112\frac{\$}{P}\right)^{1.2386}}\right)\left(1 + 1.0519\frac{P}{H}\right)(Tr + 60.312)^{-0.2336}$$

$$\frac{VMT}{Veh} = 10386\left(0.5041 + \frac{H}{TA}\right)^{-0.0419}\left(1 + 0.02759\frac{P}{H}\right)\left(1 - 0.0704\sqrt{Ped}\right) - 0.01743\left(\frac{\$}{P} - 22136\right)$$



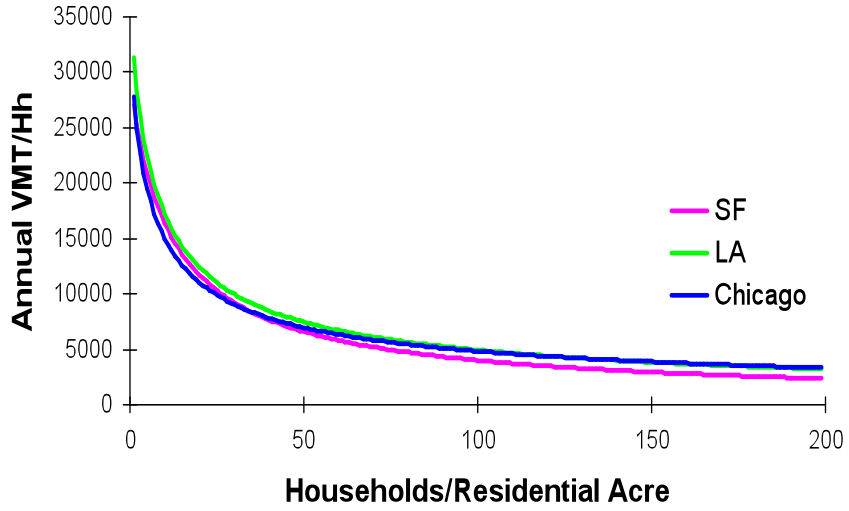
Peer-reviewed by Brookings and National Academy of Sciences 2008

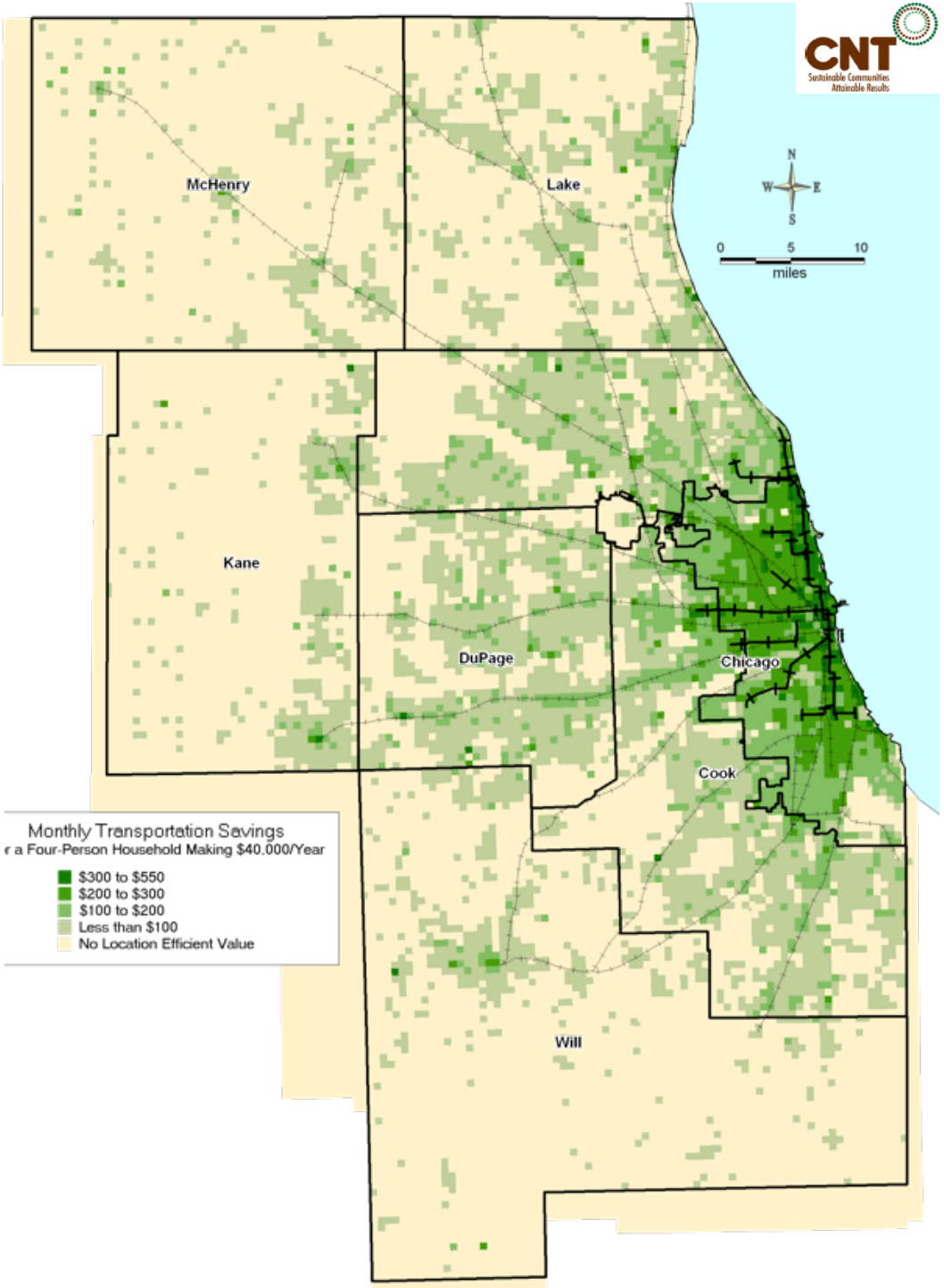
Easily Visualized Graphically— Location Efficiency: As Density + Transit Choice Increase, VMT Goes Down. Curve Works for 337 US Regions, London, Paris, &and 37 Japanese Cities



Even Easier to See: Mapping the Benefit

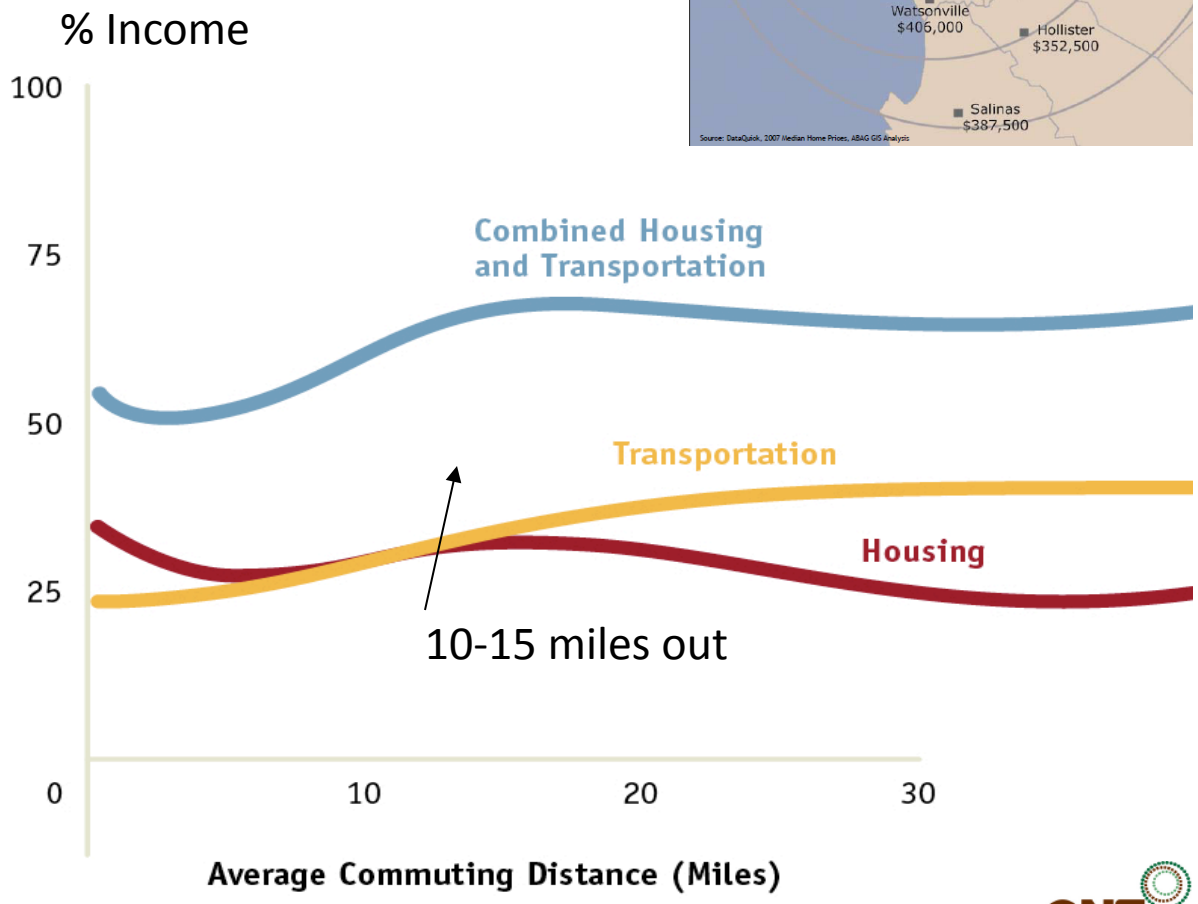
- Good transit access yields one less car per household
- Lowers cost of living by $5-8,000
- Equivalent of increasing income 10-20 percent tax free





Effect of 'Drive 'til You Qualify': Transport Costs Can Exceed Housing Costs for HHs Earning $20-$50,000

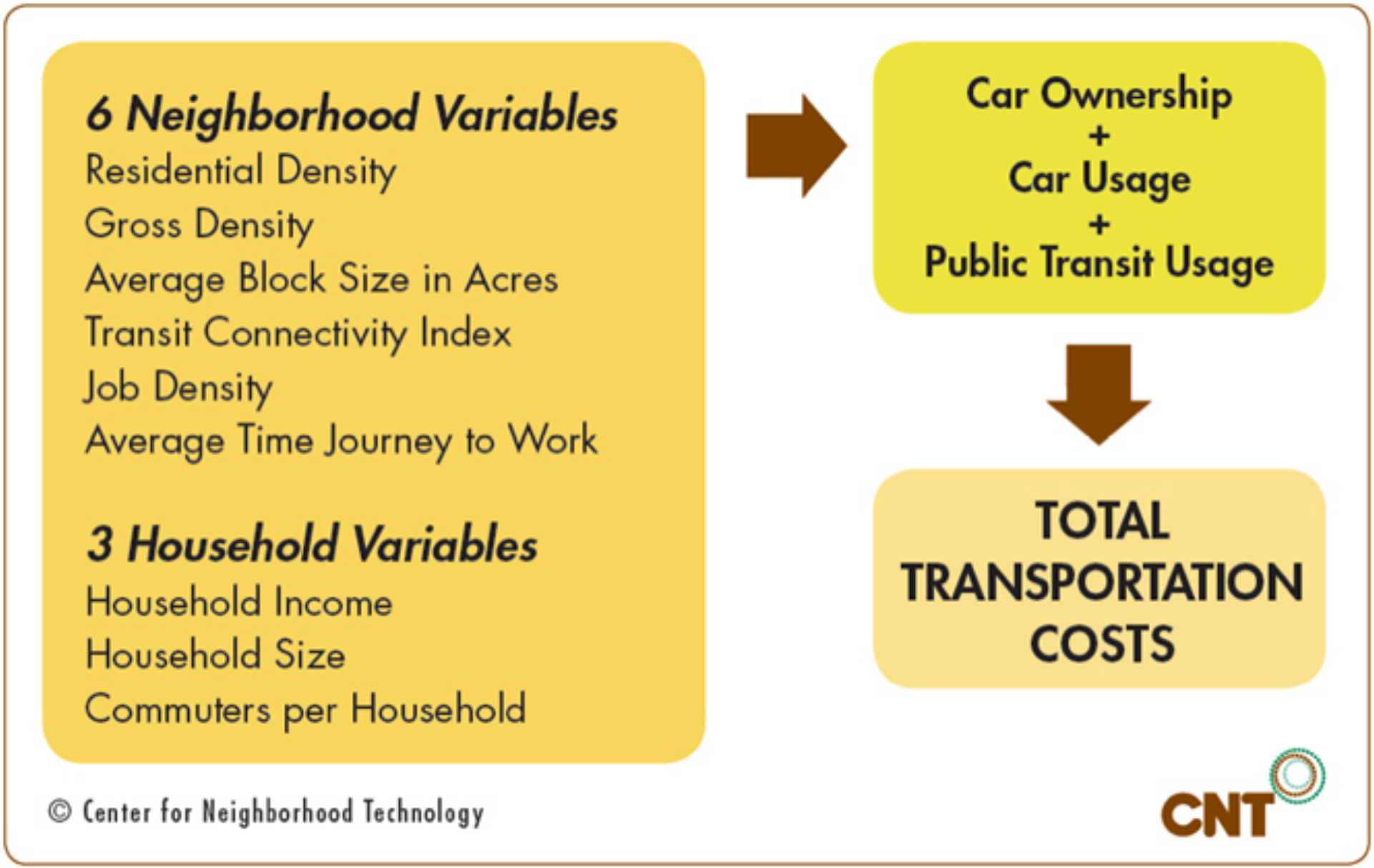
- Transportation emissions can also equal or exceed emissions from residential energy
- Creates "driving to green buildings" challenge



Source: Center for Neighborhood Technology calculations.

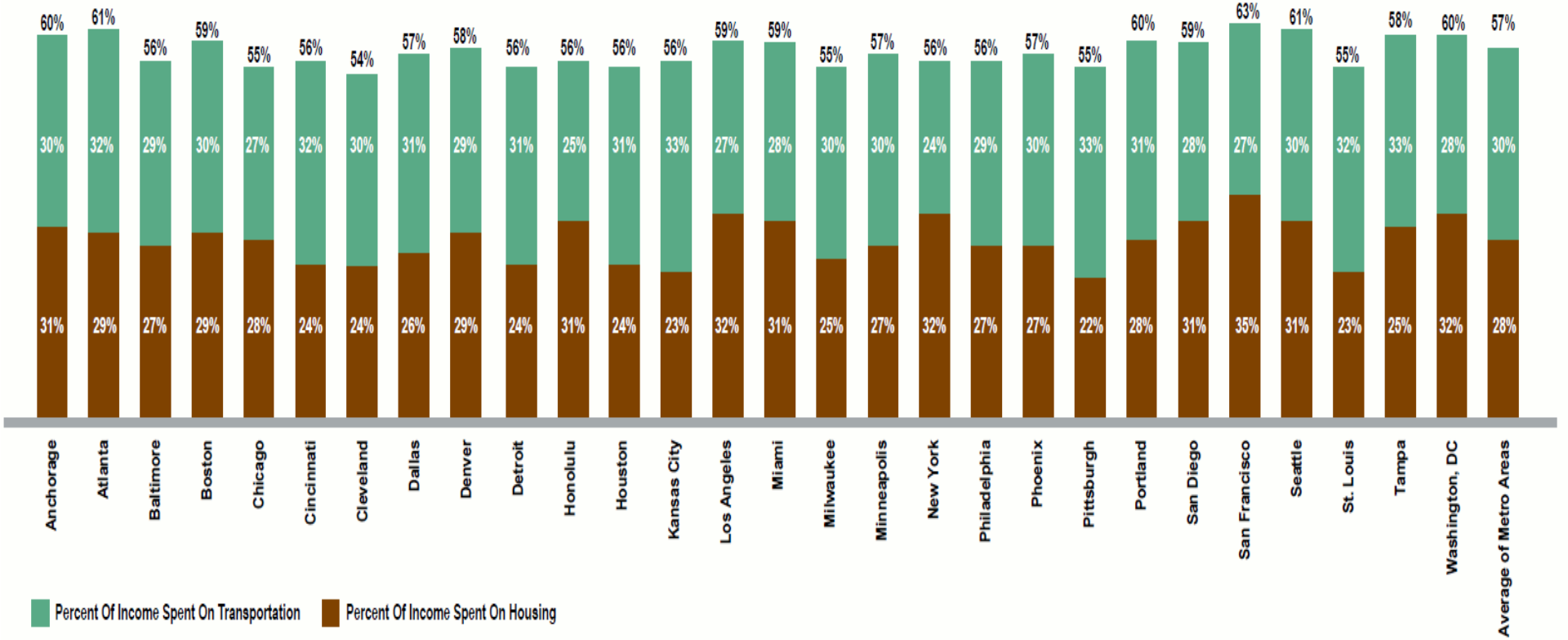
CNT
Sustainable Communities Attainable Results

How We Derive Transportation Costs



Housing + Transportation Costs Vary by Place Across the US

NATIONAL HOUSING CONFERENCE + CENTER FOR HOUSING POLICY



Percentages for working families with incomes between $20k - $50k

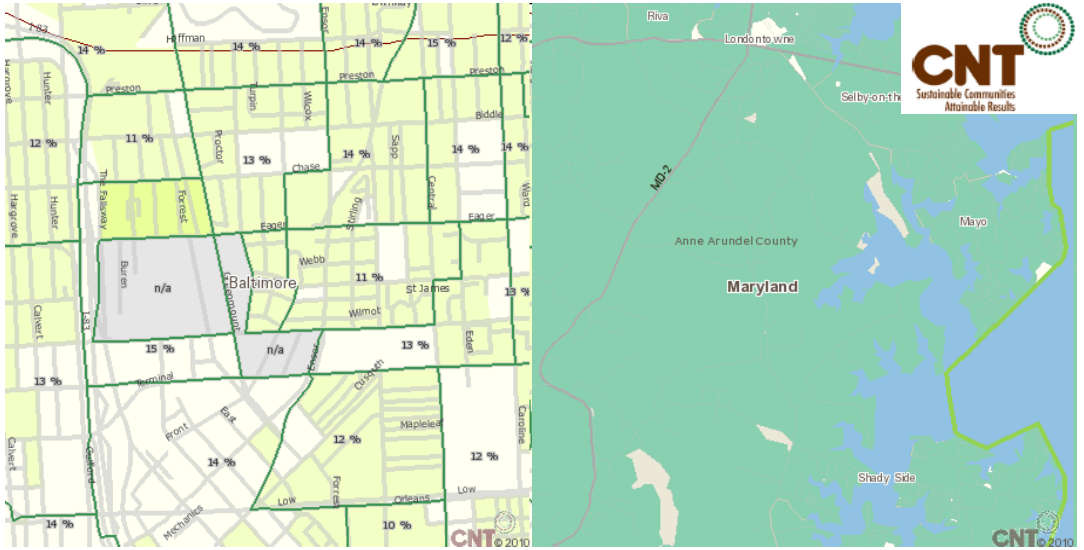
CNT Sustainable Communities Attainable Results

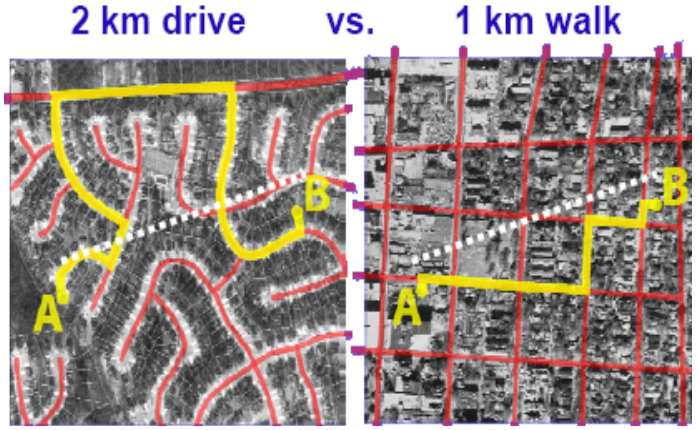
What Drives These Differences?

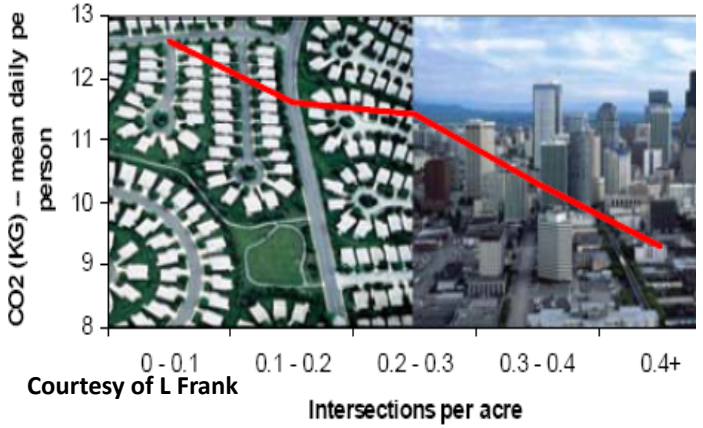
- **Access to services**
- **Walkable destinations**
- **Availability and frequency of transit**
- **Access to jobs (1/5 of trips)**
- **Access to amenities**
- **Density**

"Regardless of family size and income, households in location efficient neighborhoods own fewer vehicles and drive fewer miles, and therefore have lower transportation costs."

(Location Efficiency Study. CNT, STPP, NRDC, 2000)

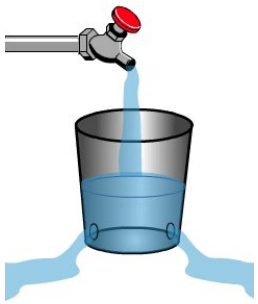




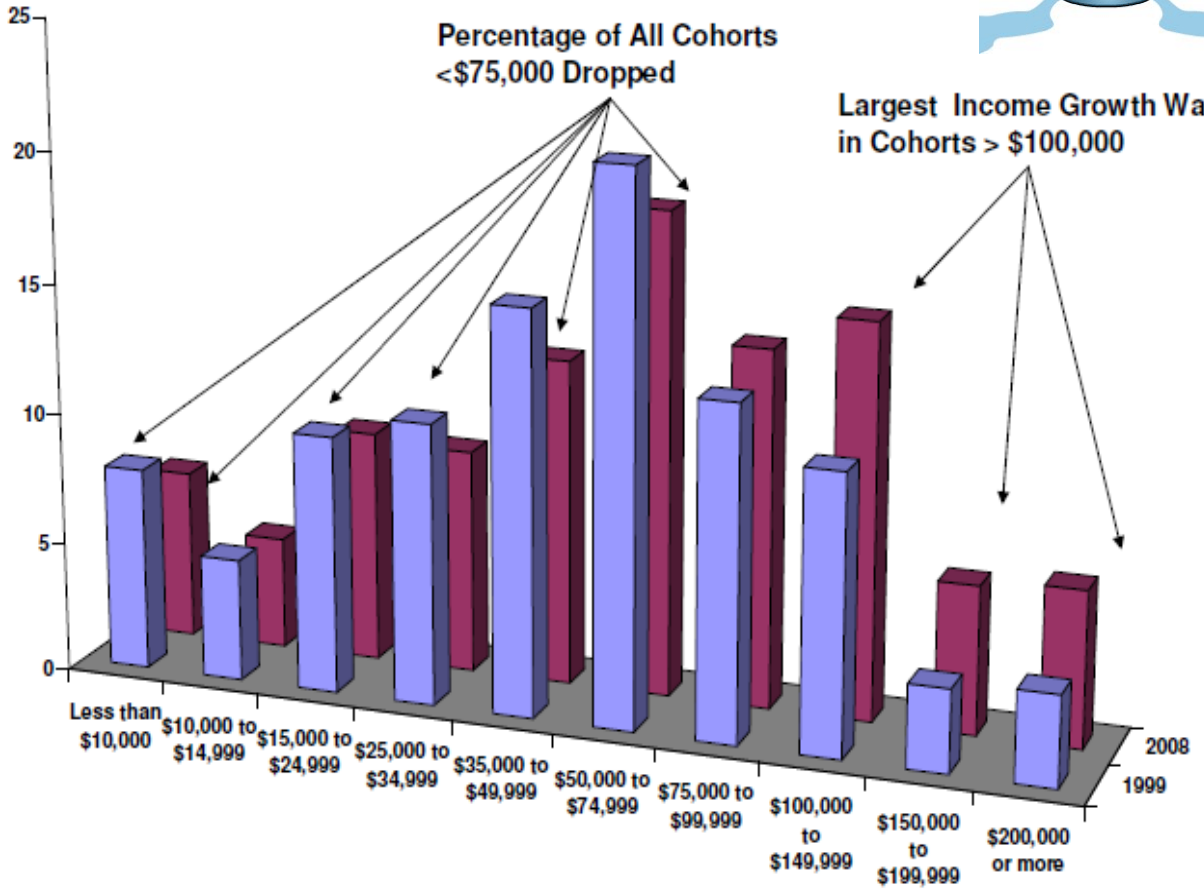


Courtesy of L Frank

Chicago MSA 1999-2008
Median Income Grew from $51046 to $61295
Mean Grew from $67768 to $82623



- Growth in median income was $854/ month
- Growth in H+T costs was $803
- Left just $51/month for all other expense increases, e.g., food, medical, mortgage resets
- Better in places with more transport choice, worse in the exurbs



http://htaindex.org

Maps About Press Method Mailing List

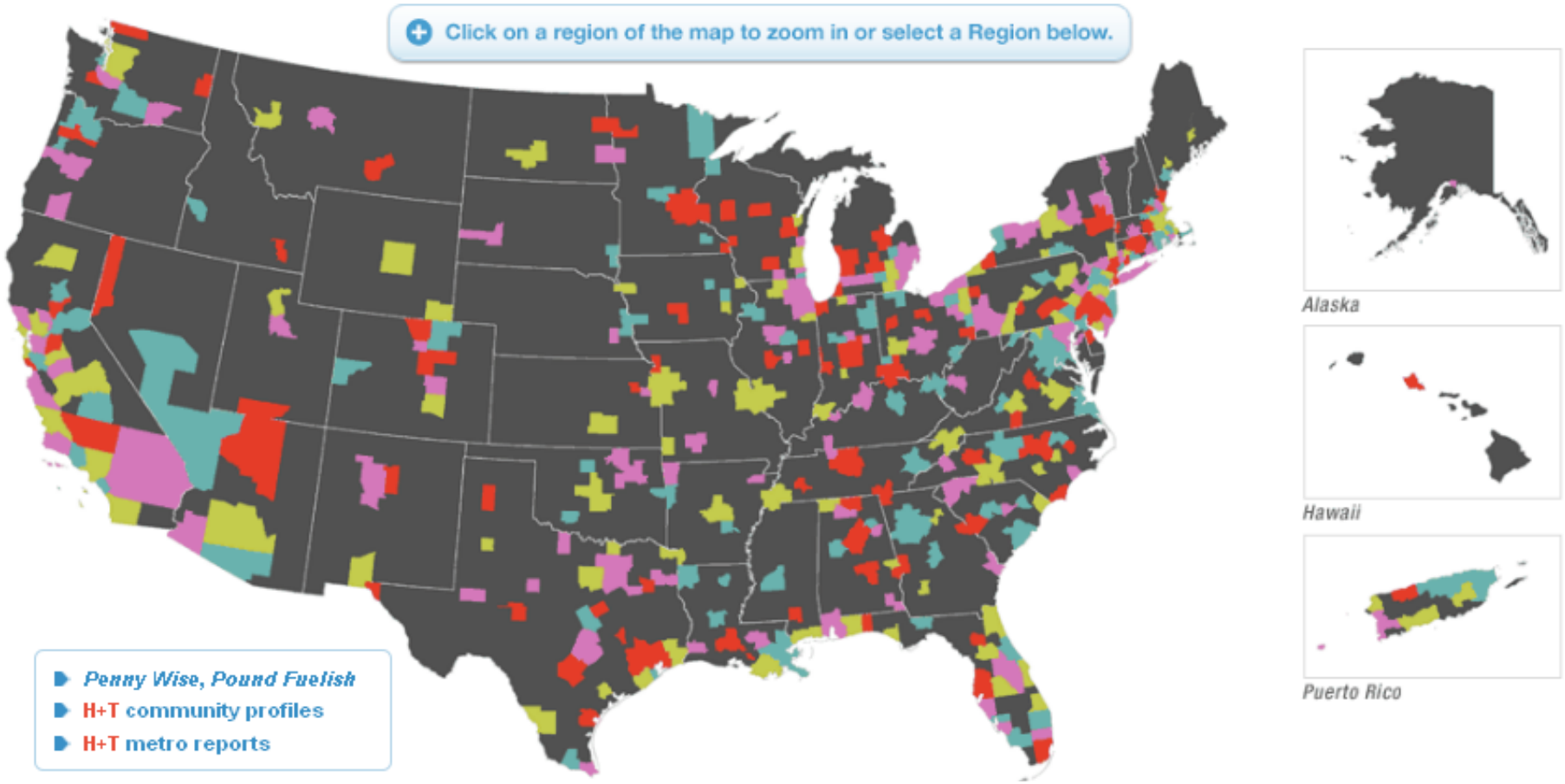
True Affordability and Location Efficiency

H+T℠ Affordability Index

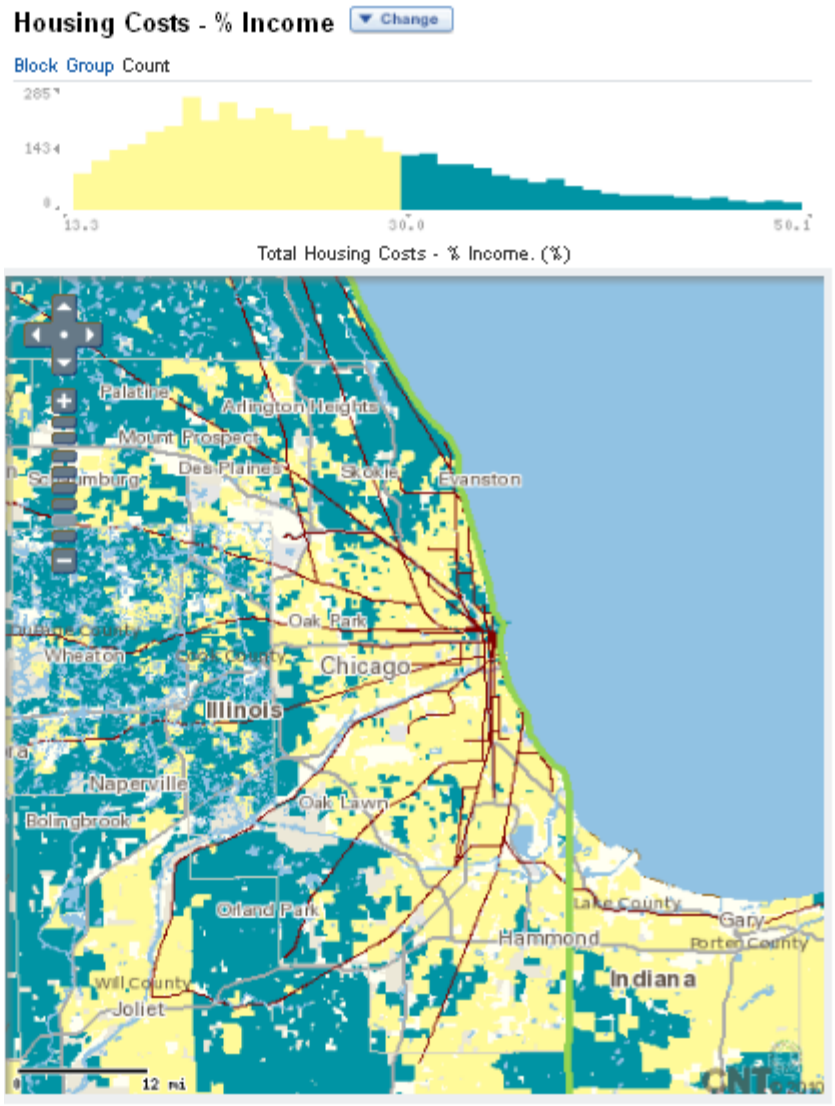
For more information about CNT please visit the CNT website. CNT

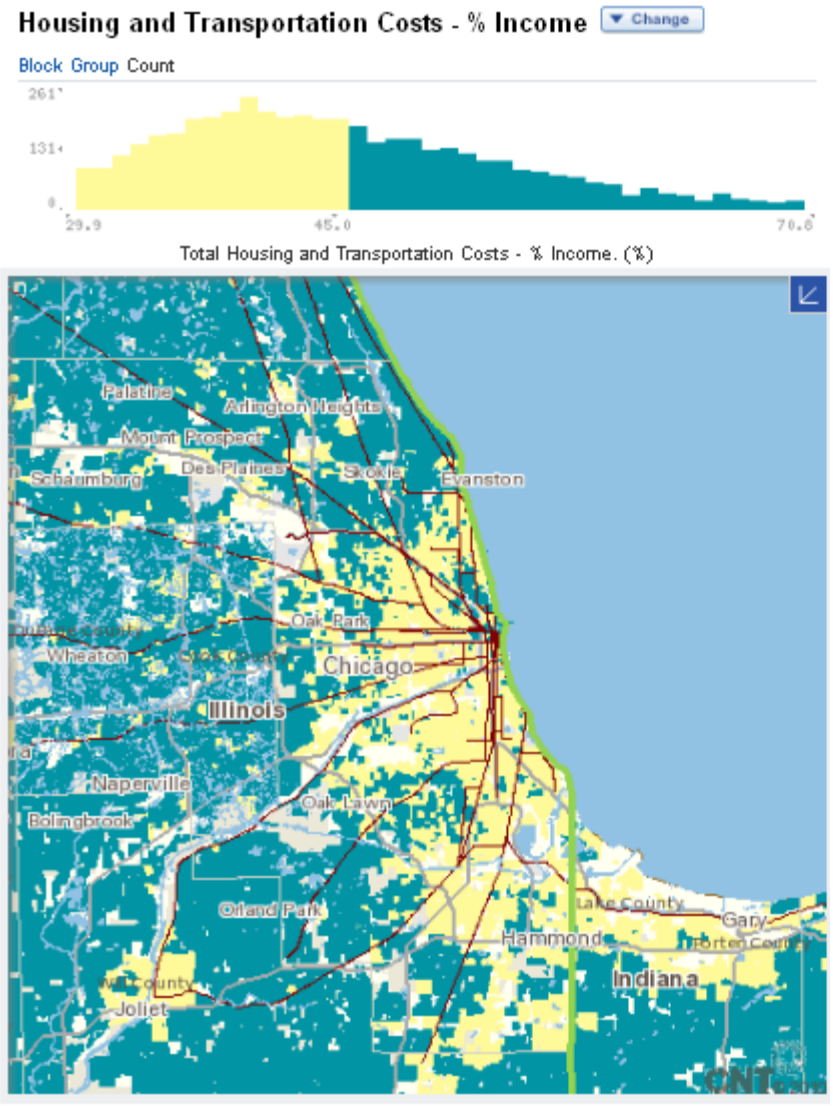
The Housing + Transportation Affordability Index is an innovative tool that measures the true affordability of housing based on its location.

Americans traditionally consider housing affordable if it costs 30 percent or less of their income. The Housing + Transportation Affordability Index, in contrast, offers the true cost of housing based on its location by measuring the transportation costs associated with place.



Explaining the “affordability squeeze” in Chicago…





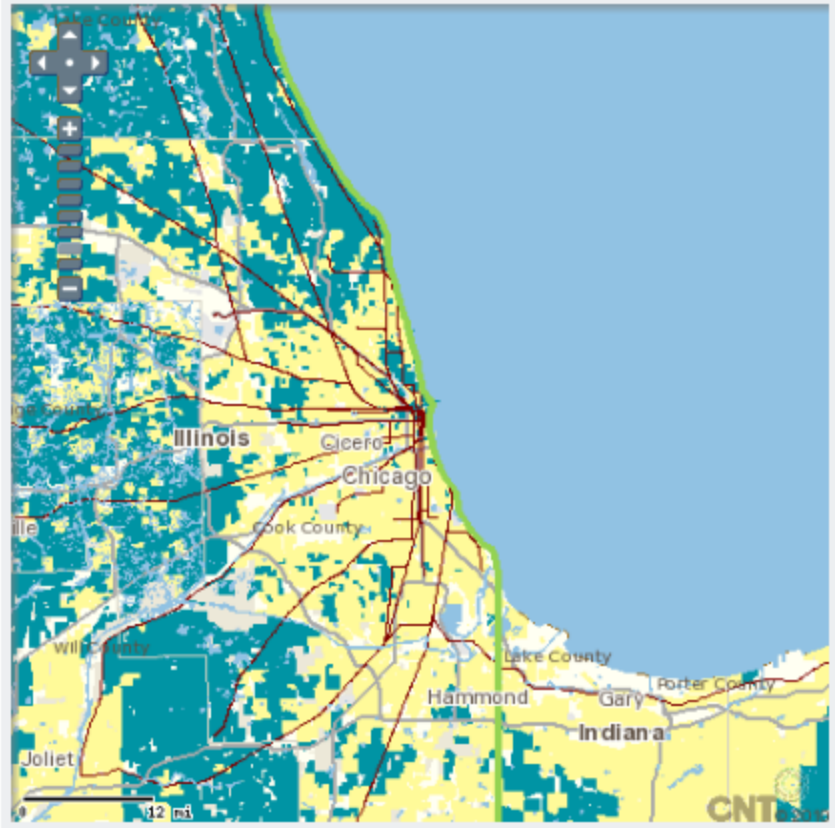
4170/5898 areas are affordable at H<=30% AMI

3198/5898 areas are affordable at H+T<=45% AMI

388,000 additional households financially stressed

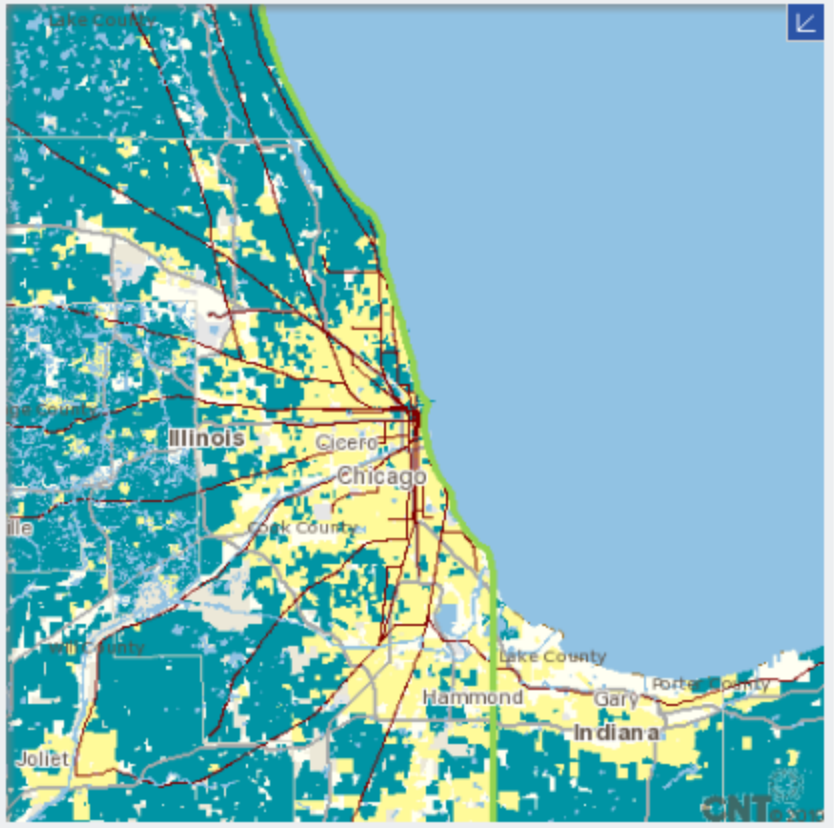
Housing Costs - % Income Change

Total Housing Costs - % Income		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,906 with data)	5,463 (5,399 with data)
Minimum	3 %	2 %
Average	28 %	28 %
Maximum	104 %	104 %
Households	2,971,638	2,645,872



Housing and Transportation Costs - % Income Change

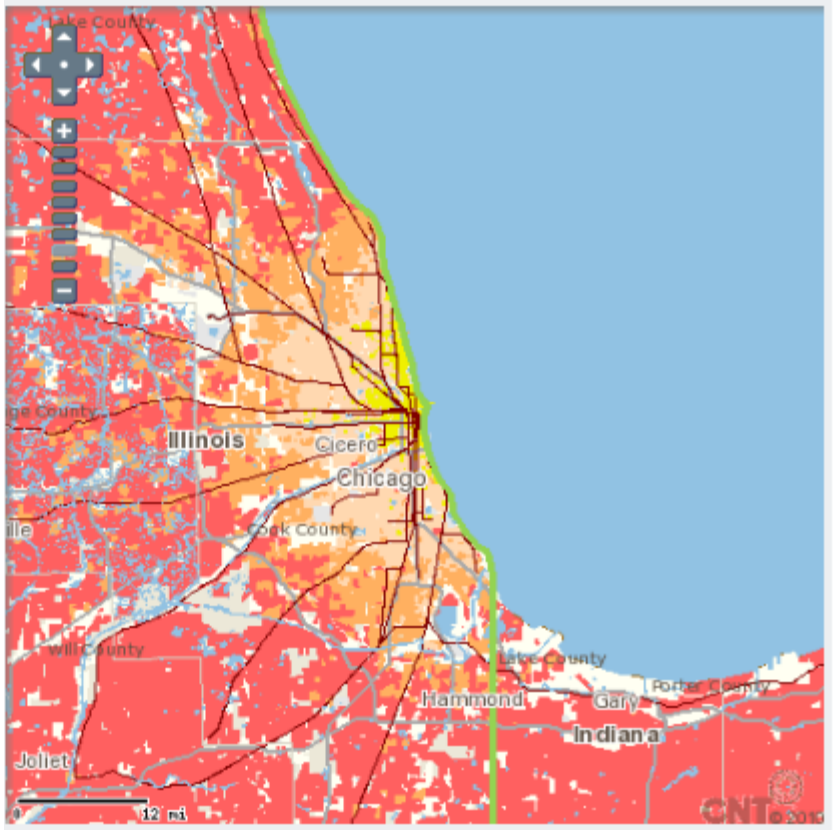
Total Housing and Transportation Costs - % Income		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,895 with data)	5,463 (5,388 with data)
Minimum	14 %	14 %
Average	48 %	46 %
Maximum	129 %	129 %
Households	2,971,500	2,645,734



In most efficient areas, cost of living increase from spike kept to 2%, in least efficient areas increased 9%

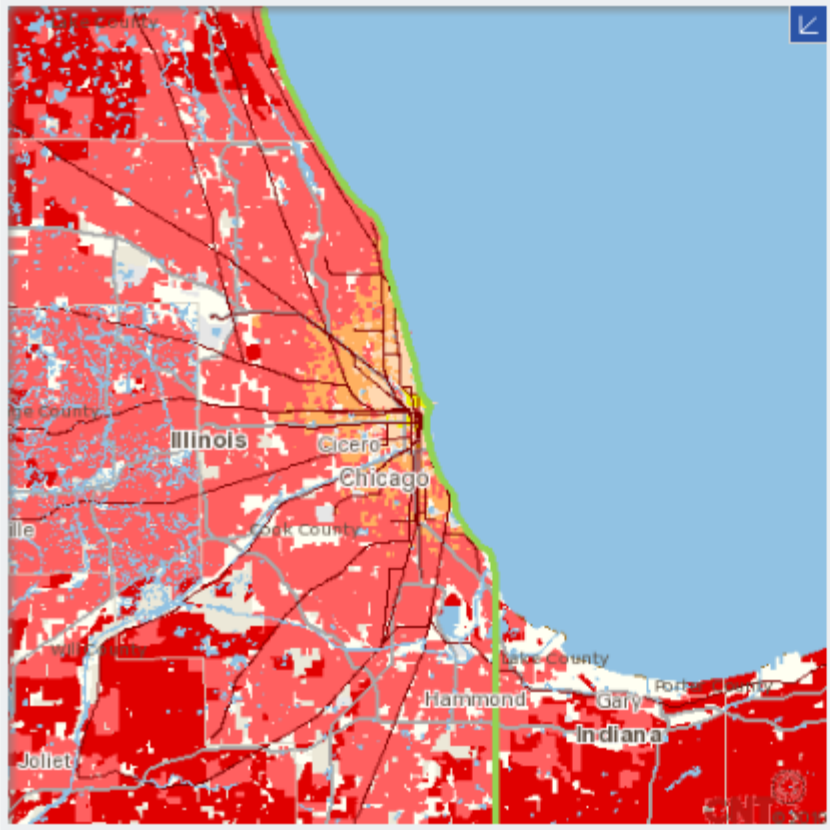
Monthly Transportation Expenses % Income - 2000 gas Change

Monthly Transportation Expenses % Income - 2000 gas Fuel Efficiency of 20.3 mpg		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,898 with data)	5,463 (5,391 with data)
Minimum	9.7 %	9.7 %
Average	19.1 %	18.7 %
Maximum	27.9 %	28.0 %
Households	2,971,528	2,645,762



Monthly Transportation Expenses % Income - 2008 gas Change

Monthly Transportation Expenses % Income - 2008 gas Fuel Efficiency of 20.3 mpg		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,898 with data)	5,463 (5,391 with data)
Minimum	12.6 %	12.6 %
Average	23.4 %	22.8 %
Maximum	35.8 %	35.6 %
Households	2,971,528	2,645,762

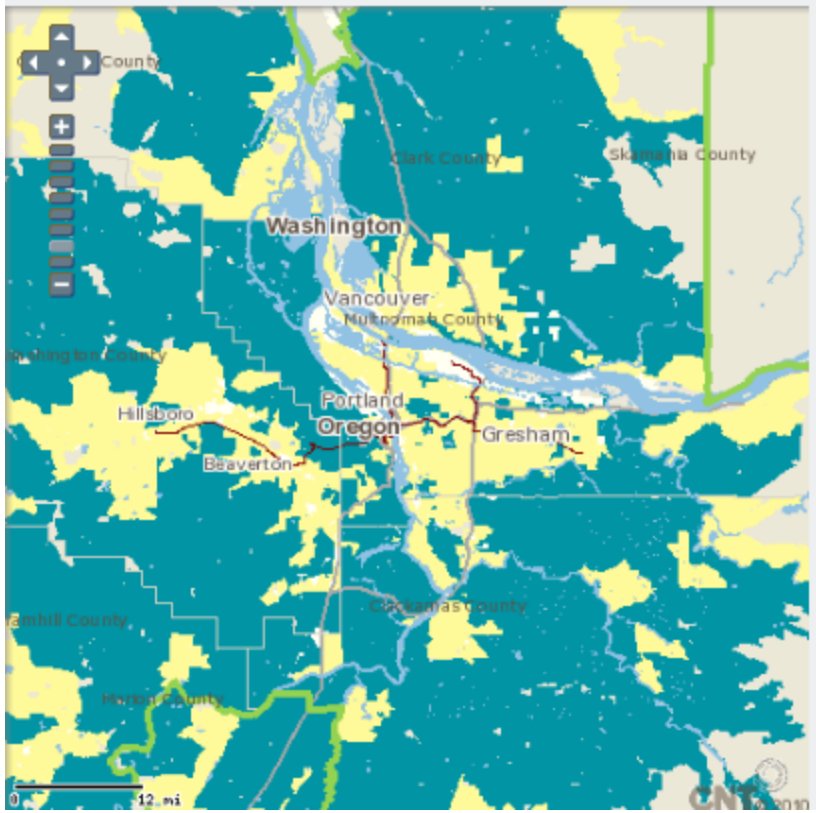


Similar effects in Metro Portland OR…

Housing Costs - % Income Change

Total Housing Costs - % Income

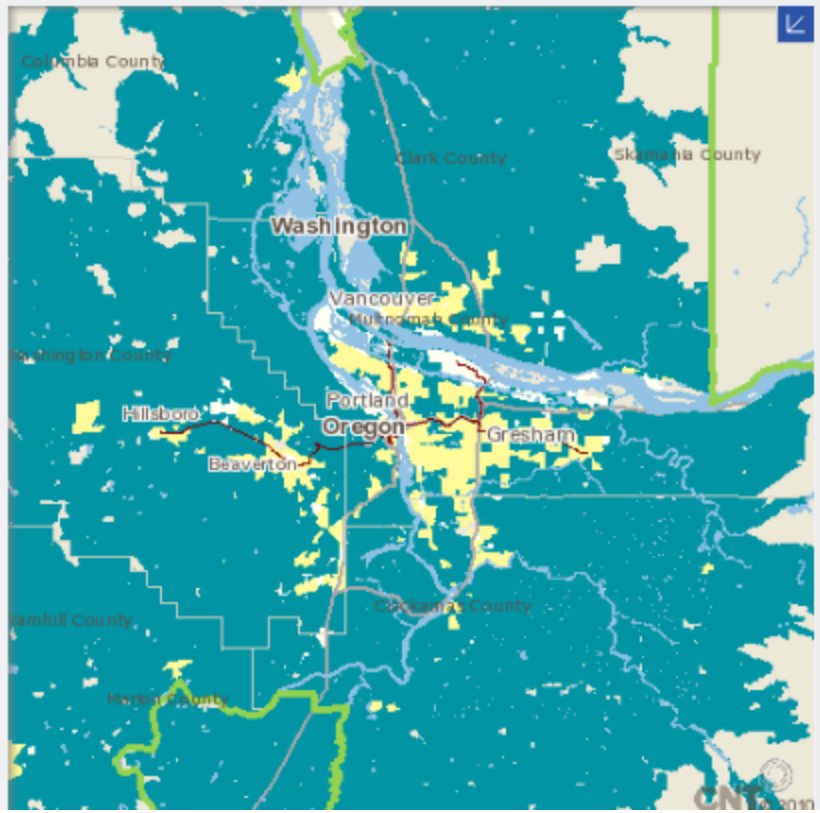
Statistics	Region	Viewable Area on Map Below
Block Groups	1,243 (1,243 with data)	1,227 (1,227 with data)
Minimum	7.4 %	7.4 %
Average	28.6 %	28.6 %
Maximum	76.9 %	76.9 %
Households	741,776	731,321



Housing and Transportation Costs - % Income Change

Total Housing and Transportation Costs - % Income

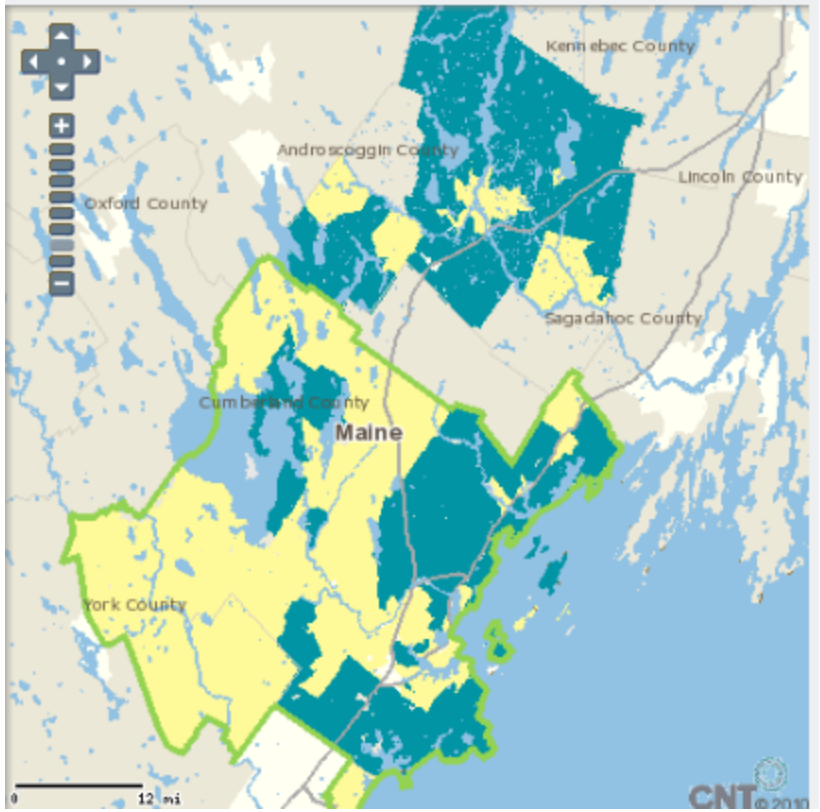
Statistics	Region	Viewable Area on Map Below
Block Groups	1,243 (1,242 with data)	1,227 (1,226 with data)
Minimum	20.2 %	20.2 %
Average	50.1 %	50.1 %
Maximum	99.4 %	99.4 %
Households	741,235	730,780



Or in Metro Portland Maine

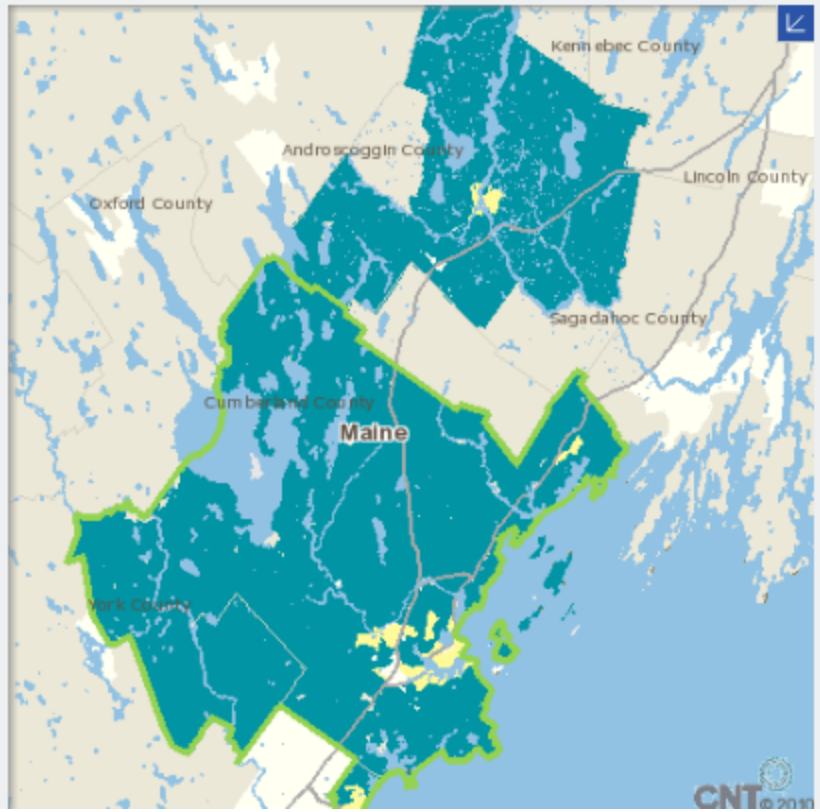
Housing Costs - % Income Change

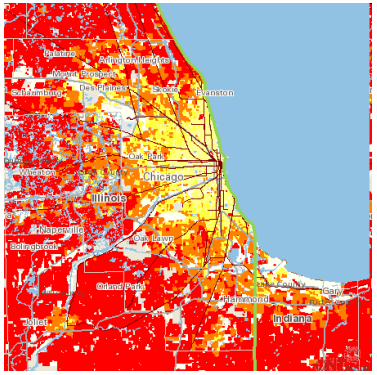
Total Housing Costs - % Income		
Statistics	Region	Viewable Area on Map Below
Block Groups	190 (188 with data)	250 (248 with data)
Minimum	8.6 %	8.6 %
Average	27.6 %	27.2 %
Maximum	58.6 %	58.6 %
Households	99,701	136,809



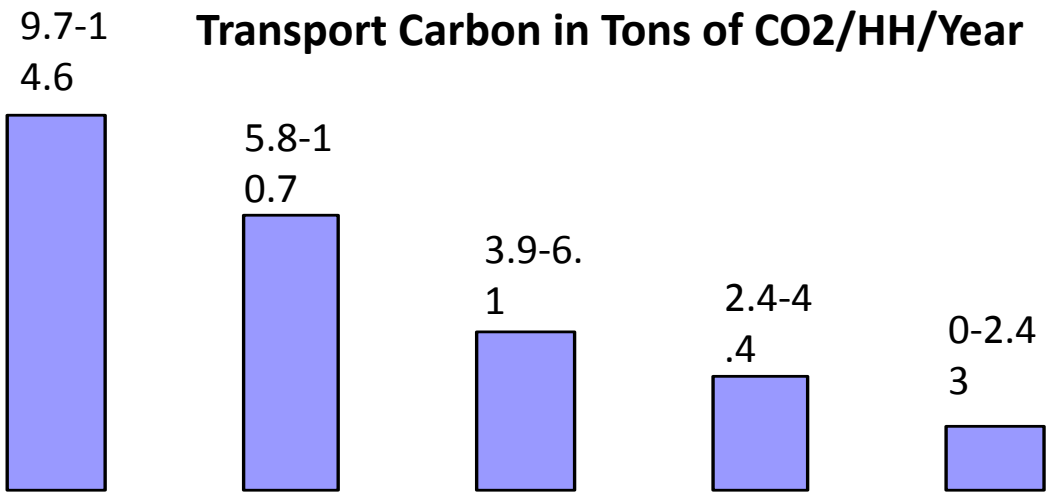
Housing and Transportation Costs - % Income Change

Total Housing and Transportation Costs - % Income		
Statistics	Region	Viewable Area on Map Below
Block Groups	190 (188 with data)	250 (248 with data)
Minimum	25.7 %	25.7 %
Average	51.2 %	52.1 %
Maximum	83.7 %	83.7 %
Households	99,701	136,809

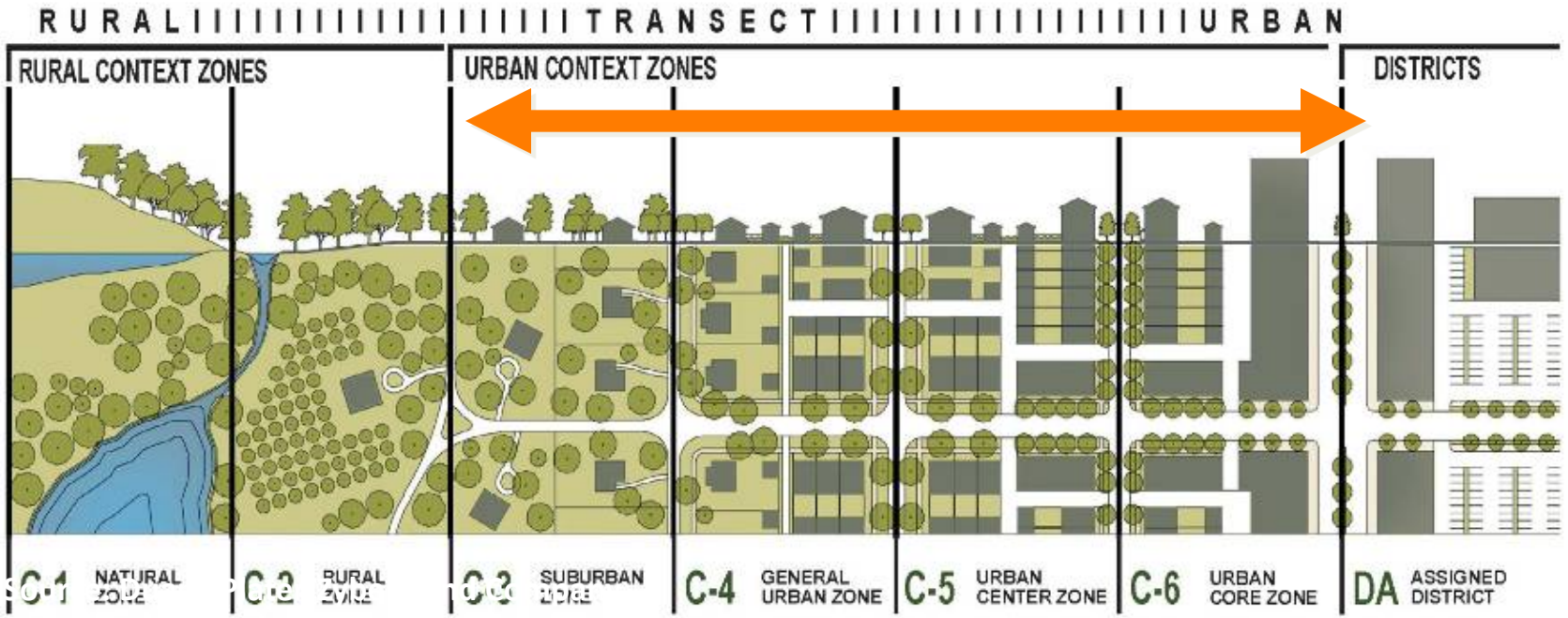




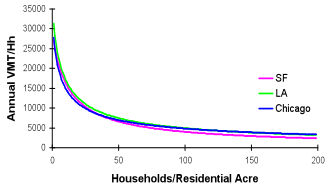
Transport Carbon in Tons of CO2/HH/Year



This Place Has the Disappearing Carbon Blues…♫

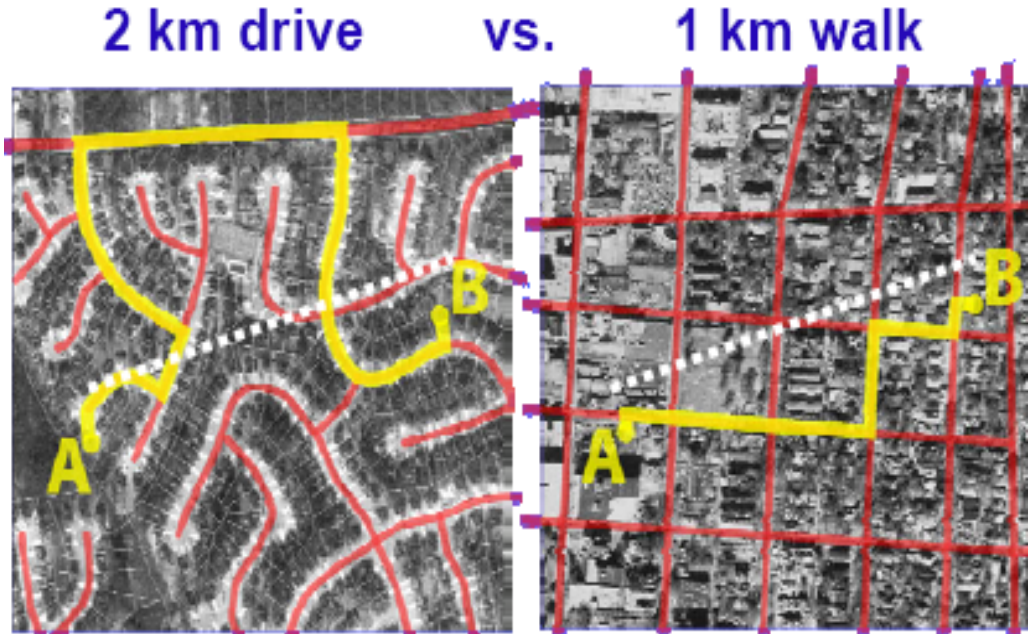


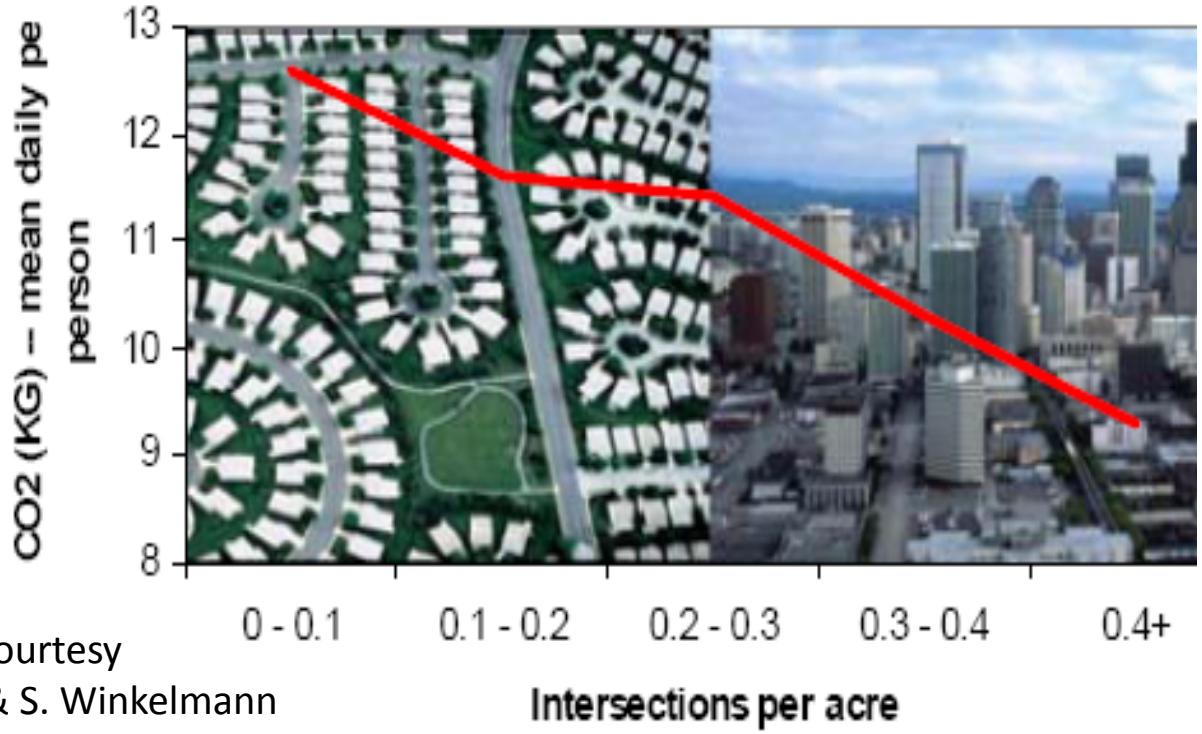
Location Efficiency & the Transect Reveals Carbon Benefits of Good Urban Form



Good Urban Form Supports Low-Carbon Travel: Convenient Remedy to an Inconvenient Truth

- Chicago has dense networks of sidewalks and streets
- The higher the connectivity, the lower the CO2 per HH
- Supports walking, biking, mixed-use land uses
- Helps avoid unnecessary car trips





Images Courtesy
L. Frank & S. Winkelmann

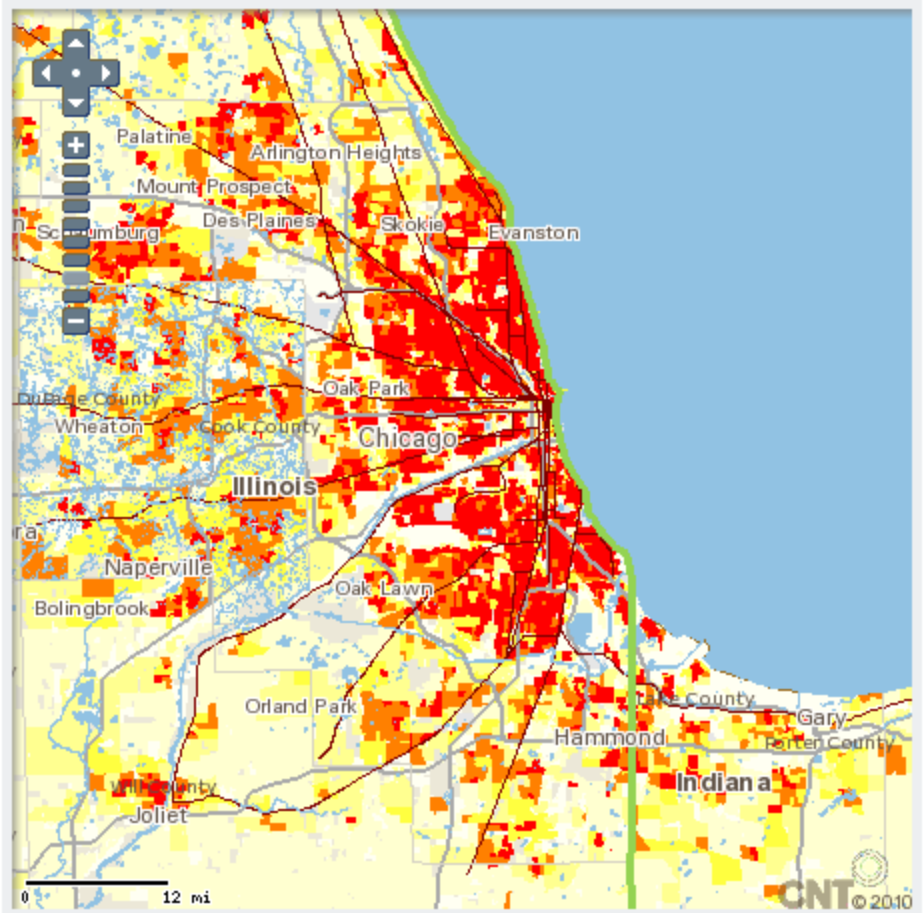
CNT
Sustainable Communities Attainable Results

Two Views of Metro Chicago and CO2—
Is Density Good or Bad?

CO2 per Acre From Household Auto Use ▼ Change

- Data Not Available
- Less than 6 Metric Tons/Acre
- 6 to 14 Metric Tons/Acre
- 14 to 20 Metric Tons/Acre
- 20 to 30 Metric Tons/Acre
- 30 Metric Tons/Acre and Greater

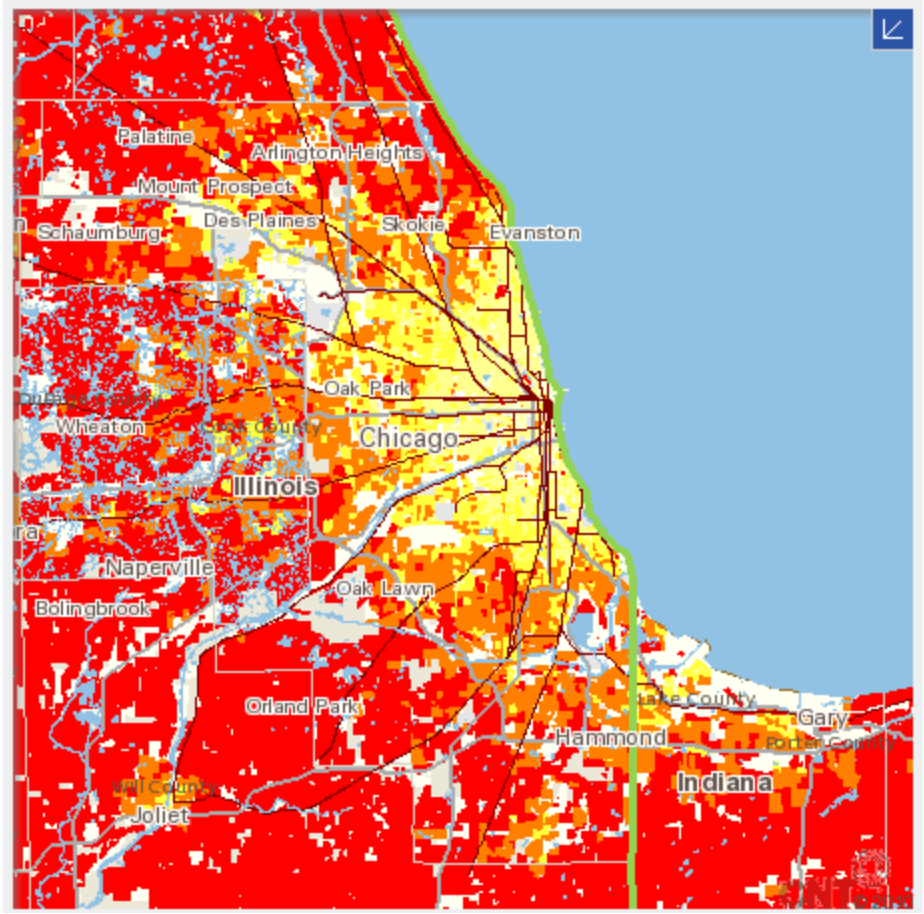
Total Carbon Dioxide (CO2) Emissions are calculated for the Block Group and then divided by the total area of the Block Group, which shows that areas with higher Residential Density tend to produce more carbon dioxide per acre.



CO2 per Household From Household Auto Use ▼ Change

- Data Not Available
- Less than 3.3 Metric Tons/HH
- 3.3 to 5.1 Metric Tons/HH
- 5.1 to 6.5 Metric Tons/HH
- 6.5 to 8.6 Metric Tons/HH
- 8.6 Metric Tons/HH and Greater

Total Carbon Dioxide (CO2) Emissions are calculated for the Block Group and then divided by the total number of households in the Block Group, which shows that areas with higher Residential Density have low average emissions per household. Comparing this figure with CO2 per Acre From Household Auto Use illustrates that location efficiency reduces per household emissions.



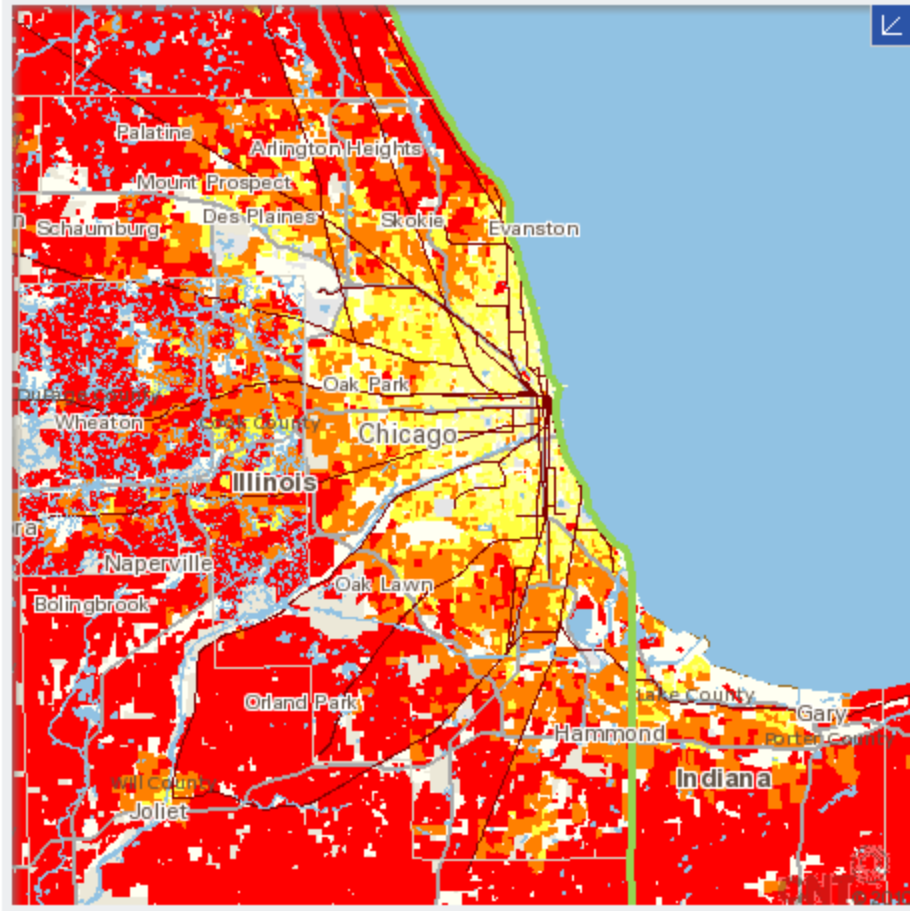
Mirror Images—Households per Residential Acre and CO2 per Household per Year

Residential Density ▼ Change

Household Density		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,970 with data)	5,583 (5,583 with data)
Minimum	0 HHs/Res. Acre	0 HHs/Res. Acre
Average	11 HHs/Res. Acre	12 HHs/Res. Acre
Maximum	347 HHs/Res. Acre	347 HHs/Res. Acre
Households	2,971,690	2,739,718

CO2 per Household From Household Auto Use ▼ Change

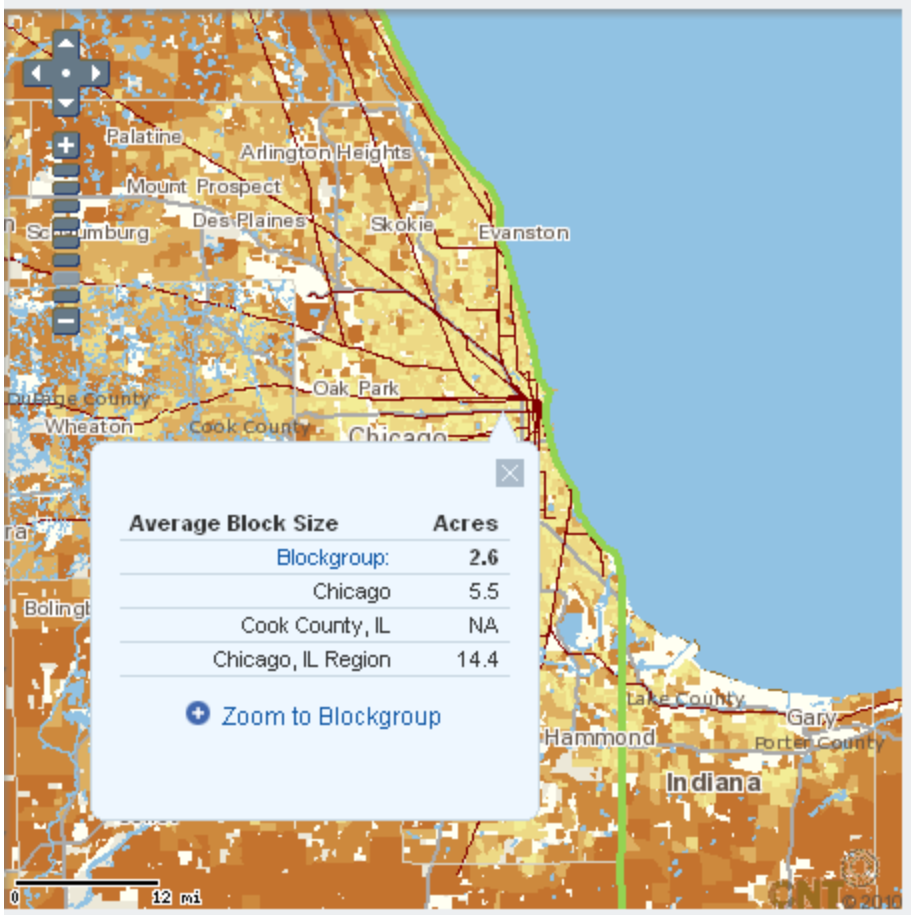
CO2 per Household From Household Auto Use		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,898 with data)	5,583 (5,511 with data)
Minimum	0.7 Metric Tons/HH	0.7 Metric Tons/HH
Average	7.5 Metric Tons/HH	7.1 Metric Tons/HH
Maximum	15.9 Metric Tons/HH	15.9 Metric Tons/HH
Households	2,971,528	2,739,556



With smaller block sizes, higher densities, emissions go down

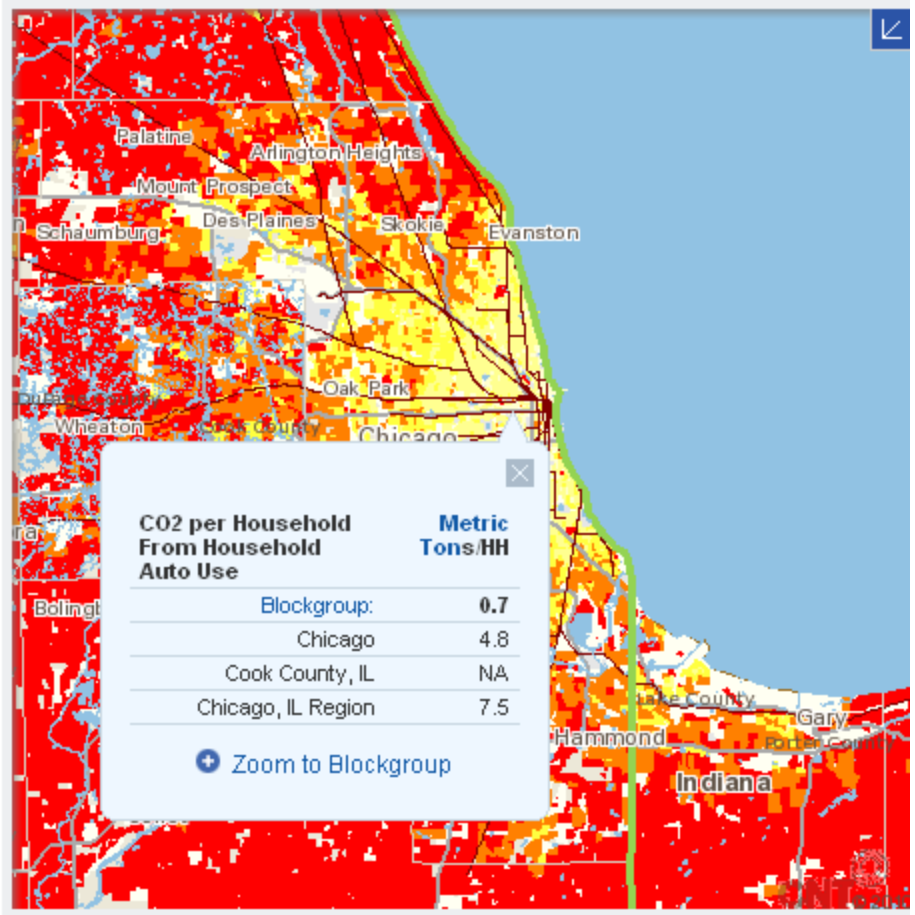
Average Block Size ▼ Change

Average Block Size		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,970 with data)	5,583 (5,583 with data)
Minimum	0 Acres	0 Acres
Average	14 Acres	11 Acres
Maximum	630 Acres	387 Acres
Households	2,971,690	2,739,718



CO2 per Household From Household Auto Use ▼ Change

CO2 per Household From Household Auto Use		
Statistics	Region	Viewable Area on Map Below
Block Groups	5,970 (5,898 with data)	5,583 (5,511 with data)
Minimum	0.7 Metric Tons/HH	0.7 Metric Tons/HH
Average	7.5 Metric Tons/HH	7.1 Metric Tons/HH
Maximum	15.9 Metric Tons/HH	15.9 Metric Tons/HH
Households	2,971,528	2,739,556



Index is Being Adopted At Several Levels

- HUD and DOT are using to screen sustainable communities and TIGER grant applications
- MPOs in Bay Area, Chicago, DC and elsewhere using to re-screen, prioritize LRTP investments
- Chicago and other cities have used to calibrate goals and track outcomes for their climate action plans
- MTC in Bay Area used to justify helping capitalize TOD investment fund
- State of Il. new act requires five agencies to screen investments
- City of El Paso TX now uses to direct affordable housing to areas of low transportation costs
- Experiments conducted with location efficient mortgages and low-driving insurance rates

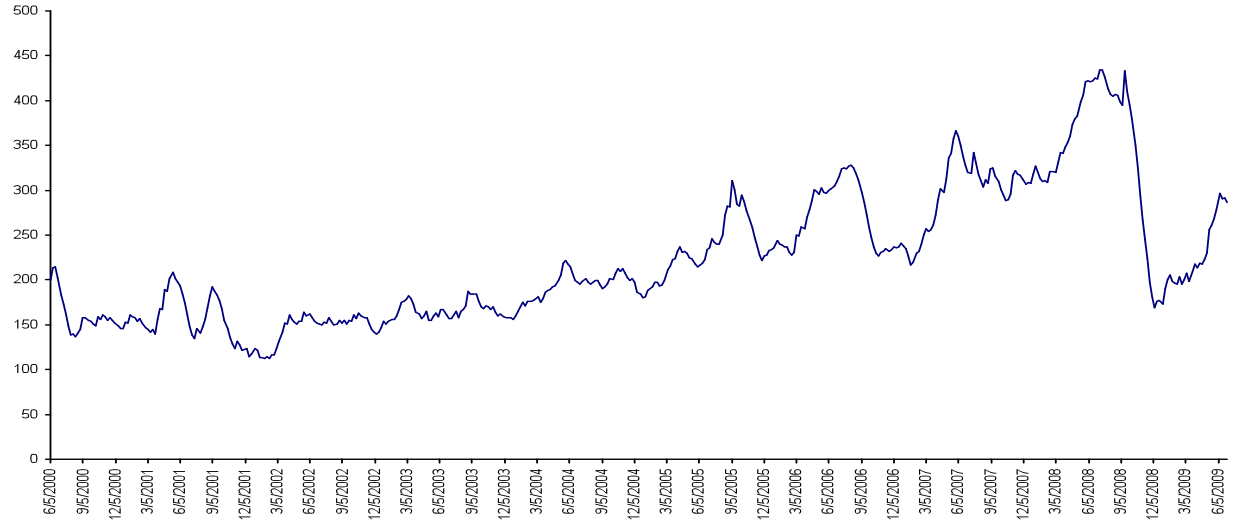
Getting the Goals Right

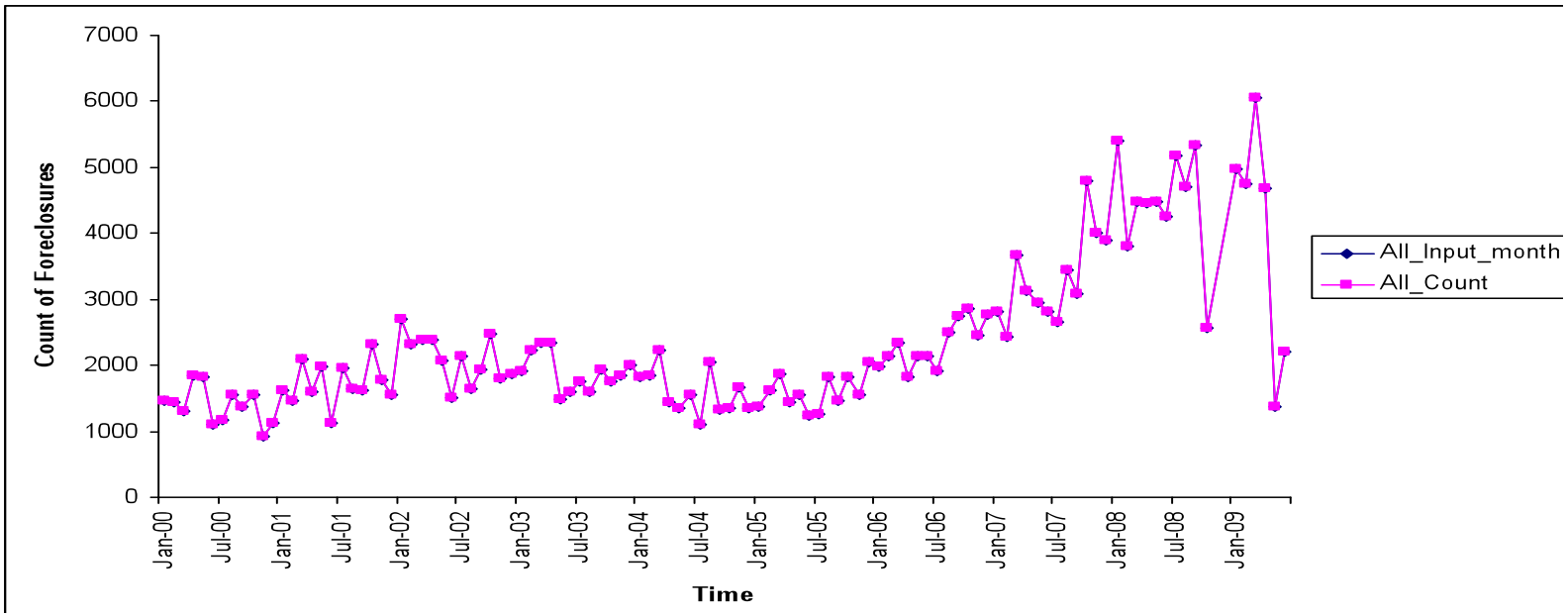
- Affordability and reducing the real cost of living
- Investing to create value and capture it locally
- Creating and sustaining jobs through economic networks
- Reducing economic risks
- Acting as a region

We Can Use This Knowledge To—

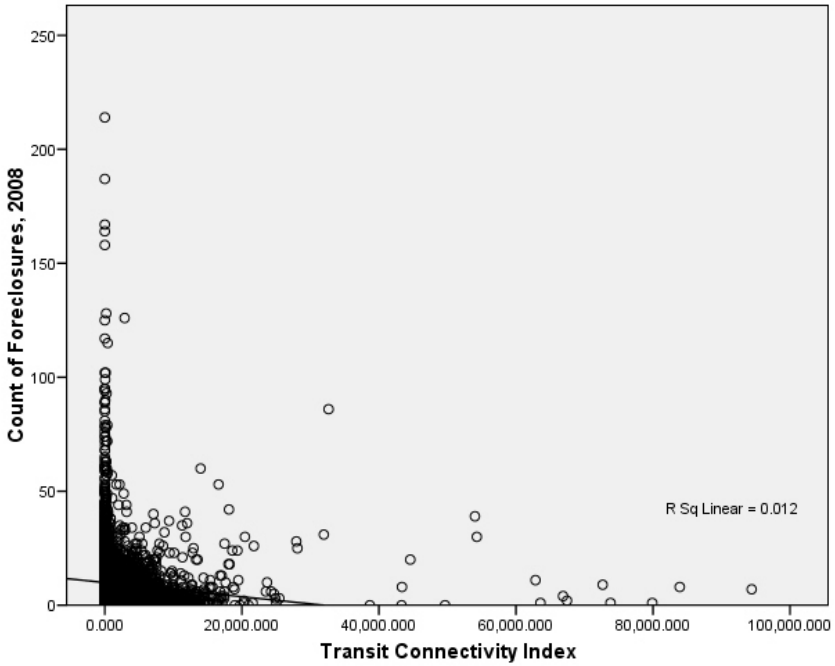
- Protect consumers against “hidden” costs by providing better information
- Analyze trends & compare across HH types
- Define housing needs for public policy purposes
- Encourage coordination of housing and transportation policies
- Inform sub-Federal planning efforts
- Predict the ability of a household to pay rent or mortgage
- Improve financial / housing counseling
- Help make the case for and package alternative financing for accelerated transit system build-out

Can Gas Price Spikes Help Provide Early Warning of Defaults and Foreclosures?

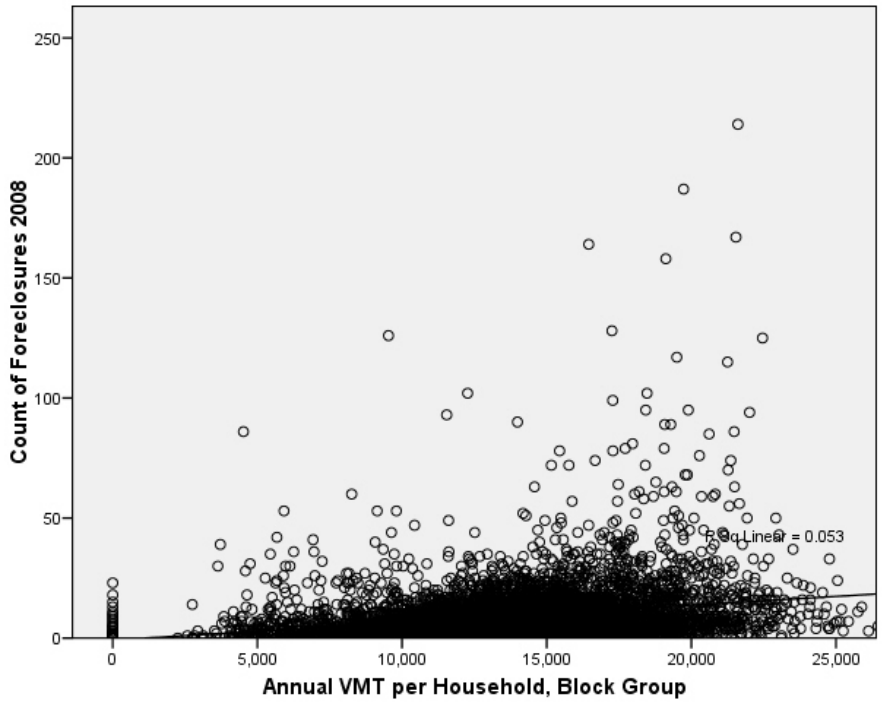




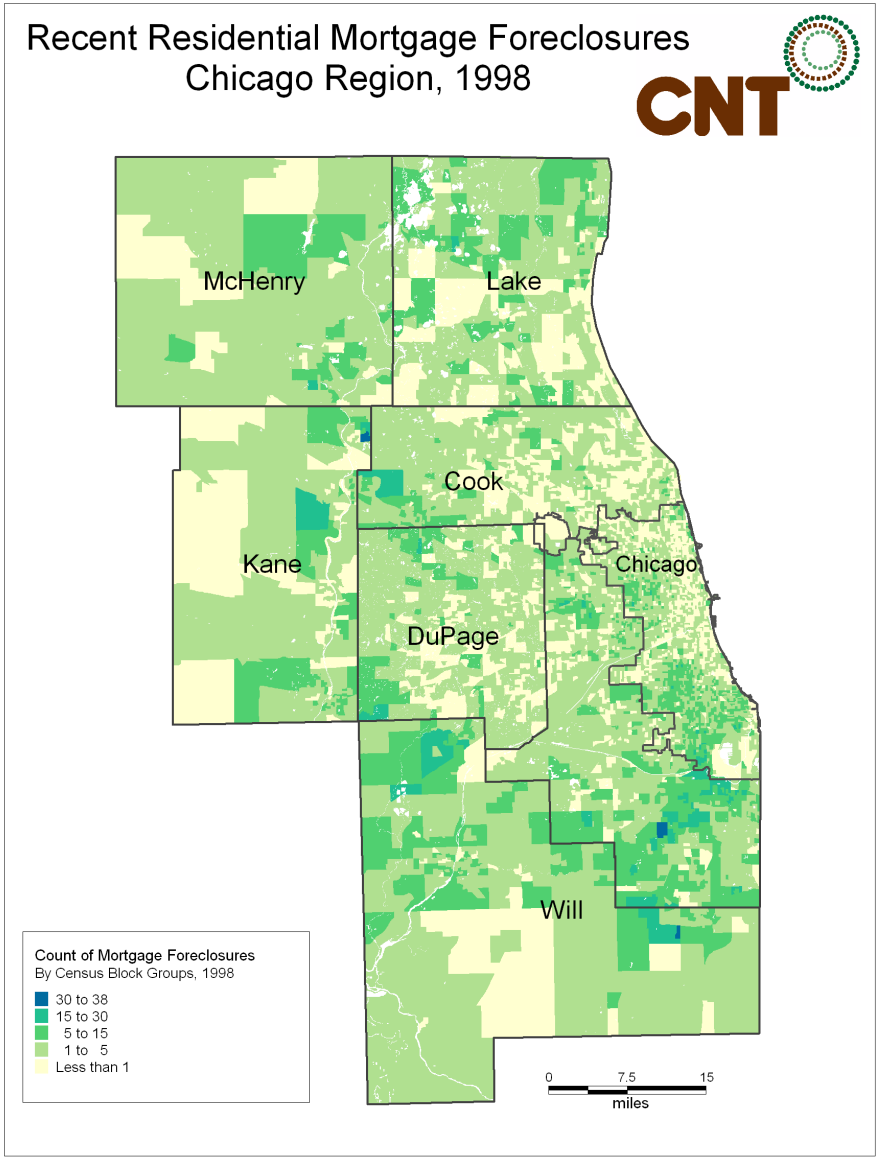
The lower the TCI, the greater the number of foreclosed properties by Census Block Group

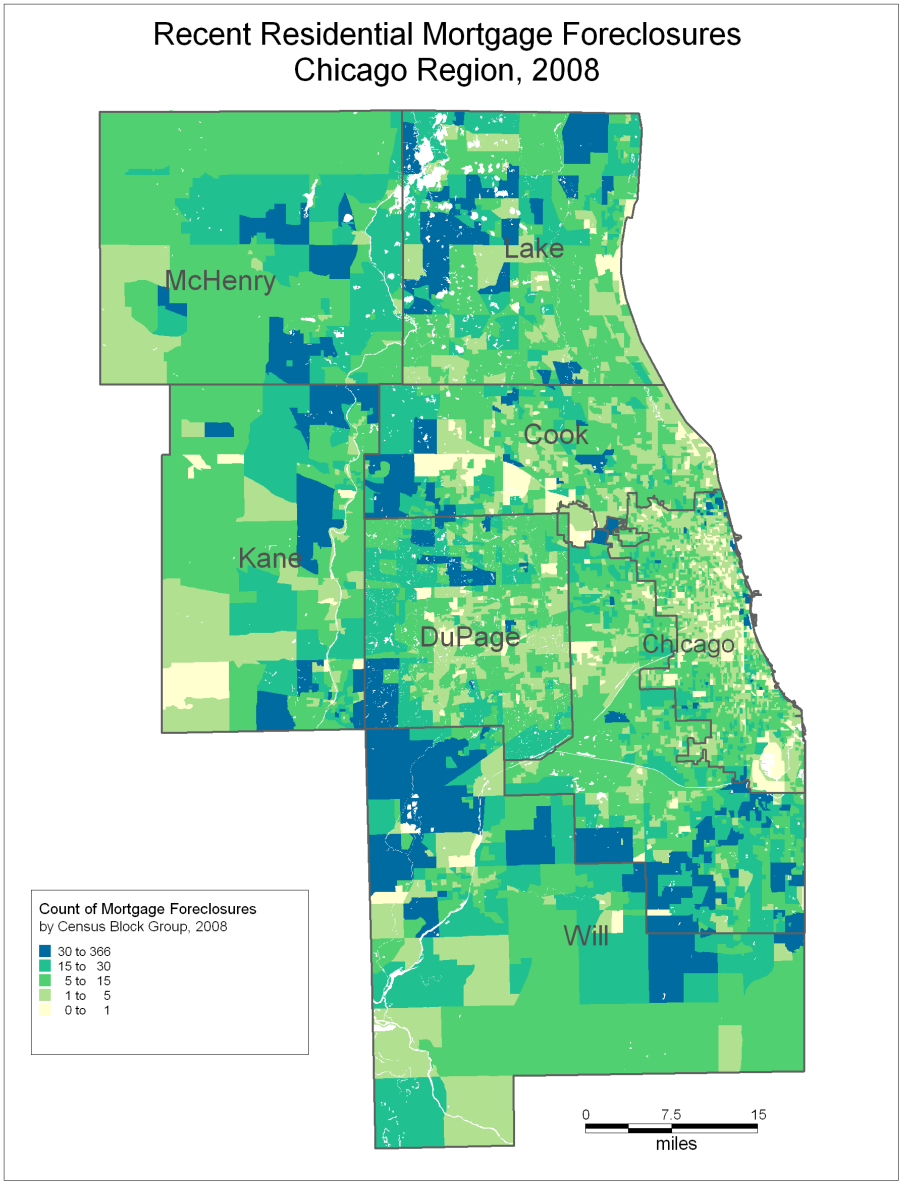


Foreclosures increase once the average annual VMT per Block Group exceeds 15,000

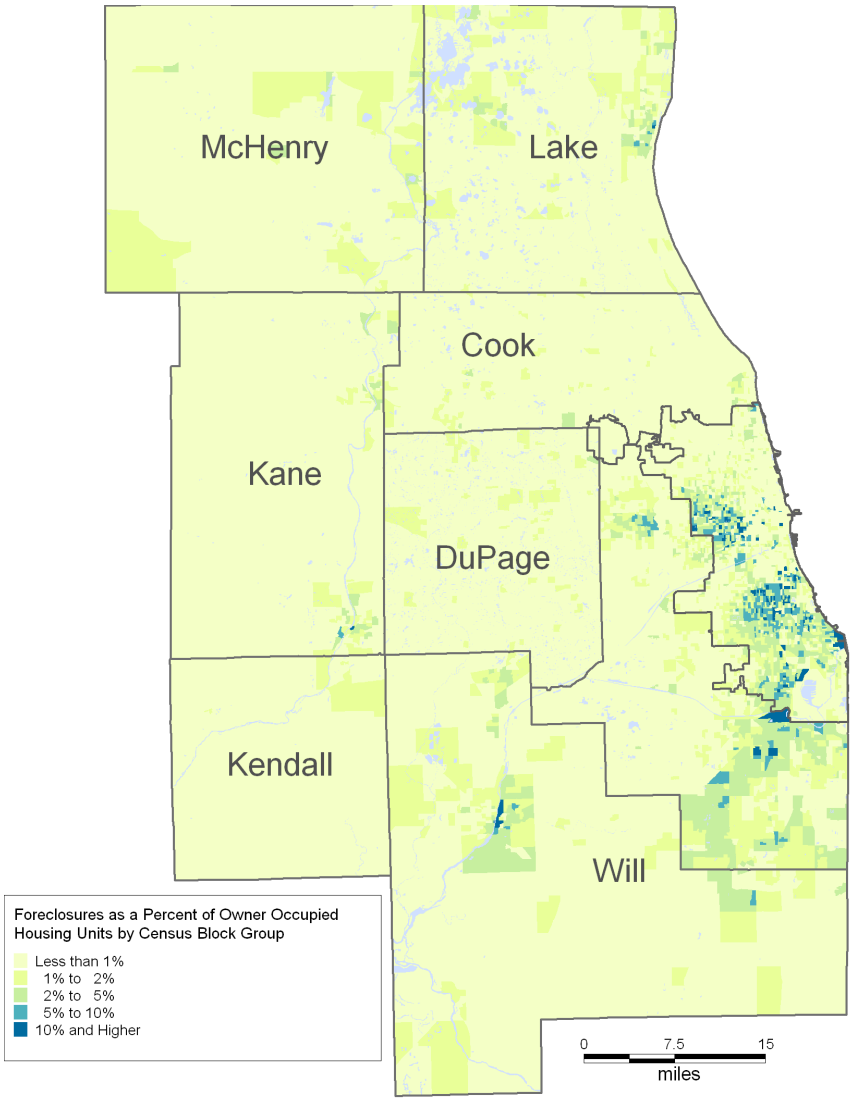


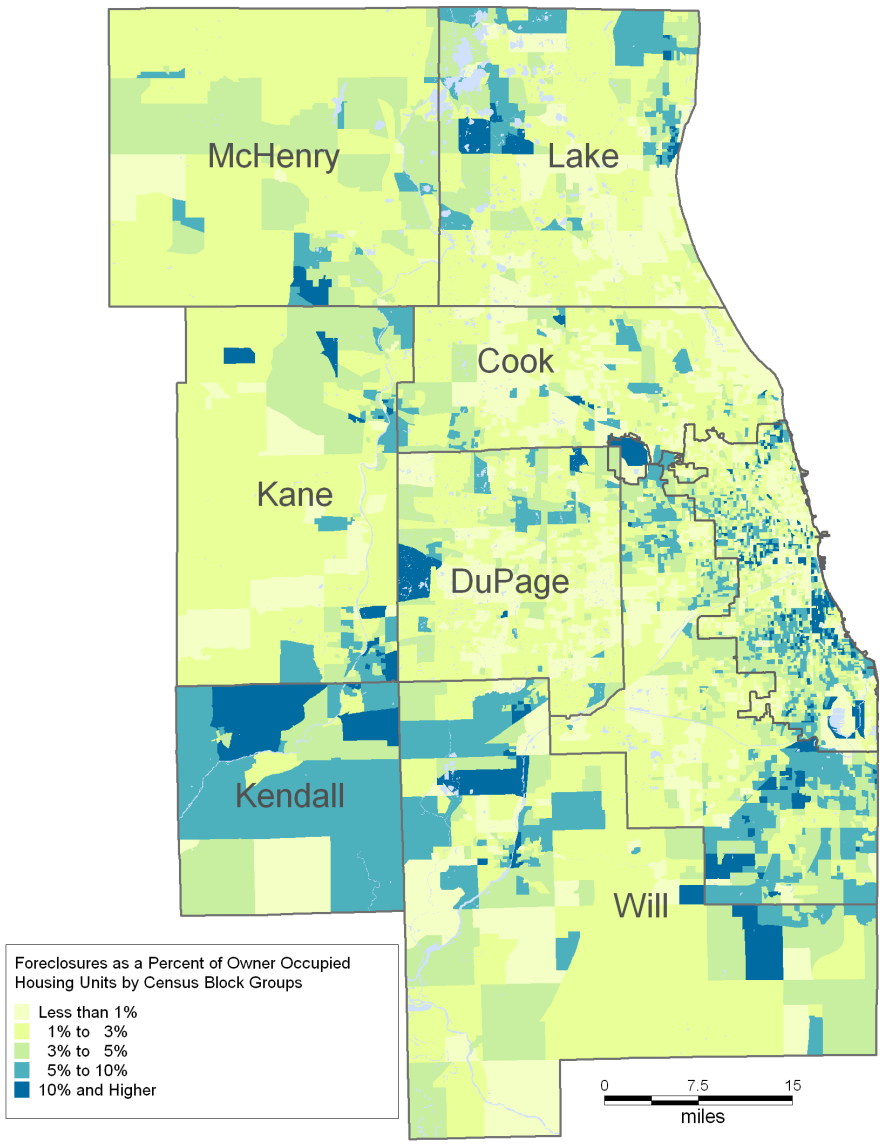
Ten Years of Foreclosures in Metro Chicago





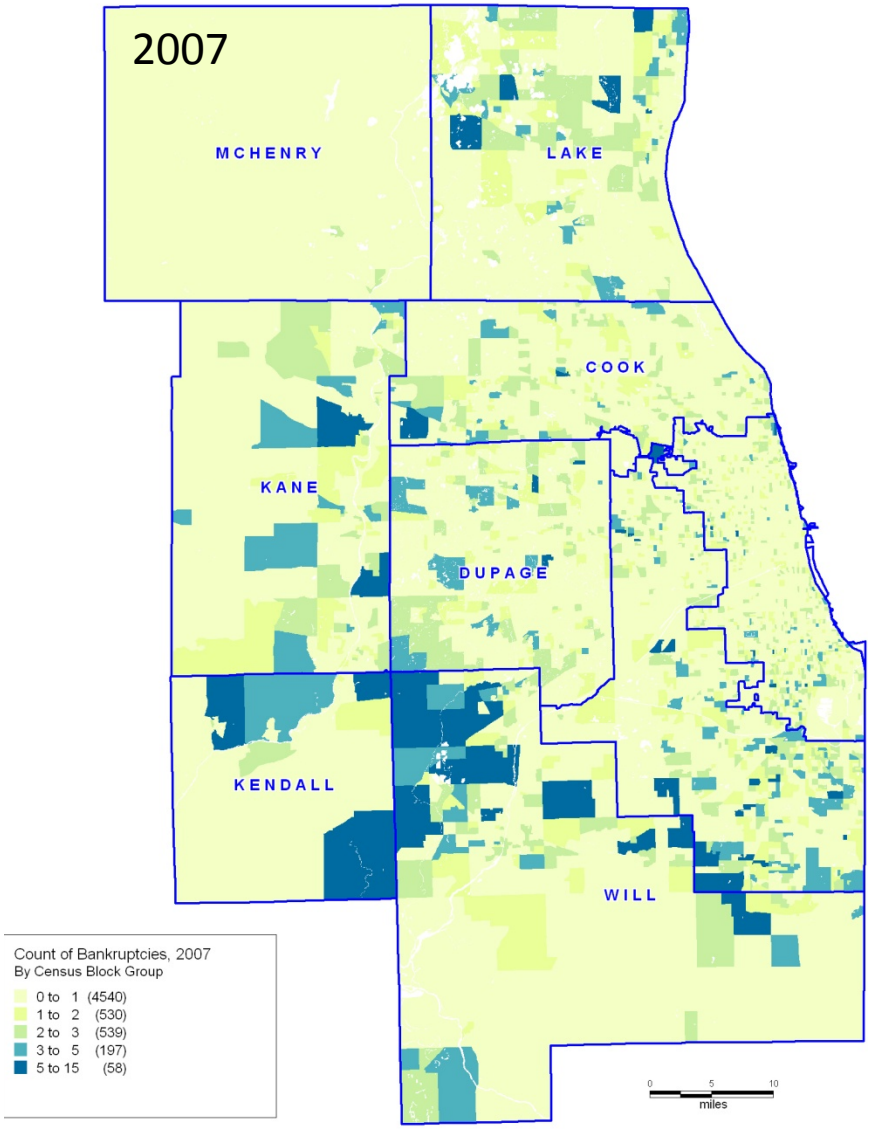
Foreclosure Rates in Chicago 2000 and 2008
Highest in Areas of High T-Cost and
Extensive Use of Variable Rate Financing

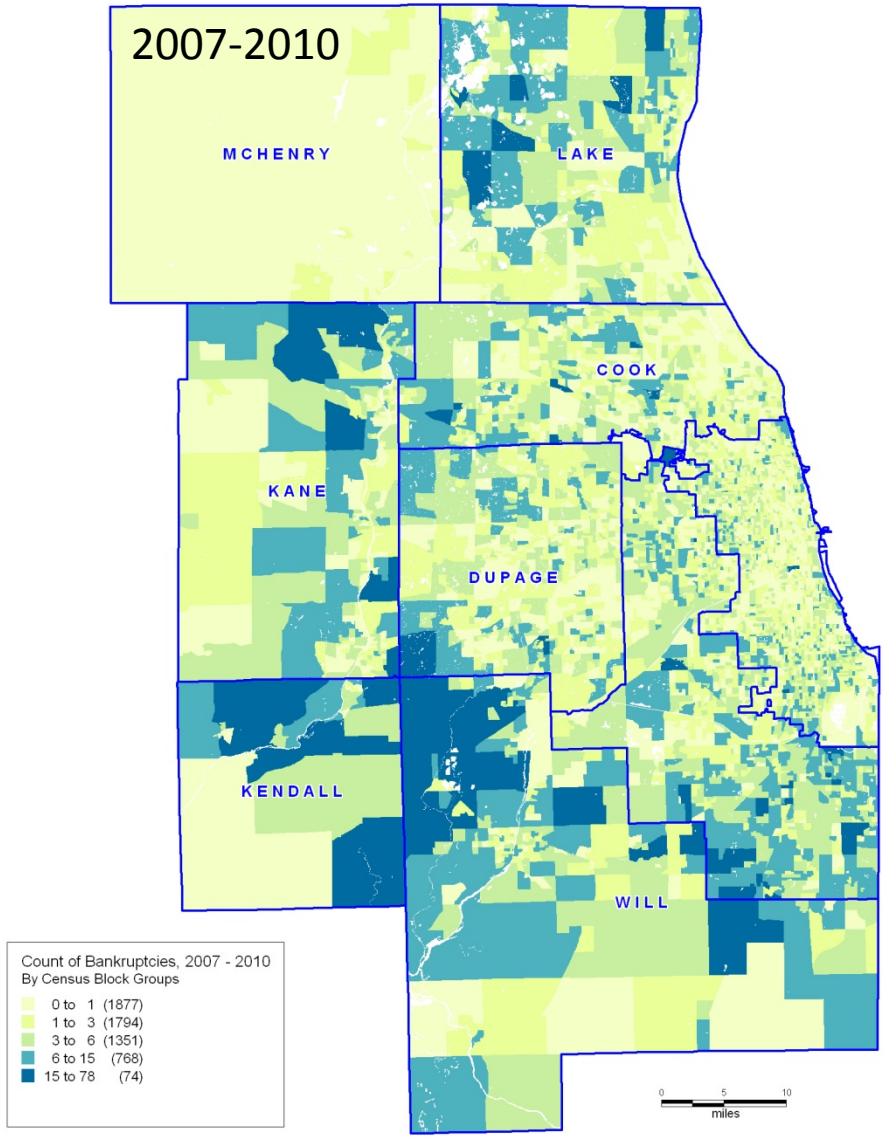




Count of Bankruptcies in Chicago Metro Area 2007 and 2007-2010

Source: PACER





Taking This Risk Into Account—Location Efficient Mortgages, Idea Was Well Received, Seems to Have Outperformed Market

Chicago Tribune

18 Section 1 Sunday, June 4, 2000

Skip the car, buy a house

There's a lot of hand-wringing nowadays about suburban sprawl and the need for "smart growth."

But like the weather, nobody's doing much about it.

Much of the home-buying public still opts for wide-open spaces along the metropolitan fringe. And despite thoughtful warnings from civic and regional groups, political realities in Illinois militate against significant governmental action.

Now comes a modest but innovative pilot program that just might make a small difference. Maybe even a big difference—*if* it educates the public about the true cost of living "out there."

It's called the Location Efficient Mortgage, or LEM, and it has been developed by environmental groups such as Chicago's Center for Neighborhood Technology along with Fannie Mae, the government-chartered, stockholder-owned repurchaser of home mortgages.

It works like this: Participating lenders, in evaluating applicants, take into consideration how close the dwelling is located to public transportation. If it's so close the applicant can live without a car, or a working couple can get by with just one, the estimate of disposable income is increased, and with it, the size of the mortgage for which they qualify.

A couple jointly earning $60,000 and buying into Chicago's transit-rich Edgewater neighborhood, for instance, would qualify for a home selling for $212,218. Out in the boonies, under traditional guidelines, the limit would be $158,364.

And there are sweeteners. LEMs are not subject to income limits and they offer more flexibility, including lower down payments, than conventional mortgages. The City of Chicago, moreover, is offering vouchers worth $900 toward the purchase of energy-efficient appliances to the first 100 LEM borrowers.

Downsides? There's mandatory counseling. And for now it's limited to Chicago and three West Coast cities.

The ultimate value of LEM, however, may be to show, in ways people readily understand, that sprawl does impose costs. Some of that cost is paid, knowingly and gladly, by those who choose to live "out there." Much of it, however, is hidden, and paid indirectly by those who live "back here."

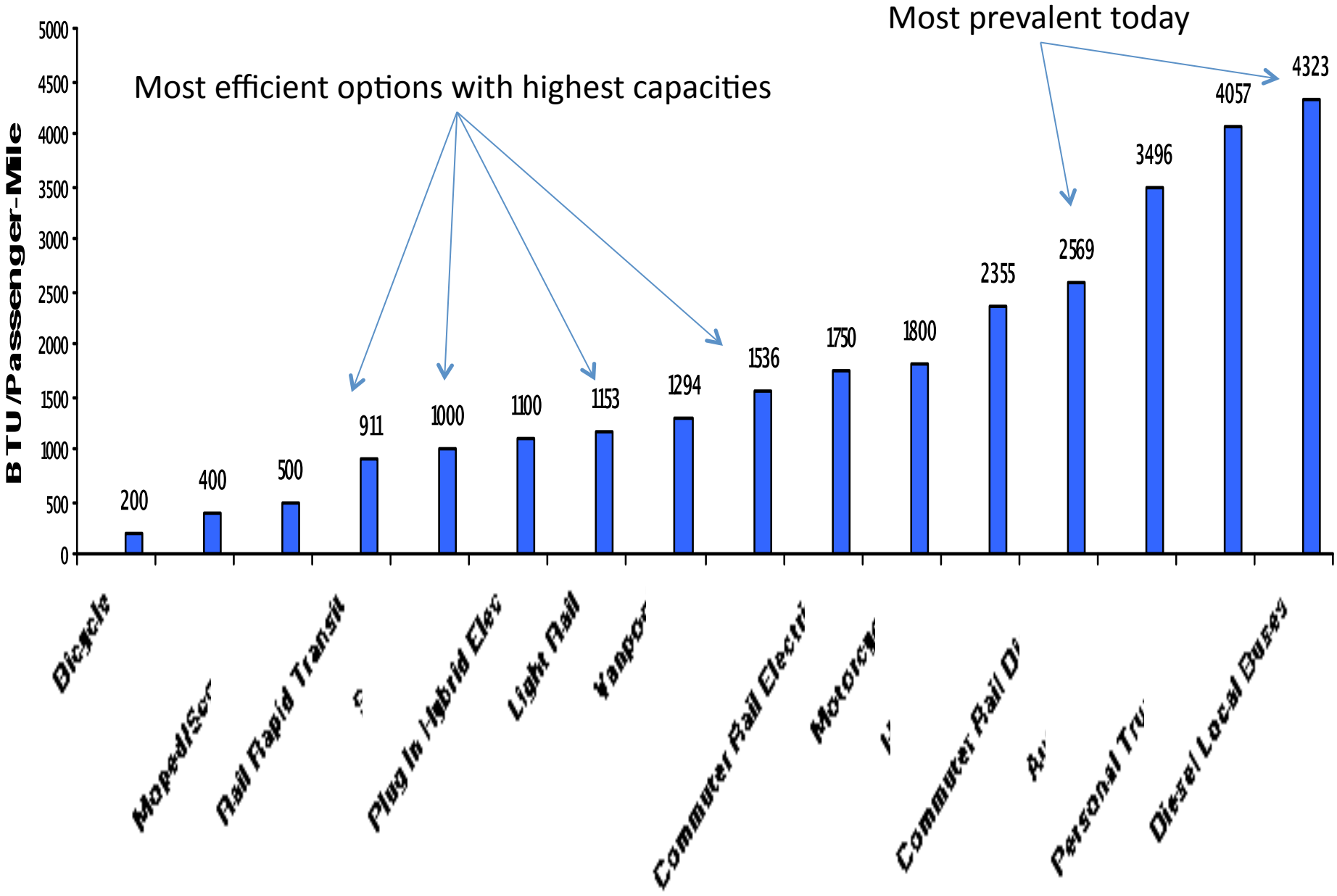
For more information about LEMs call 1-800-732-6643.

Sample Strategies and Uses

Car Sharing-
Poised for Takeoff?

- 200 cars, 15000 members
- Pay as you go vehicle access
- Available in many Chicago communities plus Oak Park, Evanston
- Half of members sell a car
- Takes 17 cars off the road for each shared car in service
- Reduces car travel 5,000 VMT per user
- Users significantly increase walking, biking, riding

Back to the Future—Range of Energy Intensities for Local/Regional Transport Options



Calgary CA—500 passengers, 5-25 miles, 15-40 minute trips, no oil, zero GHGs—1st 100 % Wind Powered Transit System

Image courtesy Anthony Perl

Electric Traction Corridors—Multi-modal transportation, electric reliability and economic development strategy—utilities re-establish role as investors in mass transportation

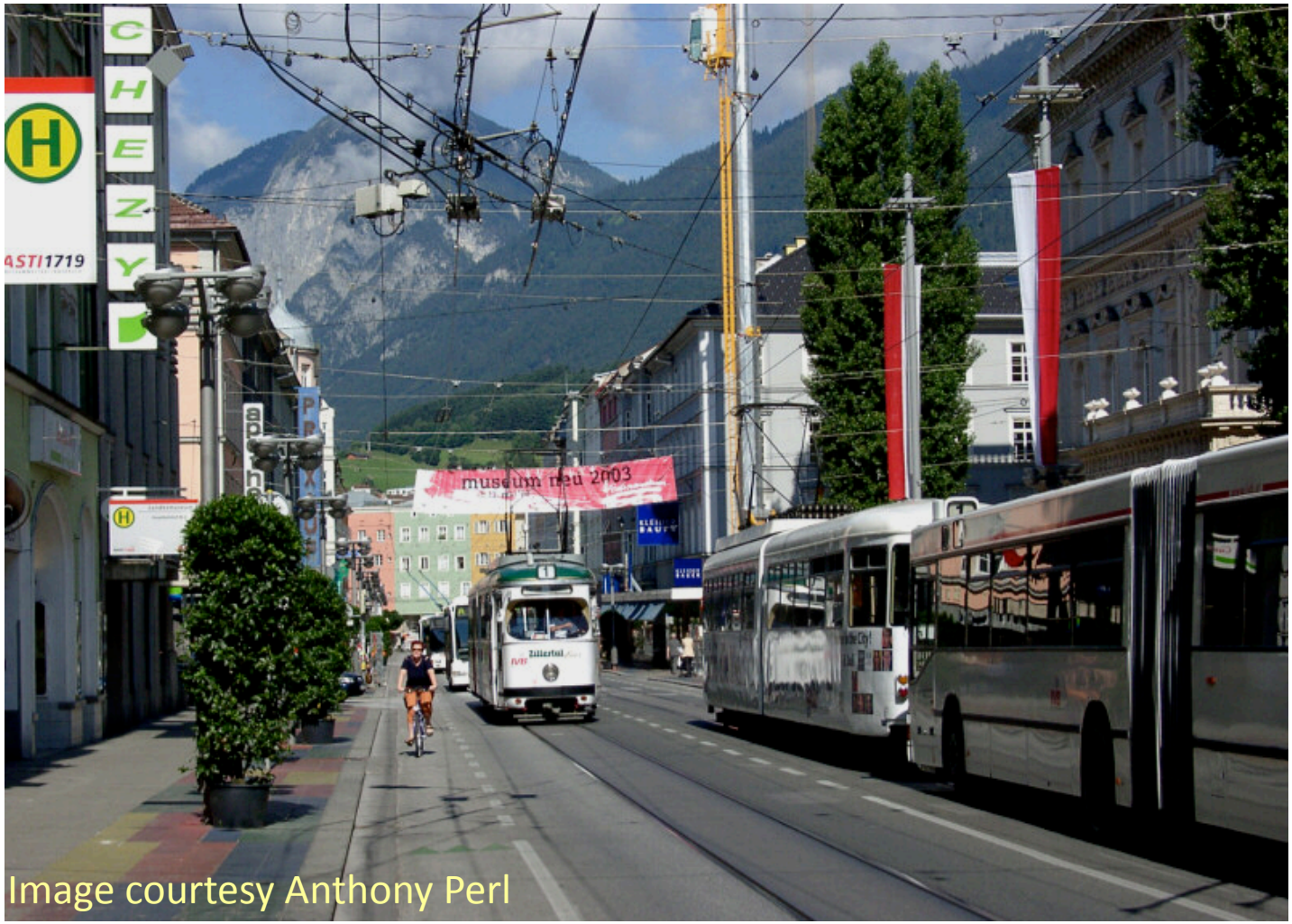


Image courtesy Anthony Perl

Electric Trolley Buses

- Can operate on trolley lines or independently
- Same cost as hybrid diesels
- More fuel efficient
- Quieter
- Operating in Seattle, Boston, Philly, SF, Vancouver & Dayton
- 10-15 % more revenue/bus

CNT
Sustainable Communities
Attainable Results

Dresden—Revived old US practice of using rail assets to solve local freight challenge

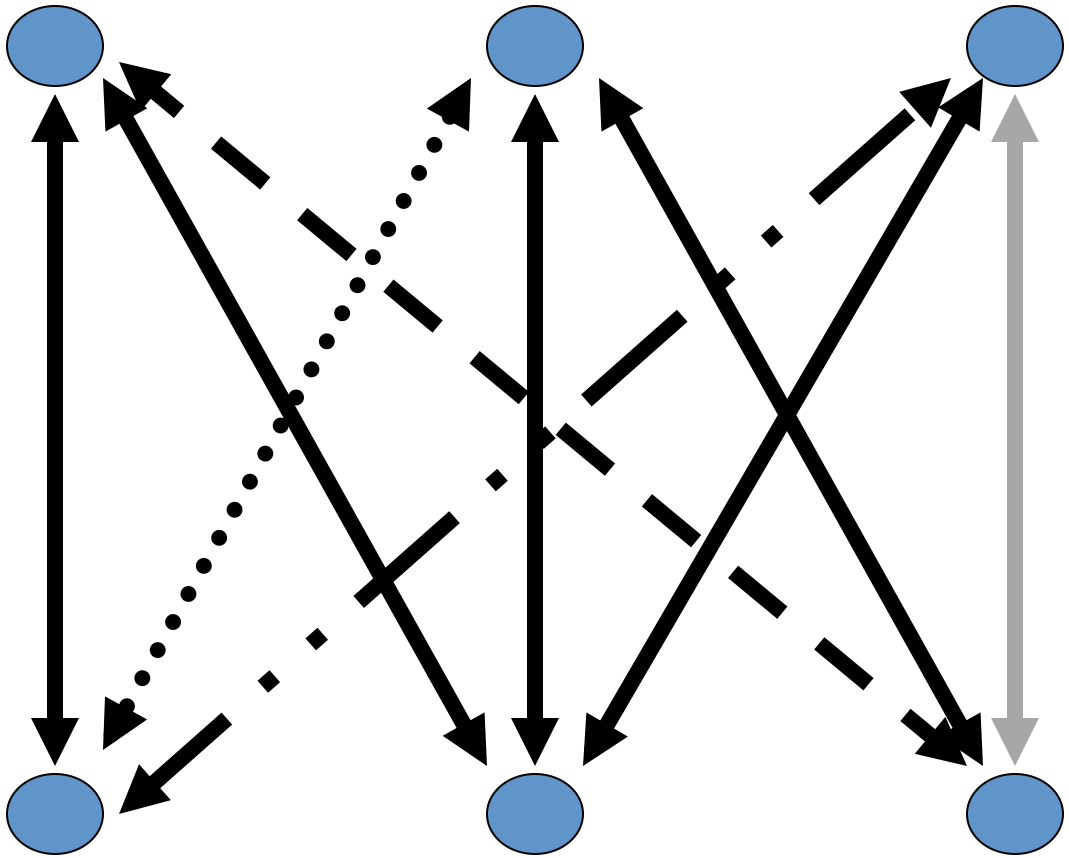
Smart Grid could change market for electric transportation

- PHEVs intro'd in 2010
- Micro-grids soon
- Wind-electric now
- New shared infrastructure arrangements with utilities
- Customers and communities paid for demand shaping-now
- Turns all full time consumers into part-time producers

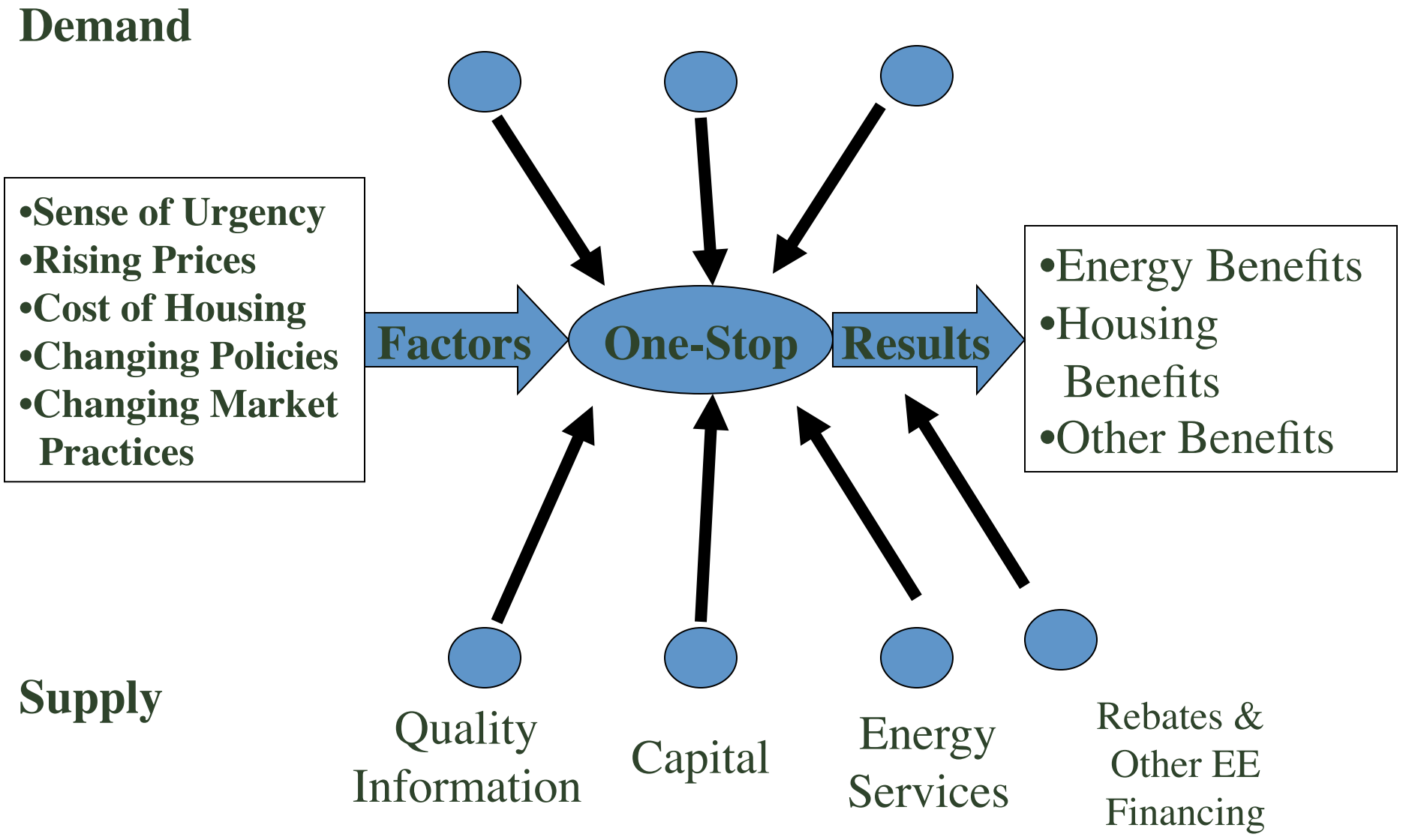
What Are Some Analogous Tools and Activities for Soundscape Planning?

When Coffee Came to London…

The Need for One-Stop Shopping: The Current Unorganized Market

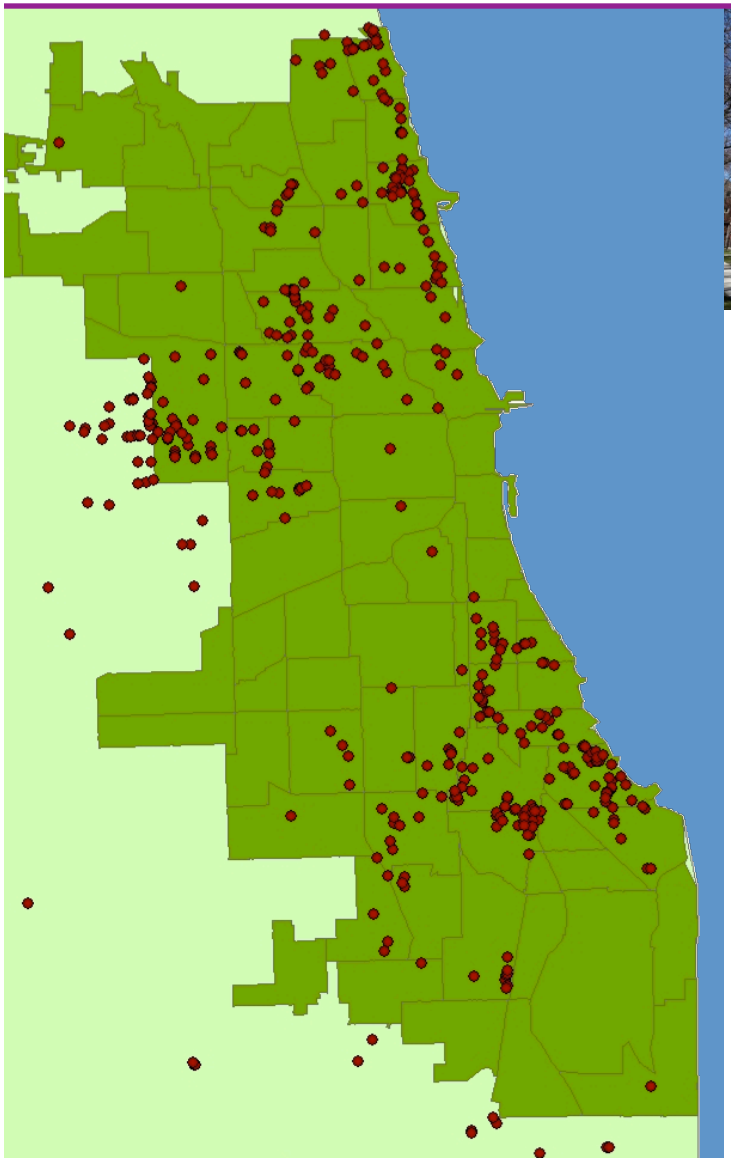


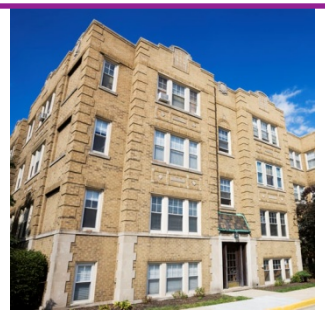
The Need for One-stop Shopping:
A Better Model for the Residential Sector



CNT energy savers

CNT
Sustainable Communities
Attainable Results

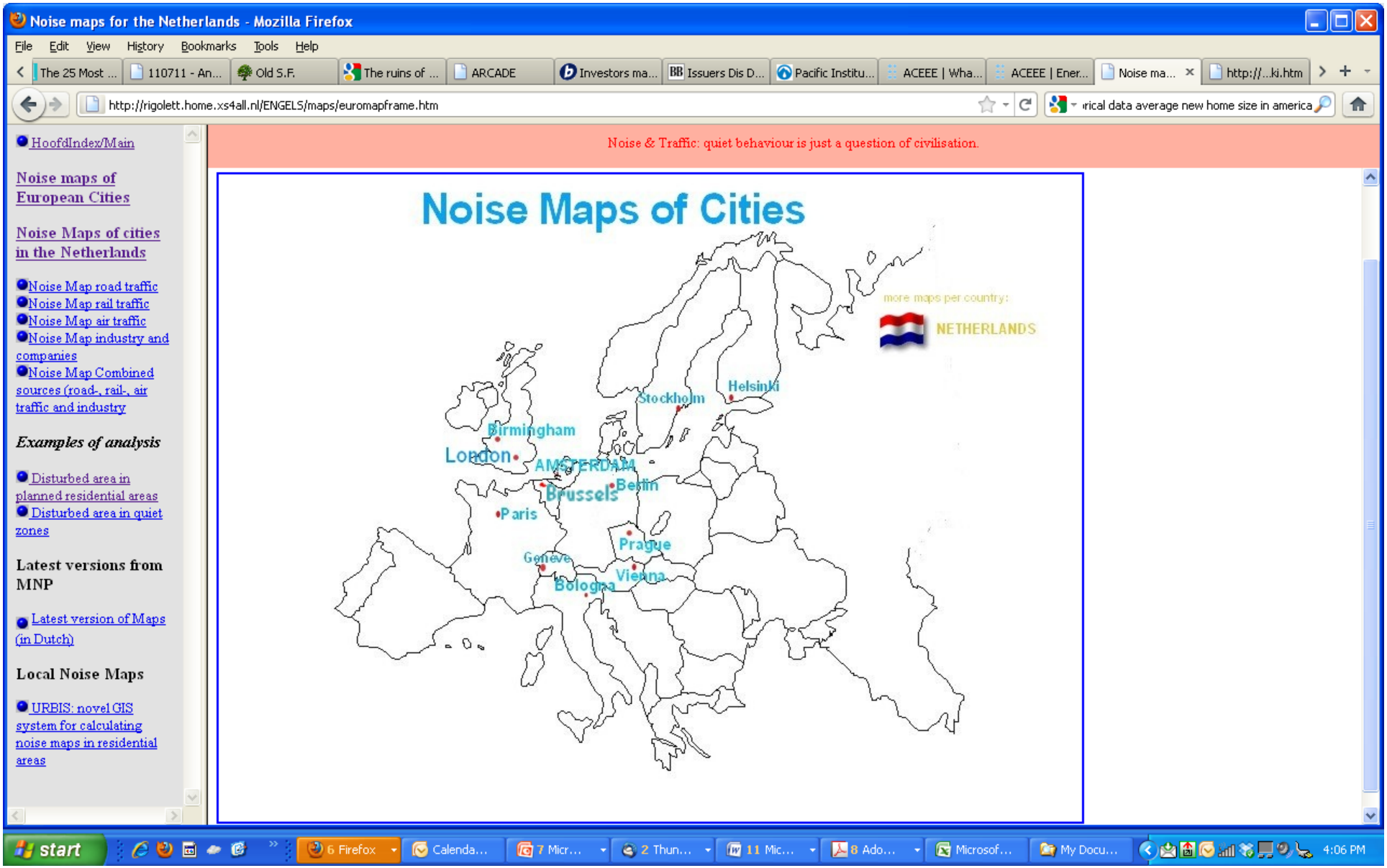




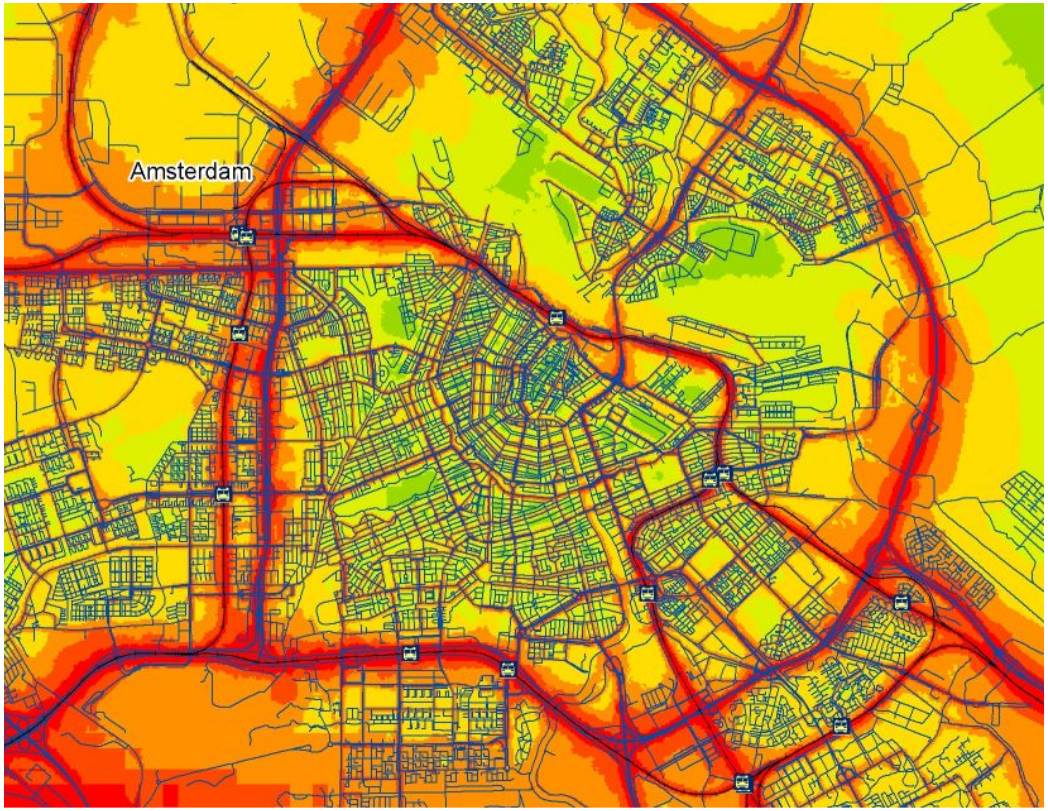
Energy efficiency solutions for Chicago-area apartment buildings

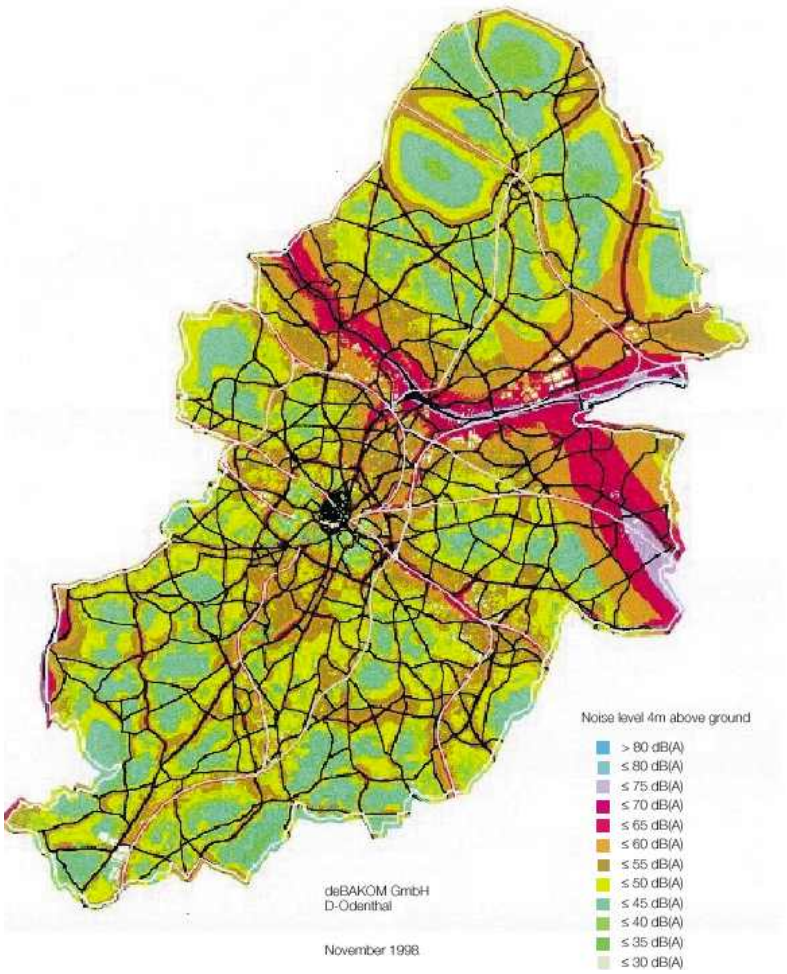
- 10,000 units since 2008, one-half retrofitted
- 30% average energy savings
- Part of Preservation Compact devoted to preserving affordable rental housing in northern Illinois—in process of being copied in a dozen other regions

Start Mapping Noise Levels and Provide a Portal for Good Comparisons—EU Requires



Samples from Amsterdam and Birmingham





Measuring Tire-Pavement Noise at the Source—
6db rise for heavy trucks 55-70mph,
4db rise for light vehicles 55-70mph
Better incentives or regulation toward slower traffic helps

- Tire-pavement noise measured both on-board and at 25 & 50 feet
- Rises with vehicle weight, speed, proximity
- Other studies show tire traction noise > engine noise for speeds >60mph

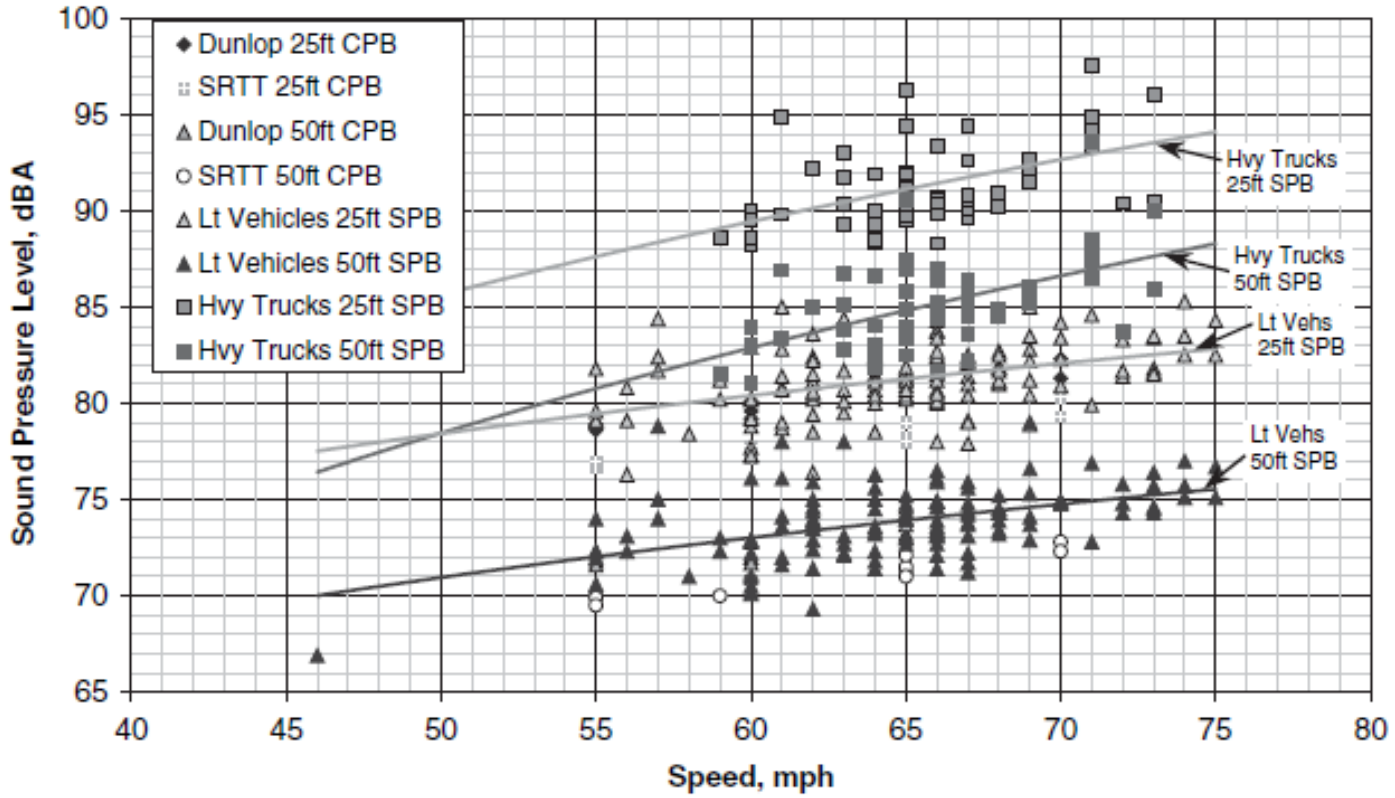


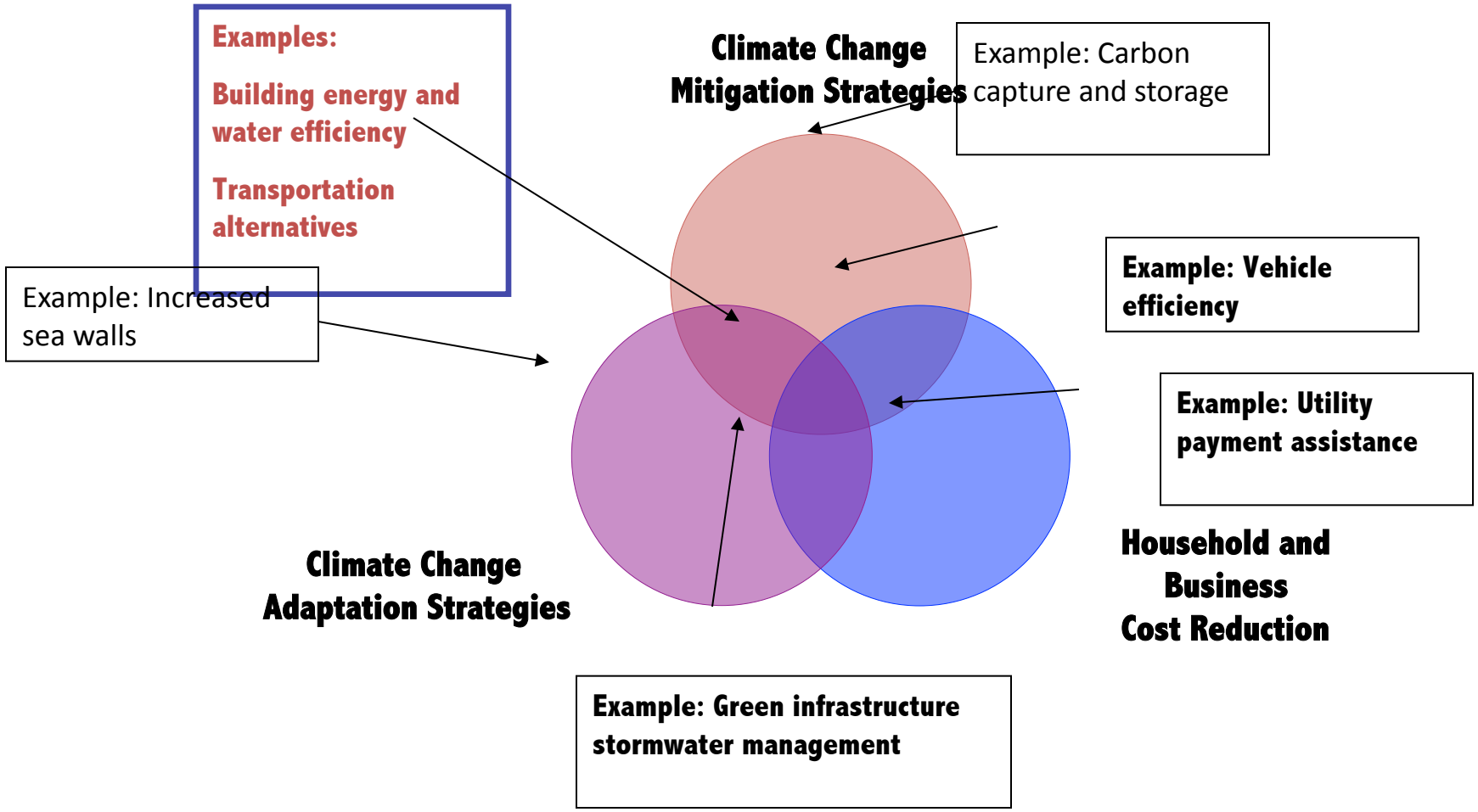
Figure 13. SPB and CPB levels versus speed for heavy and light vehicles at 25 and 50 ft for Site 5 (longitudinally tined PCC pavement).

NCHRP 630, 2009, National Academies Press

Learning from Events Constituting 'Natural Experiments'

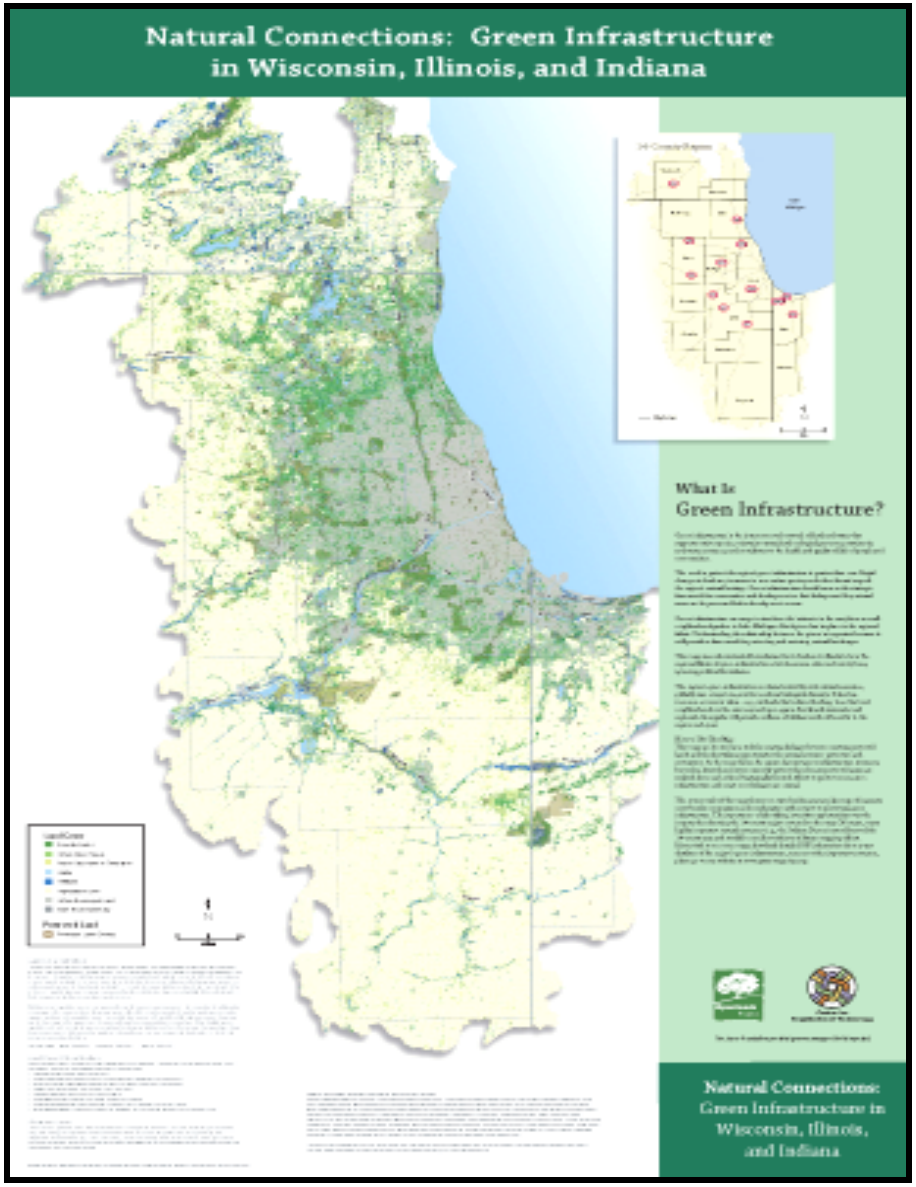
- Traffic continues to drop in proportion to prices, choices
- Traffic shutdown ordered during Atlanta Olympics
- Up to 44 percent reduction in respiratory disease in normally exposed population
- Week starting September 12—shutdown of the entire US aviation system following 9/11 attacks
- "Bike the Drive"
- Several weeks ago—NYC, hurricanes shut down the NYC MTA and major roads

Adaptation and Mitigation can Have Overlapping Benefits—Market Co-Benefits of Better Soundscapes



Making Permeability Transparent

- 170 GIS layers
- Land status, current and historic
- Interactive, searchable
- Shows where baseline GI network can be extended



www.greenmapping.org

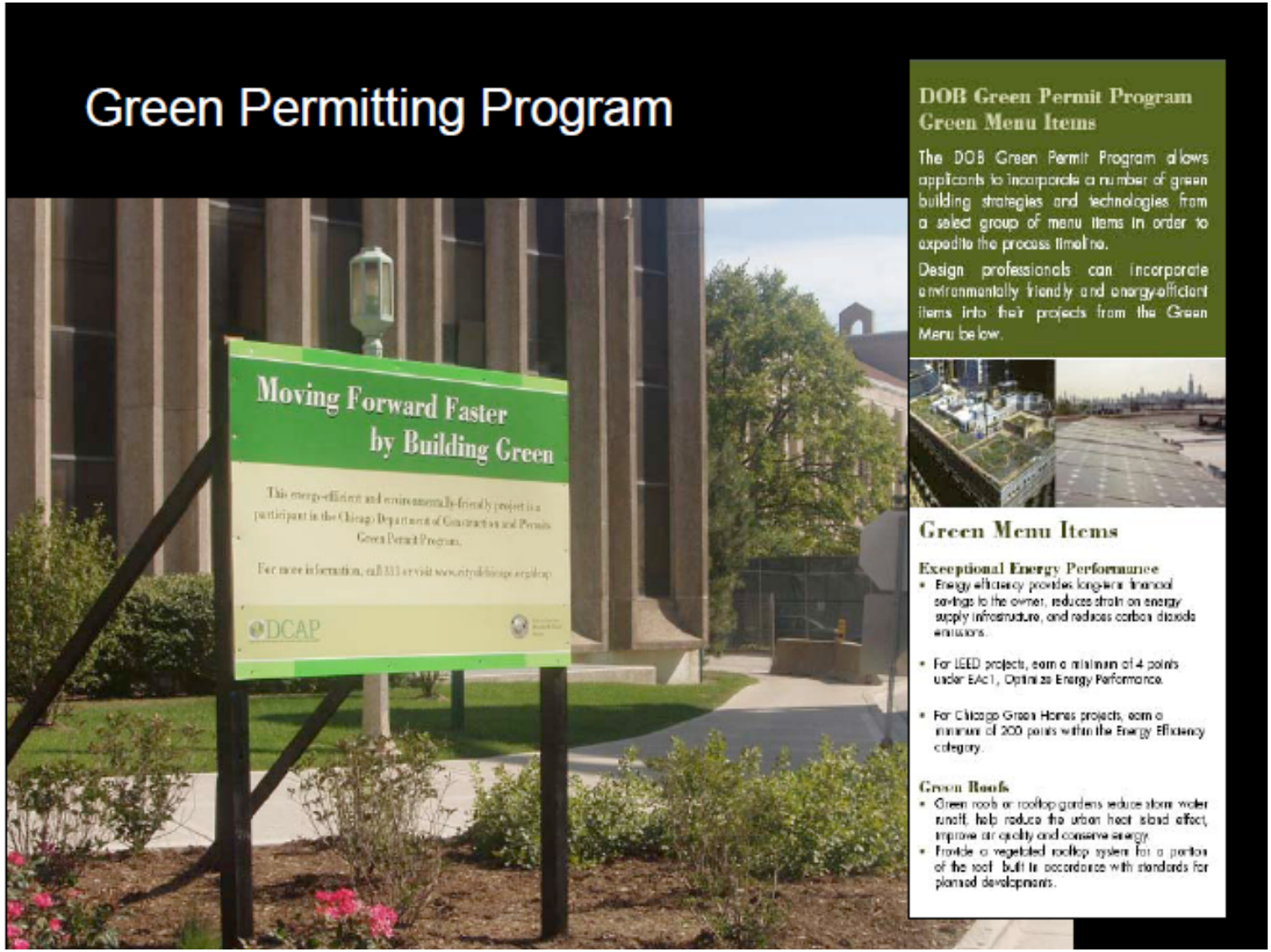
Making the Local Value of Green Transparent

Compares green and conventional 'grey' infrastructure hydrological impact, life cycle costs, + benefits

Adaptable to local ordinance compliance

greenvalues.cnt.org

Chicago Policies: Accelerated Green Permitting



CNT
Sustainable Communities
Attainable Results

How Complete is your Street?

- Stormwater Management
- Energy Efficiency
- Water Efficiency
- Alternative Transportation
- Recycling
- Urban Heat Island
- Education
- Beauty and Community
- Site Selection
- Air Quality

cnt.org/natural-resources/sustainable-streets/

SUSTAINABLE STREETS *for* CHICAGOLAND

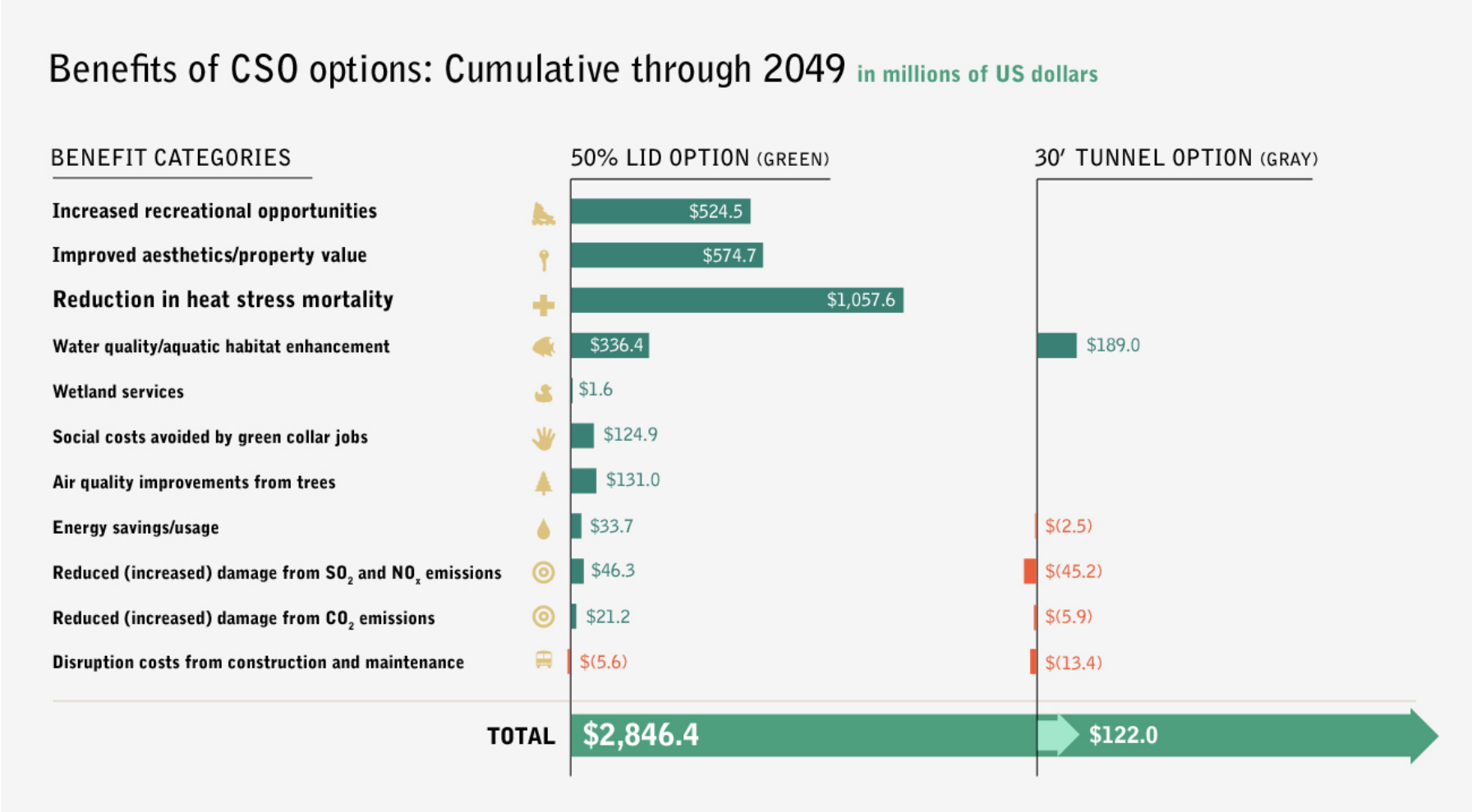
multi-modal, multi-functional and *totally fabulous*

The Chicago Department of Transportation and the Center for Neighborhood Technology invite you to learn about Chicago's innovative integrated design practices from Green Alleys to photocatalytic cements. Expert practitioners will explore how transportation projects can incorporate sustainable lighting, stormwater, and material development, with numerous opportunities for questions and discussions.

U.S. Department of Transportation
Federal Highway Administration

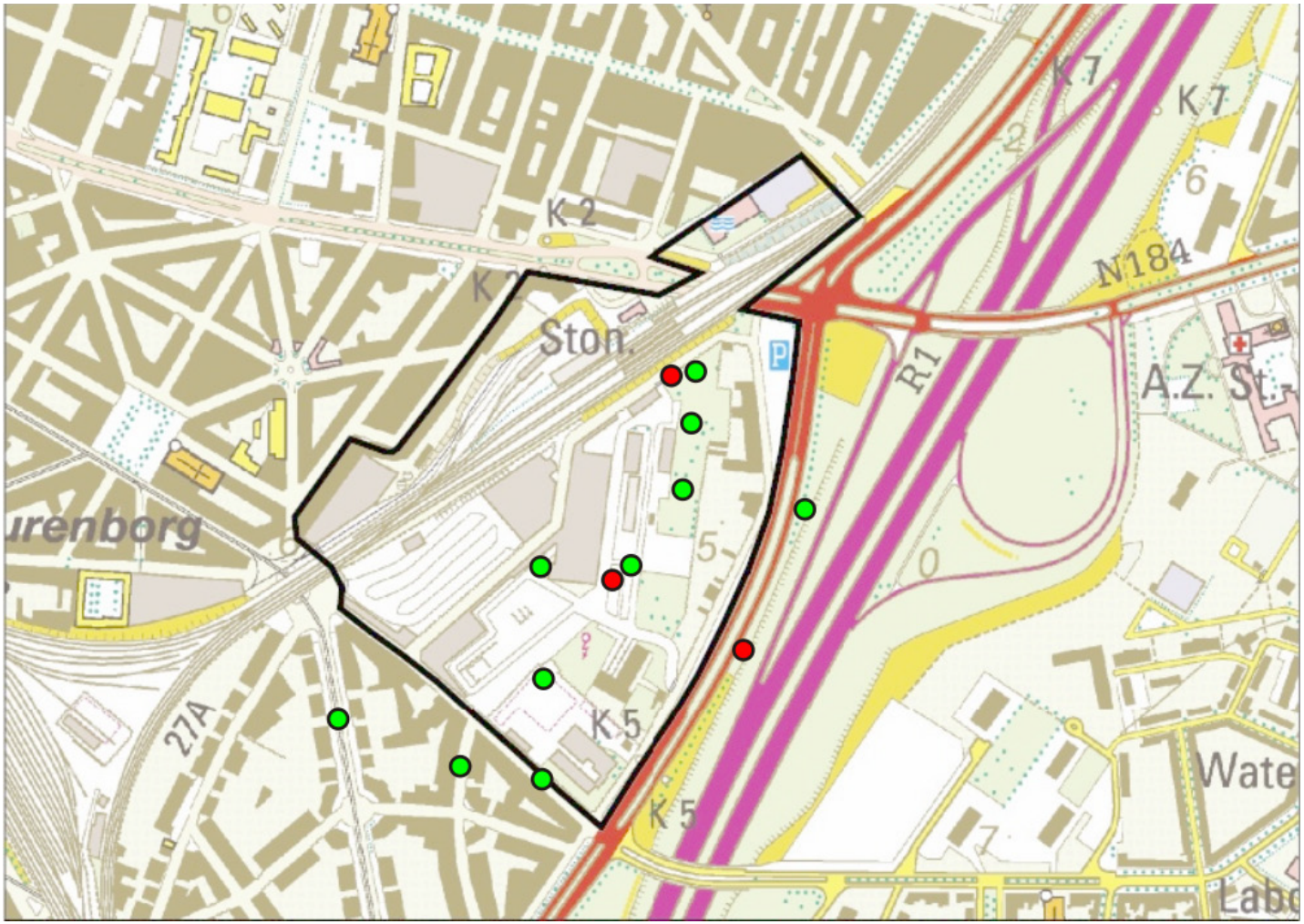
When: **Wednesday, June 17**

Philly Triple Bottom Line



Philadelphia Watersheds (Stratus Consulting) 2009

Plan for Retro-fitting the City for a Satisfying Soundscape--Antwerp



Use participatory planning, modeling and visualization to increase local buy-in

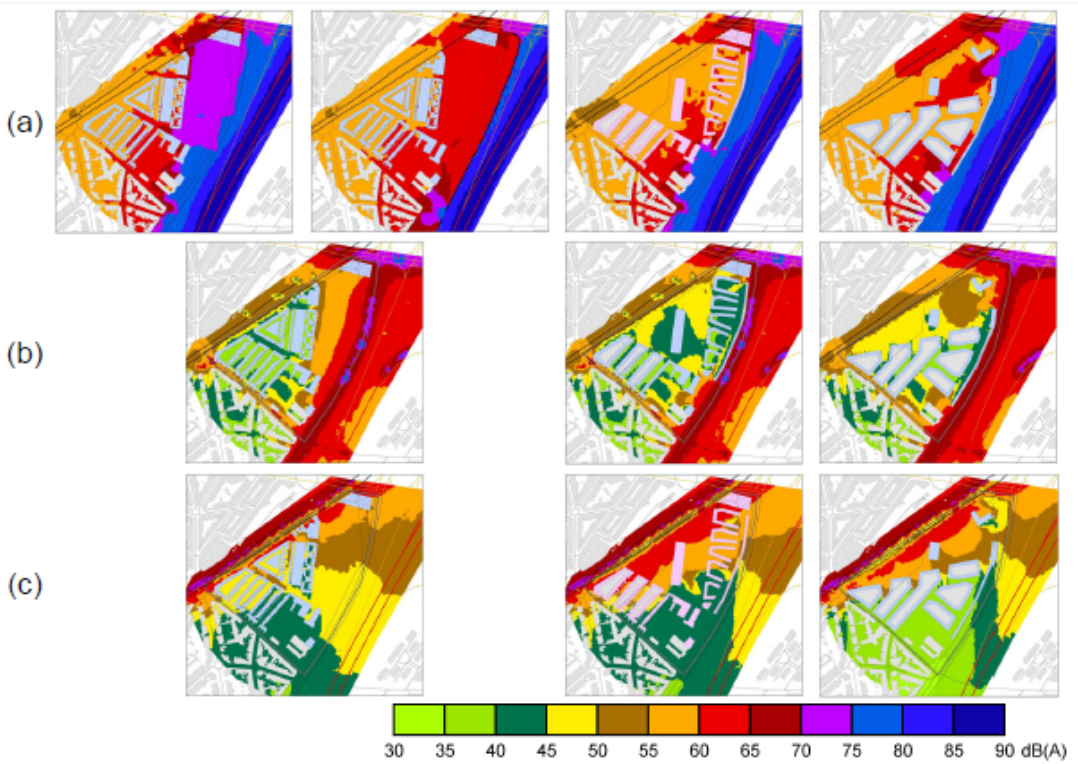


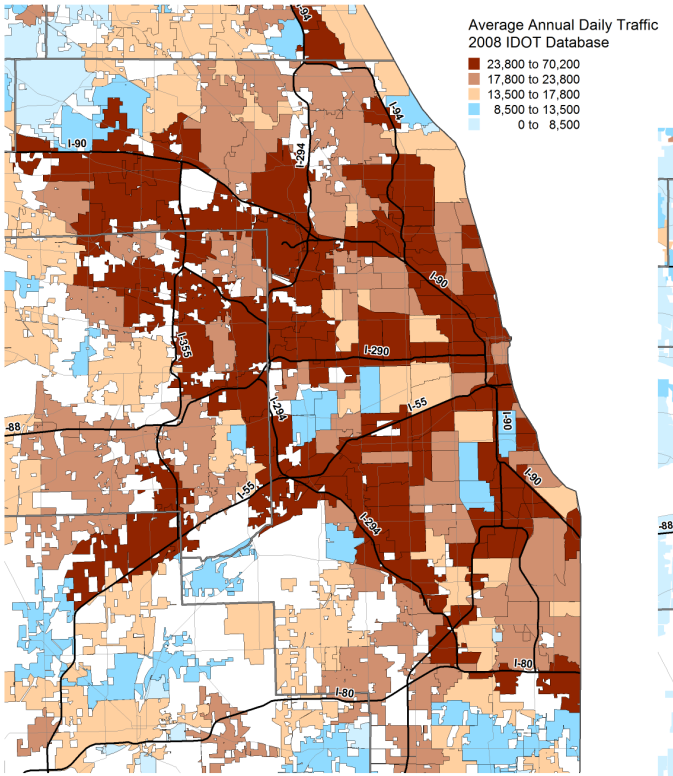
Figure 6 – Noise maps for the different scenarios: $L_{Aeq,day}$ calculated for the noise caused by (a) freeway traffic, (b) local road traffic, (c) railway traffic.

Table 1 – Rough estimates of the percentage of new inhabitants that are potentially highly annoyed by noise from the freeway, local roads and railway.

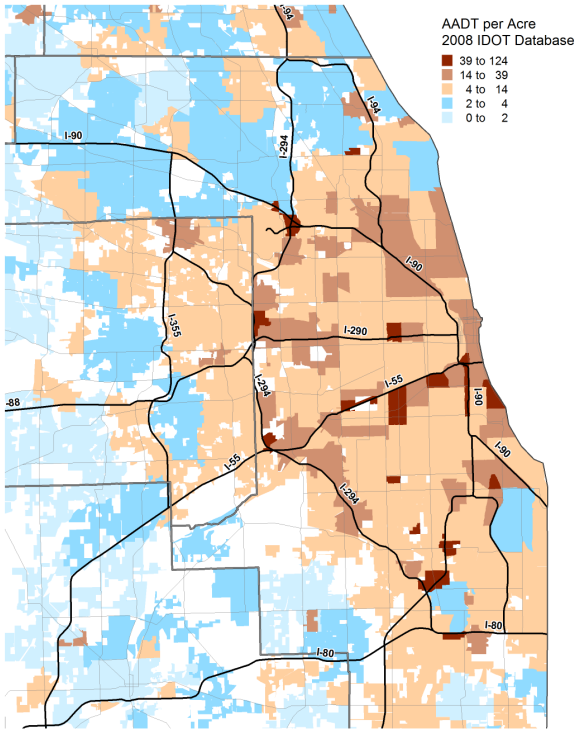
Scenario	Freeway	Local roads	Railway
1a	10.5 %	2.1 %	2.1 %
1b	9.2 %	2.1 %	2.1 %
2	11.1 %	3.7 %	3.8 %
3	10.8 %	1.8 %	1.8 %

Develop New Knowledge of the Distribution of Sounds….

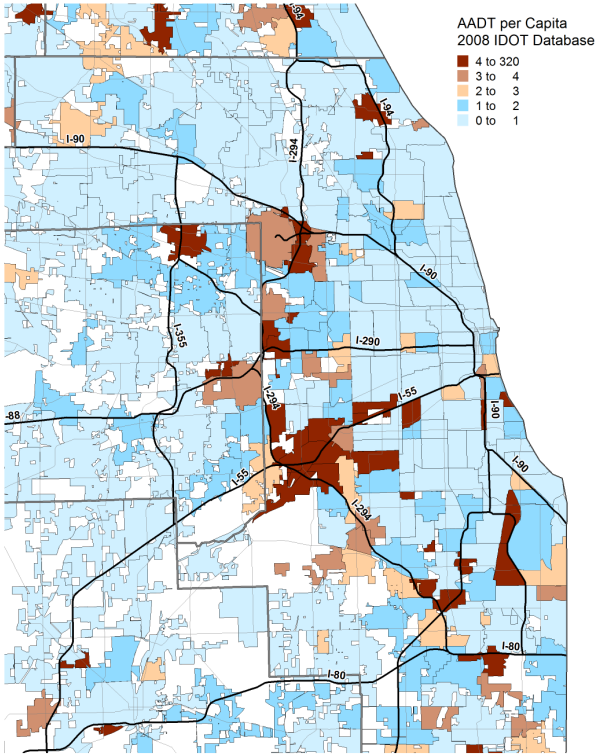
Average Annual Daily Traffic Counts
Chicago Community Areas & Suburban Places



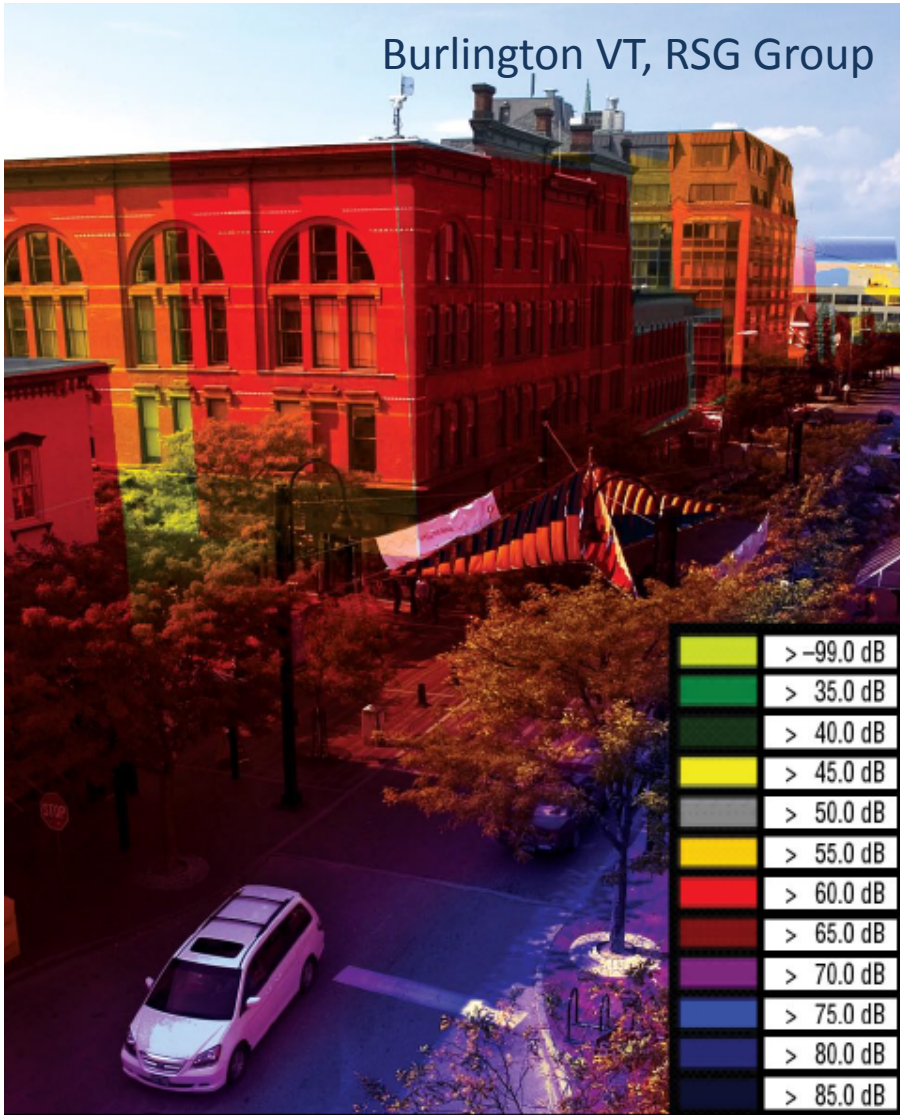
AADT per Acre
Chicago Community Areas & Suburban Places



AADT per Capita
Chicago Community Areas & Suburban Places



And along with better measurement, use it to build effective demand for a livable soundscape



Abogo® transportation costs made transparent

What is Abogo?

Abogo is a tool that lets you discover how transportation impacts the affordability and sustainability of where you live.

Sign up for Updates

Blog

Mayoral Transportation Costs

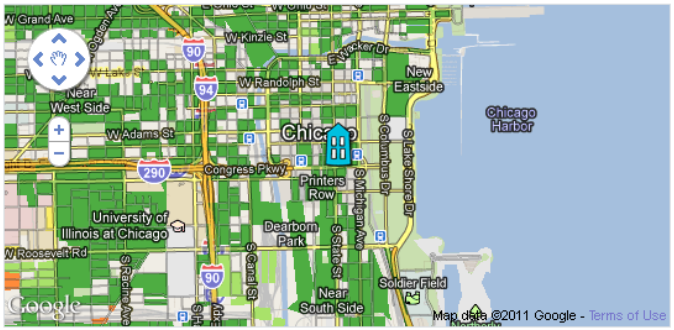
We're back this week with something a bit different. Abogo and CNT are proud to call Chicago home, and we were happy to find this Chicago Tribune article about Mayor Rahm Emanuel's move back into his house; emphasized was his trip to work via the CTA Brown Line. Of course, that got us thinking—what kind [...]

Houston Gas Prices: Space City Transportation Costs

Despite the ongoing heat, we're continuing our sojourn into the

Enter an address to find out what a typical household would spend on transportation.

Current Address: 33 East Congress Parkway Chicago Search



$ per month: N/A | < $730 | $730 - $800 | $800 - $860 | $860 - $930 | > $930

Transportation Cost for an average household

$551/month

Regional average: $821

Transportation CO_2 Impact for an average household

0.19 metric tons/month

Regional average: 0.62 metric tons

Thank you!

- scott@cnt.org
- www.cnt.org
- http://htaindex.org
- http://toddata.cnt.org
- http://abogo.cnt.org
- www.transact.org
- www.reconnectingamerica.org/ctod