

An aerial, grayscale photograph of a busy multi-lane highway. The highway has several overpasses and is filled with cars and trucks. The surrounding area includes some commercial buildings and parking lots. The text "defining mobility with a purpose" is overlaid in the center of the image.

defining mobility
with a purpose

Affordable

Profitable

Equitable

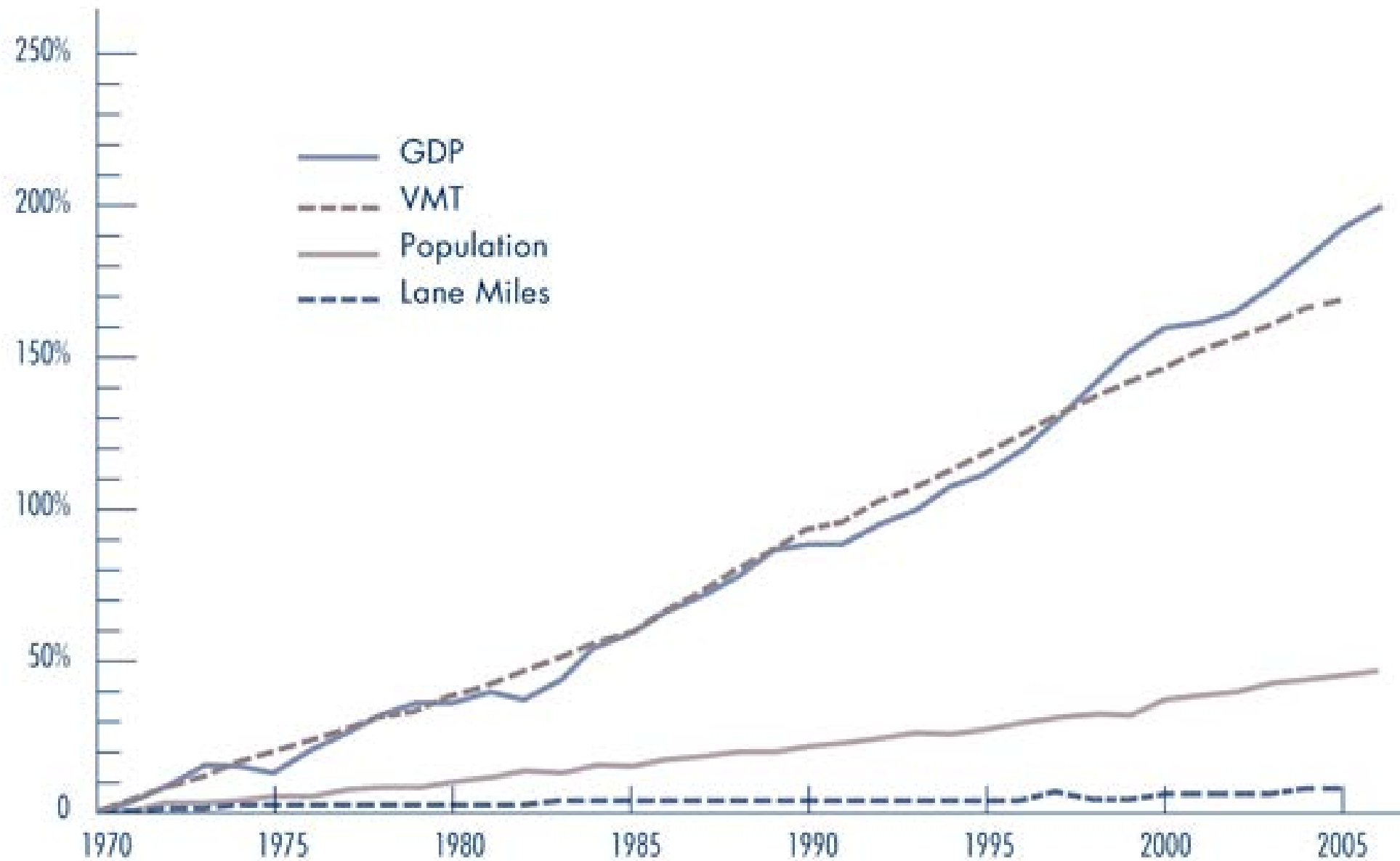
Empowering

Conventional Transportation Thinking

Thought:

If more driving equals economic growth than we should encourage more driving by building more highway capacity...

...and if more driving means the potential for more congestion, than we have to build more highway capacity.

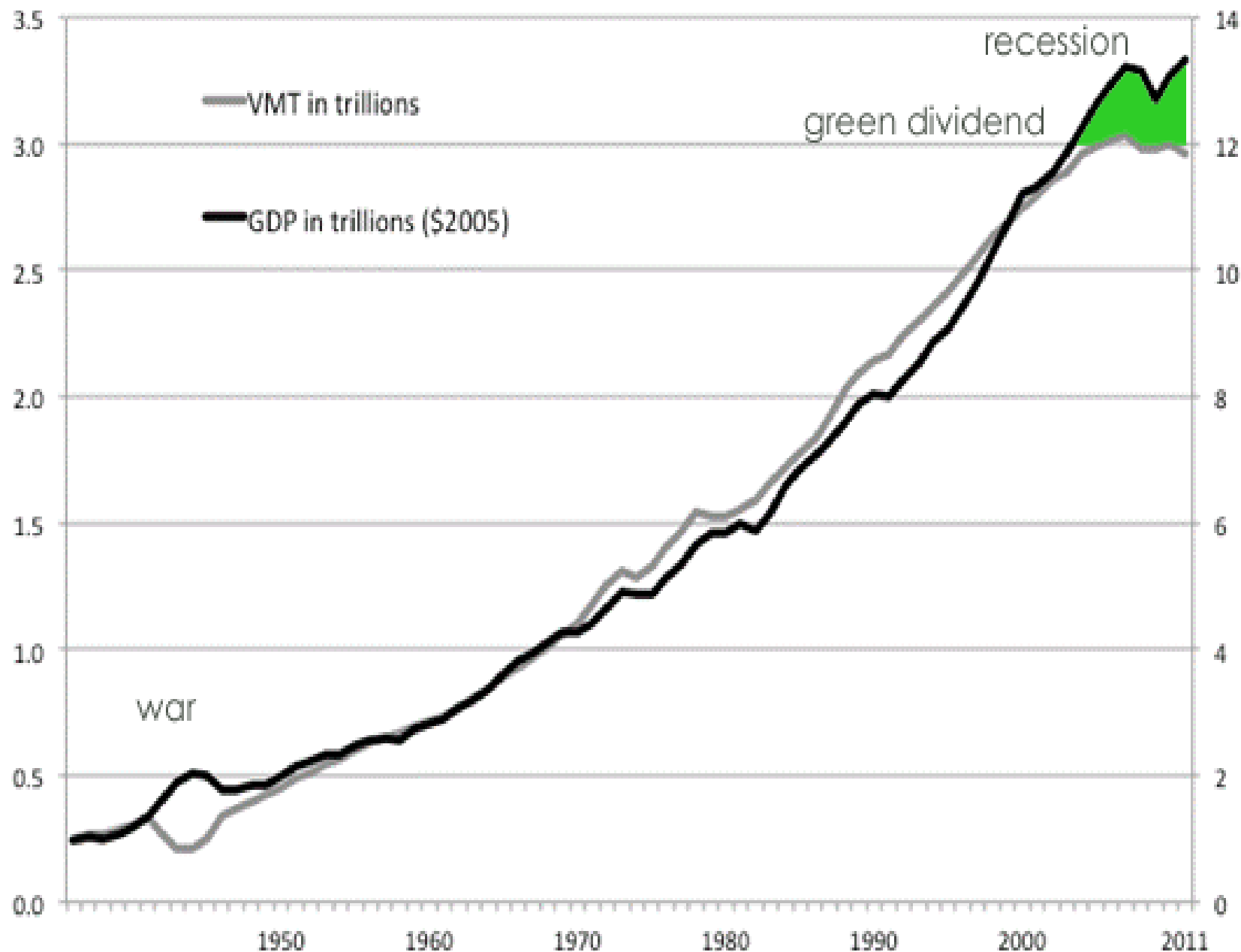


YEAR

Interesting Recent Phenomenon

VMTs are trending down

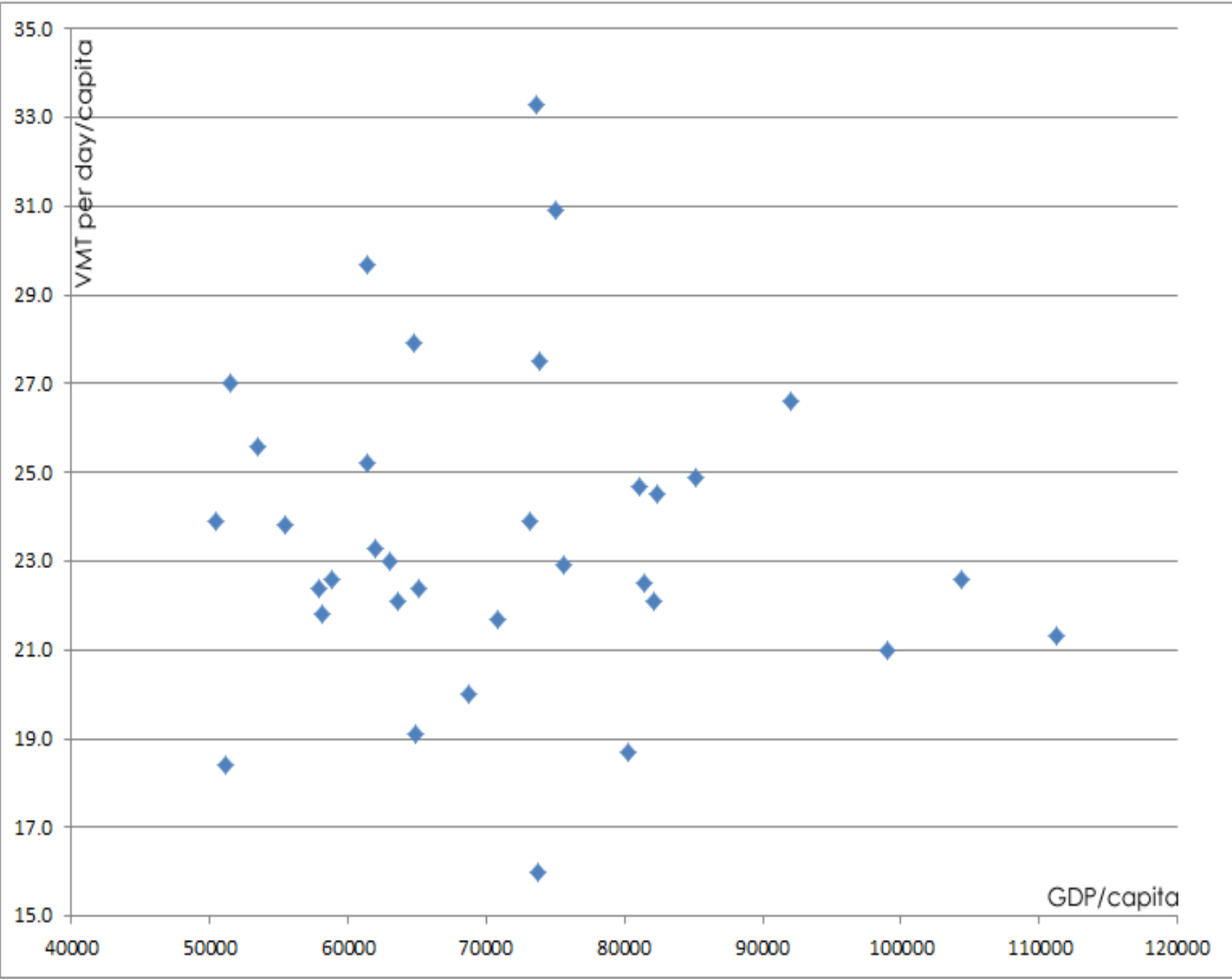
Despite the 2008 recession, GDP is rising again while no longer tethered to VMT

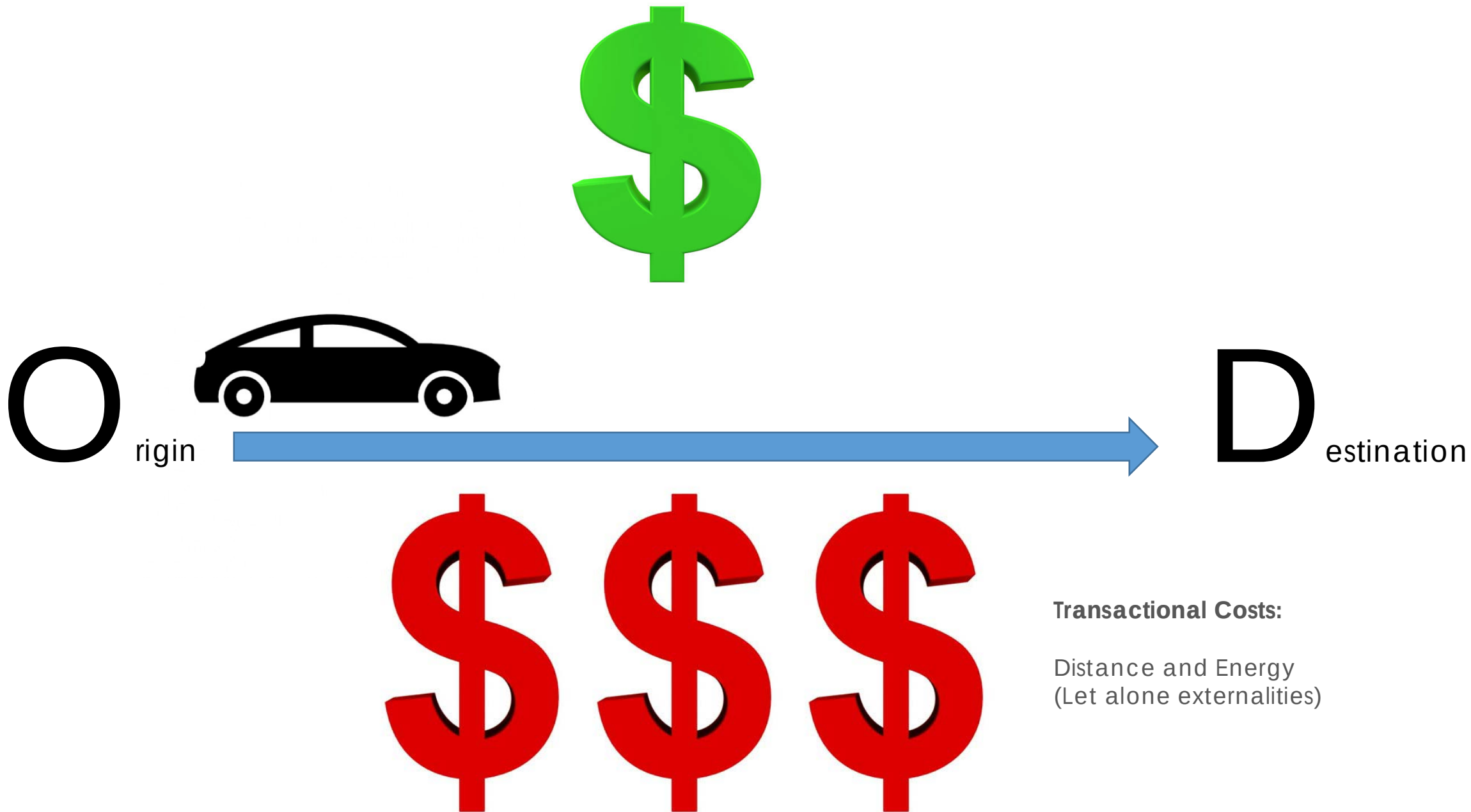


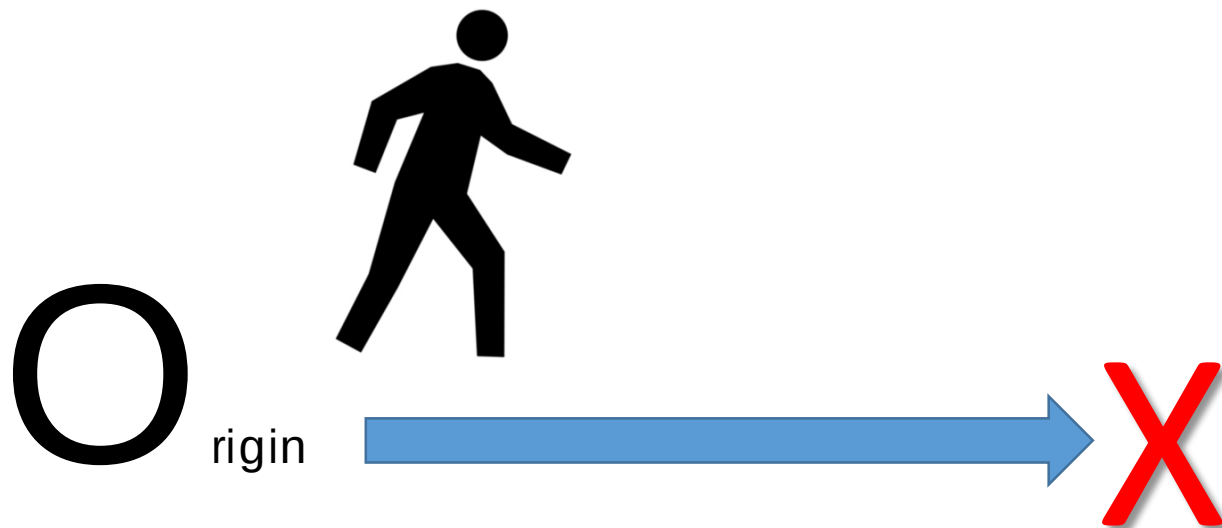
VMT: Lagging Indicator

City to City there is zero relationship
Between GDP and VMT

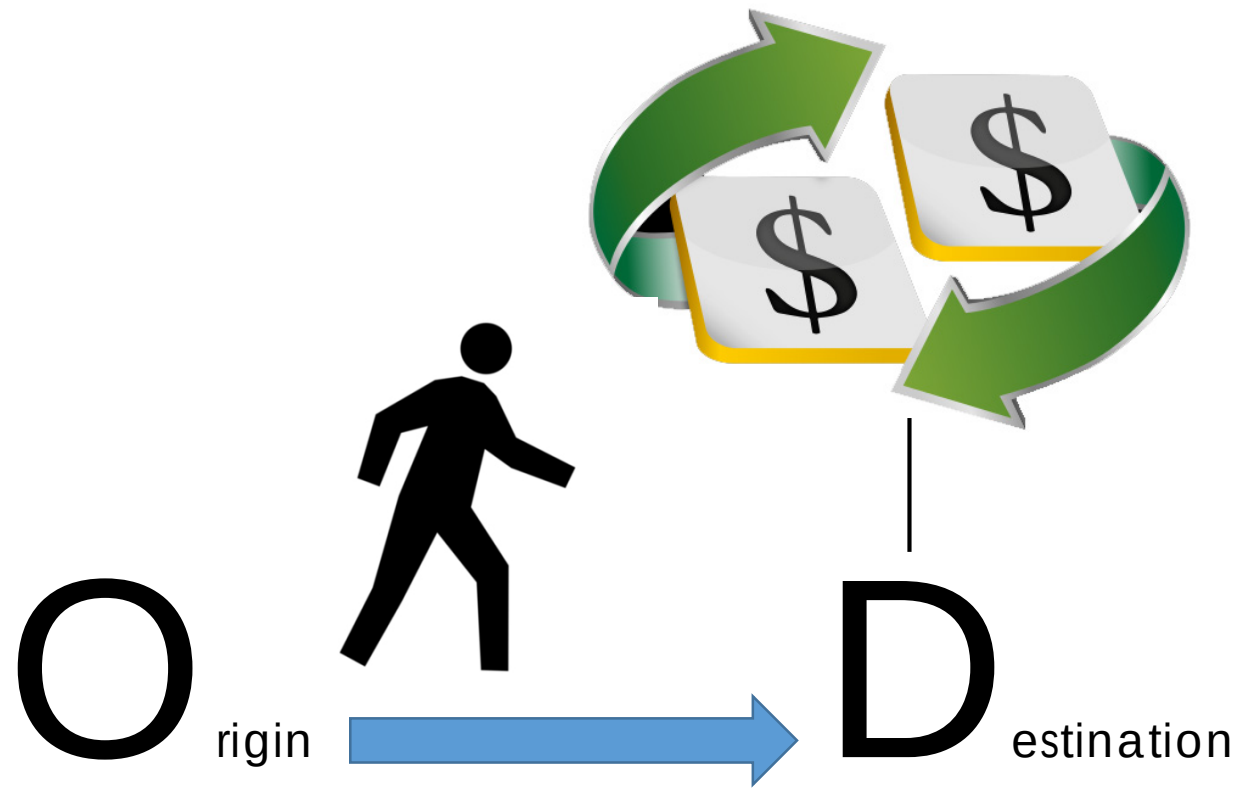
Prosperity led to waste, a leading
indicator of future hardship?







D_{estination}



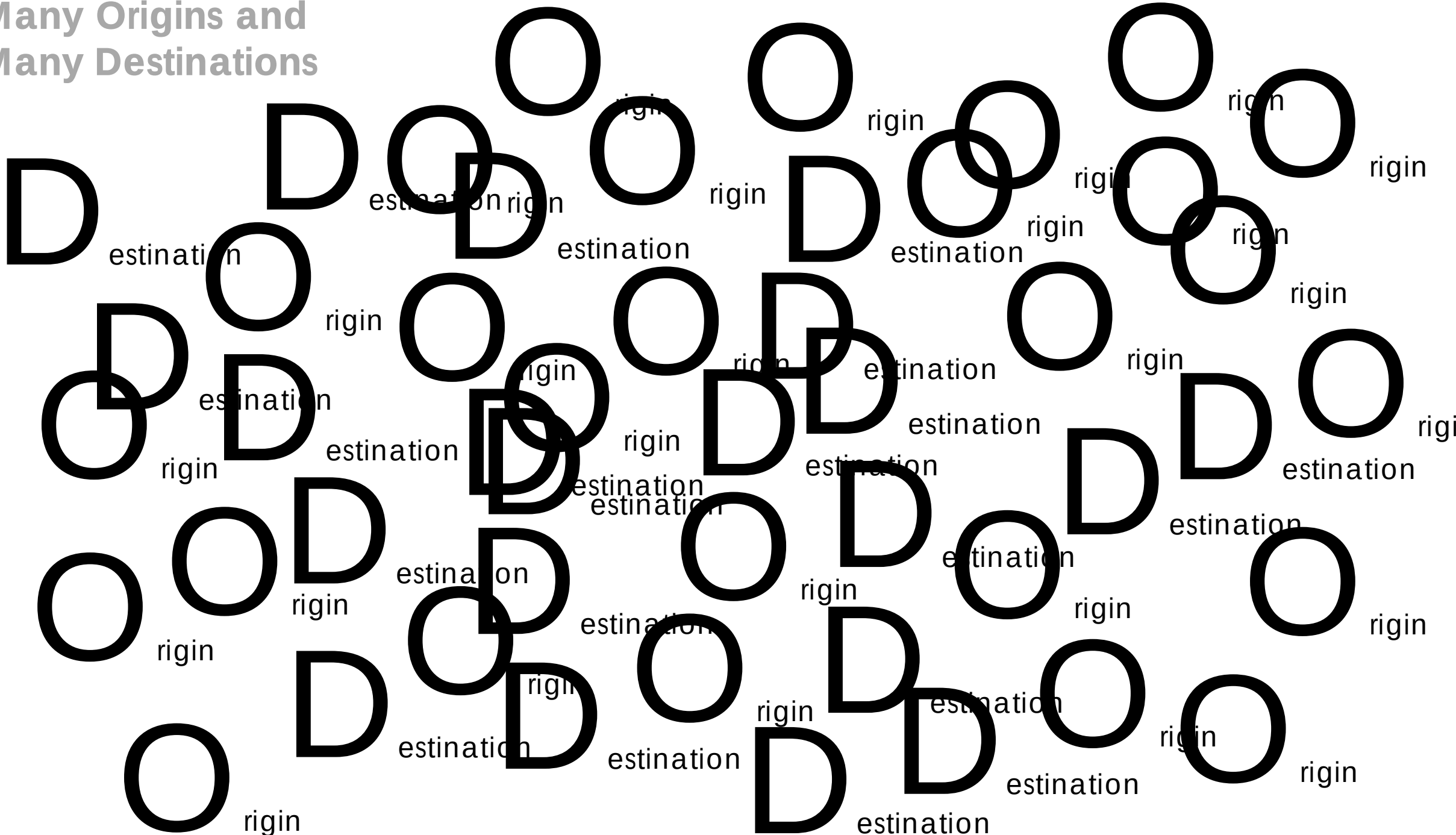
Value is in the transaction

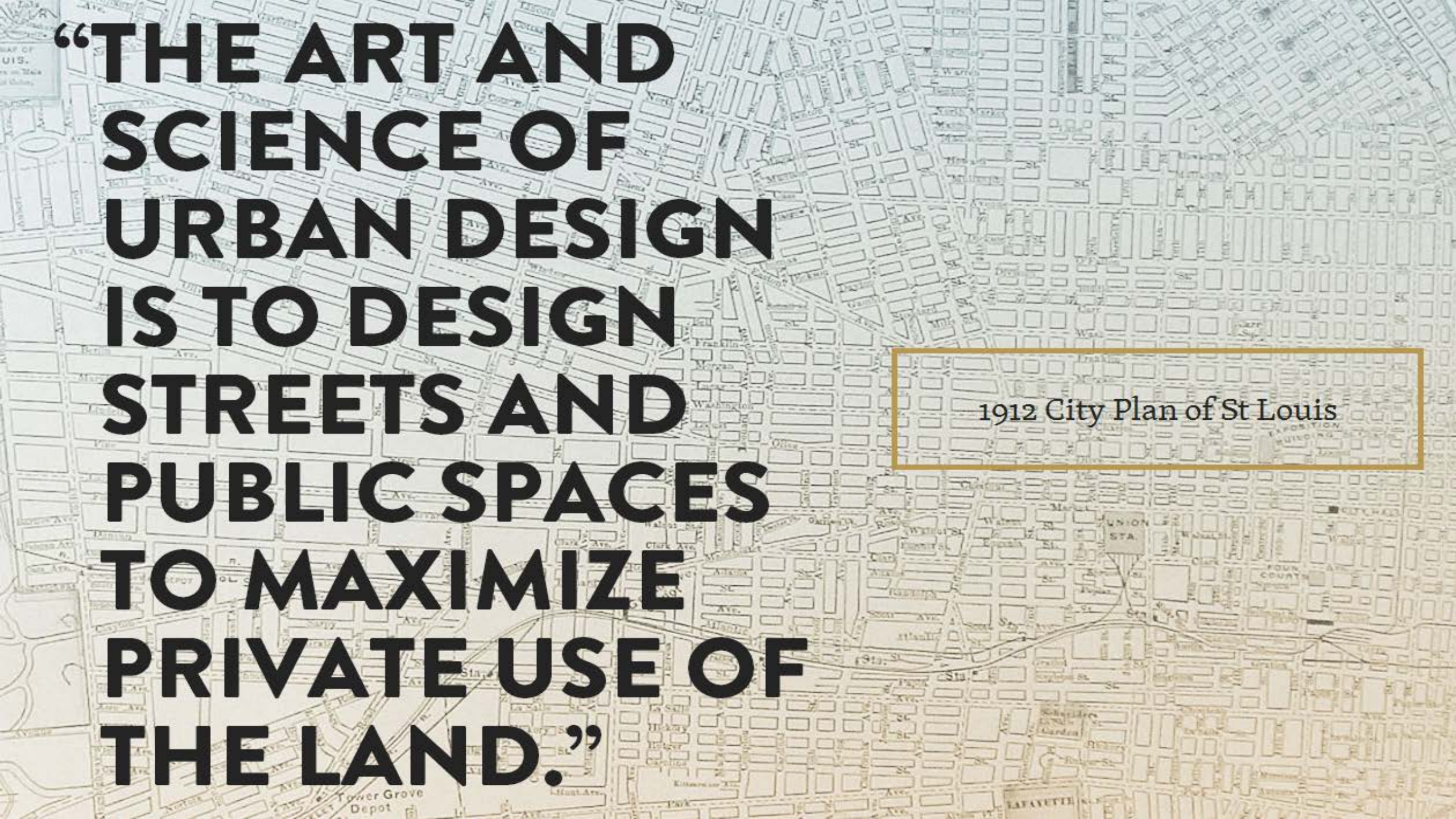
(presuming it isn't fraudulent)

The trip, not the mileage.

\$ Minimized
transactional
costs

Many Origins and
Many Destinations



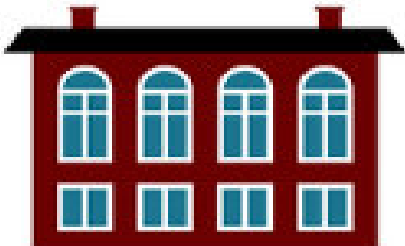
A detailed historical map of St. Louis, Missouri, from 1912. The map shows a dense grid of streets, with major thoroughfares like Market Street, Washington Avenue, and the Mississippi River visible. Various landmarks and buildings are labeled, including the Union Station and the Exposition Building. The map is oriented with North at the top.

**“THE ART AND
SCIENCE OF
URBAN DESIGN
IS TO DESIGN
STREETS AND
PUBLIC SPACES
TO MAXIMIZE
PRIVATE USE OF
THE LAND.”**

1912 City Plan of St Louis

Maximizing Choice

In Housing



Maximizing Choice

In Transportation

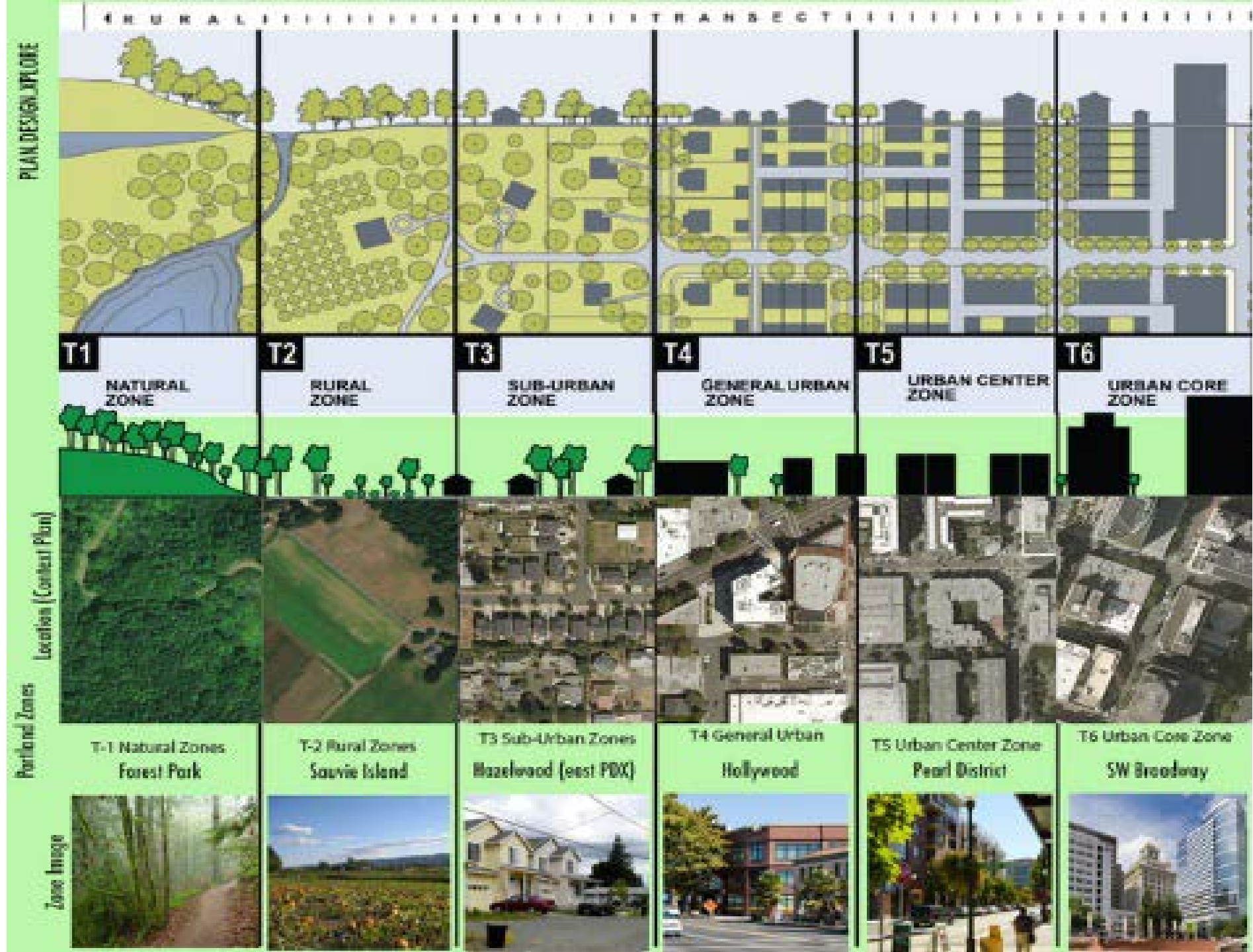


"Capacity" of a Street

Lockwood

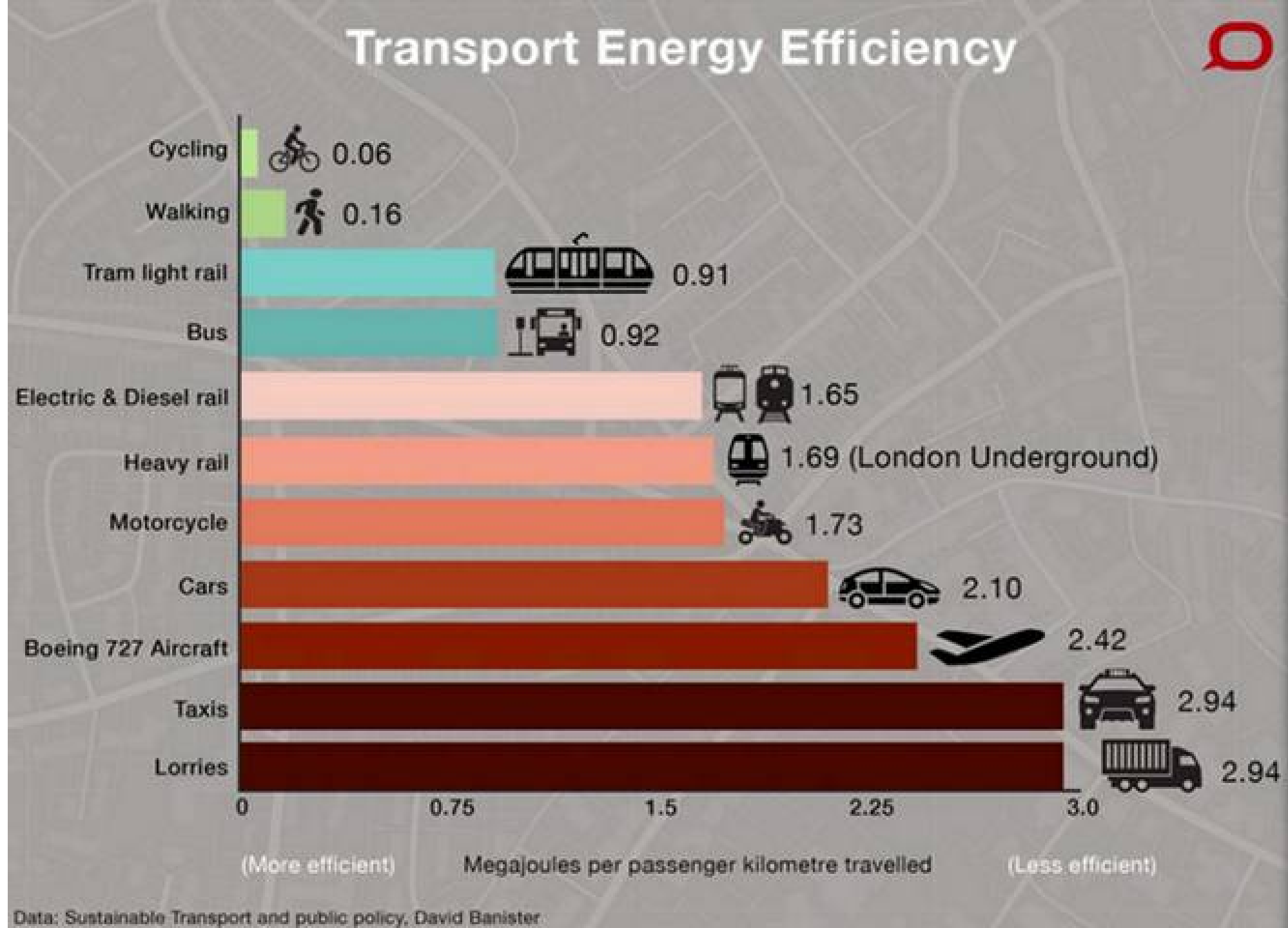
Maximizing Choice

In Neighborhood Type

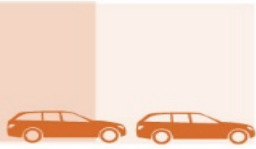


Inescapable Physics of Transportation

Just so happens that is the least efficient way to get around.



Making Smart Decisions: Geometry and Mobility within Finite Space



PRIVATE MOTOR VEHICLES
600–1,600/HR



MIXED TRAFFIC WITH FREQUENT BUSES
1,000–2,800/HR



TWO-WAY PROTECTED BIKEWAY
7,500/HR



DEDICATED TRANSIT LANES
4,000–8,000/HR

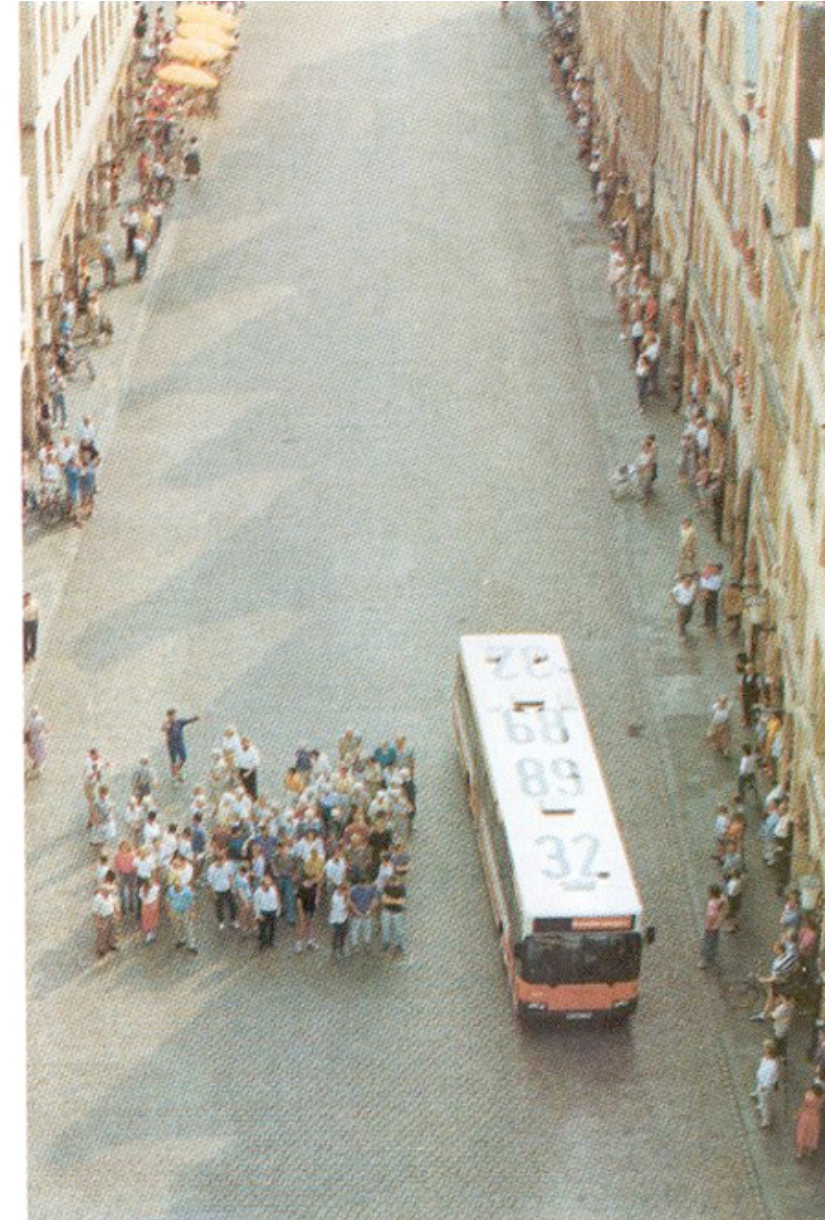
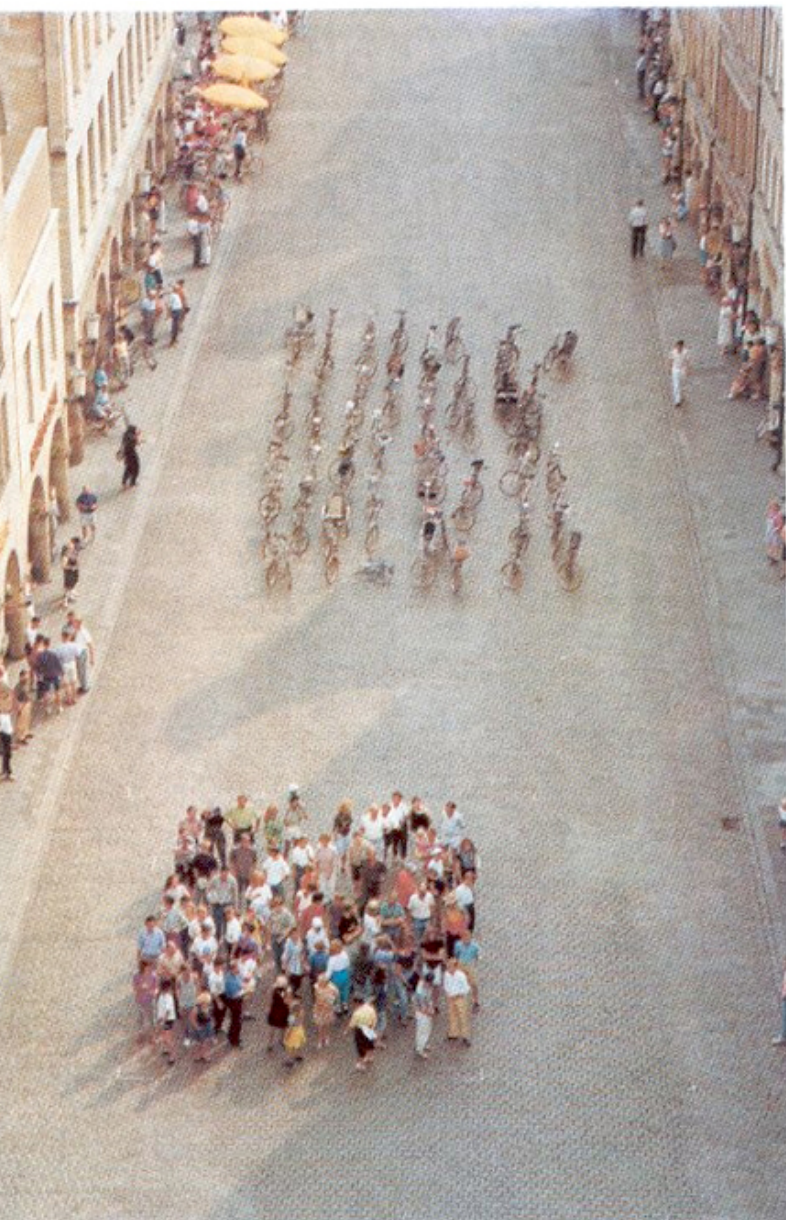


SIDEWALK
9,000/HR



ON-STREET TRANSITWAY, BUS OR RAIL
10,000–25,000/HR

Making Smart Decisions: Geometry and Mobility within Finite Space



Internalizing Externalities

Drain on economy

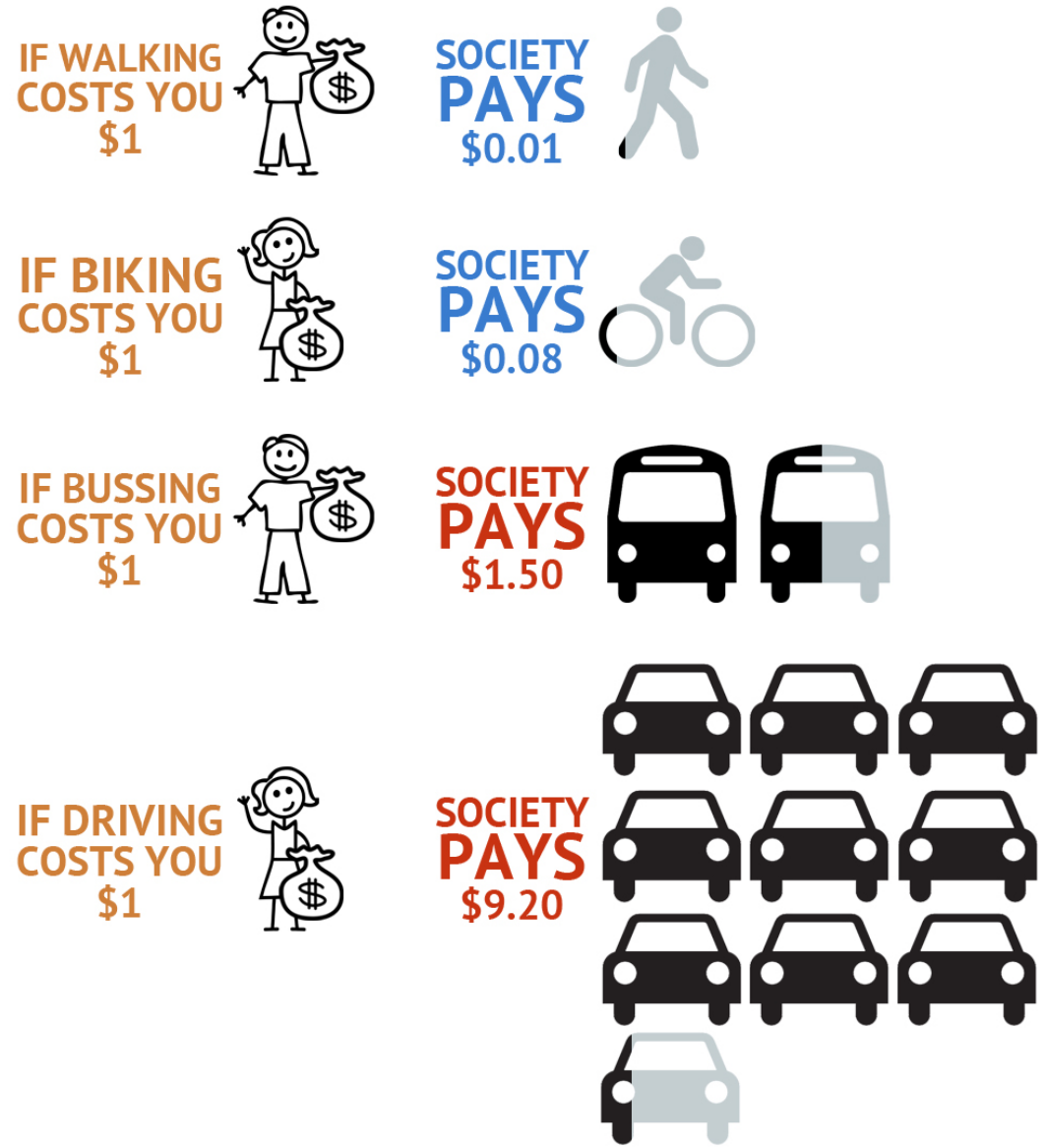
How much does your commute cost (or save) society?

Every time you travel you put money into the system, but you also cost the system. Your contribution to and burden on the system differs depending on how you travel.

For example, when you ride the bus you pay a fare – money into the system. Your burden on the system includes the cost of operating the bus, and also less obvious impacts like emissions and noise pollution.

By looking at the ratio of what we put in versus what we cost the system, we see that different ways of travelling are more subsidized than others.

The practice of taking these less tangible costs and benefits into consideration and assigning them a dollar value is known as “full-cost accounting.” While there are many ways of doing this, this infographic shows one example of how those costs and charges can be calculated.



2006 FHWA Commissioned Report on Economic Returns of Highway Investment

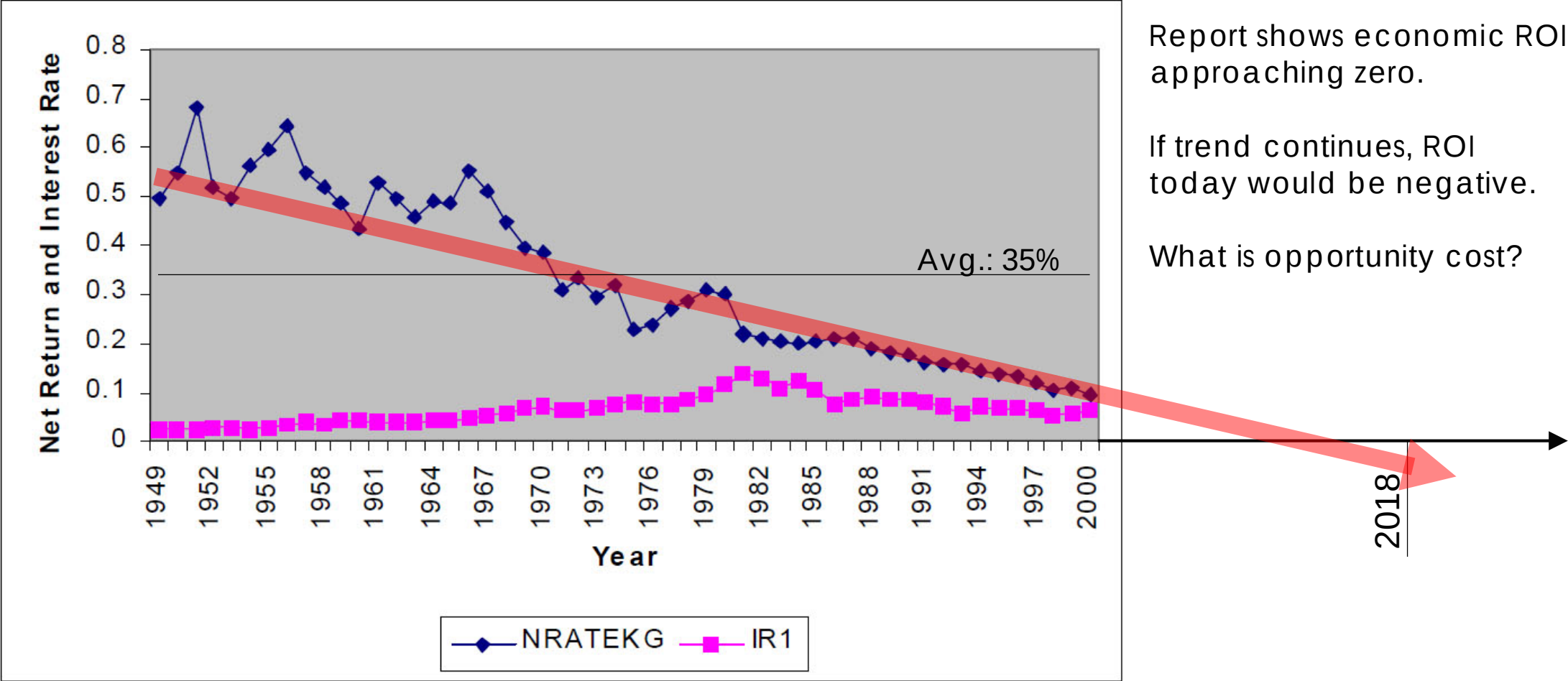
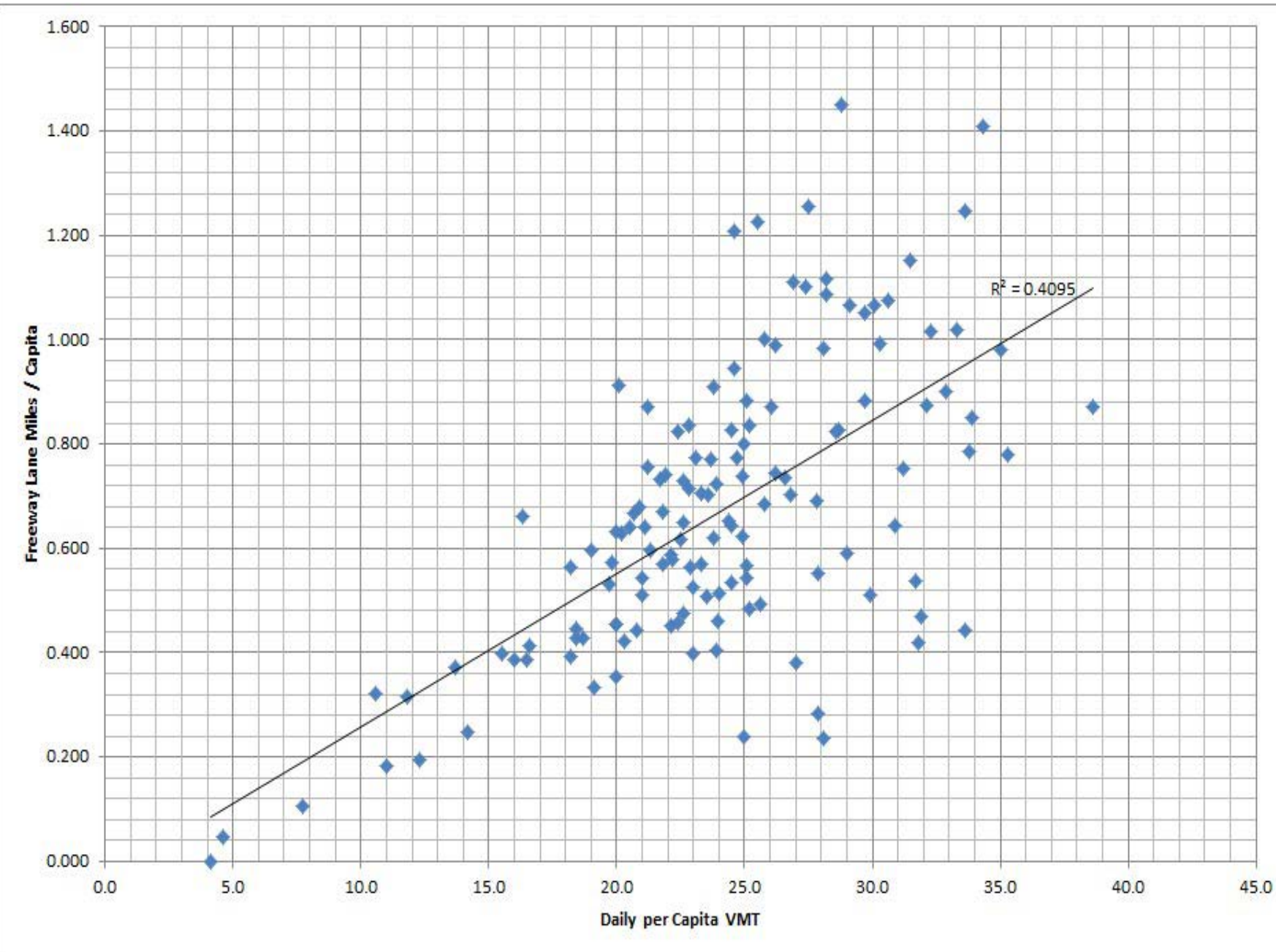


FIG. 1. NET RATE OF RETURN TO HIGHWAY CAPITAL AND LONG TERM INTEREST RATE



MORE HIGHWAYS + LOWER DENSITY = DRIVING MORE



Reason? Induced Demand

Free goods get over-utilized.

More roads = More Driving

As population disperses,
People are going to drive more.

It has effectively been subsidized and
engrained into the culture...as if we chose
it because “we love our cars”

*...and since we love our cars, we're
eager to support highway
expansion/construction projects to
“reduce congestion.”*

...and the entropy continues...

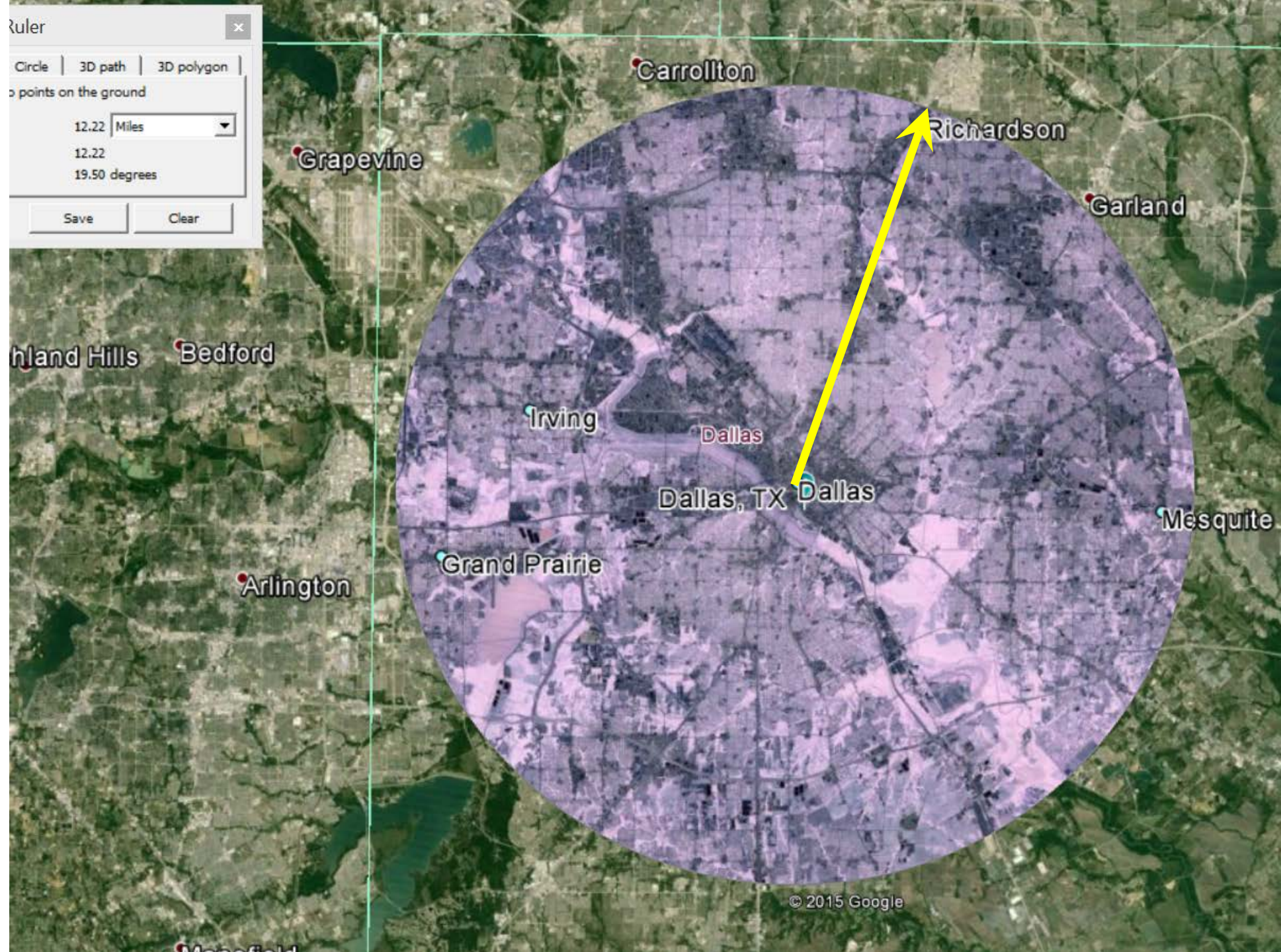
HIGHWAYS AS BARRIER

INCREASES DISTANCE
BETWEEN PEOPLE



AVERAGE COMMUTE

12.2 MILES;
OUTSIDE DALLAS



The Invisible Hand and the Invisible Arm:

Market Response to Public Policy & Spending

% INFILL HOUSING

SAN JOSE 79.7%,
LA 62.6%,
NY/NJ 60.8%,
SAN FRANCISCO/OAKLAND 56.2%,
PORTLAND 44.3%,
MIAMI 42.5%,
CHICAGO 41.1%,
SEATTLE/TACOMA 39.8%,
SAN DIEGO 38.2%,
BOSTON 31.3%,
HOUSTON 25.2%

DFW, 17.2%





PLACES THAT DRIVE MORE...SPEND MORE TO DO SO

Houston: 95% of trips by motor vehicle;
14% of metro GDP spent on transpo.
New York: 10%
Paris: 7%
Copenhagen: 54%/4%.



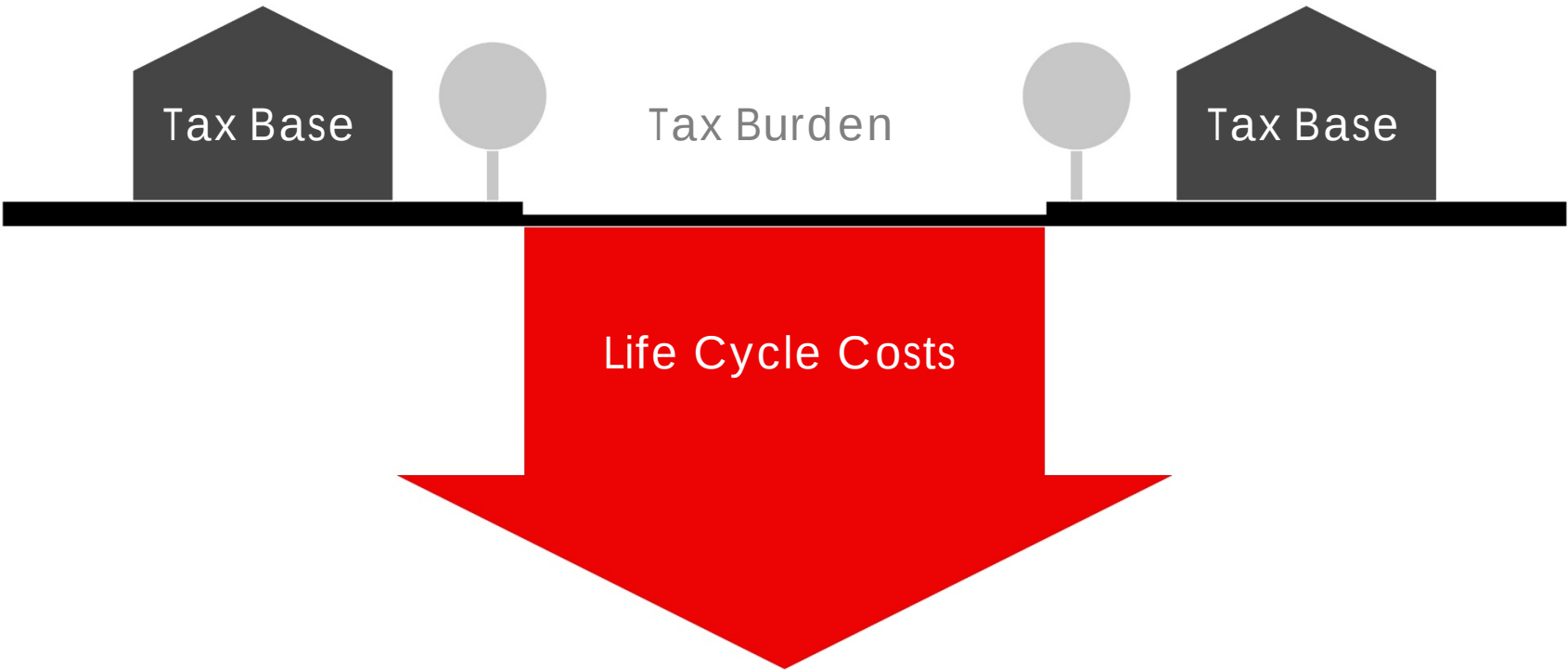
10% of GDP = \$50 Billion that could stay in local economy

- *Better housing*
- *Start a business*
- *Invest*
- *Save*

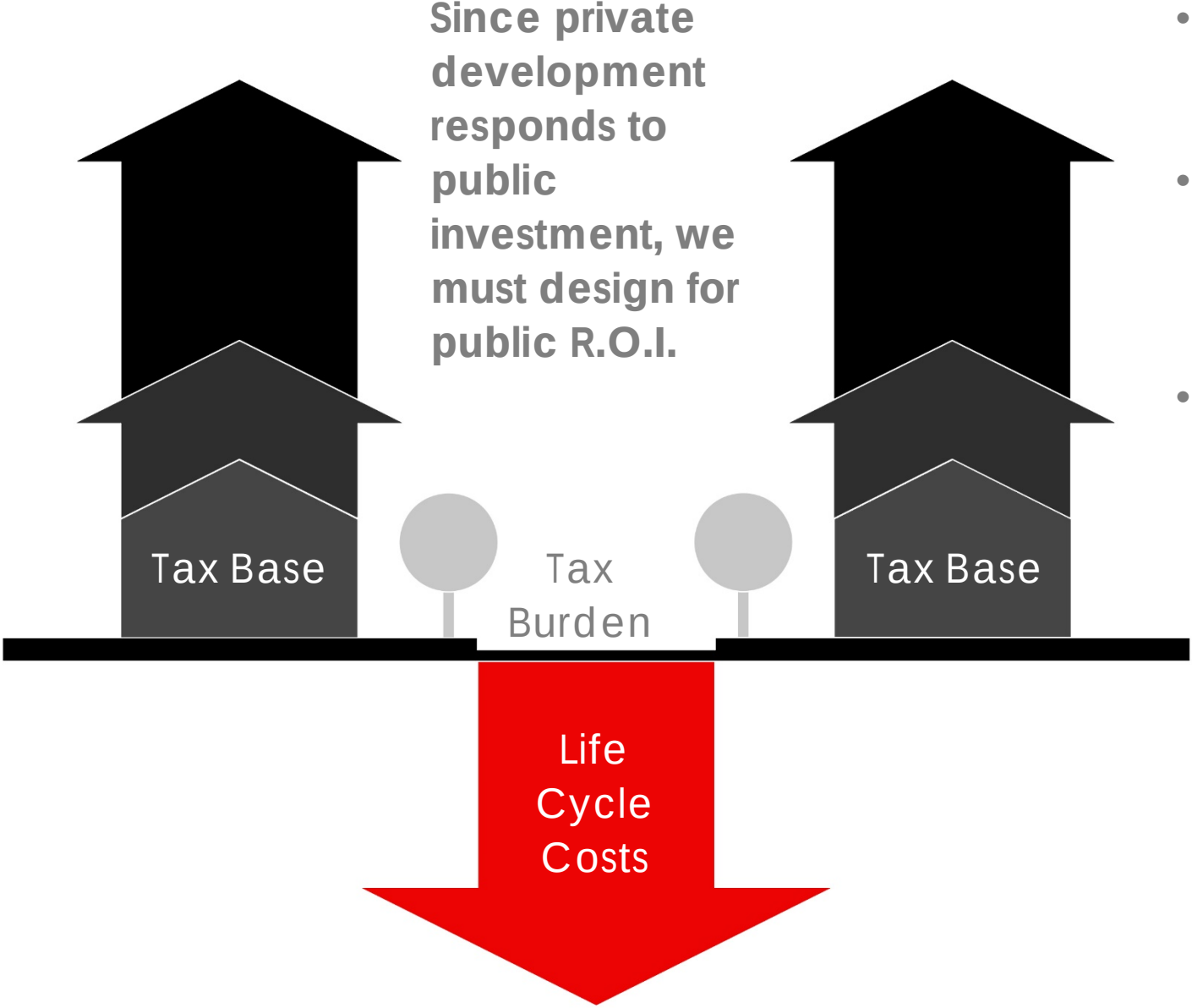
Relationship Between Public and Private Realms

Life Cycle of Tax Base
must exceed Life Cycle
costs of tax burden.

If not = insolvency.



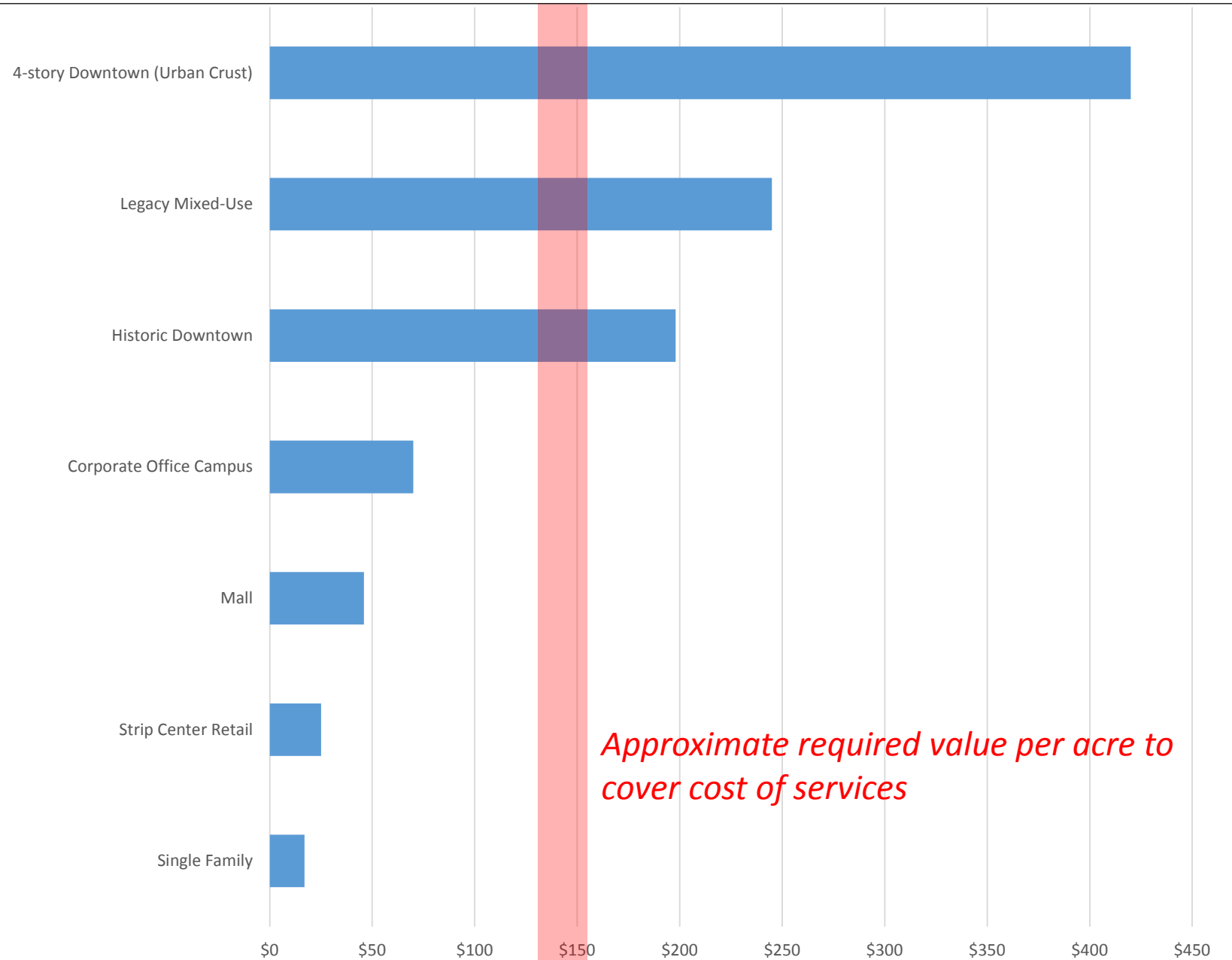
From Insolvency to Amenity



- Increased financial choice.
- Public sector can increase amenity and/or reduce taxes
- Private sector has reduced transportation costs.



Collin County Property Taxes/acre by Development Type (000s)



What kind of networks encourage clustering, restore the value of proximity, and efficient exchange?

Social and Economic Exchange.



To be efficient as a physical platform for Exchange
City form is a form of productivity

Compress space and time.
Reduces spatial and energy transactional costs; encourages innovation

For individuals, cities, and civilization to succeed requires access to these markets.



Spatial/energy transactional costs of time and distance are a barrier to access.

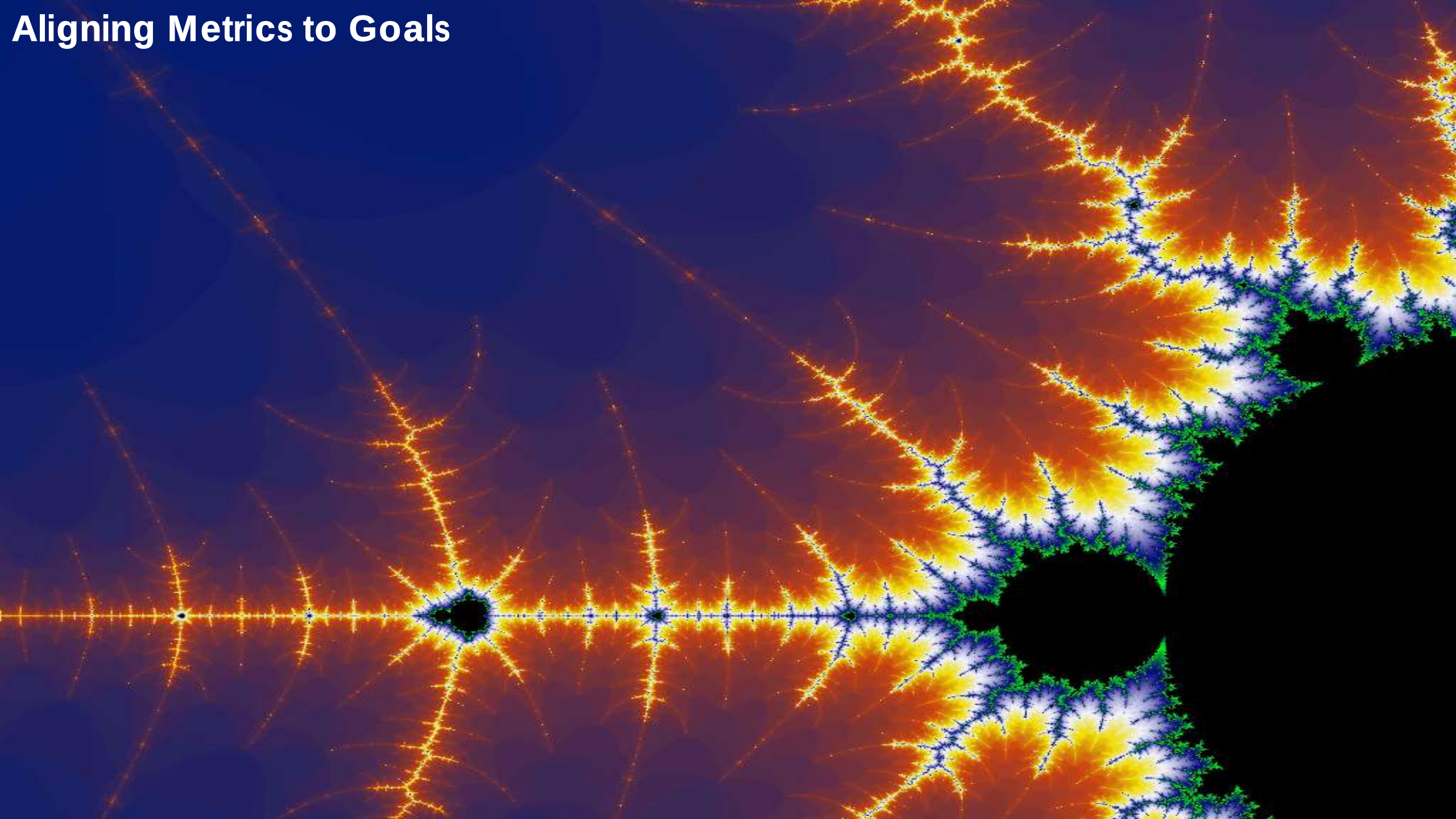


Competition of 21st Century Cities

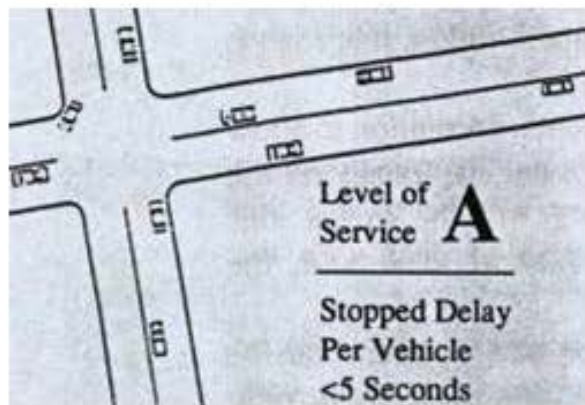
The cities that succeed will be those that empower the greatest % of their populations through economic/physical mobility and choice.

Policy + Budget = Outcomes

Aligning Metrics to Goals



Local – Vehicular Level of Service



A:
Free flow



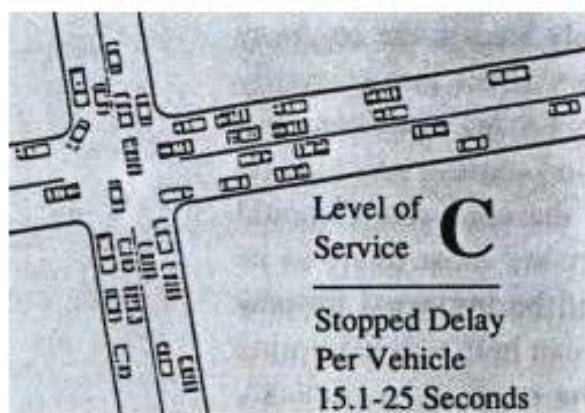
D:
Instability



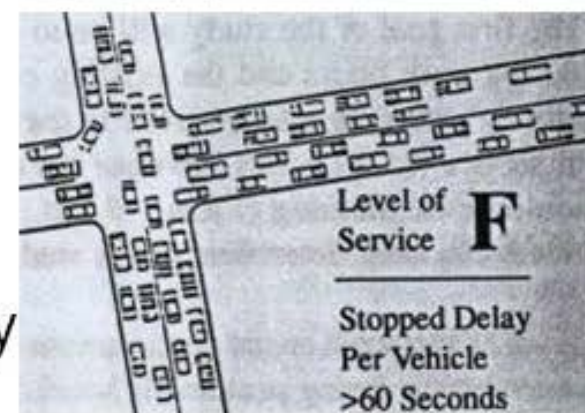
B:
Stable flow



E:
At capacity



C:
restricted
maneuverability



F:
Stop-and-go

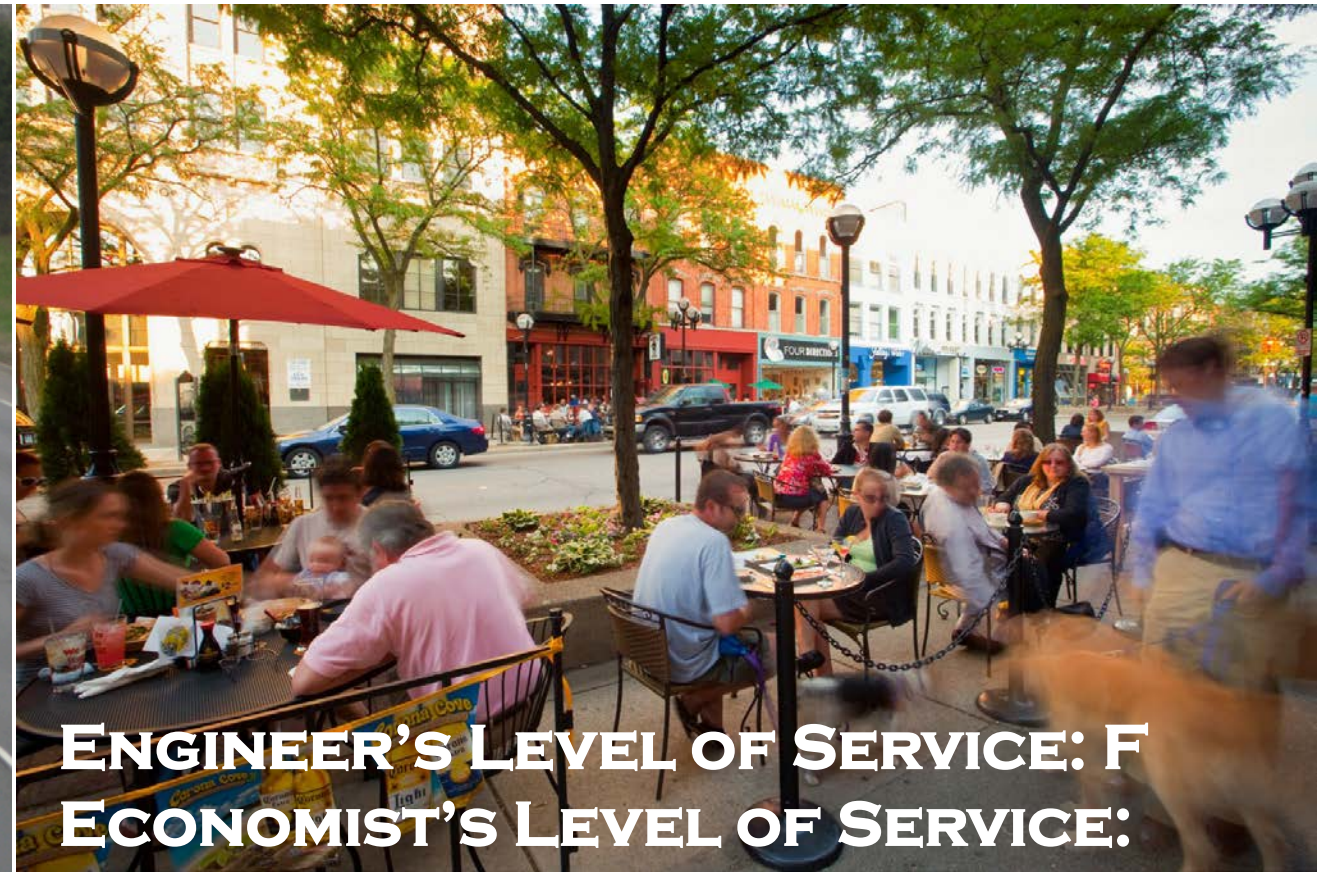
Who Designs the City?

Highway: Functions best with NO Traffic on the Road

City Street: Functions Best with Many People on the Road



ENGINEER'S LEVEL OF SERVICE: A
ECONOMIST'S LEVEL OF SERVICE:



ENGINEER'S LEVEL OF SERVICE: F
ECONOMIST'S LEVEL OF SERVICE:

Corridor Capacity & Value

Irving Boulevard (Dallas) vs Maple Road (Birmingham, MI)

16,000 vehicles/day

Property Value:

\$14.58 / sq Ft



Corridor Capacity & Value

Irving Boulevard (Dallas) vs Maple Street (Birmingham, MI)

24,000 vehicles/day

Property Value:

\$77.04 / sq Ft

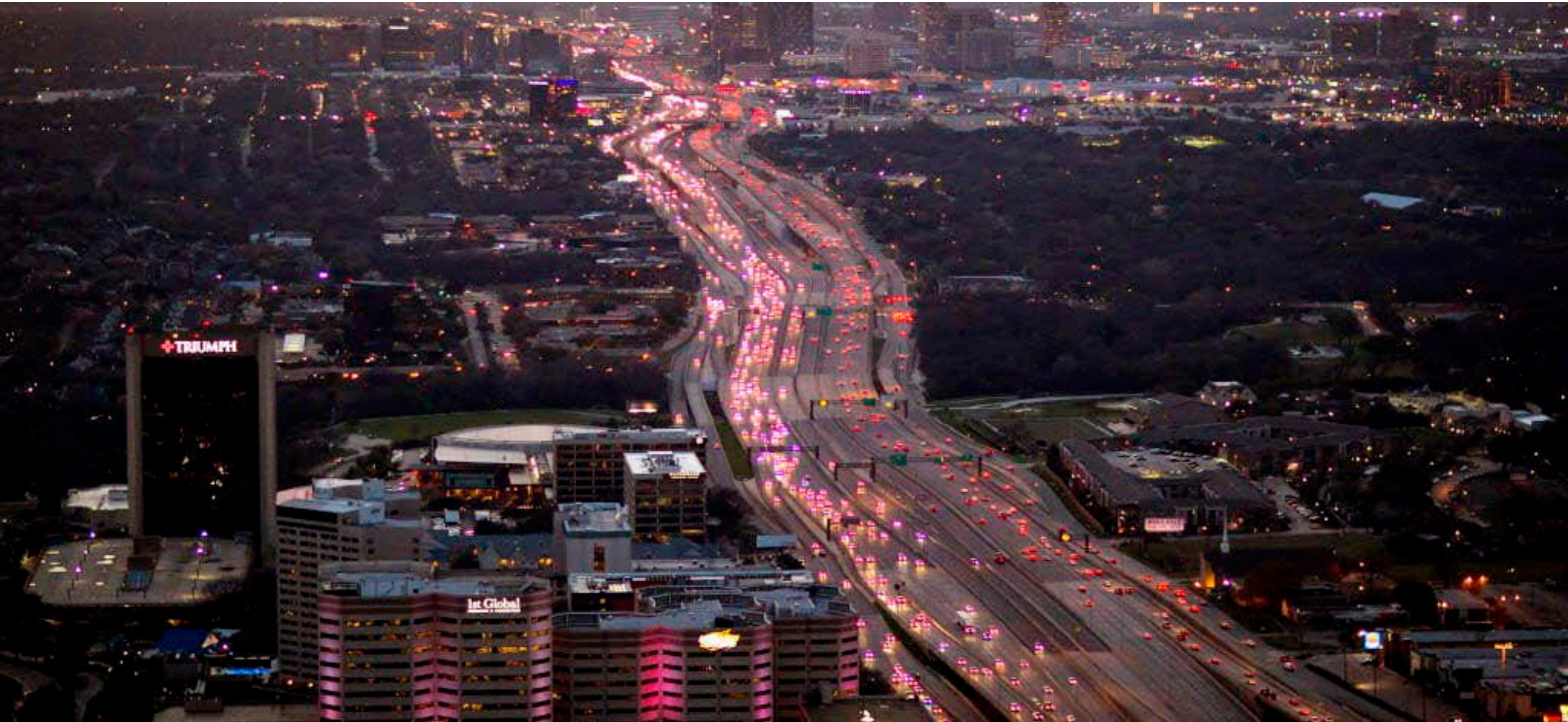
On Less than Half R.O.W.



Corridor Capacity & Value

635: The New Center of Town

250,000 vehicles/day



Corridor Capacity & Value

Champs Elysees – Paris, FR

80,000 vehicles/day

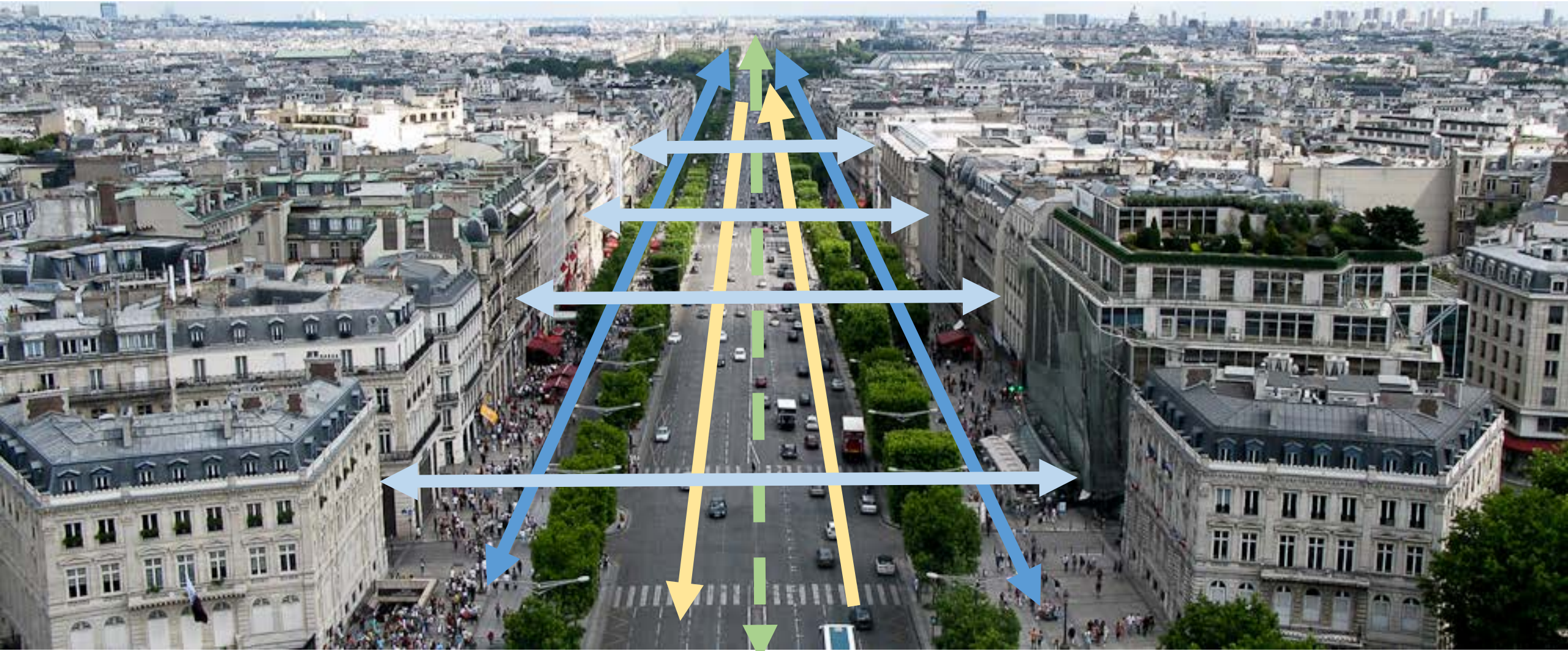
500,000 pedestrians/day

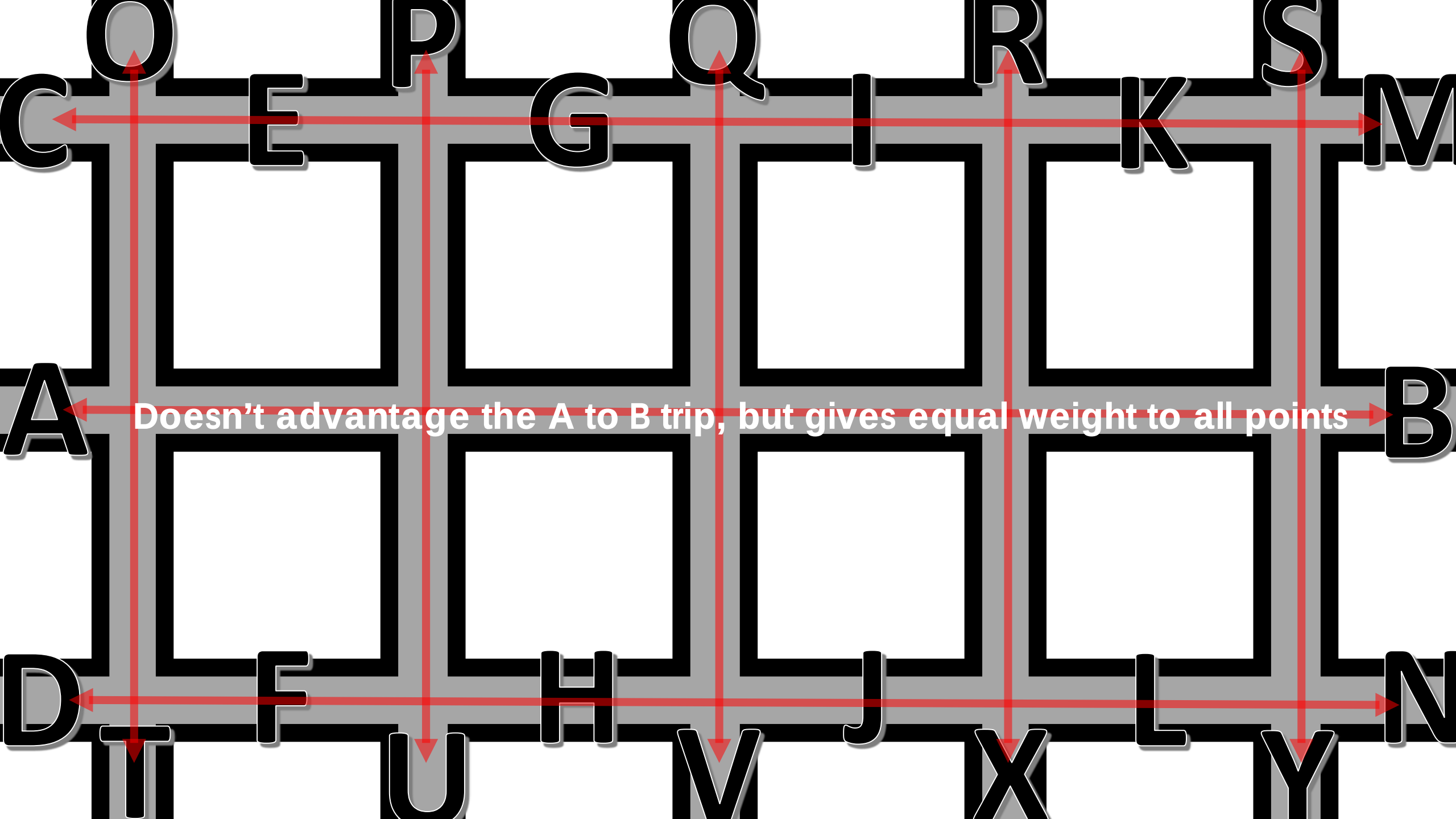
1,000,000 transit passengers/day on the 1 line

Property Value:

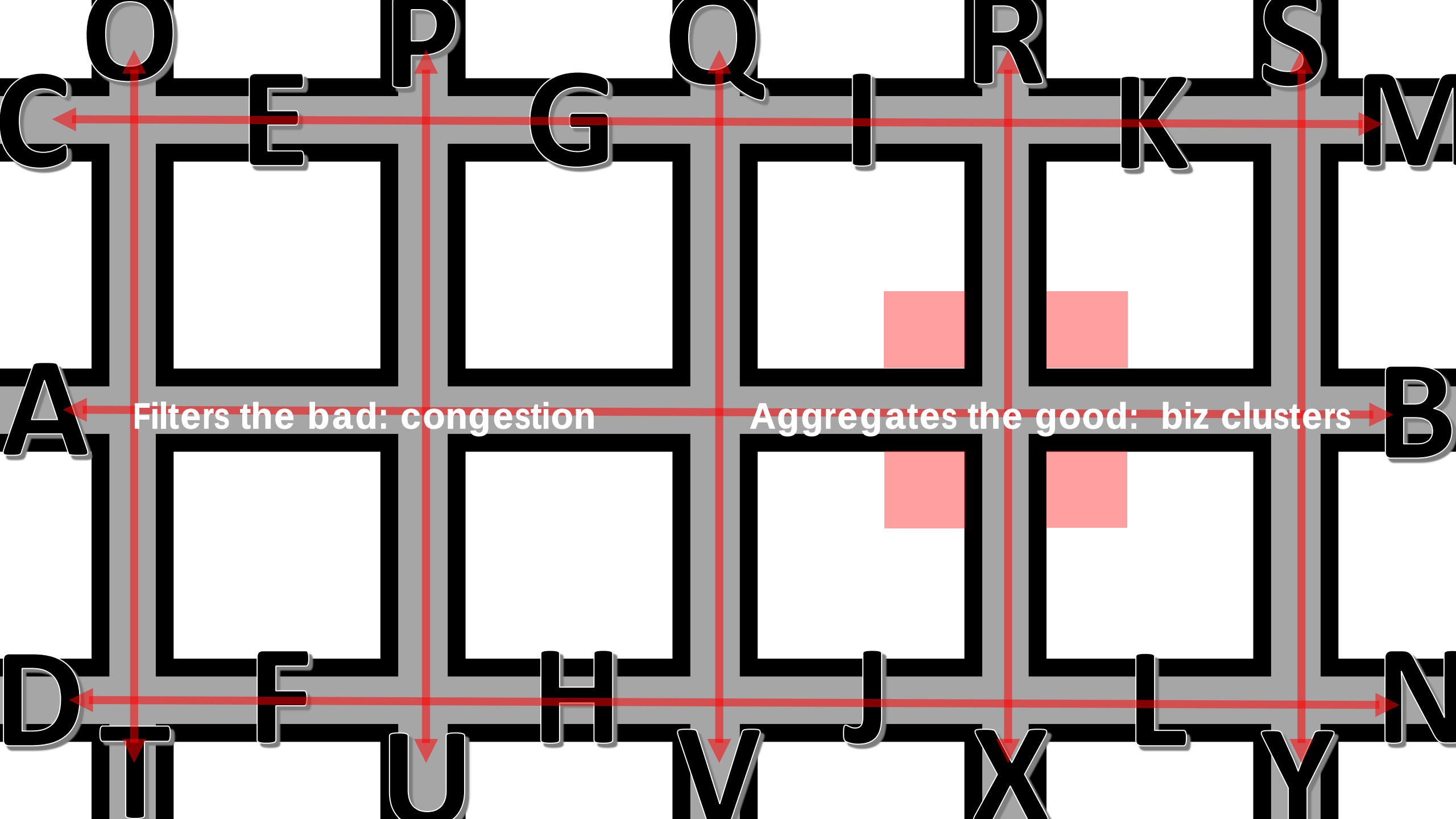
10x / sq Ft

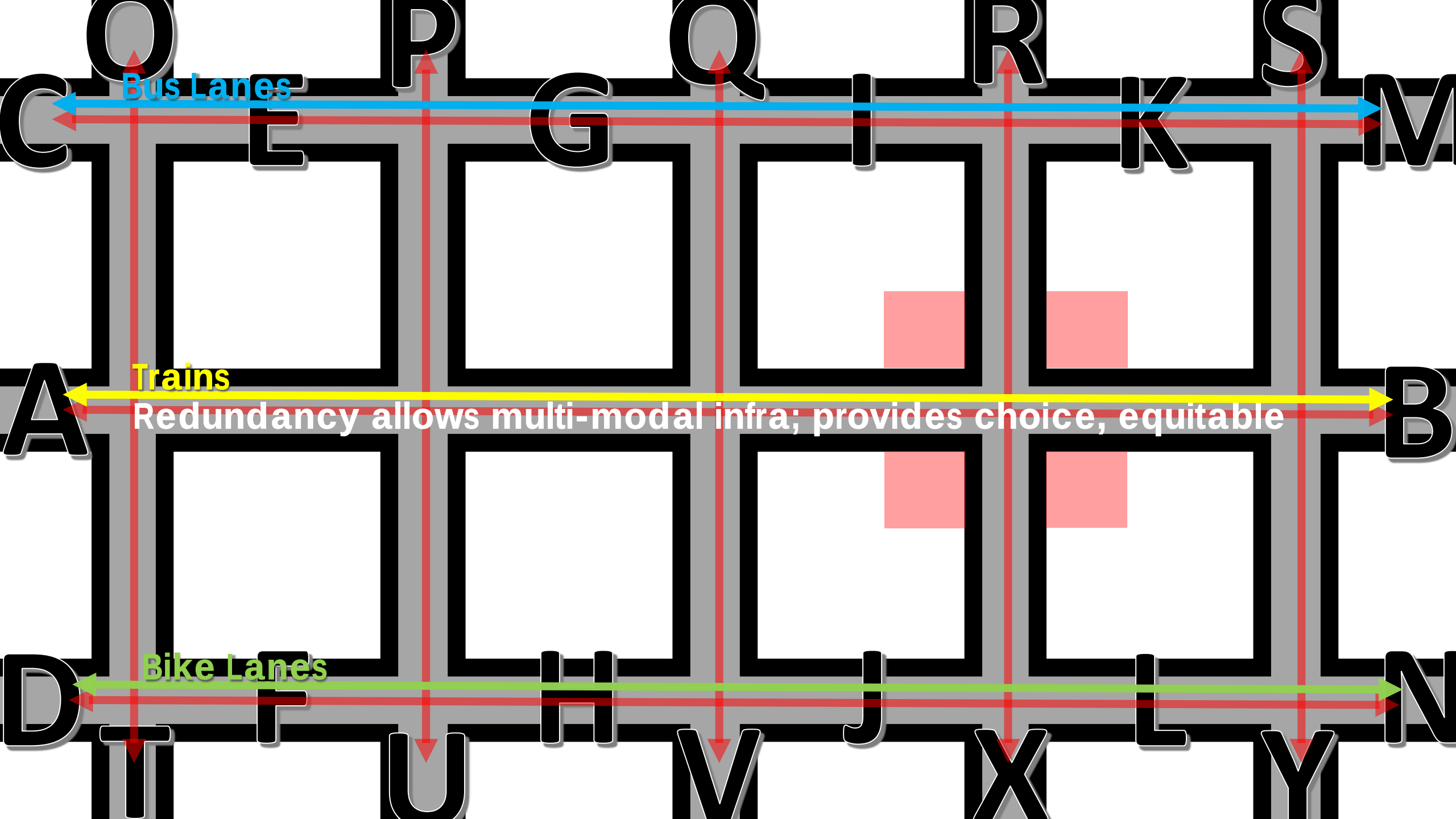
On Less than Half R.O.W.





Doesn't advantage the A to B trip, but gives equal weight to all points





Bus Lanes

Trains

Redundancy allows multi-modal infra; provides choice, equitable

Bike Lanes

Perception:

Traffic = Value



Reality:

People = Value

The Amount of People that can (and WANT to) Access a Property Drives Value.



What is: **Congestion** ?

Bad congestion occurs from the Convergence of:

MODE

Most car-dependent metro in US

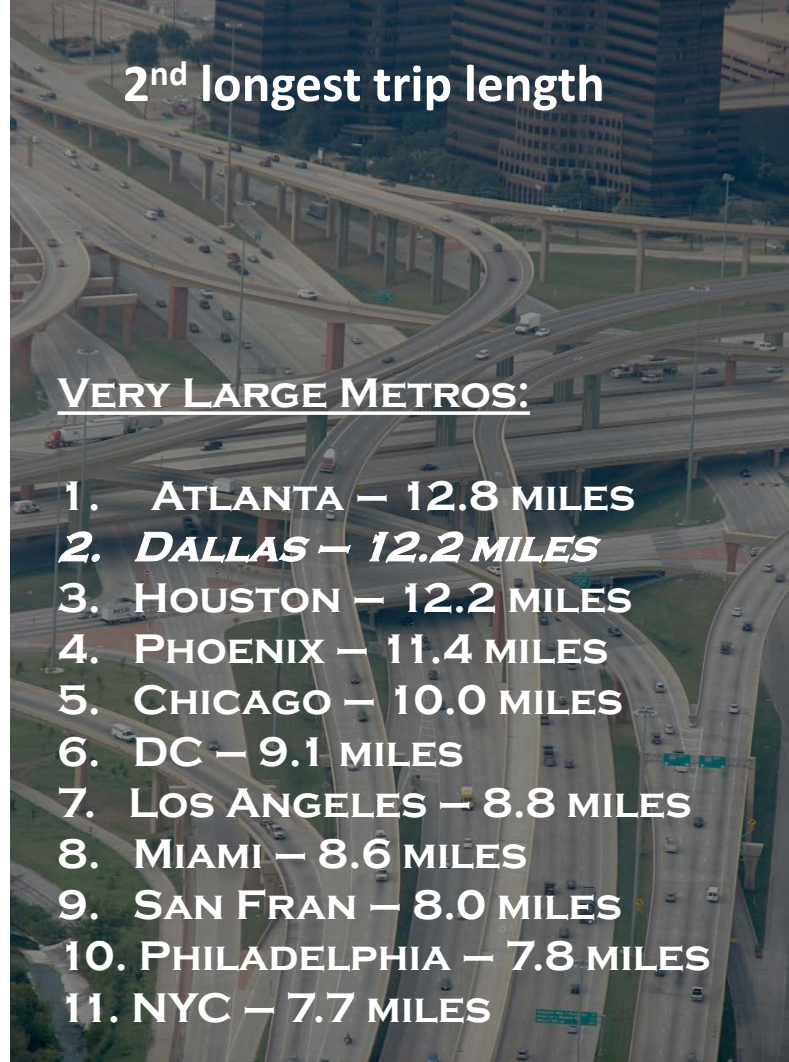


SPACE

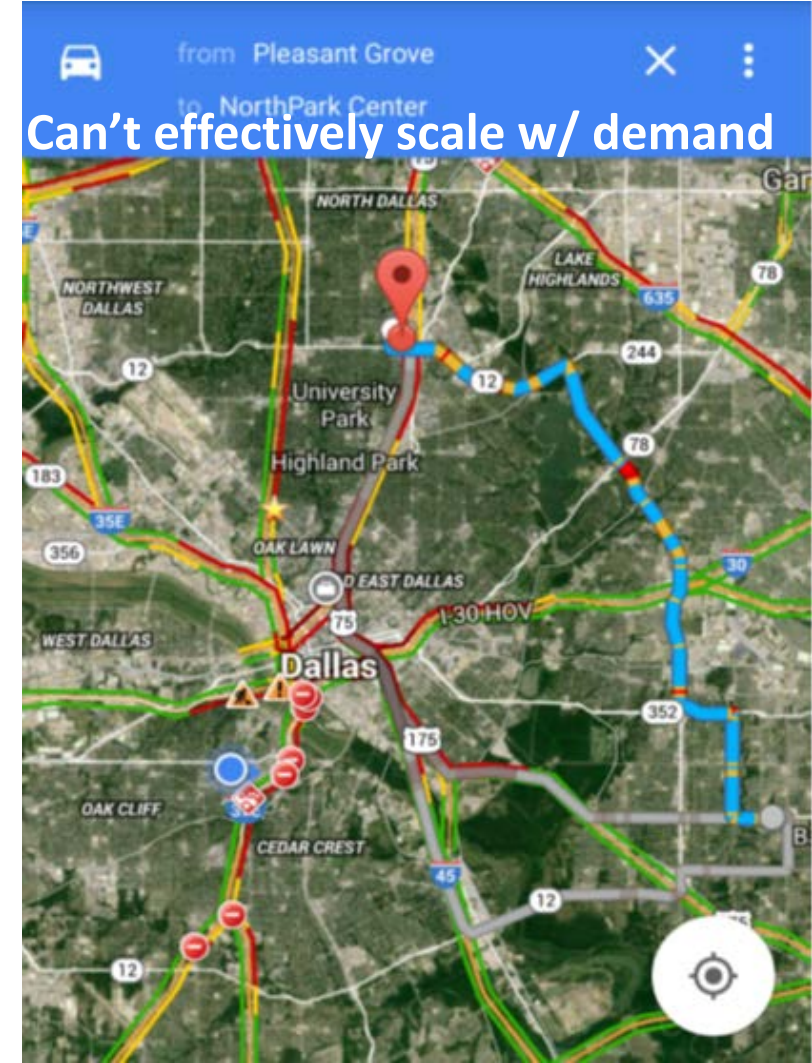
2nd longest trip length

VERY LARGE METROS:

1. ATLANTA — 12.8 MILES
2. **DALLAS — 12.2 MILES**
3. HOUSTON — 12.2 MILES
4. PHOENIX — 11.4 MILES
5. CHICAGO — 10.0 MILES
6. DC — 9.1 MILES
7. LOS ANGELES — 8.8 MILES
8. MIAMI — 8.6 MILES
9. SAN FRAN — 8.0 MILES
10. PHILADELPHIA — 7.8 MILES
11. NYC — 7.7 MILES



TIME



Costs of congestion per capita...

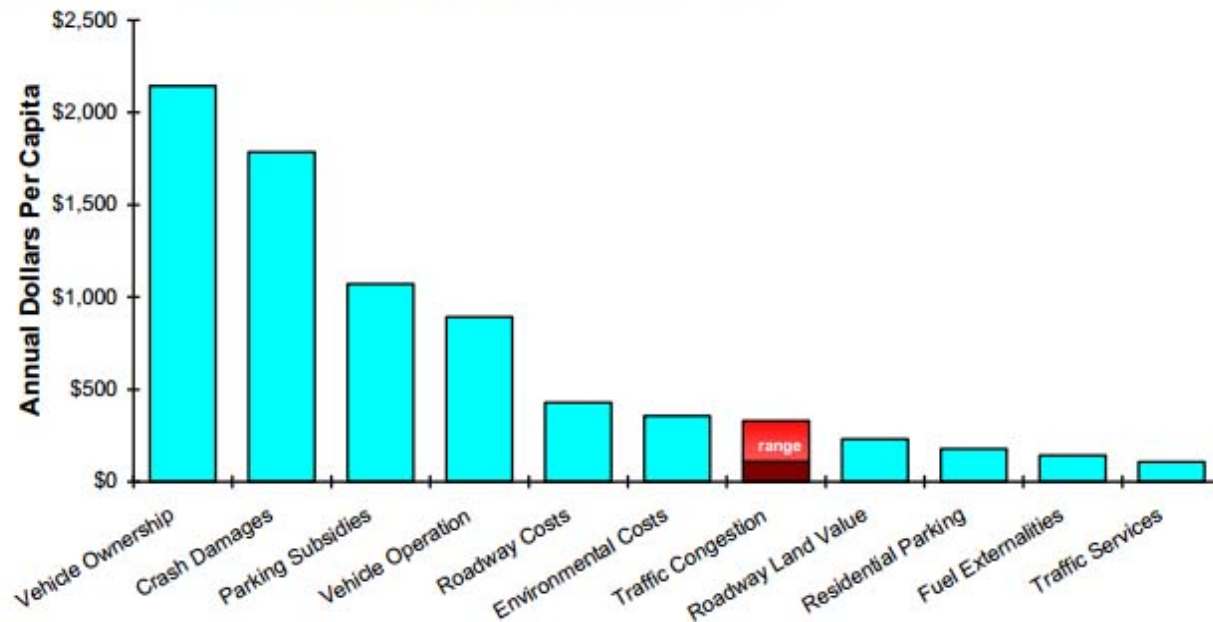
FEAR OF CONGESTION

Congestion costs the country \$120 billion each year.

That seems like a big number.

...but what if we add up the costs of car dependence?

Figure 7 Costs Ranked by Magnitude (Litman 2009)

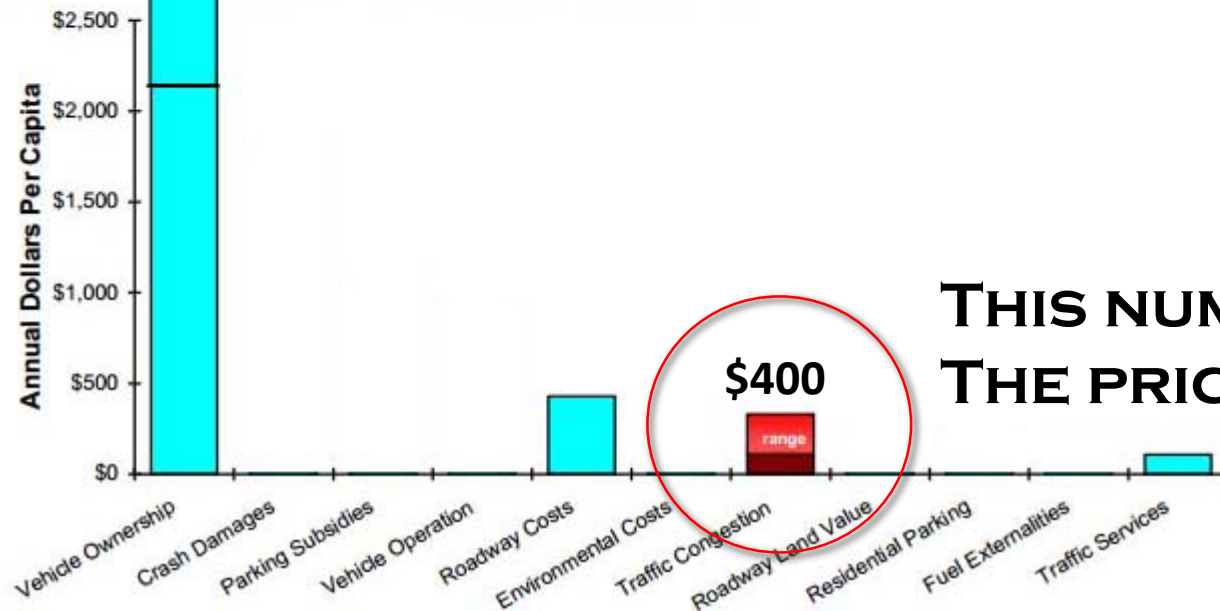


SOURCE: TODD LITMAN, VTPI

\$6,800

\$2 TRILLION/YEAR IN WASTE

WE CAN REDUCE THIS NUMBER BY DIMINISHING CAR-DEPENDENCE AND REDUCING OVER-BUILT, WASTEFUL INFRASTRUCTURAL BURDEN.



DEFINING CONGESTION

There is good and bad kind, like cholesterol. Social and economic exchange is predicated on people coming together.

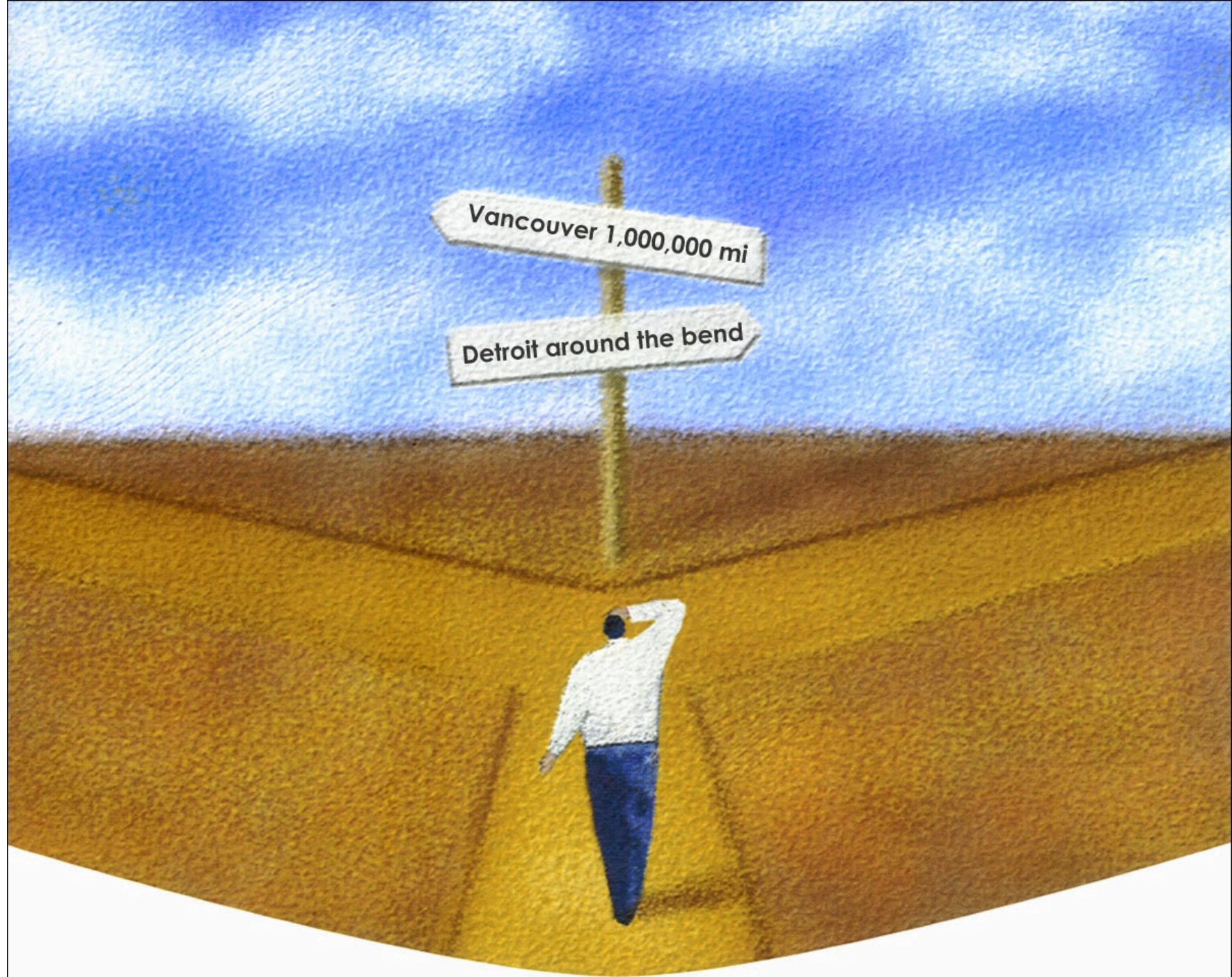
When everybody is in cars funneled to certain arterials and highways, reducing modal and route choice, while degrading the quality of place, it is the bad kind.

City is the platform, but we're building Anti-City.

**THIS NUMBER IS CONSTANT ACROSS ALL CITIES.
THE PRICE OF DOING BUSINESS.**

DALLAS AT A CROSSROADS

HOW TO ADDRESS
CONGESTION?



INTER-CITY VS INTRA-CITY (INNER-CITY) HIGHWAYS

The Funnel: Single Corridor handles increased capacity through cities by getting wider.

Sucks up all the energy from surrounding streets and neighborhoods, then areas decay.

INTER-CITY, LINKS REGIONAL ECONOMIES



INTRA- OR INNER-CITY, DISCONNECTS LOCAL ECONOMIES

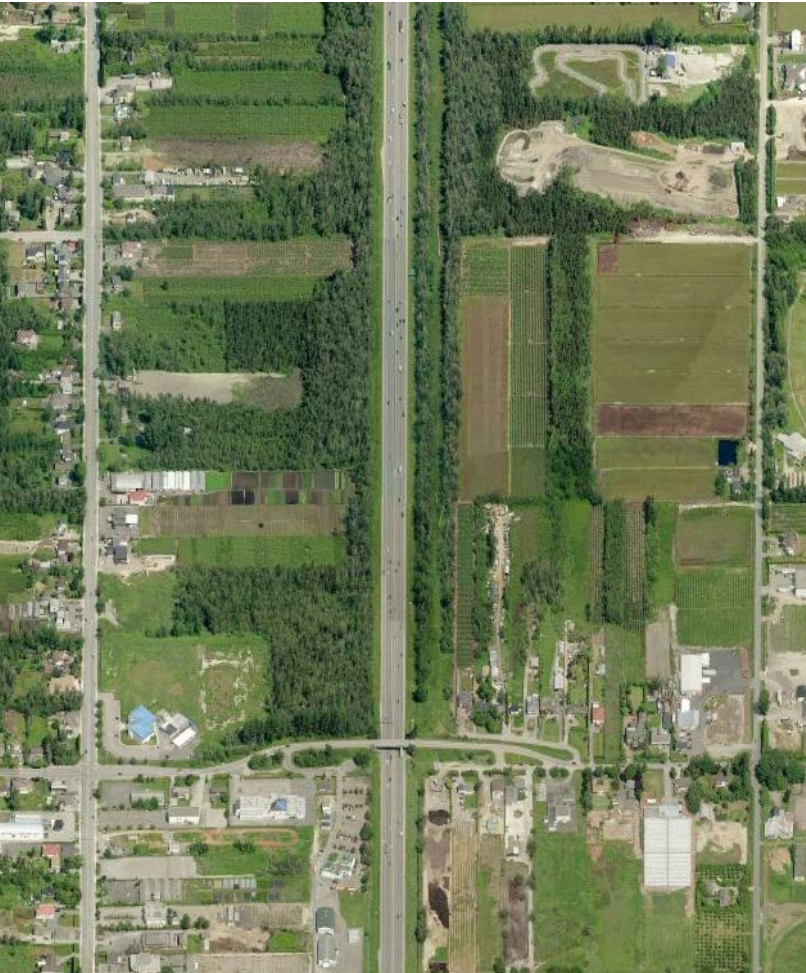


Context Sensitive Design

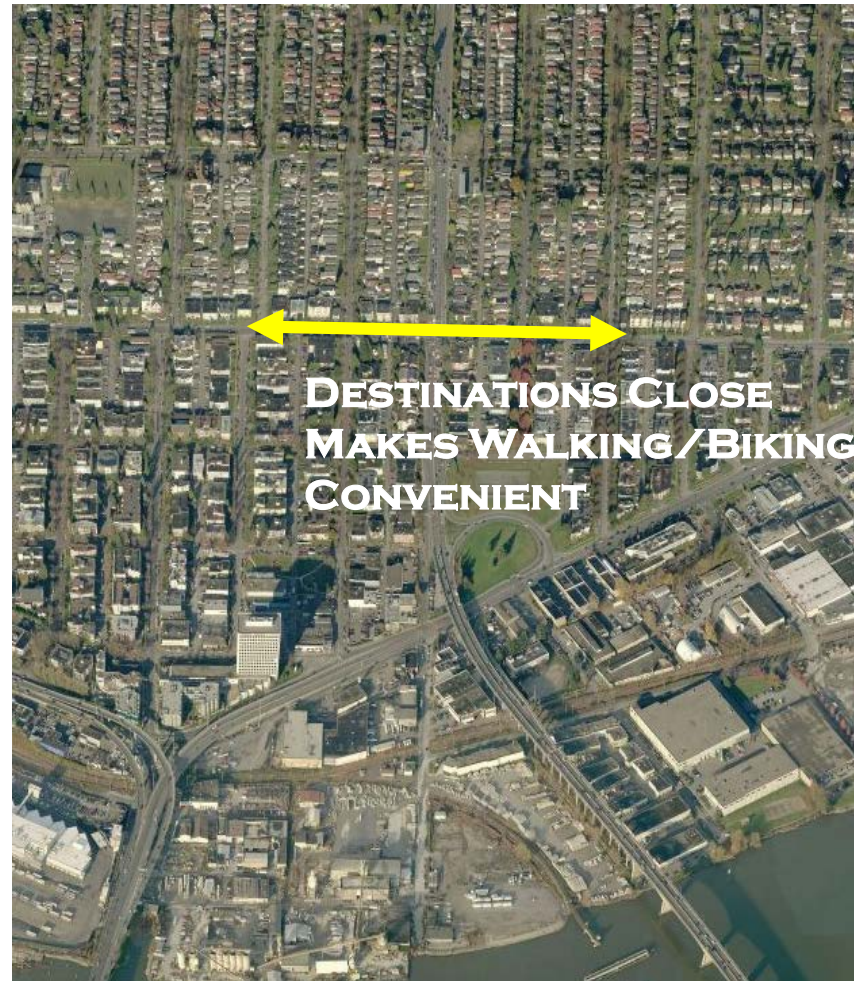
The Filter: Highway corridor narrows as it enters city allowing grid to handle increased capacity needs.

This diffuses the negative impacts of congestion while allowing for agglomeration economies, shortened trip lengths & providing greater route choice and adaptability

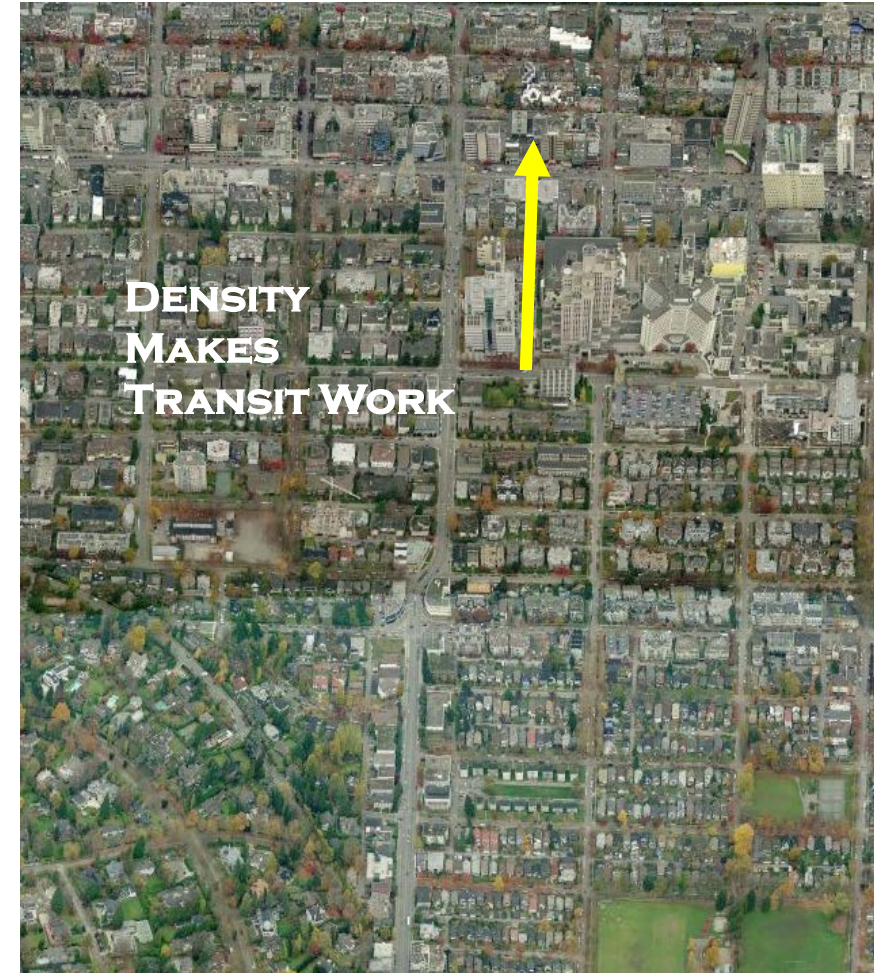
RURAL TO SUBURBAN



SUBURBAN TO URBAN TRANSITION

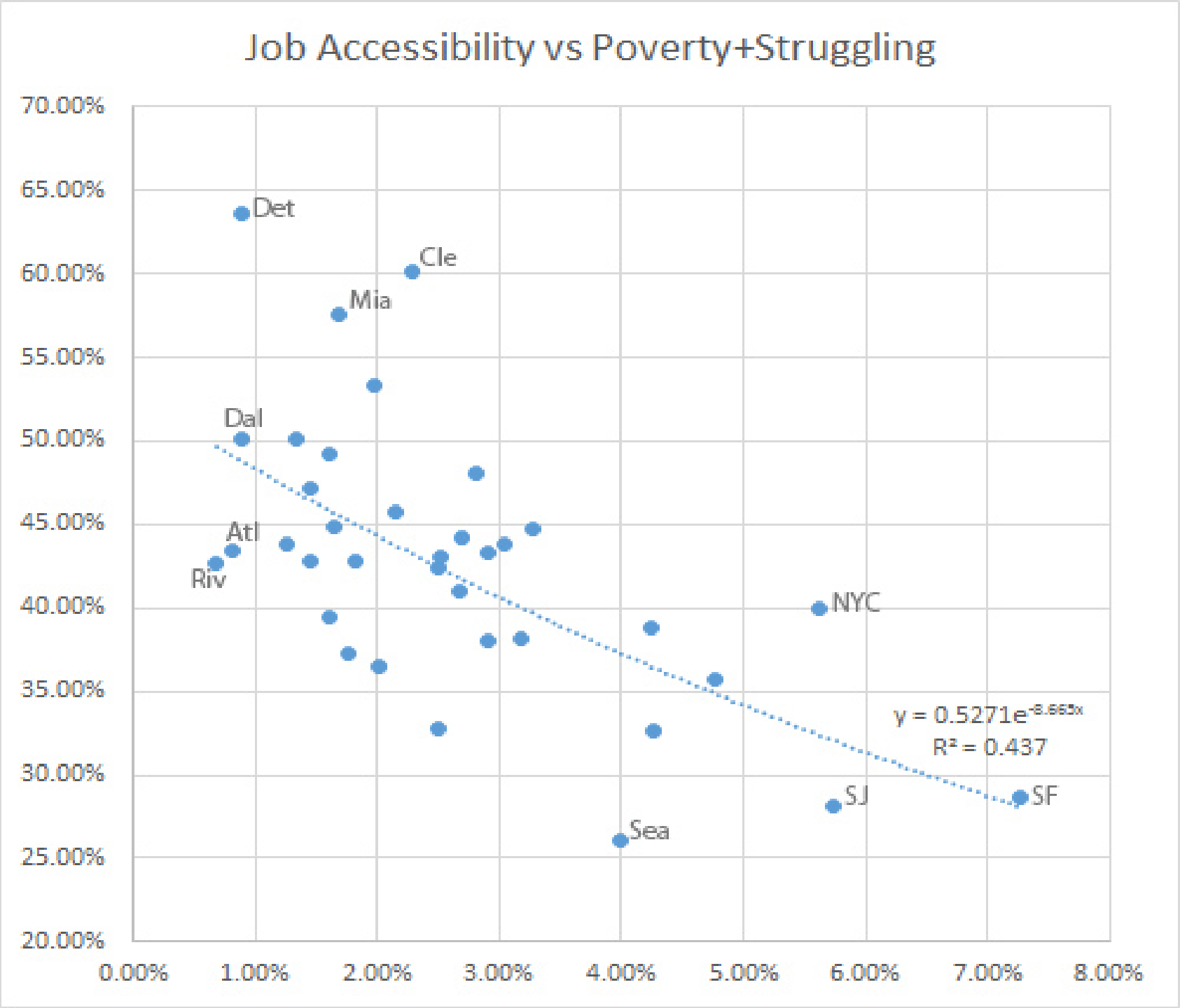


URBAN - GRID



Transit and Opportunity

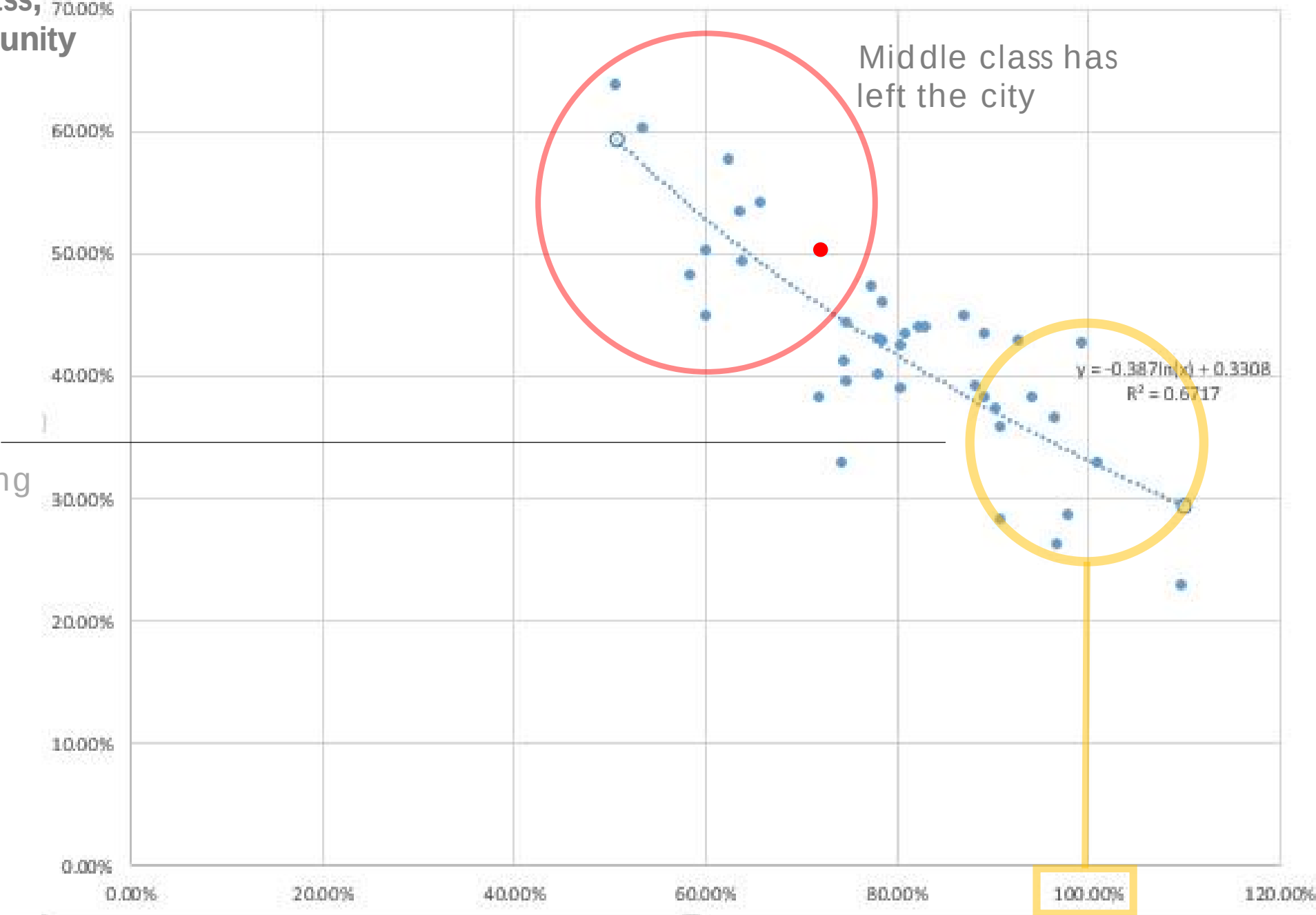
Percentage of Regional jobs accessible within 40-minute transit commute.



Income Disparity,
The Loss of the Middle Class,
And the Ladder of Opportunity

% Struggling vs. City/Metro Median Income Ratio

Middle Class lives in
Core city and surrounding



What to do?

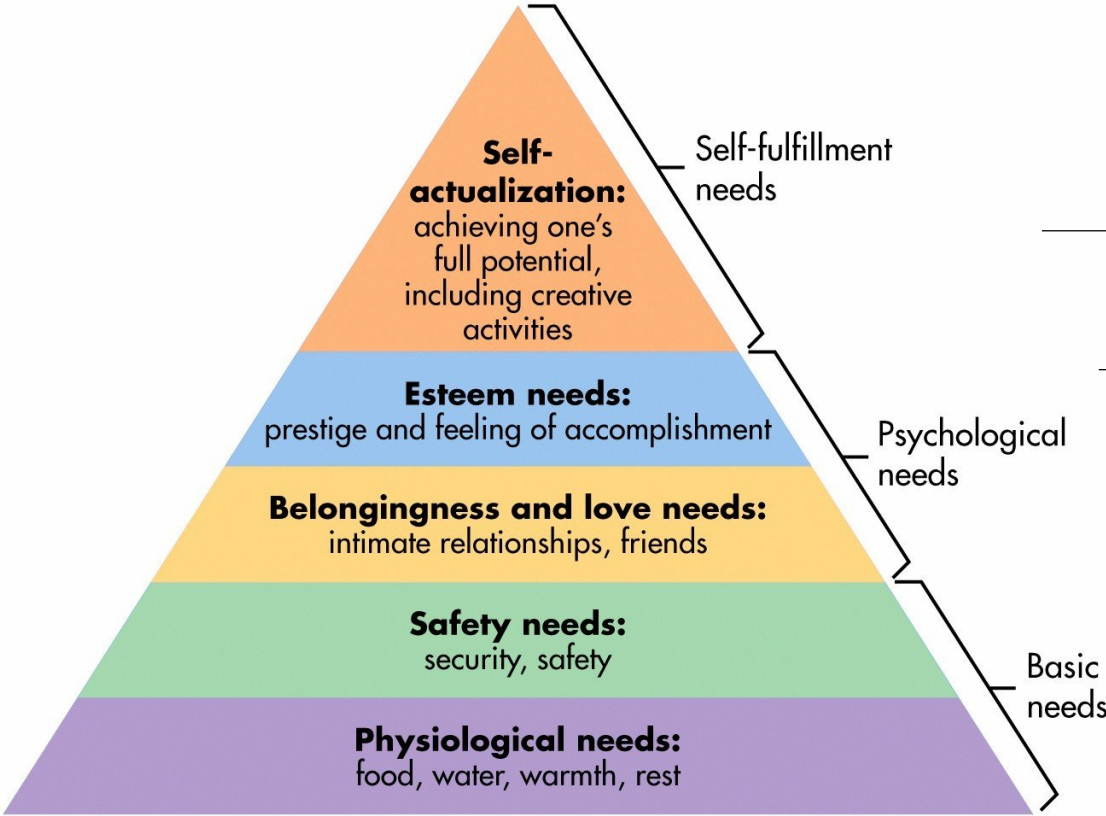
Simultaneously reinvesting in the livability of existing neighborhoods.

Expand the reach and accessibility of active transportation

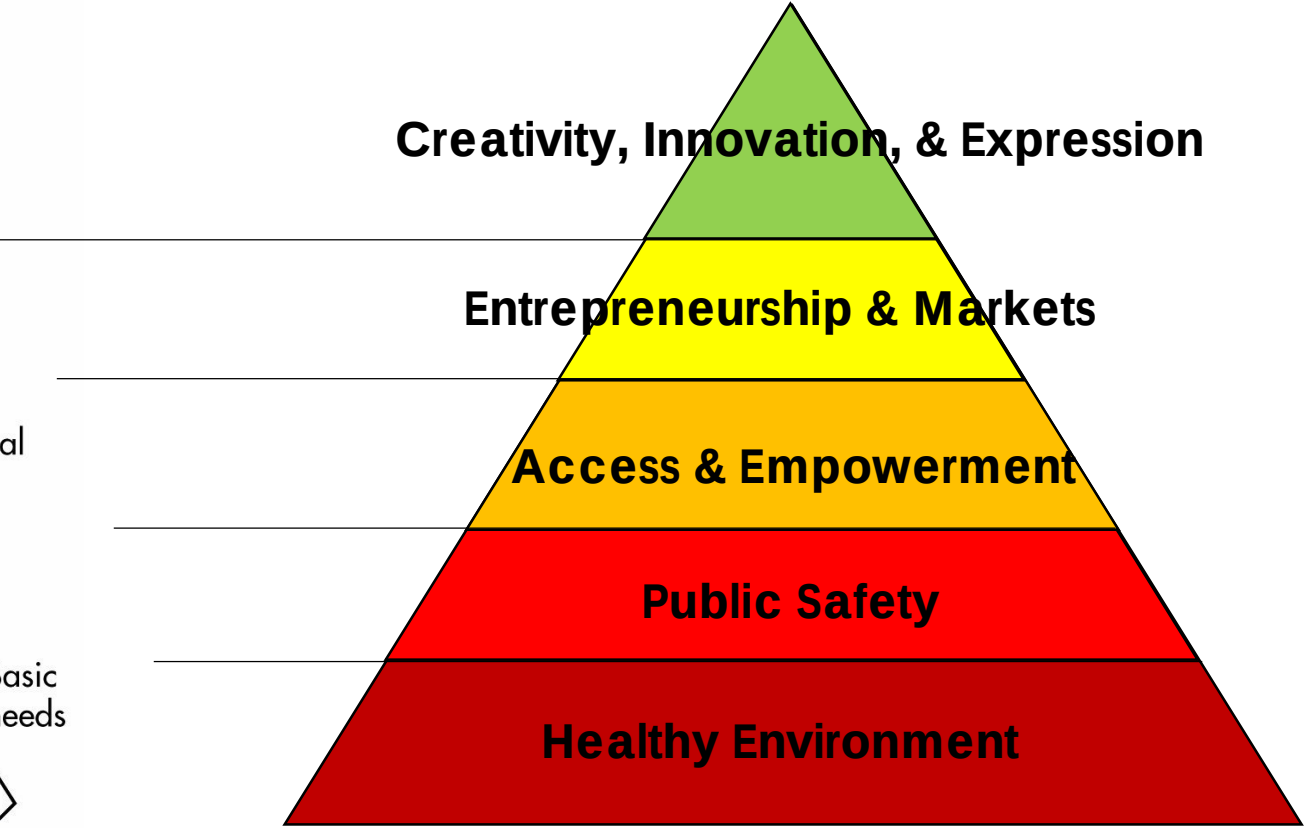
Accessibility > Mobility

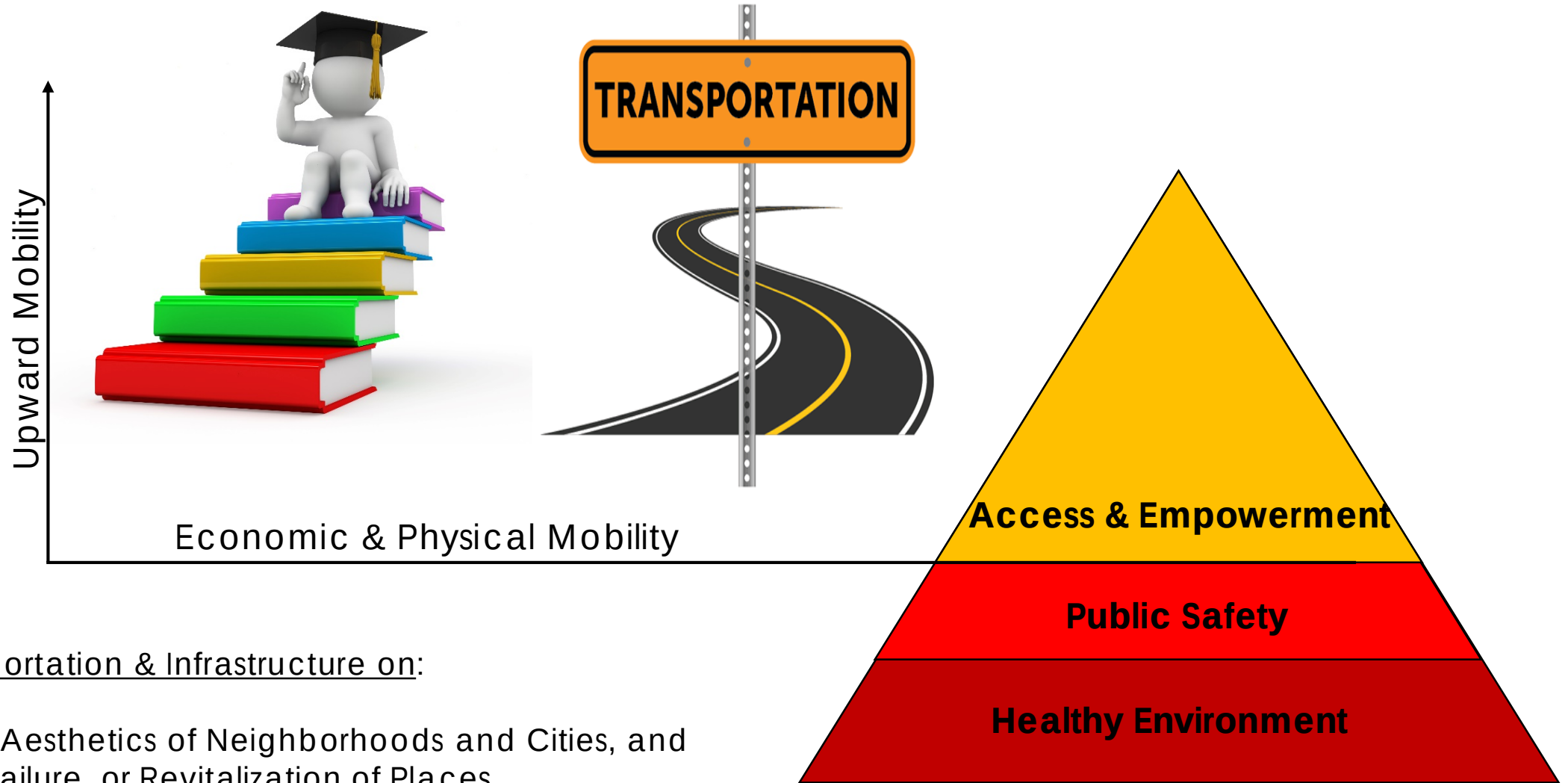
Maslow's Hierarchy of Needs

INTERNAL



ENVIRONMENTAL





Role of Transportation & Infrastructure on:

1. Form and Aesthetics of Neighborhoods and Cities, and
2. Success, Failure, or Revitalization of Places



Mobility





Mobility

Are these suitably safe, convenient, and reliable to be useful?

How can we design our cities to maximize choice and therefore freedom?

Does the infrastructure of driving prevent active transportation?

Do we adequately price for the cost of driving? Maintaining infrastructure, pollution, congestion, time, stress, etc.?

Is it equitable?

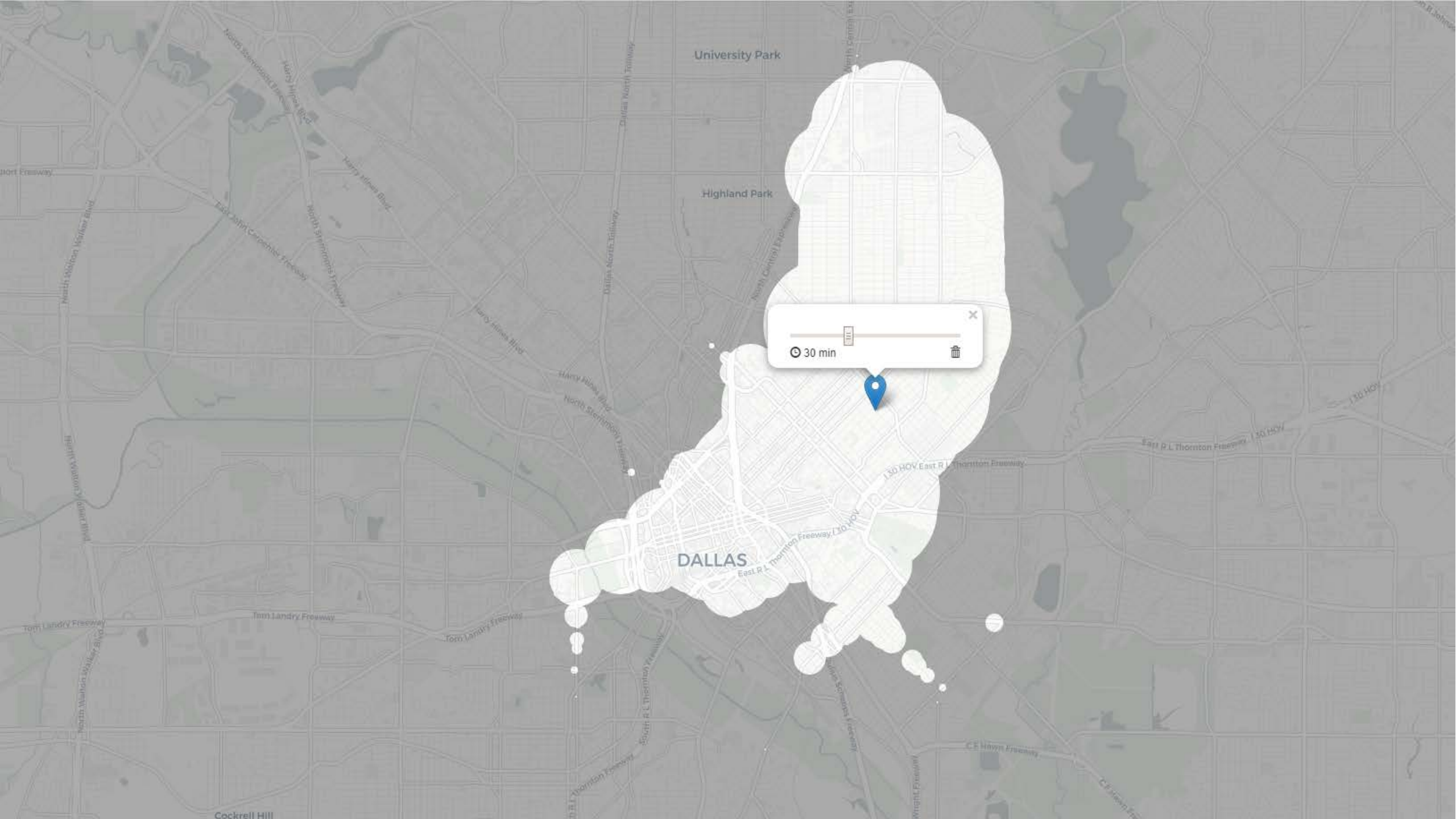
Can we afford it?



Mobility

Proximity





University Park

Highland Park

DALLAS



 30 min







WalkScore: a measure of the variety of things within close proximity



Walker's Paradise

Daily errands do not require a car.



Good Transit

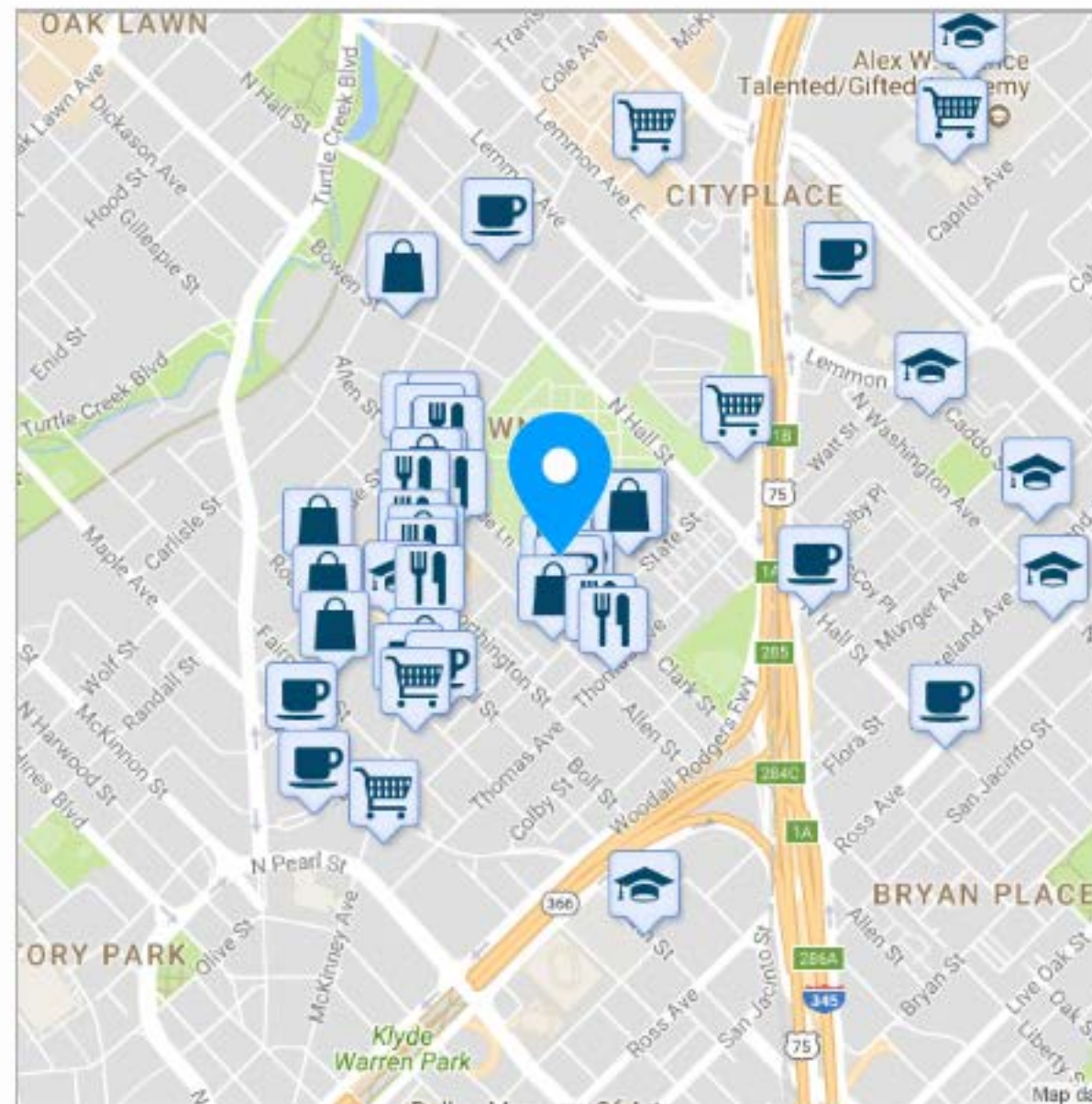
Many nearby public transportation options.



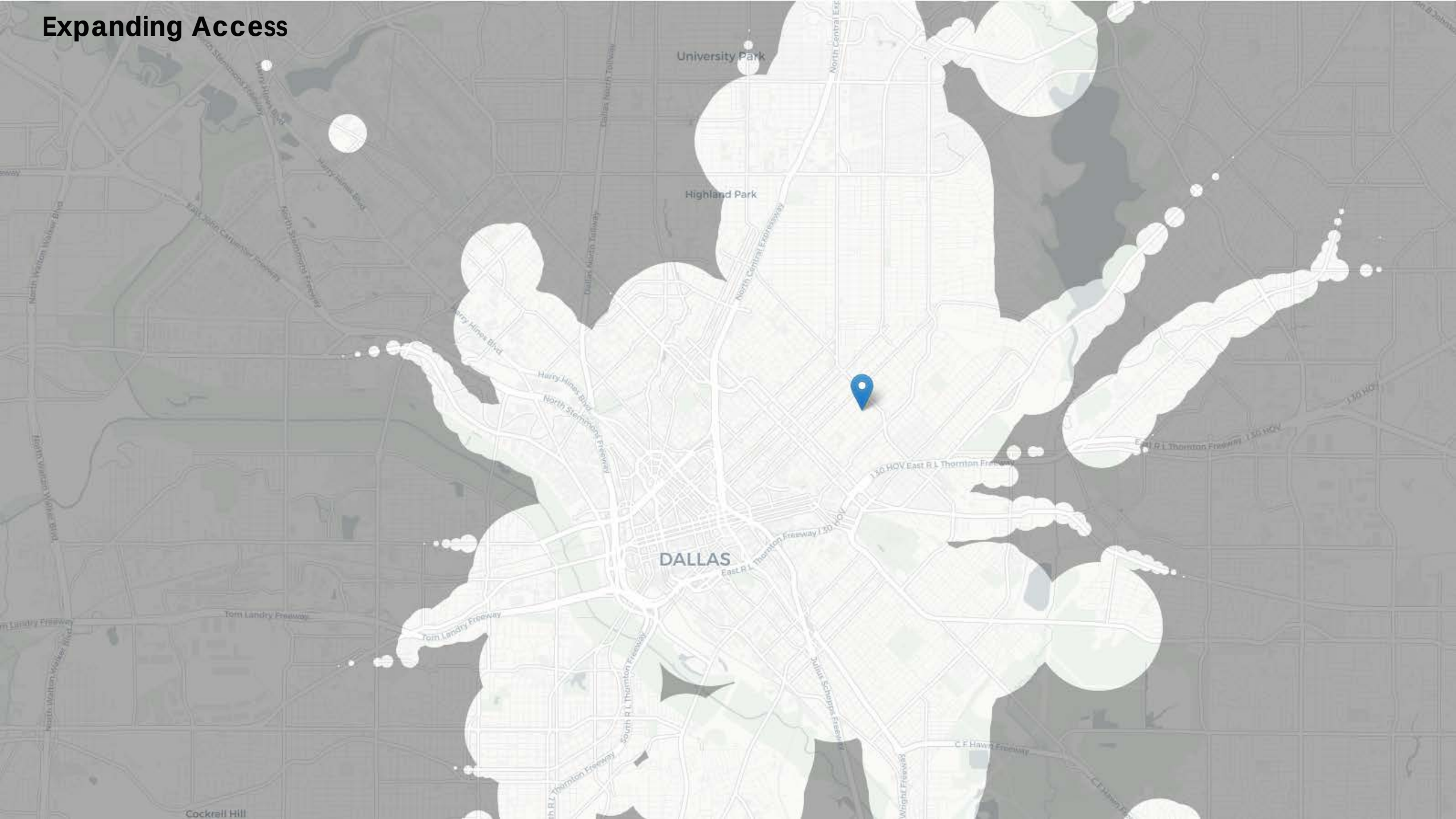
Bikeable

Flat as a pancake, minimal bike lanes.

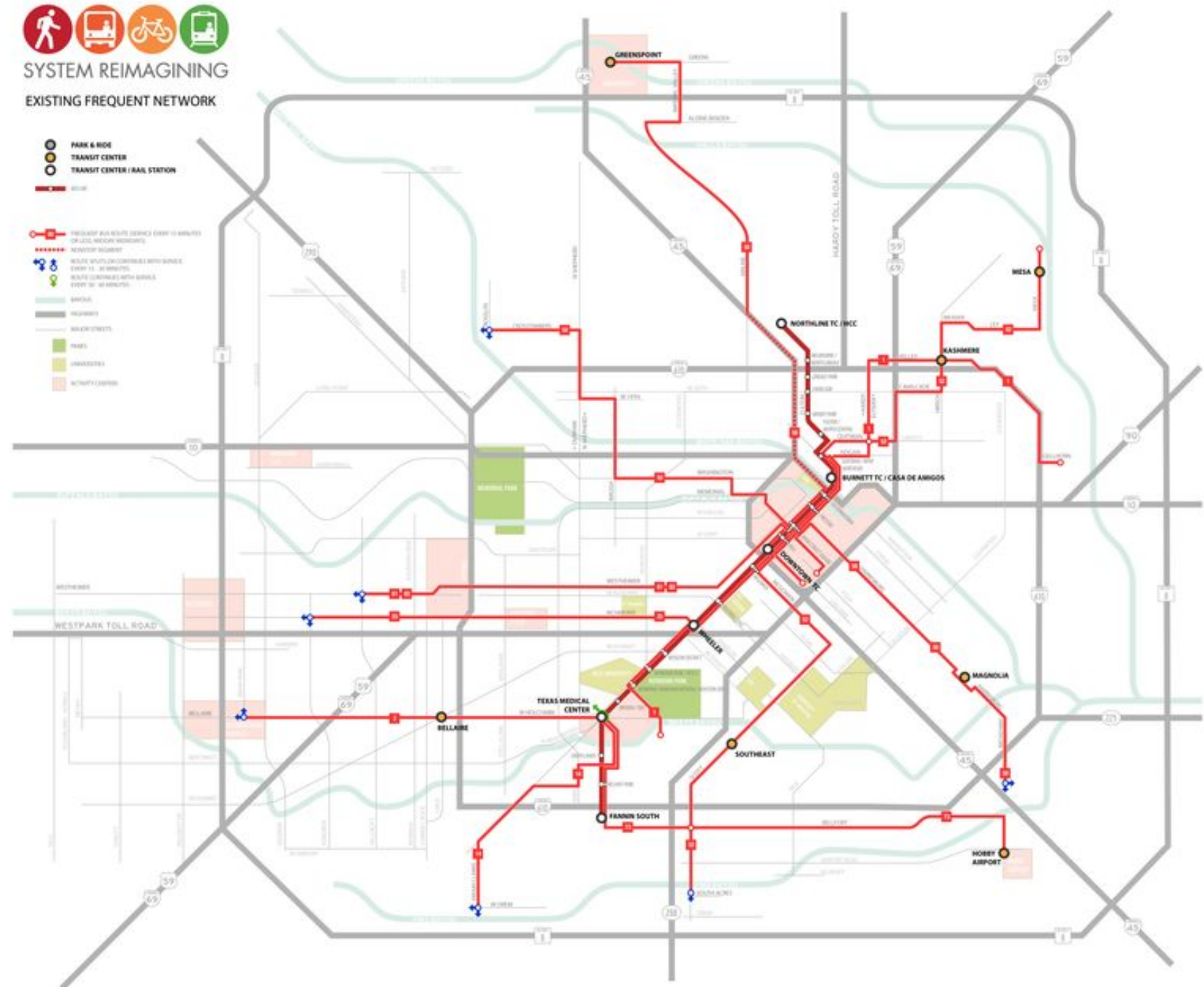
[About your score](#)



Expanding Access



OLD 'FREQUENT' NETWORK



QUALITY COVERAGE

NEW 'FREQUENT' NETWORK

- MORE GRIDDED;
- MORE STRAIGHT LINES;
- LESS FOCUS ON DOWNTOWN

CONNECTS 1 MILLION MORE PEOPLE TO 1 MILLION MORE JOBS

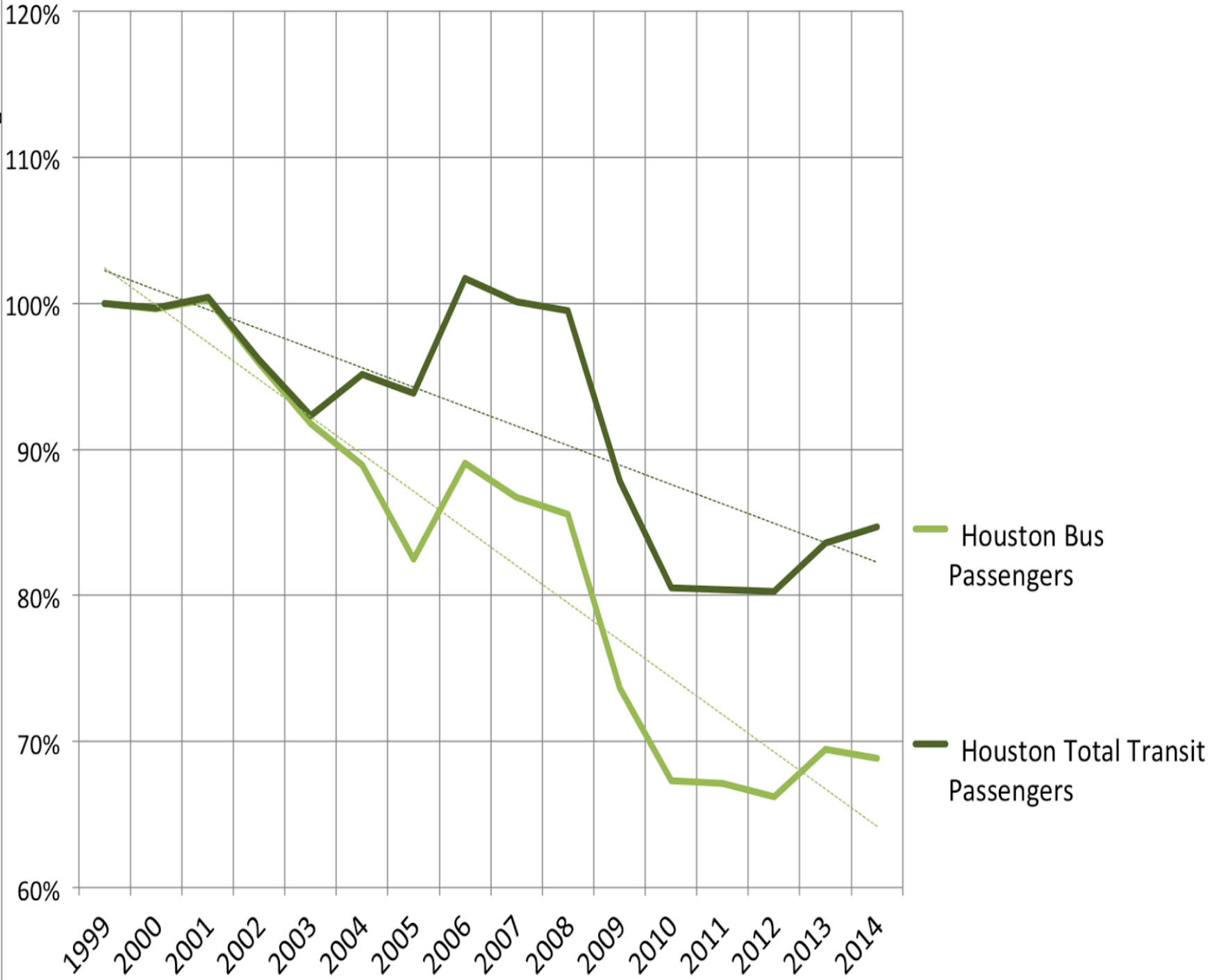
*NO INCREASED BUDGET



QUALITY COVERAGE

NO LONGER LOSING RIDERSHIP

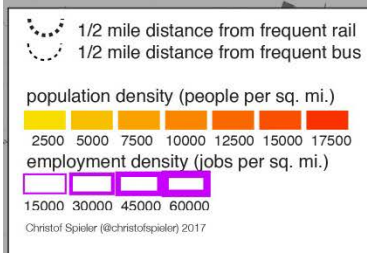
BUT MORE IMPORTANTLY, THE
REDUCED WAIT TIME IMPROVES
PEOPLE’S LIVES.



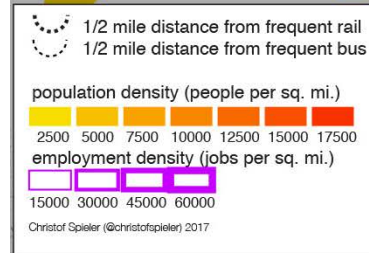
**NOT
COVERAGE
BUT
QUALITY
COVERAGE**

**WHEN YOU
FOCUS ON
IMPROVING
FREQUENT
NETWORKS TO
REDUCE
TRANSFER TIMES,
YOU CREATE
BETTER ROUTES
THAT ARE MORE
LIKELY TO
ATTRACT
MARKET
RESPONSE =
LESS
TRANSFERS.**

HOUSTON



DALLAS



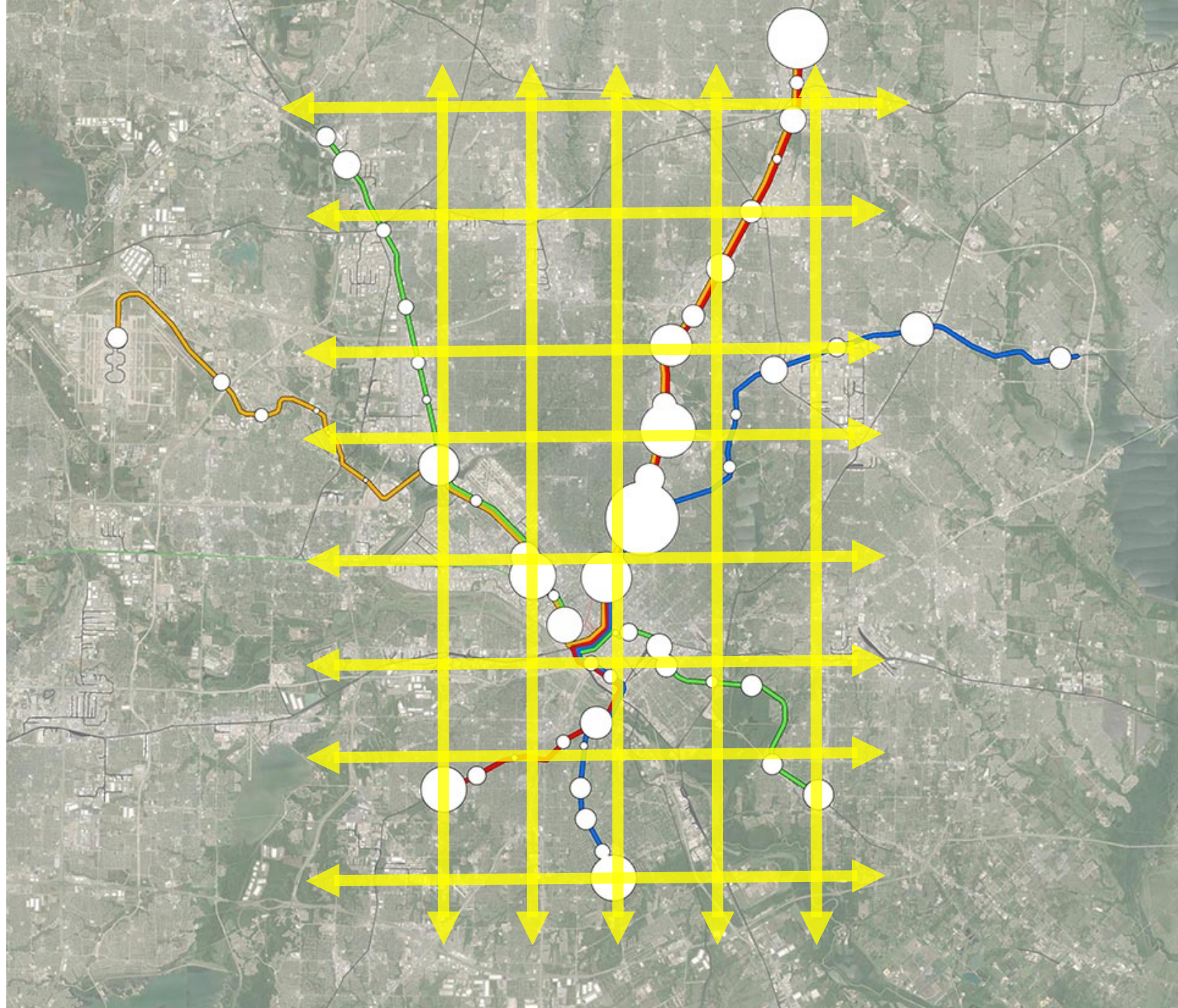
VALUE OF THE GRID

DART RAIL IS RADIAL

ONLY COVERS 7% OF LAND AREA

DOWNTOWN CONSISTS OF 6.5% OF JOBS

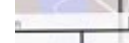
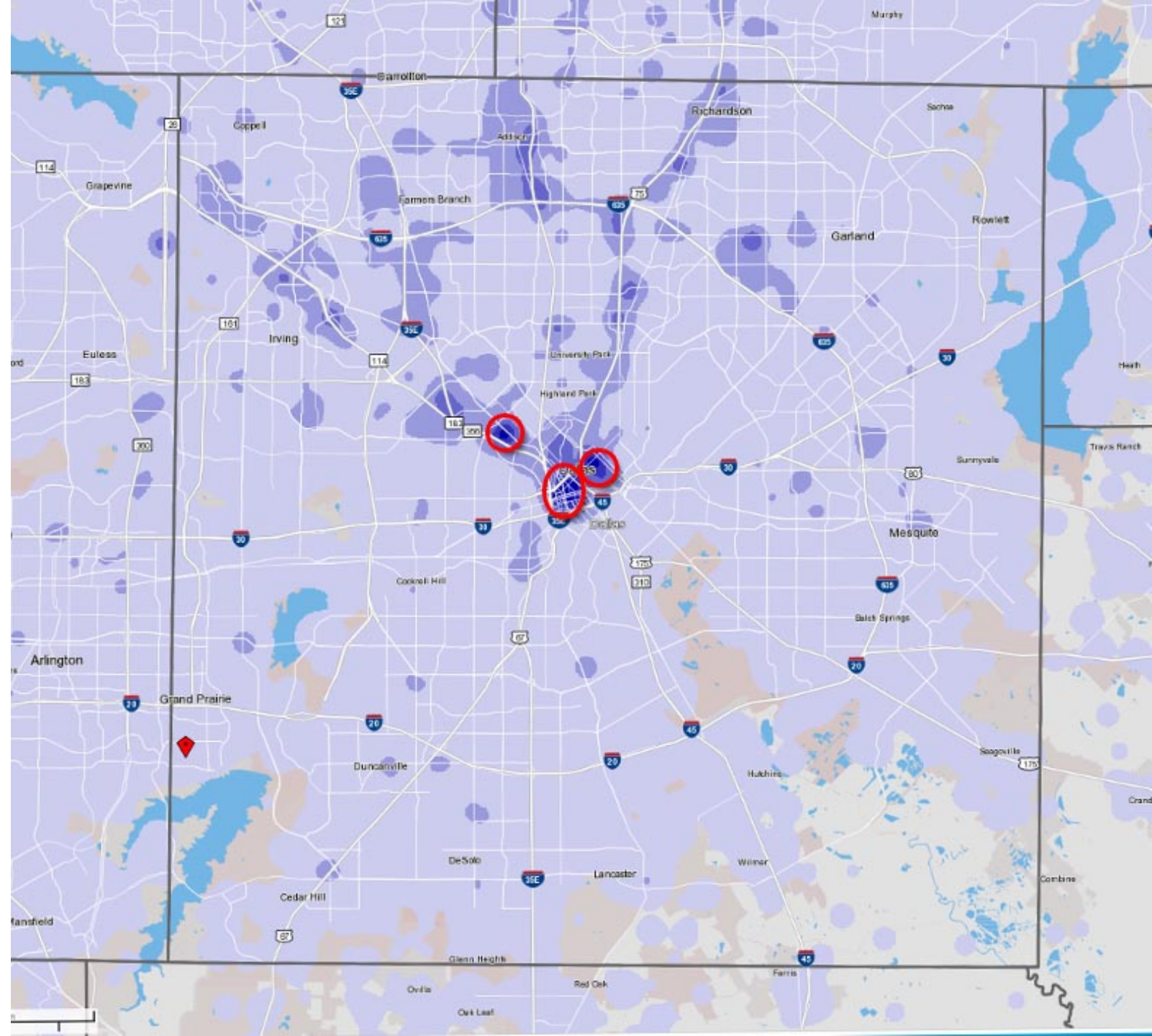
A GRIDDED BUS NETWORK CAN COVER THE ENTIRE CITY W/ ONE TRANSFER MAX.



DEMAND AND SUPPLY

NEED TO ELIMINATE REDUNDANCY AND PREDICTABLY LOW PERFORMING ROUTES

HIGH DENSITY JOB CLUSTERS



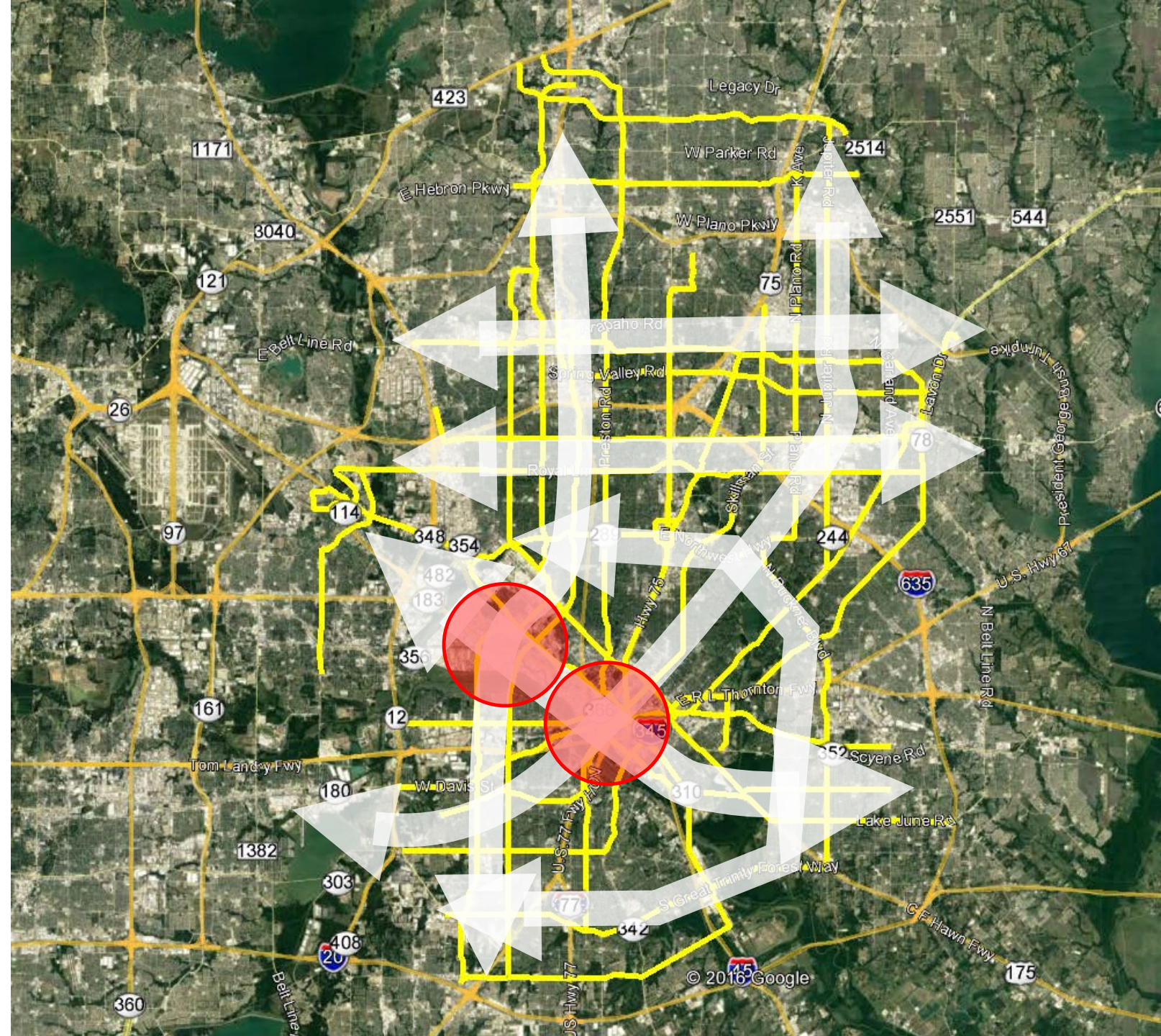
NEW ALL-DAY FREQUENT NETWORK GRID

GOOD N-S AND E-W CONNECTIONS

UTILIZES 1-MILE ARTERIAL GRID, THE 'BONES' OF THE CITY.

PRIMARY CONNECTION NODES AT JOB CLUSTERS.

STILL TOO EXTENSIVE — HOW FAR CAN RESOURCES GO?



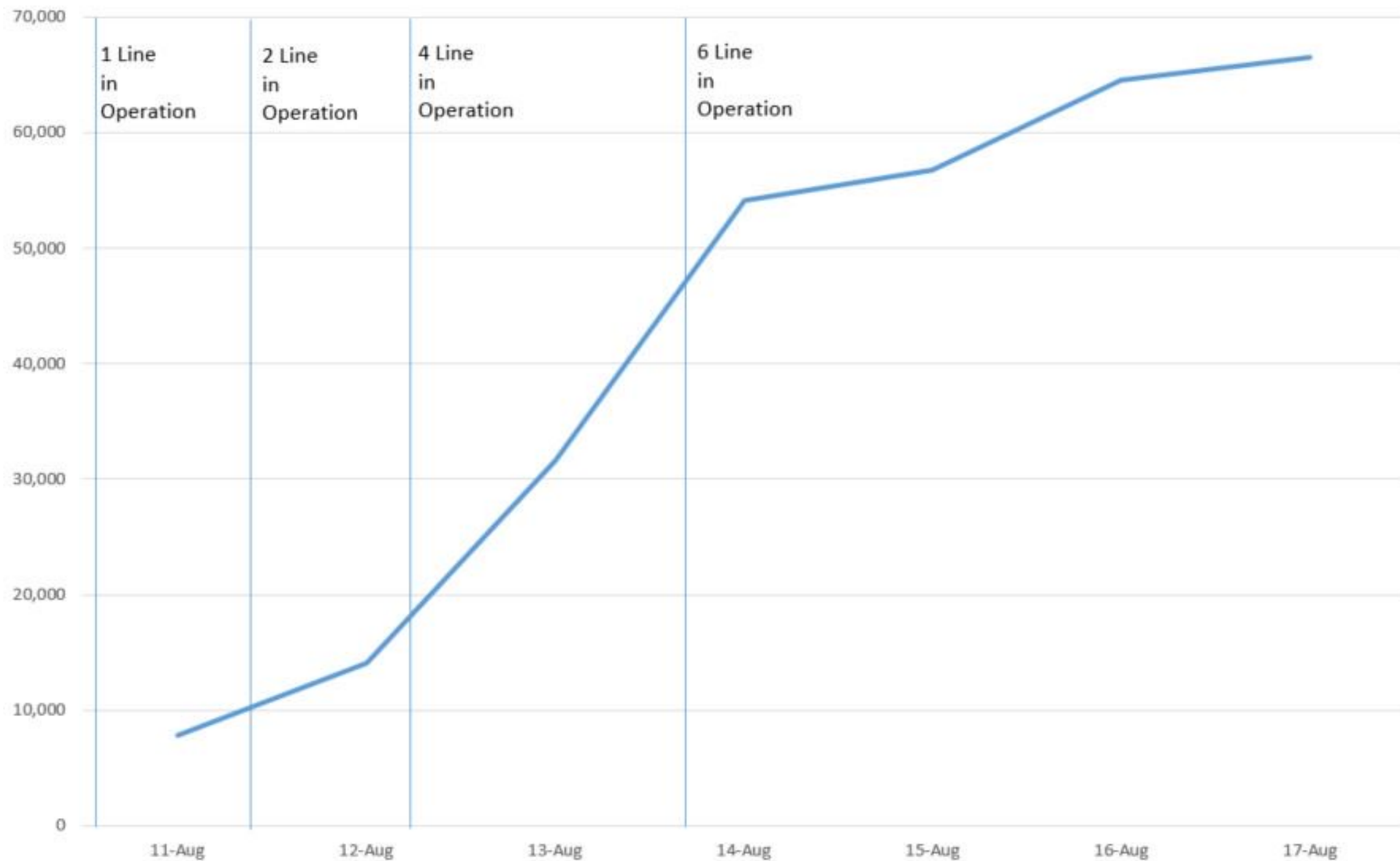
SUPPLYING DEMAND DRIVERS

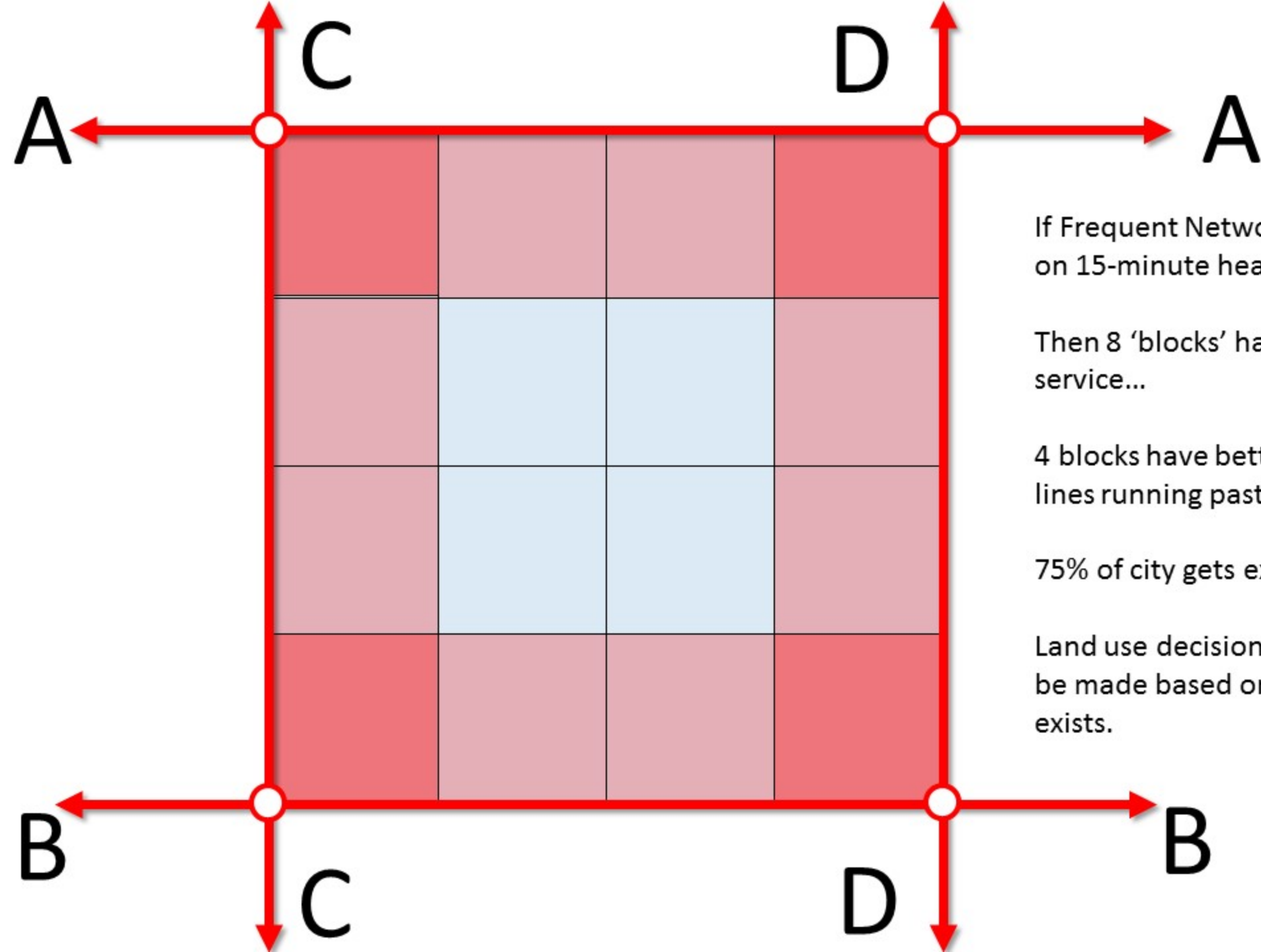
FREQUENCY AND
RELIABILITY

CAN WE
ACCOMMODATE
DEDICATED TRANSIT
LANES TO ENSURE
BUSES DON'T GET
STUCK IN TRAFFIC, MISS
CONNECTIONS, BUNCH,
ETC.



King County Rapid Ride - Aug Ridership





If Frequent Network routes A, B, C, D all run on 15-minute headways...

Then 8 'blocks' have frequent network service...

4 blocks have better than frequent w/ two lines running past.

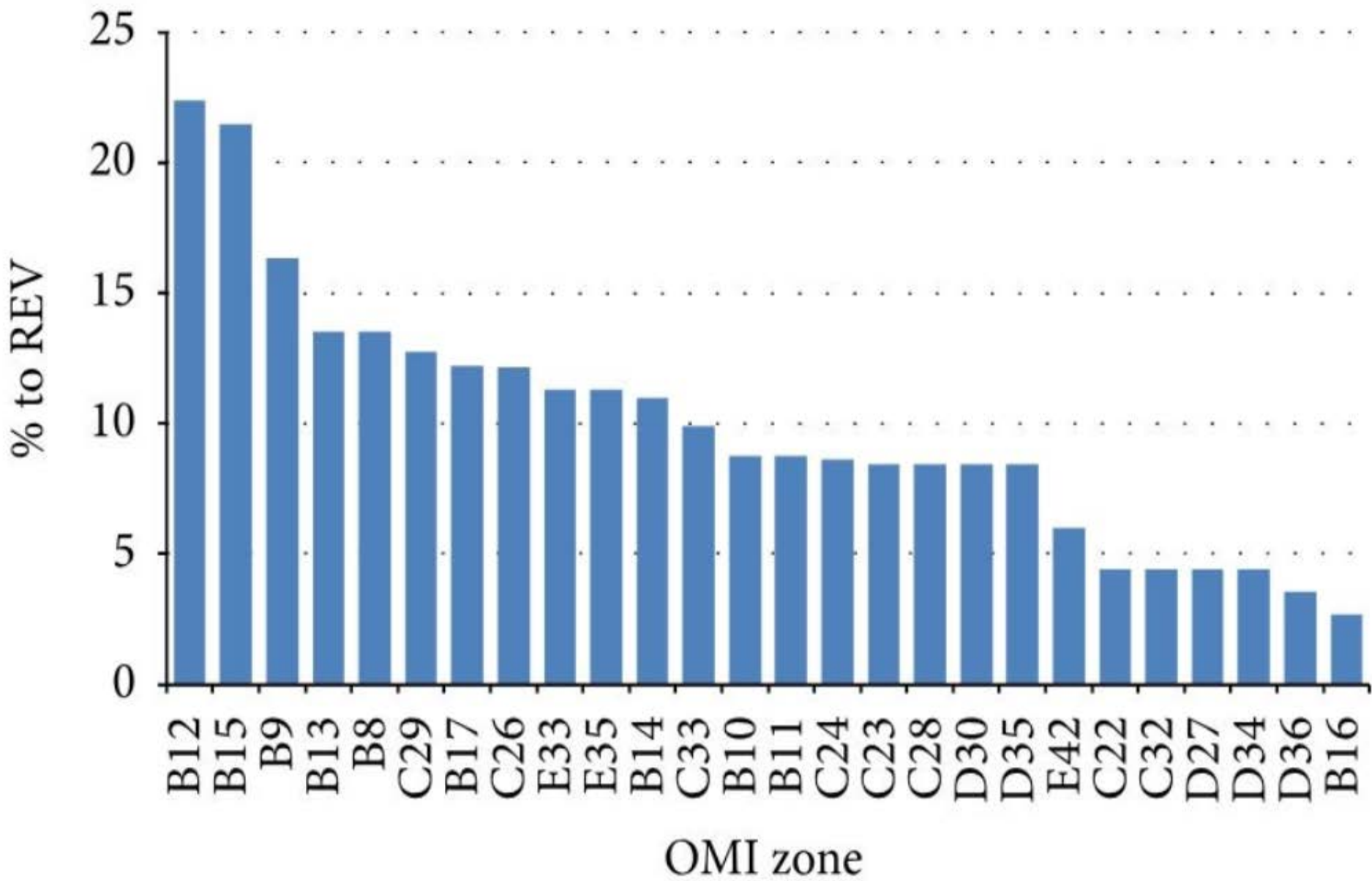
75% of city gets excellent transit service

Land use decisions (public and private) can be made based on where excellent service exists.

FREQUENCY AND REAL ESTATE

TRANSIT ONLY
CONTRIBUTED TO
REAL ESTATE
PREMIUMS WHERE
HIGH FREQUENCY
SERVICE WAS
PROVIDED.

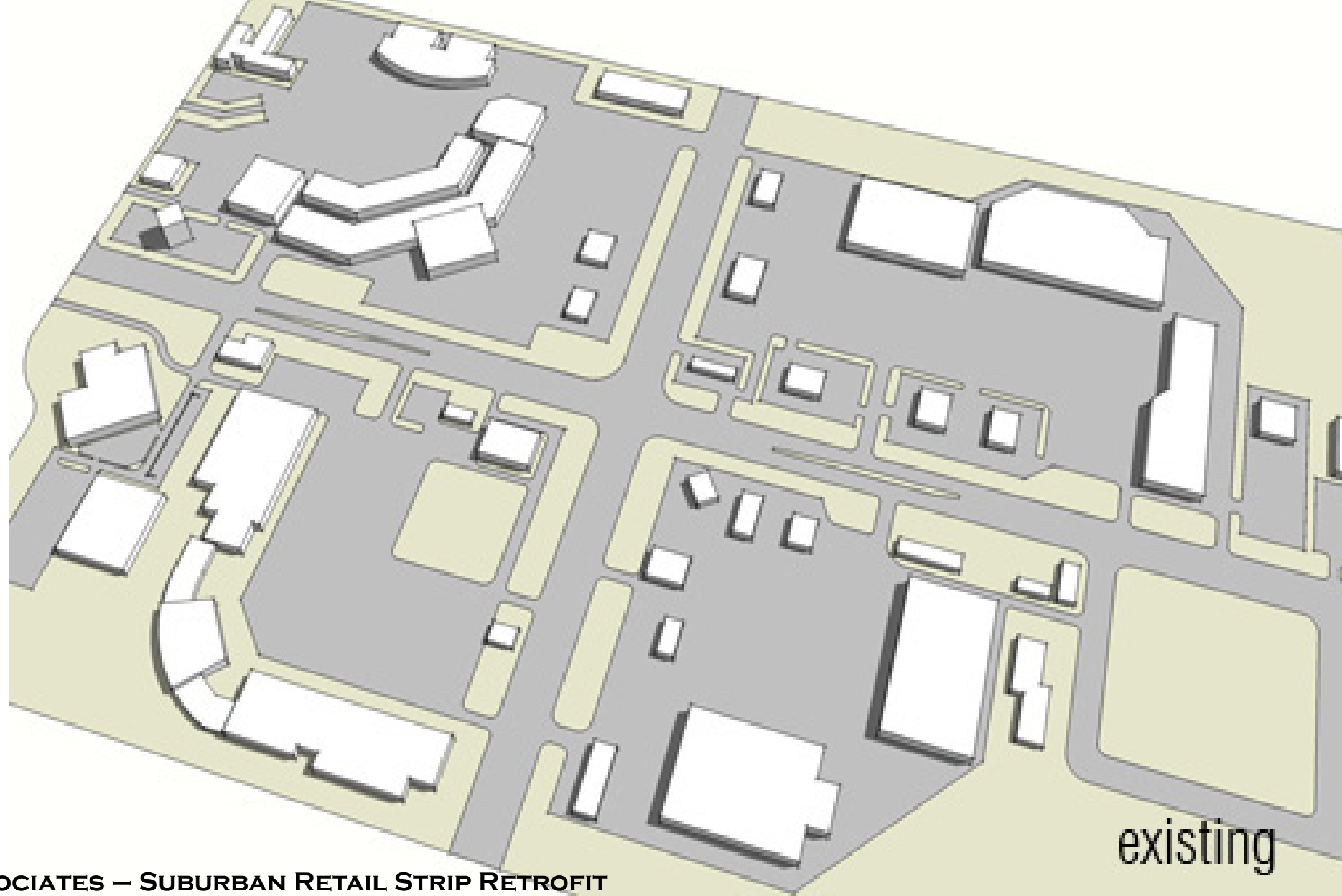
LOW FREQUENCY
HAD NO AFFECT
ON REAL ESTATE
VALUE BUT
OCCASIONALLY
NEGATIVE.



RE-THINKING THE RETAIL CORNER



BEFORE:

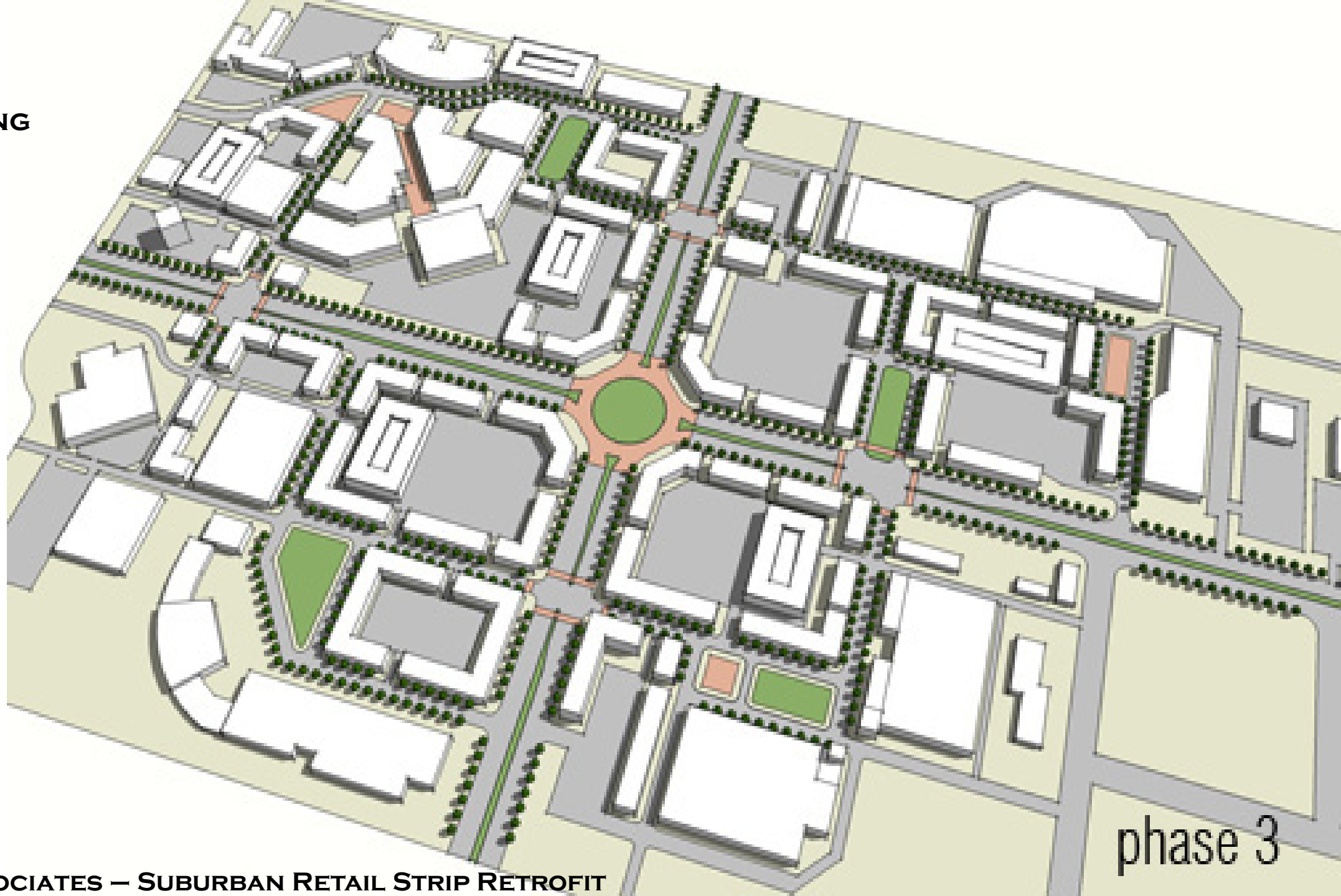


existing

SETH HARRY ASSOCIATES — SUBURBAN RETAIL STRIP RETROFIT

AFTER:

**ALLOWS HOUSING
POLICY GEARED
TOWARDS
ACCESSIBILITY**



phase 3

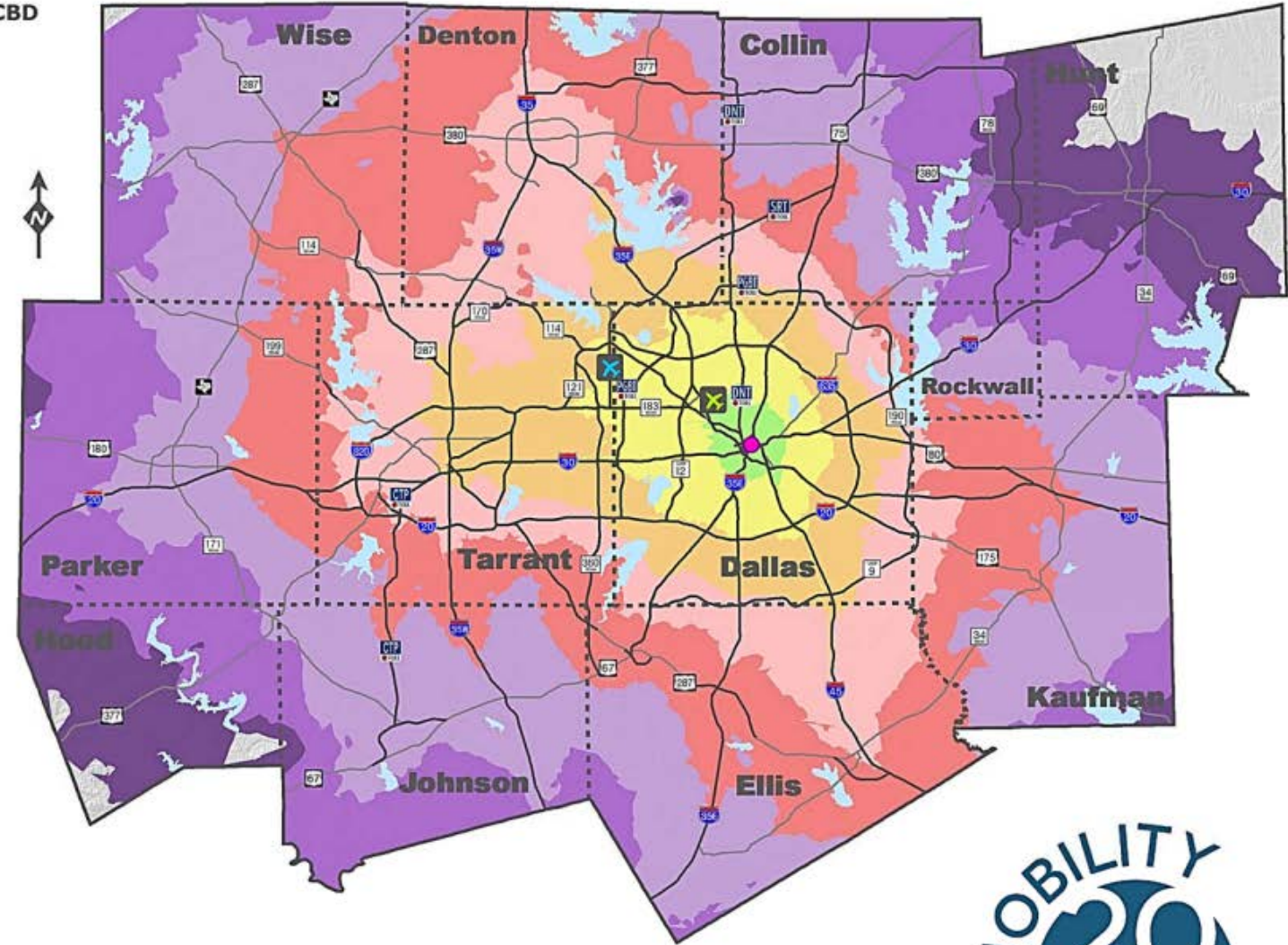
SETH HARRY ASSOCIATES — SUBURBAN RETAIL STRIP RETROFIT

You Measure What You Prioritize

And your metrics drive
policy

2040 PM Peak Period Travel Times from Dallas CBD

Travel Times from Dallas CBD



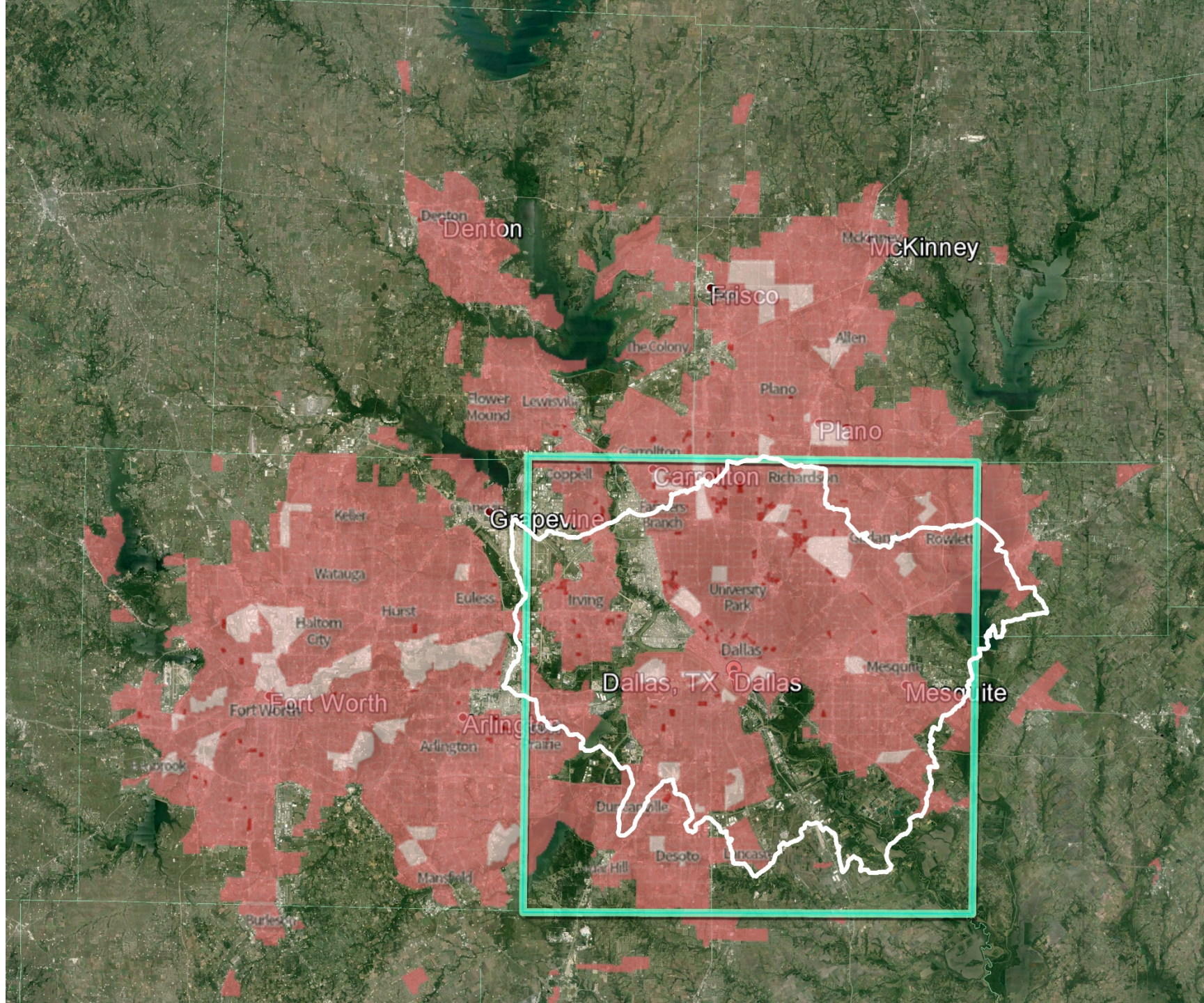
North Central Texas
Council of Governments

September 2016



Contours based on modeled average peak period speeds in 2040.

London to Dallas-Fort Worth
To scale.

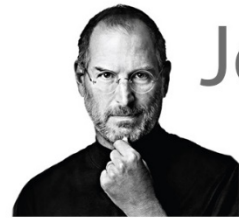


JOBS/HOUSING/INFRASTRUCTURE DYNAMIC

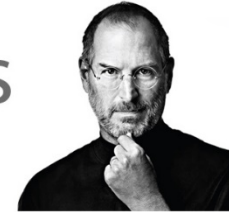
**IF WE CAN REDUCE THE AMOUNT OF
NECESSARY CAR TRIPS...**

AND REDUCE THE LENGTH OF THOSE TRIPS...

**WE INCREASE EXISTING CAPACITY
EXPONENTIALLY, SIMPLY BY USING THE MARKET**



Jobs



Jobs

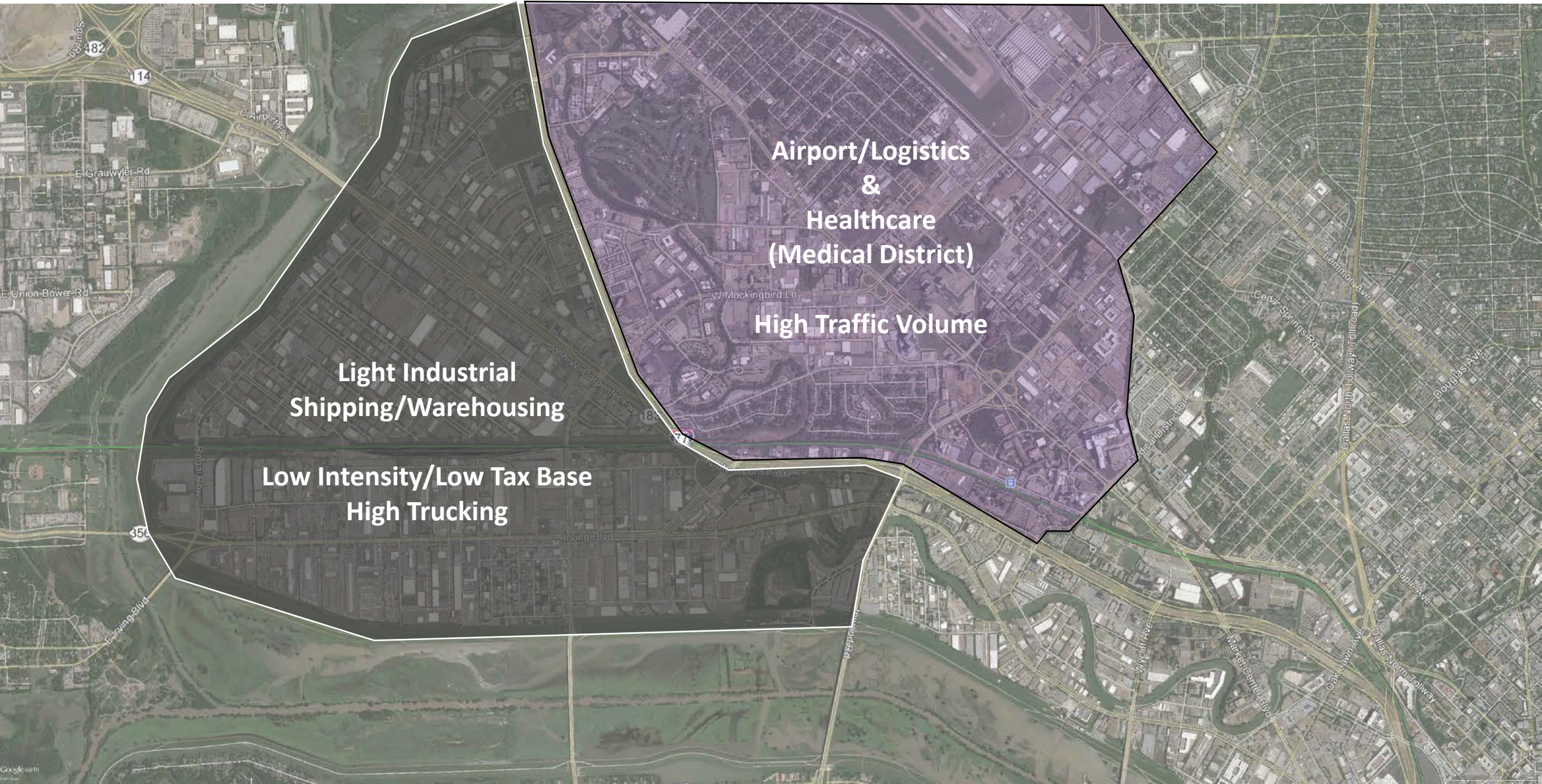


Housing

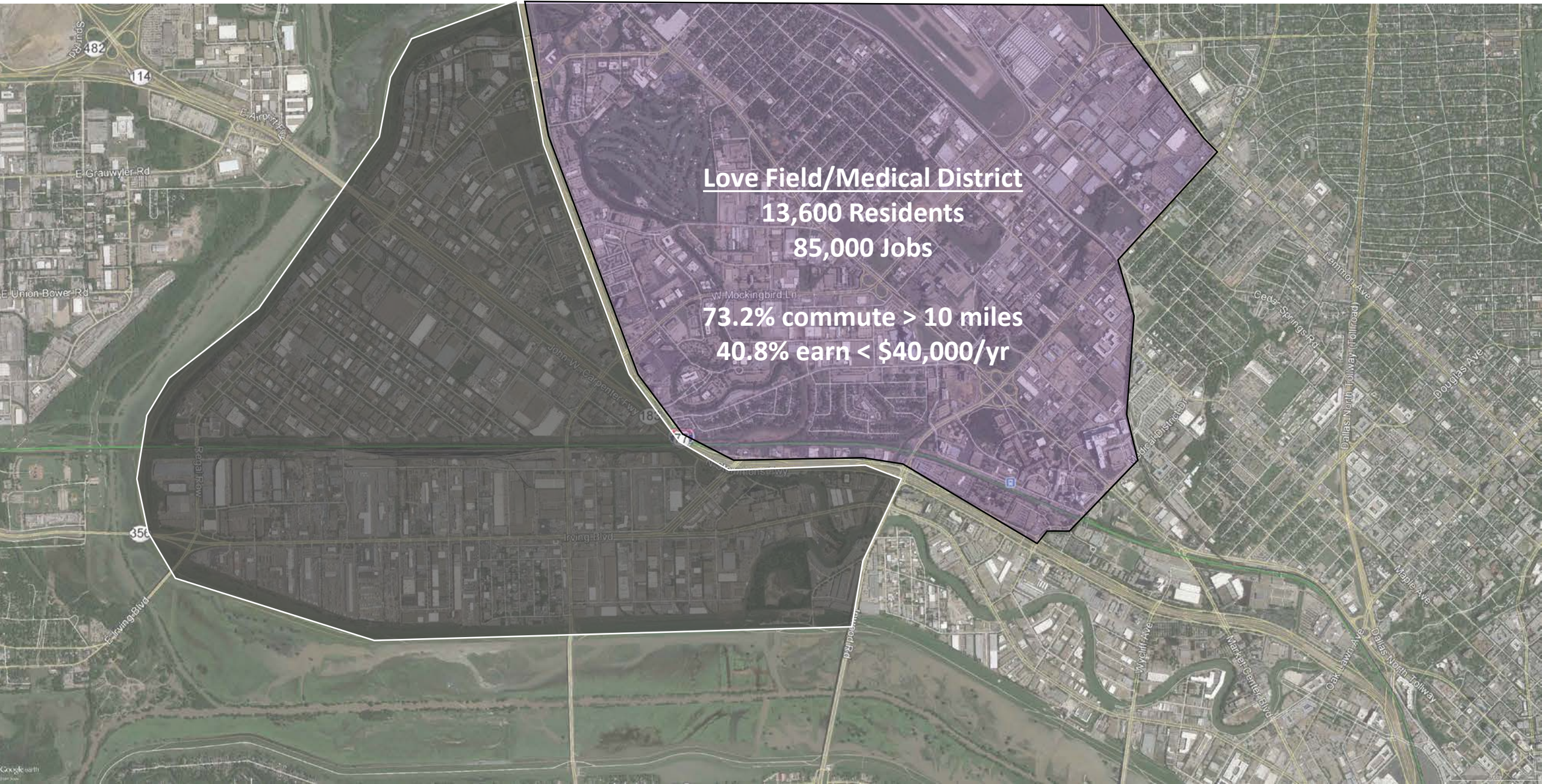
IRVING BOULEVARD / REGAL ROW - EXISTING

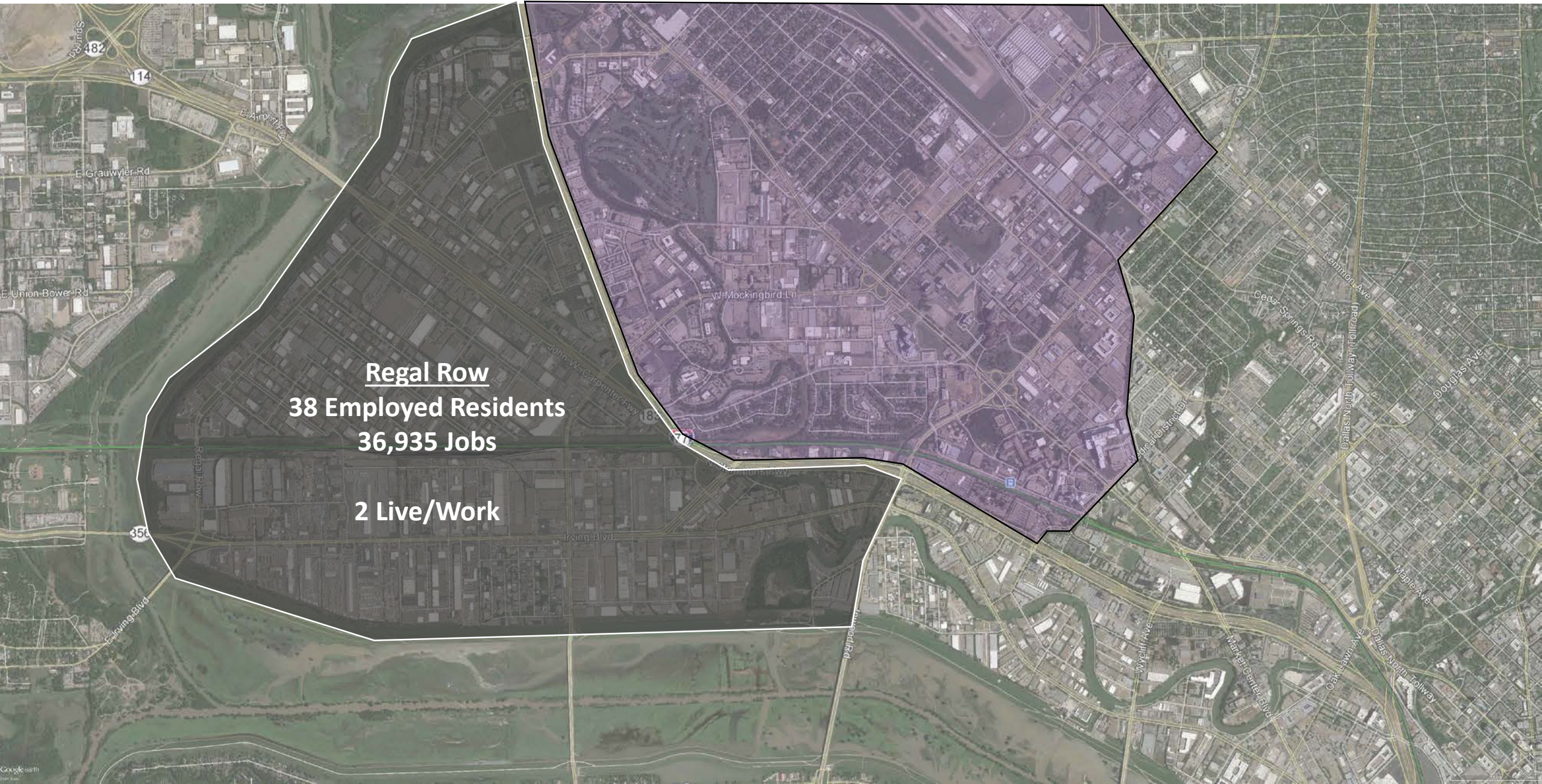


TRINITY TOLLROAD JUSTIFICATION: GET PEOPLE TO JOBS



RE-THINK THE PROBLEM





Regal Row

38 Employed Residents
36,935 Jobs

2 Live/Work

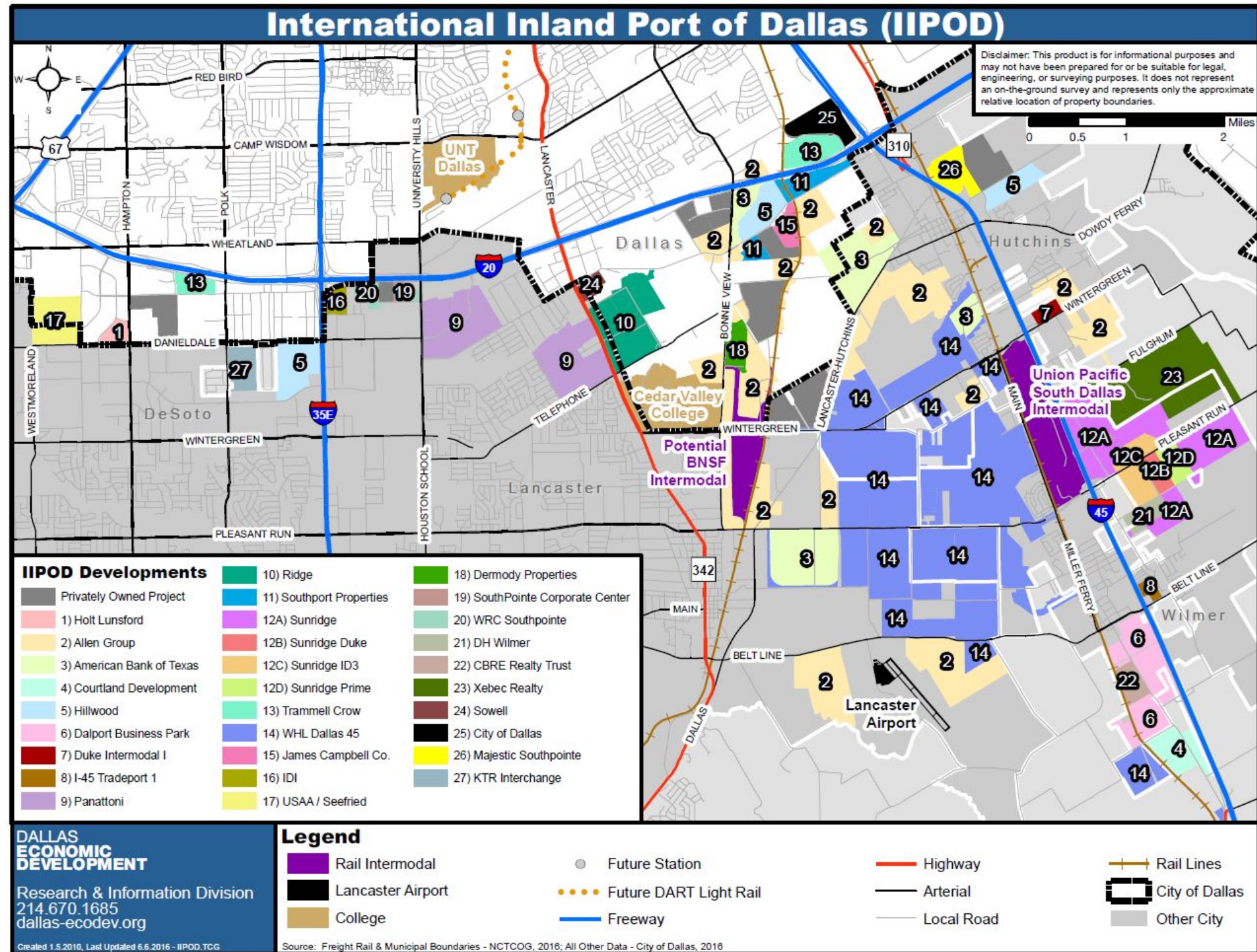
LONG-TERM PLAN:

GOAL:
RELOCATE TRUCKING
INTENSIVE LAND USES
AWAY FROM CONGESTED
AREAS W/
INTERSTATE/FREIGHT
RAIL

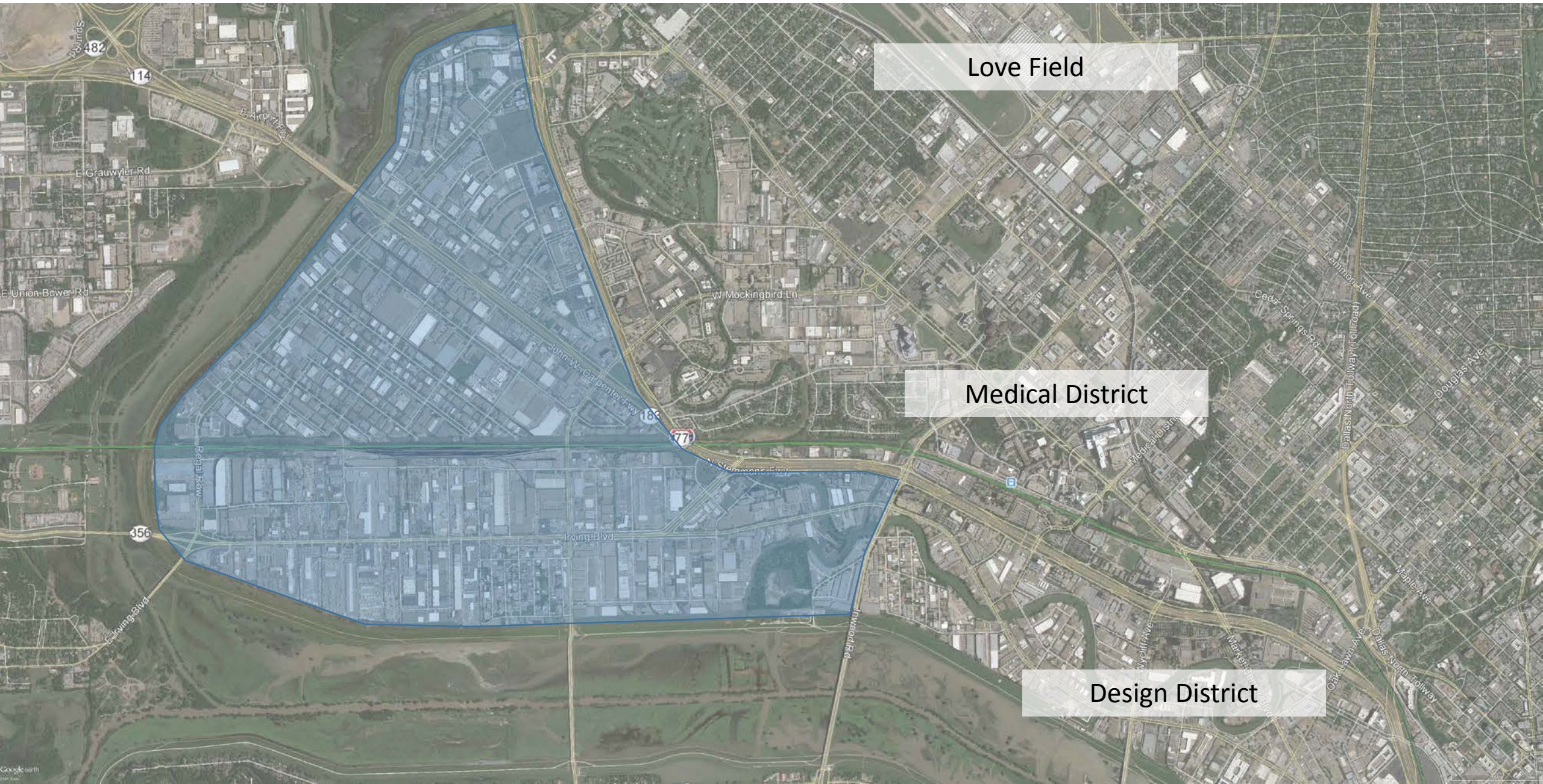
CARROT & STICK
INCENTIVE PACKAGE FOR
INITIAL PHASES TO
RELOCATE TO

**RE-ZONING OF IRVING
BOULEVARD/REGAL
ROW**

**MORATORIUM ON LIGHT
INDUSTRIAL/SHIPPING/
WAREHOUSING WITH
TIME LIMIT**



RE-THINK THE PROBLEM



Love Field

Medical District

Design District

ANSWER: NEW MIXED-INCOME, MIXED-USE NEIGHBORHOODS



- Opportunity for 30,000+ new homes
- Extend Trinity Strand Trail
- Opportunity for new TRE station

Questions?

patrick@spacebtw.com
@walkableDFW