Development patterns & budgets:

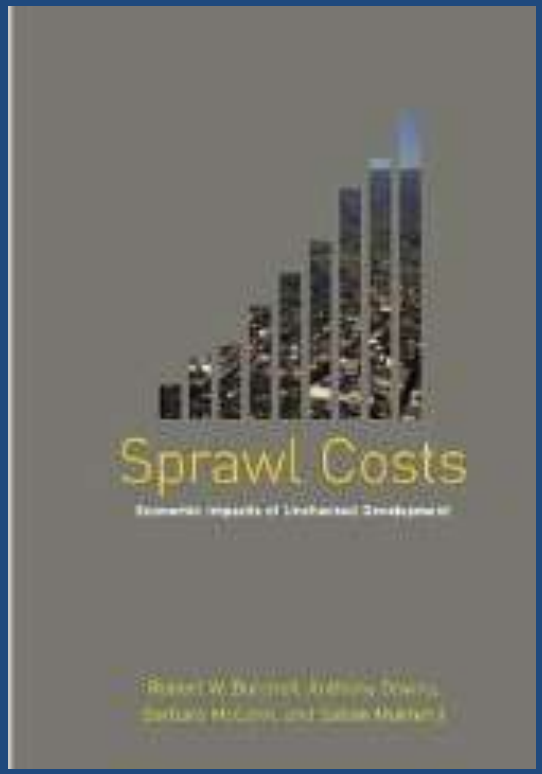
Assessing the cost of sprawl

Christopher Zimmerman
Vice President for Economic Development

Tulsa, Oklahoma
July 19, 2017

Smart Growth America
Improving lives by improving communities

Since the ‘70s, studies have confirmed:
Low-density sprawl costs municipalities more than compact development



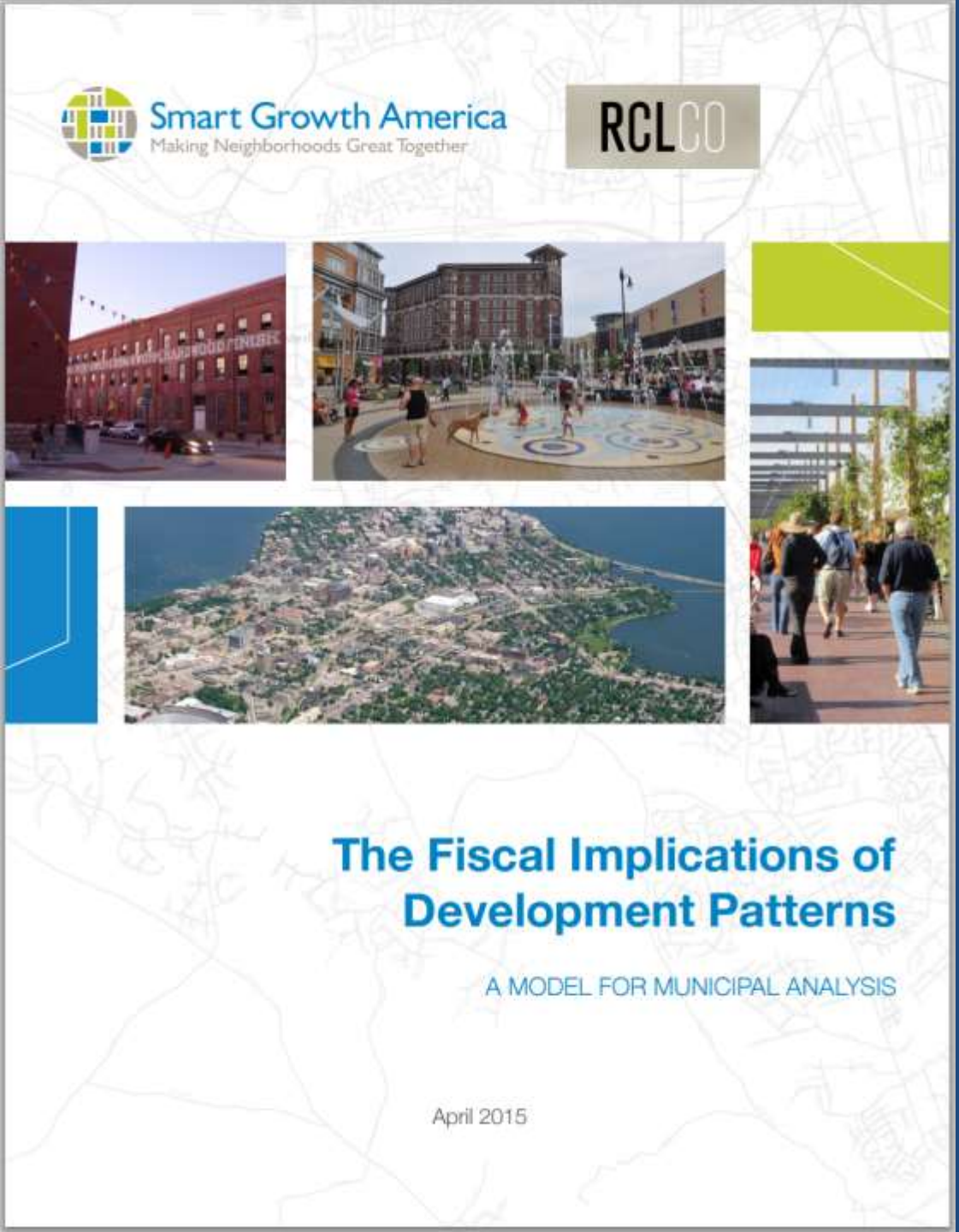
9:51 am ET
Mar 19, 2015 PLANNING

The Cost of Sprawl: More Than $1 Trillion Per Year, New Report Says

ARTICLE COMMENTS (3)

By LAURA KUSISTO CONNECT

The sprawling suburbs of cities like Atlanta and Houston have hidden costs to the United States economy that come to more than $1 trillion a year, according to a new report.



A scenario analysis tool

A fiscal impact model focused on the relative effects of sprawl versus compact development

Communities for which the model has been applied

- Madison, Wisconsin
- West Des Moines, Iowa
- Doña Ana County, New Mexico
- Macon, Georgia
- Indianapolis, Indiana
- Battle Creek, Michigan
- Kalamazoo, Michigan
- Rifle, Colorado
- Brookings, South Dakota
- Pittsburg, Kansas
- Chattanooga, Tennessee
- St. James Parish, Louisiana
- Pagosa Springs, Colorado
- Collier Co., Florida (pending)
- Tulsa, Oklahoma

Development affects costs

Compact development offers efficiencies in delivering services.

– Police and fire departments have less area to cover.

– Fewer miles of road to cover for trash pickup, school buses.

– Fewer miles of water and sewer pipes to maintain.

. . etc.

Typical average cost fiscal impact model

- Costs are assumed to be proportional to residents and employees
- Same number of residents = same additional costs regardless of density

OUR MODEL – COSTS VARY BY DENSITY

Expenditures for infrastructure and services are more efficient in denser, better connected areas.

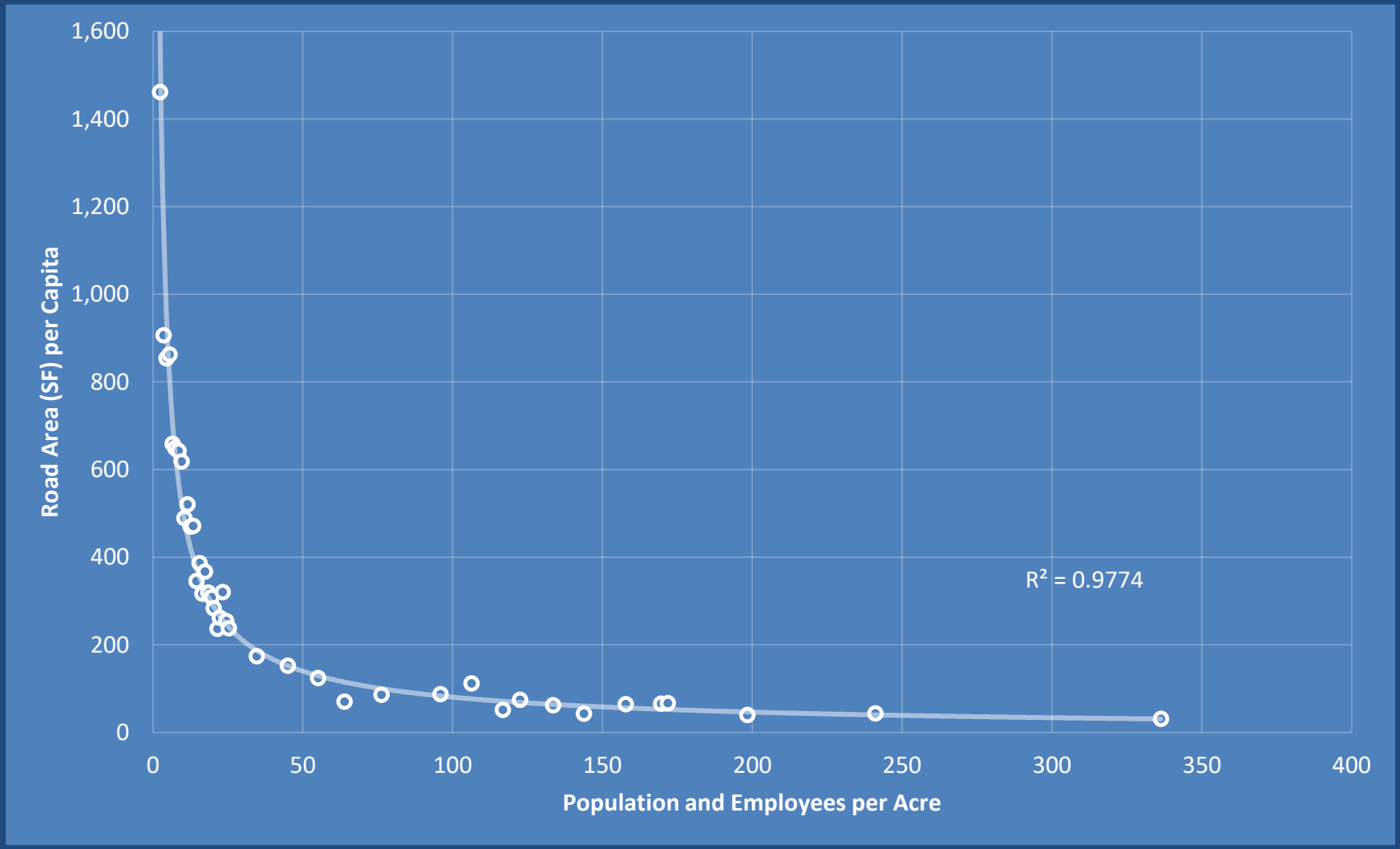
What cost categories might vary by density?

Services & Infrastructure
Fire
Roads
Stormwater
Sewer and Water
Solid Waste
Schools
Libraries
Hospitals
Parks
Police

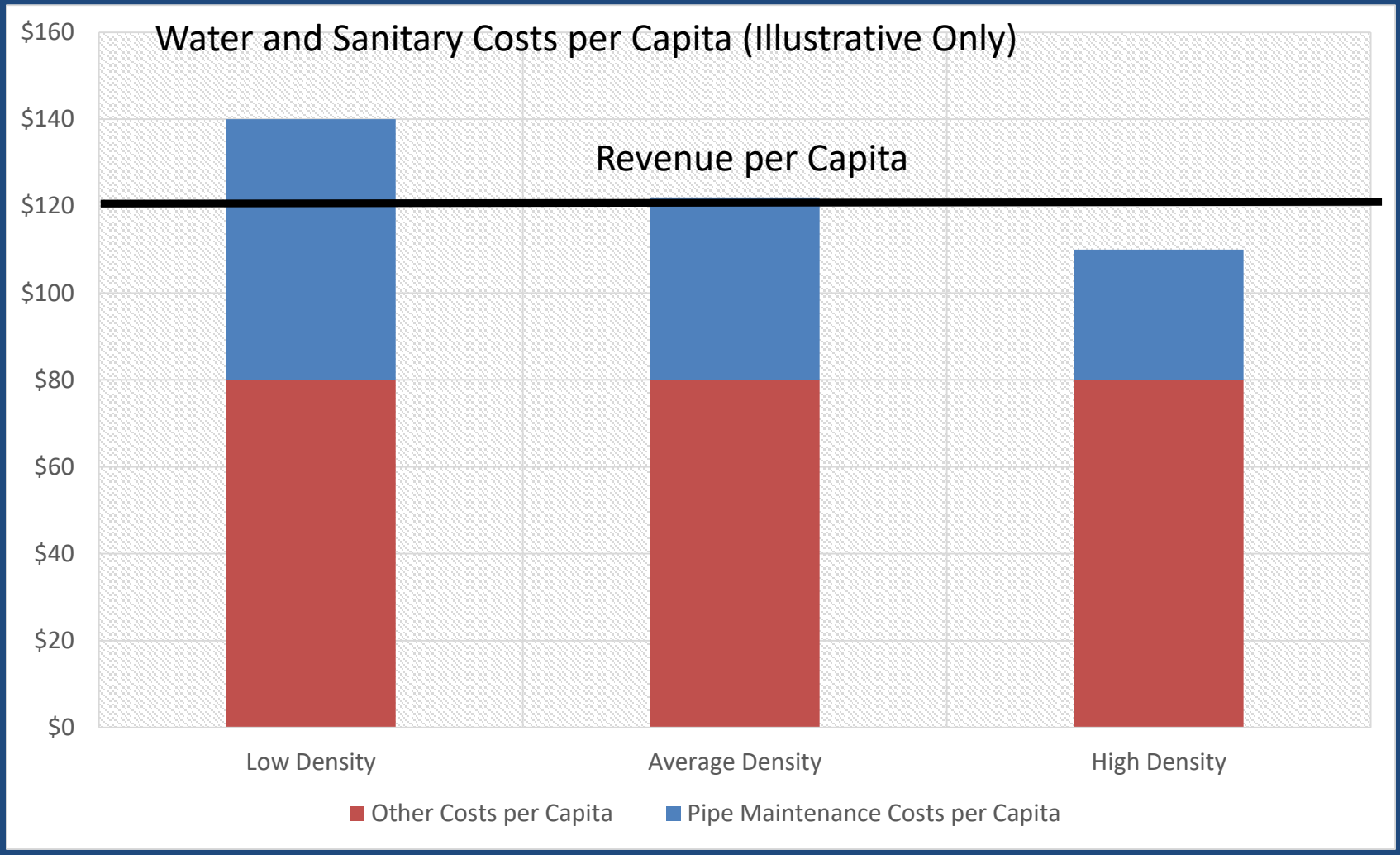
What cost categories might vary by density?

Services & Infrastructure	Dependent on Density?
Fire	Yes
Roads	Yes
Stormwater	Yes
Sewer and Water	Yes
Solid Waste	Yes (collection)
Schools	Yes (bus transportation)
Libraries	No
Hospitals	No
Parks	No
Police	Maybe

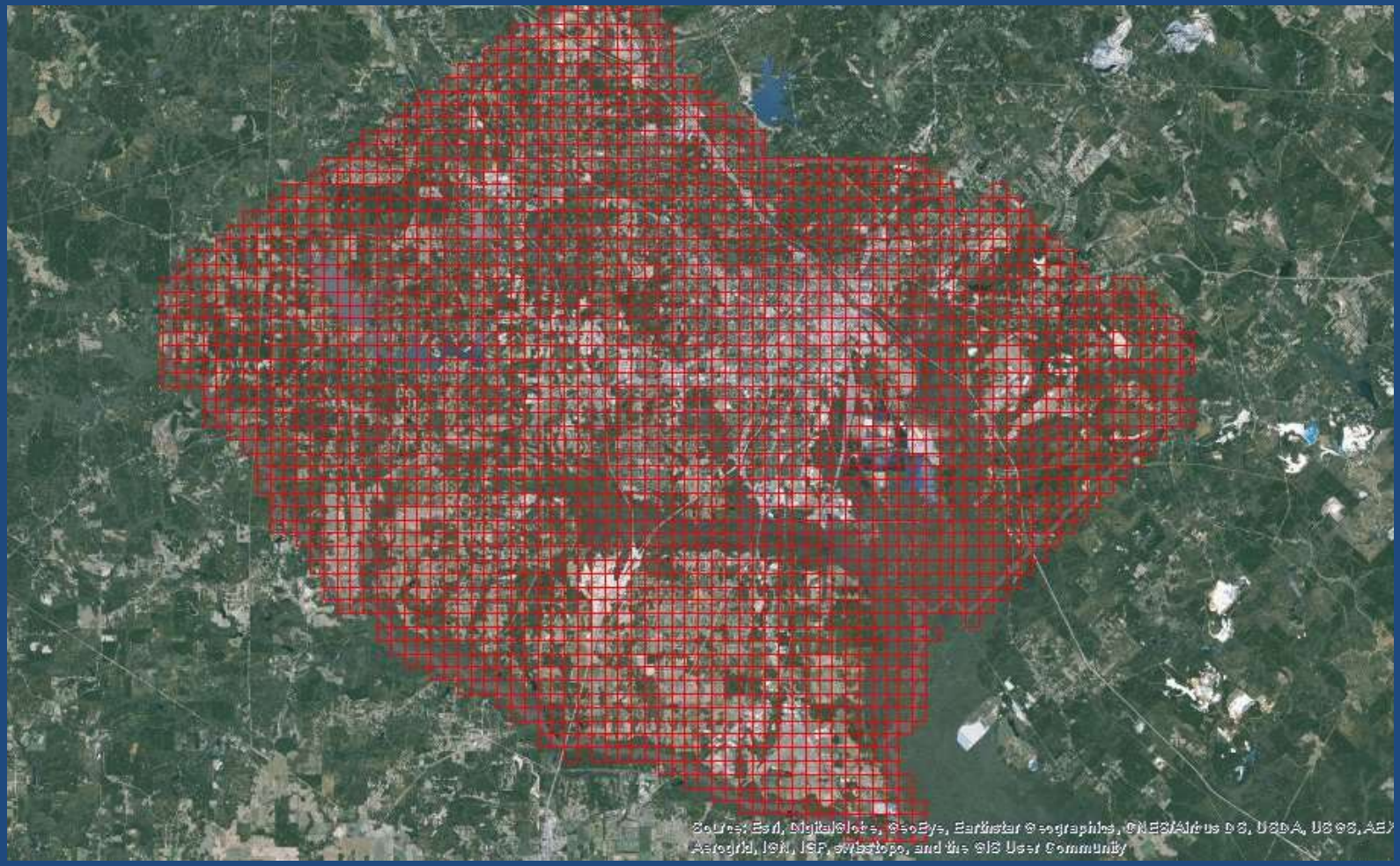
ROAD LENGTH AND AREA PER CAPITA DECREASES AS DENSITY INCREASES – ARLINGTON, VA



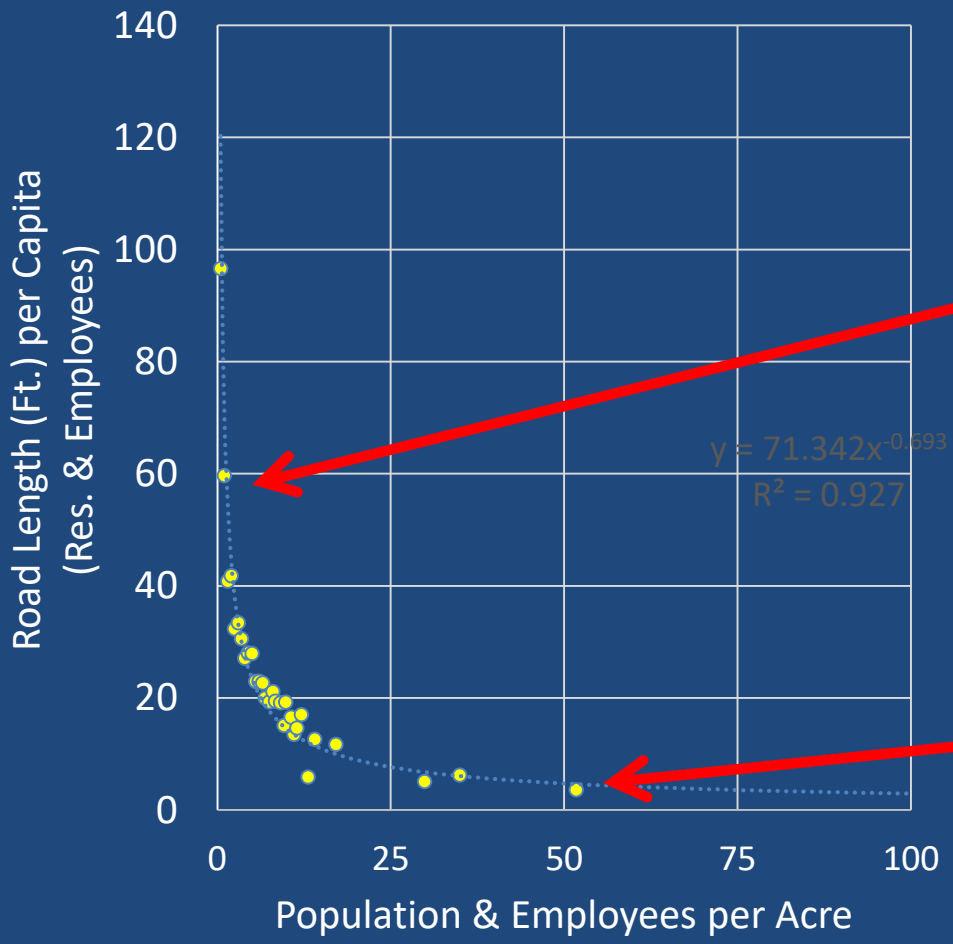
LOW DENSITY DEVELOPMENT REQUIRES MORE PIPE – MEANING HIGHER MAINTENANCE COSTS



INFRASTRUCTURE COST METHODOLOGY
THE 60-ACRE GRID OVERLAY



ROAD LENGTH AND AREA PER CAPITA DECREASES AS DENSITY INCREASES



Samples from Macon-Bibb

Suburban Residential

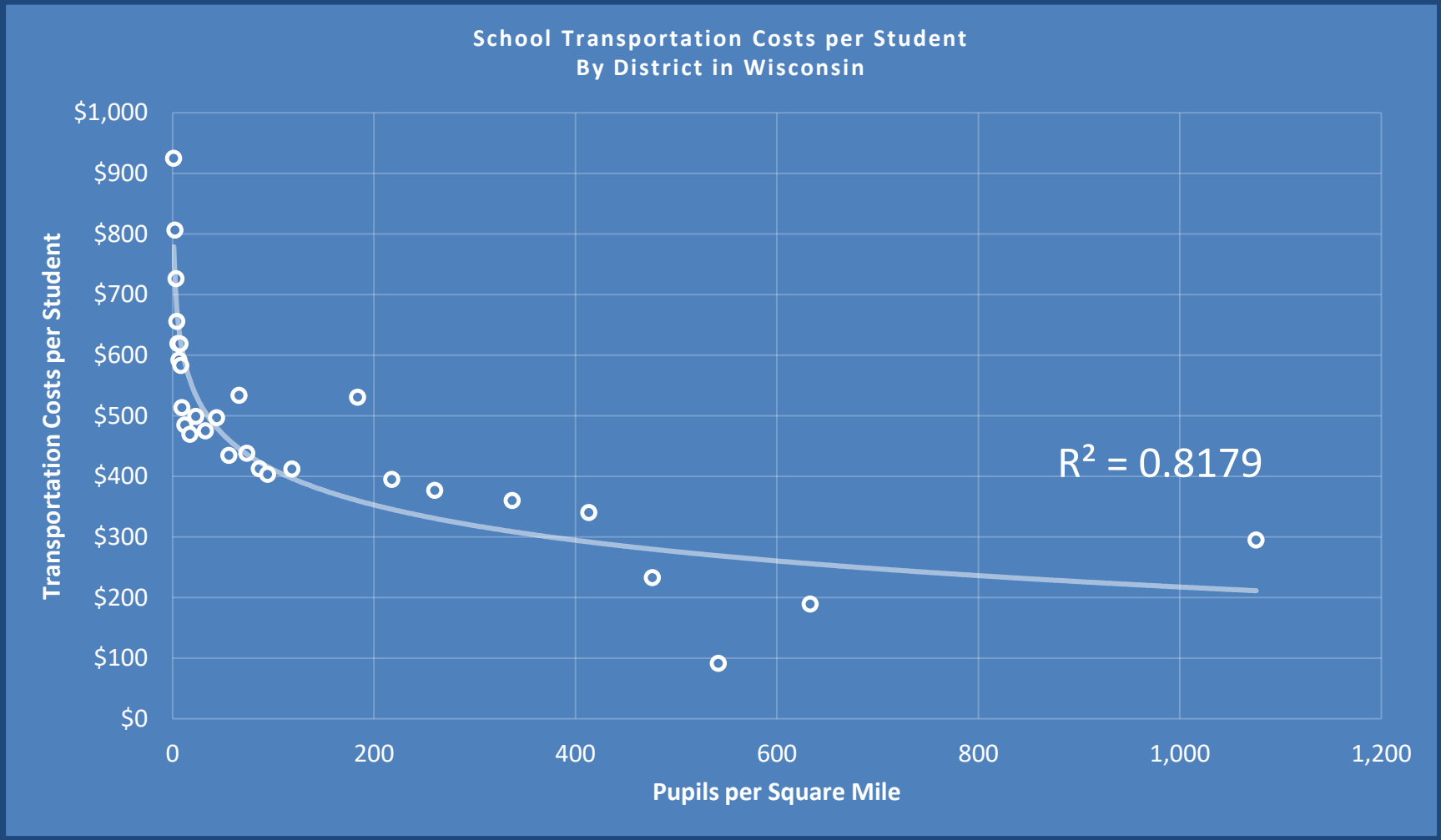
Residents: 120
Employees: 12
Total: 132
Total Res. & Emp Per Acre: 2.2
Total Road Length: 7,401
Road Length per Capita: 56 ft.

Downtown Urban

Residents: 348
Employees: 2,839
Total: = 3,187
Total Res. & Emp Per Acre: 53
Total Road Length: 17,616
Road Length per Capita: 5.5 ft.

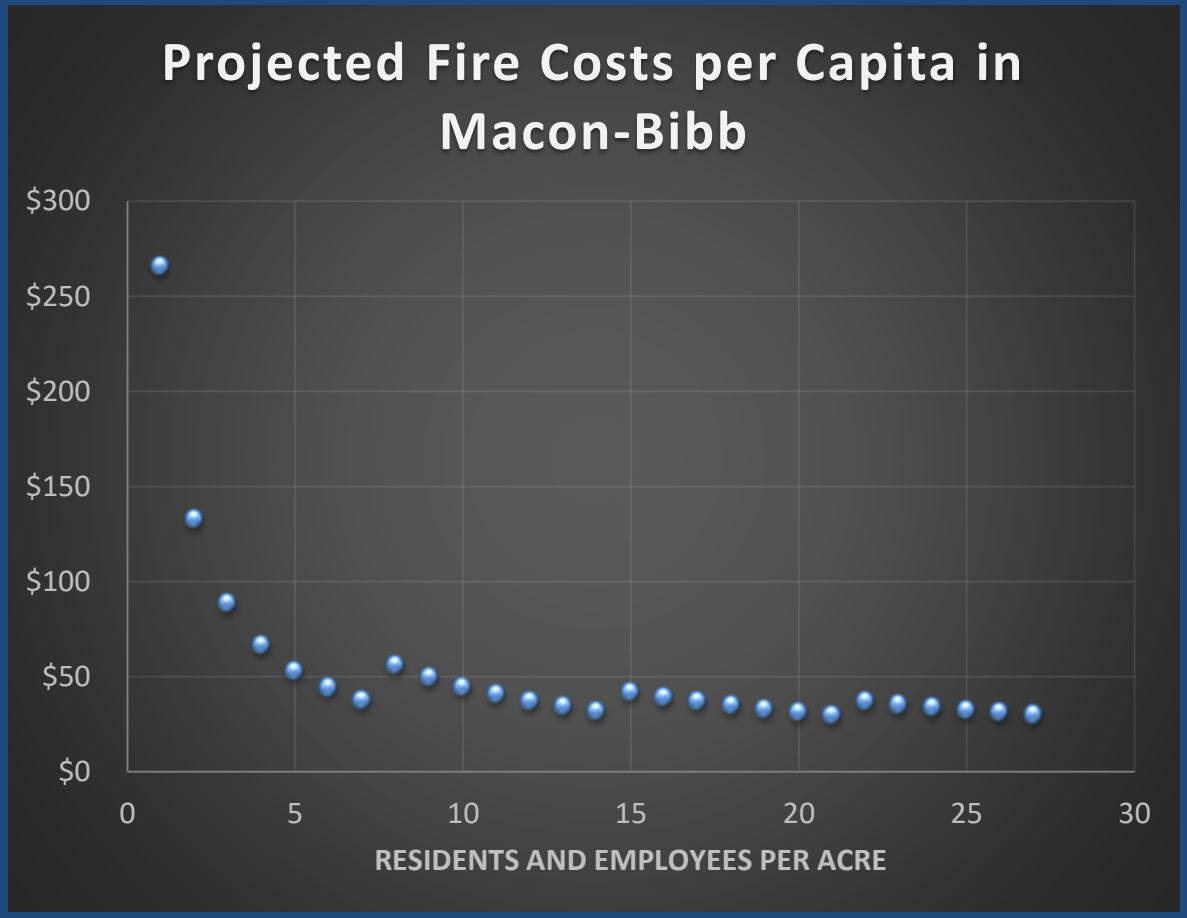
NOTE: Chart shows road length only. Road area per capita has a similar relationship to density.

SCHOOL TRANSPORTATION COSTS DECLINE AS DENSITY INCREASES



SOURCE: Wisconsin Dept. of Public Instruction

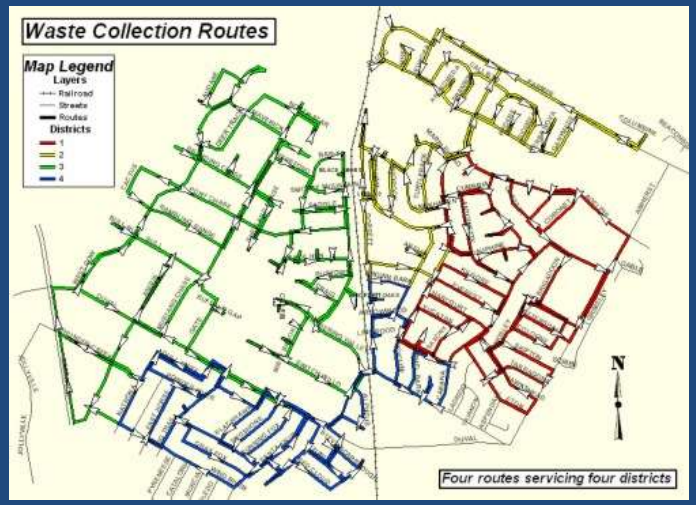
FIRE PROTECTION COSTS INCREASE DRAMATICALLY AT VERY LOW DENSITIES



Determinants of Operating Efficiency

- Response Shed Size
- Population Density
- Rate of Calls per Population
- Capacity per Fire Engine

SOLID WASTE PICKUP – HIGHER DENSITY SHOULD SAVE TIME FUEL AND VEHICLE COSTS



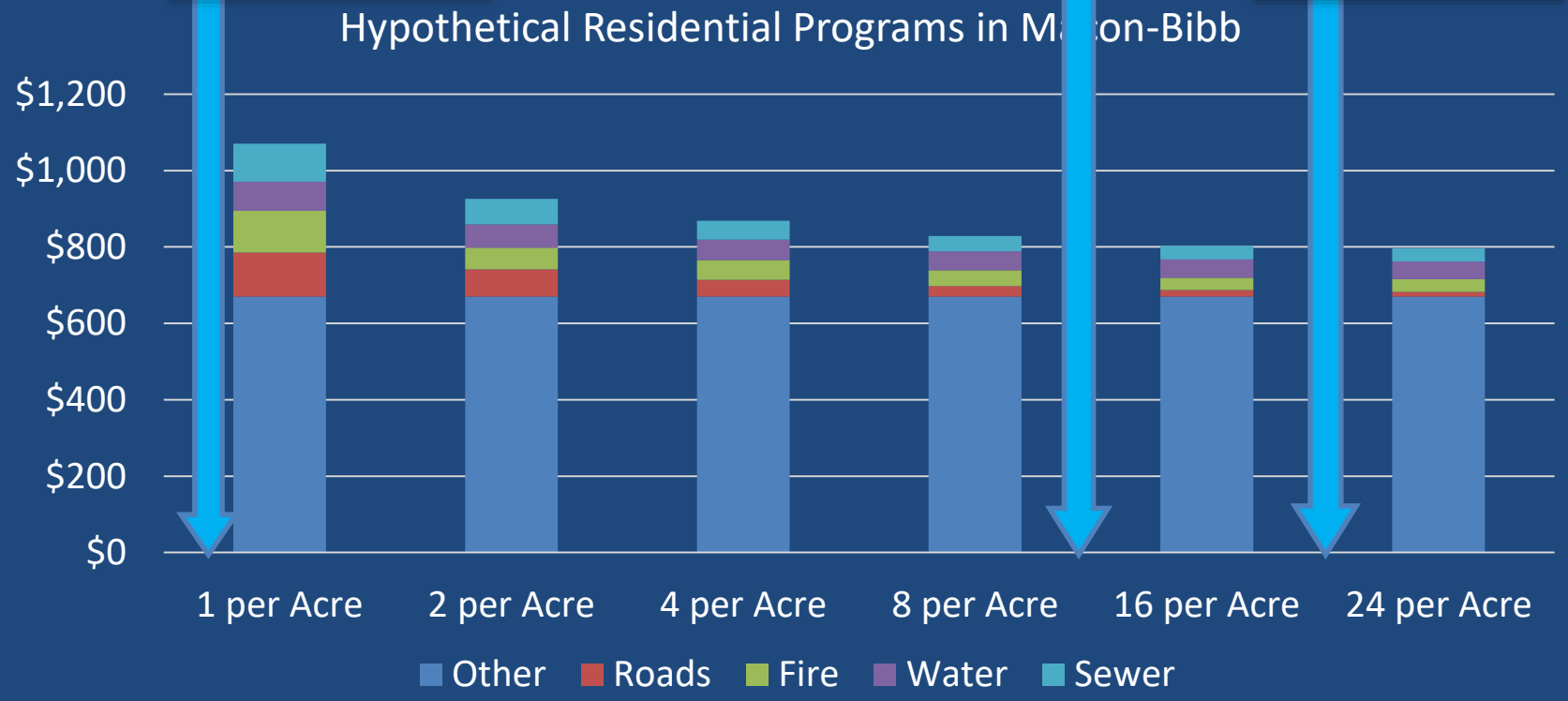
- Lower densities imply larger distances between homes
- Higher distances between pickups means more time and fuel expense per home
- Over large areas, small time and fuel savings can add up to significant sums
- So far, data limitations have prevented application of this part of the model

MACON MODEL PROJECTS THAT MOVING FROM 1 UNIT PER ACRE (NET) TO 16 REDUCES PER CAPITA COUNTY COSTS BY 25%

0.9 units per acre

11.7 units per acre

21.8 units per acre



NOTE: Does not include potential density-related savings associated with solid waste or use of existing infrastructure

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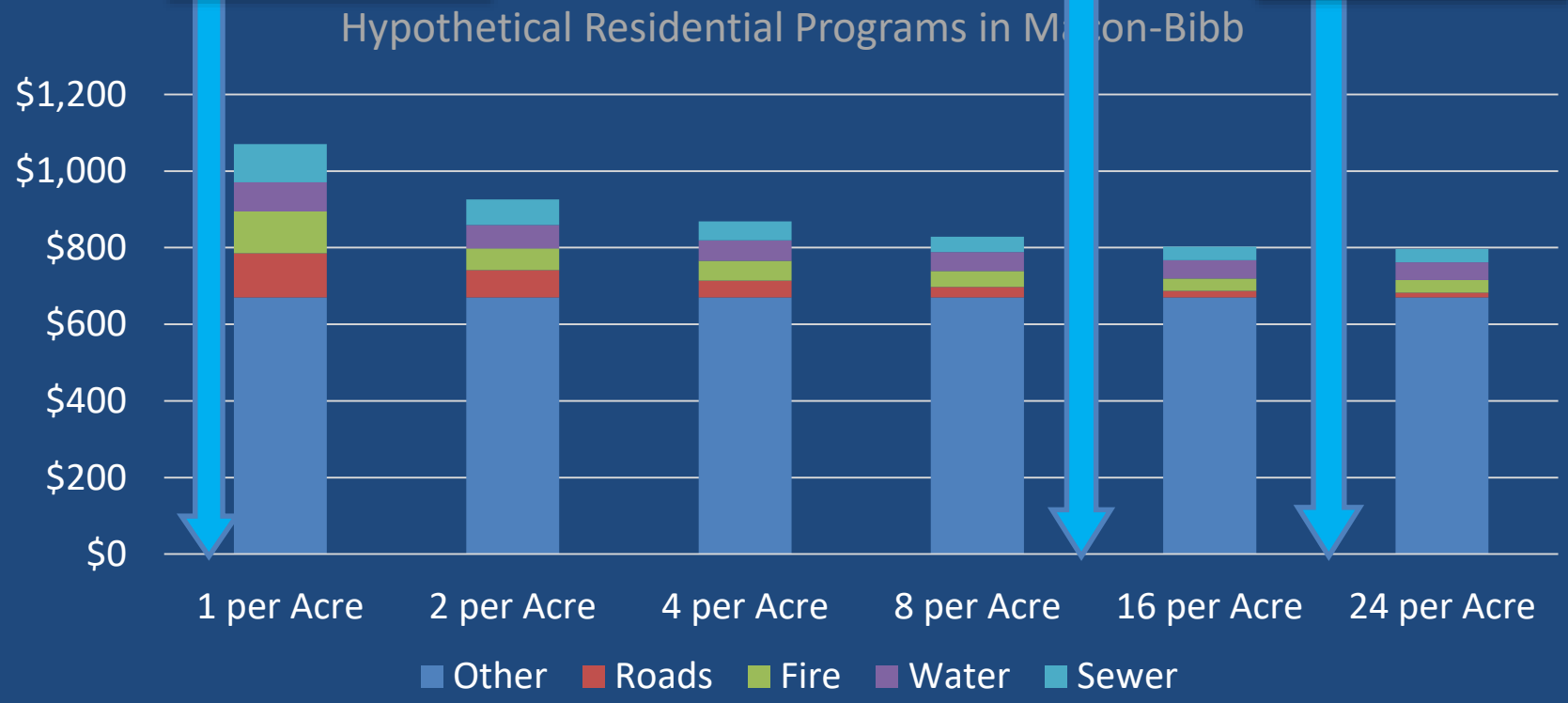


NOTE: Does not include potential density-related savings associated with solid waste or use of existing infrastructure

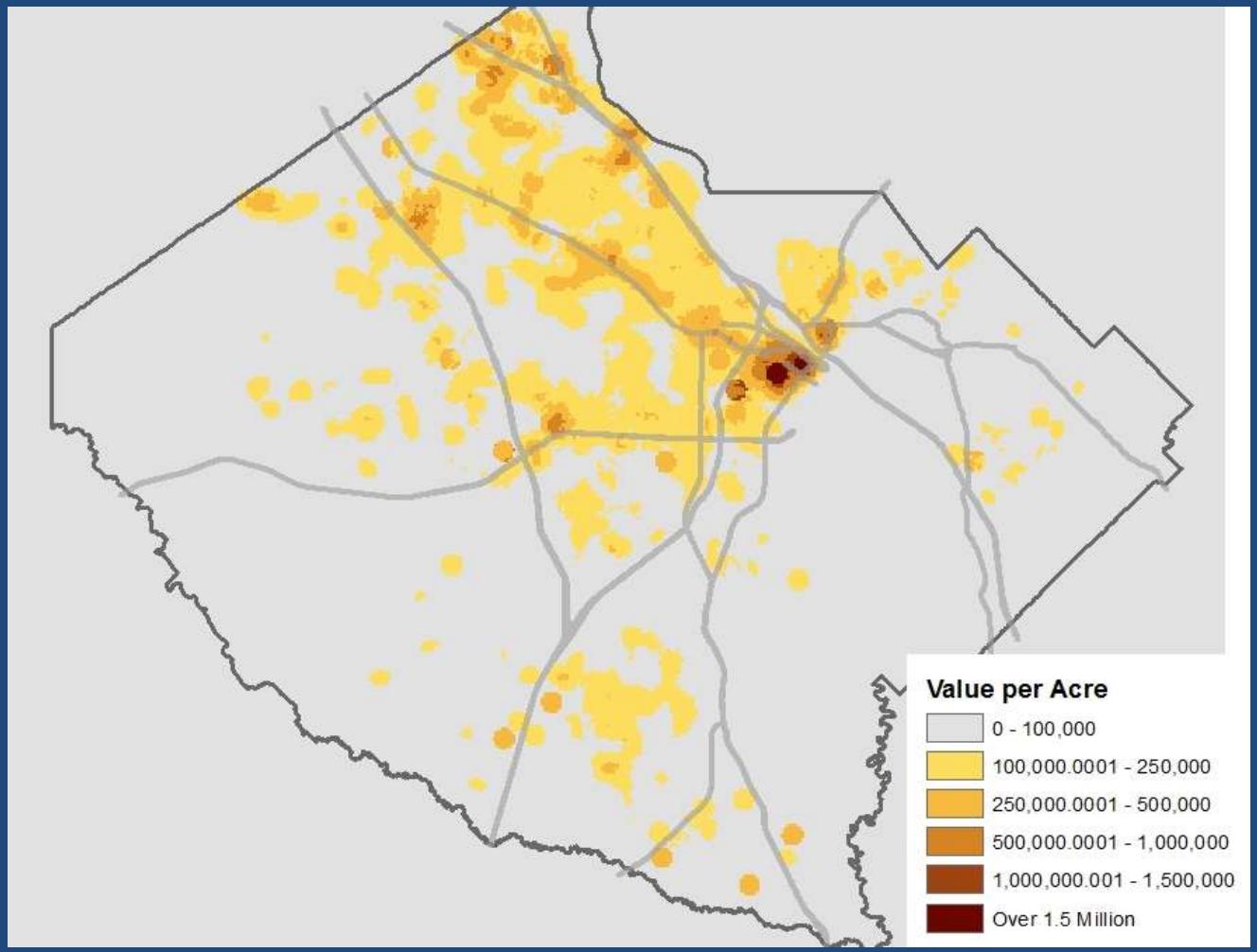
Development affects revenues

Density can affect property value and property tax revenue per acre in 2 ways:

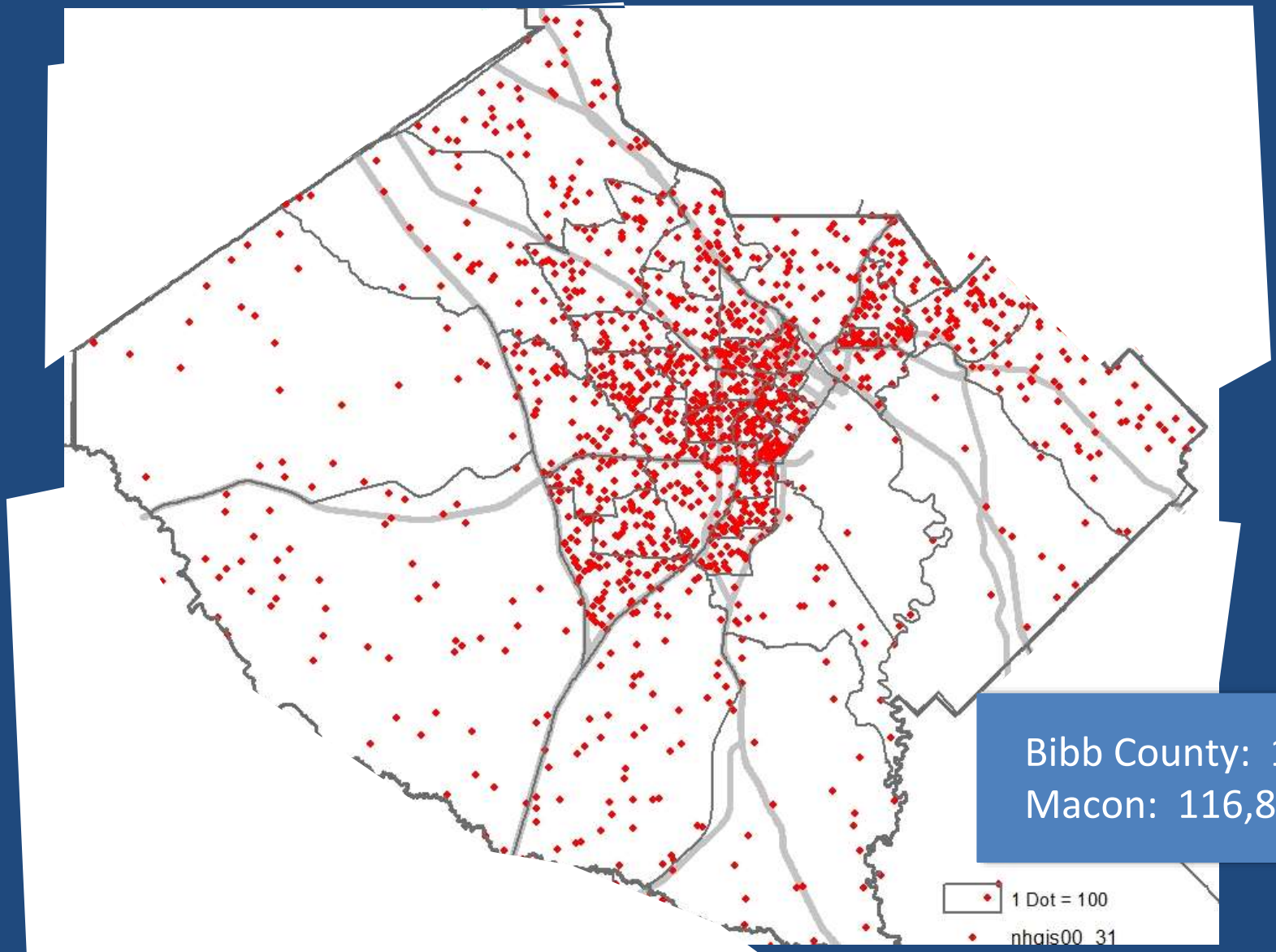
↓ By simply allowing for more occupiable space – 2 houses are worth more than 1, all else equal

← By creating economies of agglomeration, and enabling conditions for the "walkable" urban premium to emerge making each square foot more valuable

SUMMARY OF RESULTS IN MACON-BIBB

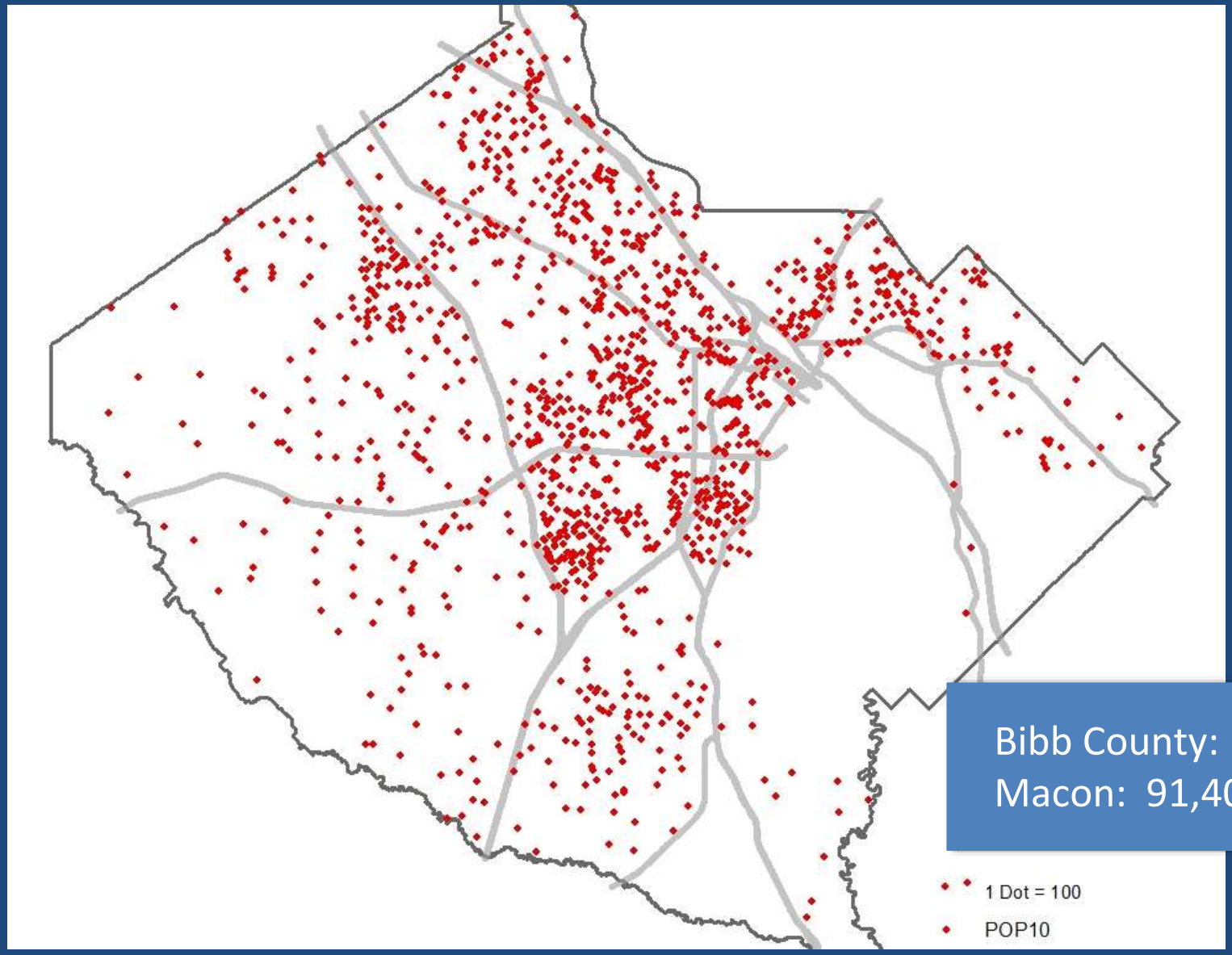


BIBB COUNTY POPULATION DISTRIBUTION 1980



Bibb County: 150,526
Macon: 116,896

BIBB COUNTY POPULATION DISTRIBUTION 2010



Bibb County: 155,635
Macon: 91,408

SCENARIOS EVALUATED:

LOW DENSITY GREENFIELD

- 300,000 SF of Office
- 200,000 SF of Retail
- 1,000 Single-Family Detached Units
- $200,000 Avg. Value per Unit
- Density of 2 per Acre (Net)
- Greenfield development requiring all new infrastructure

HIGH DENSITY GREENFIELD

- 300,000 SF of Office
- 200,000 SF of Retail
- 200 Townhouses
- $110,000 Avg. Value per Unit
- 800 Multifamily Units
- Avg. Value of $68,000 per Unit
- Overall Density of 16 per acre (net)

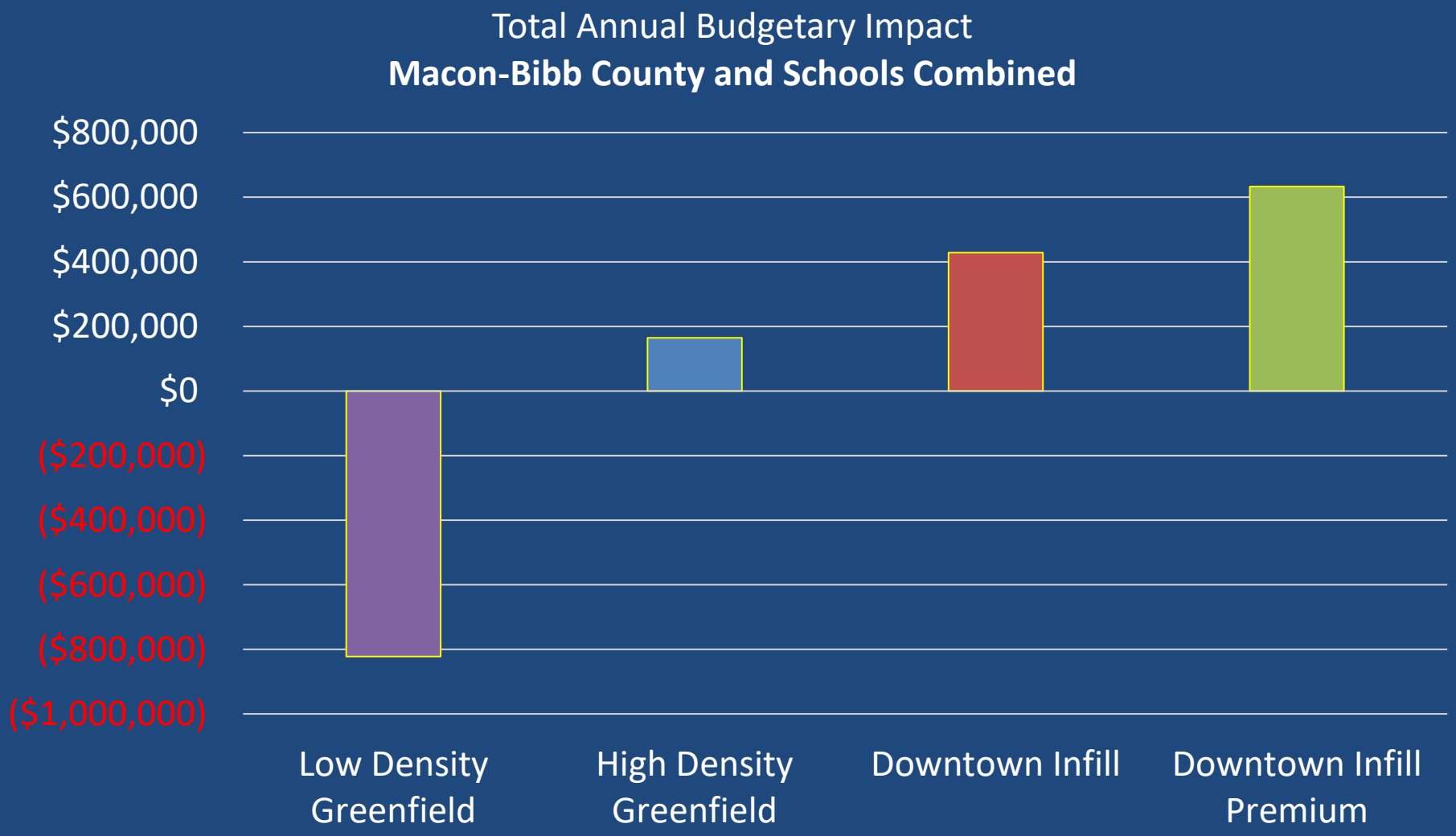
DOWNTOWN IN-FILL

- 300,000 SF of Office
- 200,000 SF of Retail
- 200 Townhouses
- $110,000 Avg. Value per Unit
- 800 Multifamily Units
- Avg. Value of $68,000 per Unit
- Only marginal additions to existing infrastructure

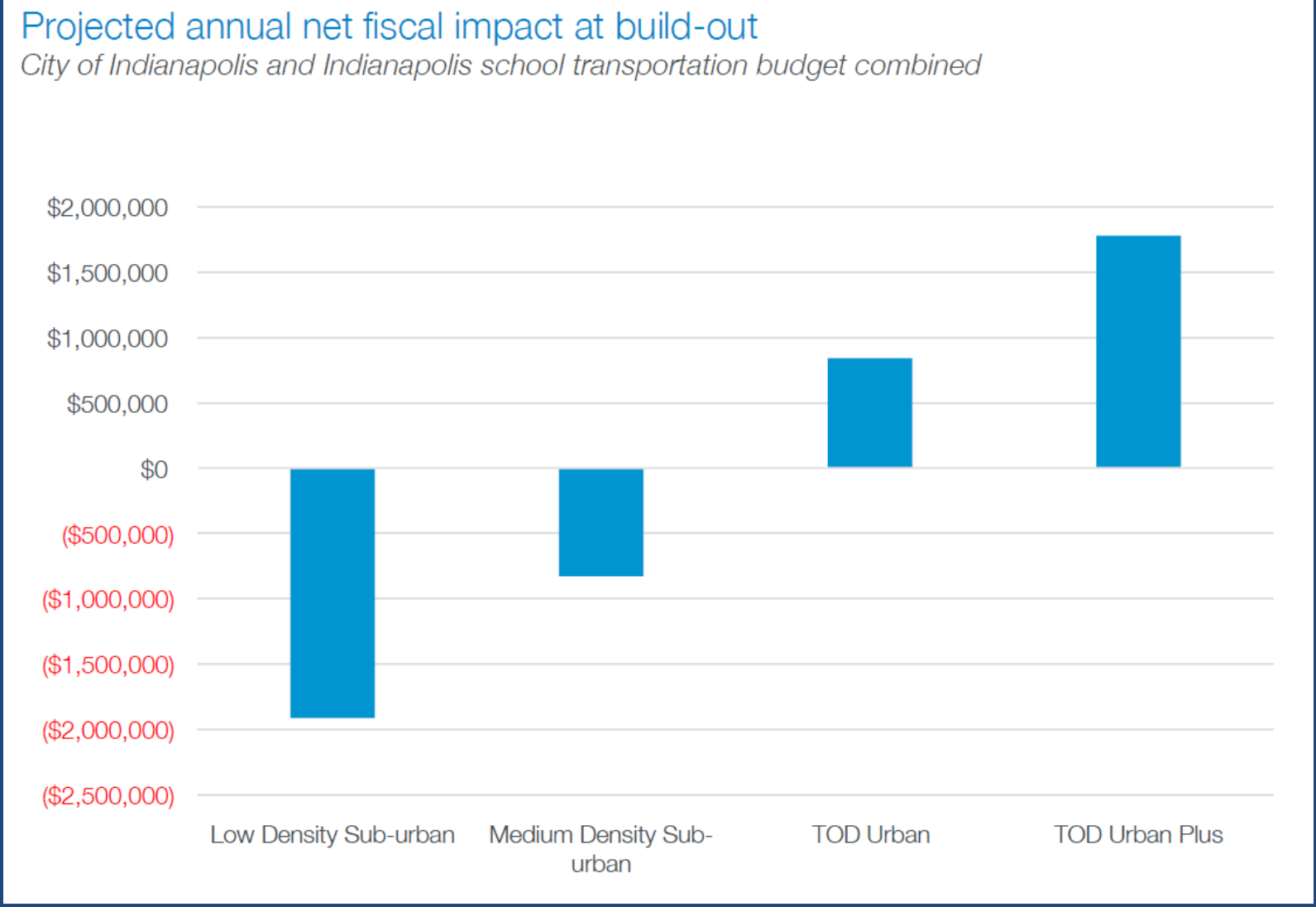
DOWNTOWN IN-FILL WITH PREMIUMS

- Same as above but assumes 20% higher assessed value for all property types

SUMMARY OF RESULTS BY SCENARIO



Indianapolis



TO SUM UP

		Development Location	
Development Density		Greenfield	Infill
	Low-density	Low or negative	Moderate
	High-density	Moderate	High positive

TO SUM UP

Certain public costs vary by density.

- All else being equal, more compact development imposes a **smaller cost burden** on municipalities, and the savings can be significant.
- Compact development uses land more efficiently and **maximizes the revenue** yield per acre.
- With the right design and “critical mass”, compact development can foster **walkable urban environments**, which often **command a “value premium.”**
- The combination of lower costs and higher values results in an **improved net fiscal impact** for the locality.

TO SUM UP

Low-density suburban development rarely pays for itself

Costs for:

- infrastructure
- ongoing operations and maintenance

Burden ultimately falls on local governments – and its taxpayers

Smart Growth America
Improving lives by improving communities

Fiscal Impact Model
Tulsa, Oklahoma

SUMMARY OF RESULTS

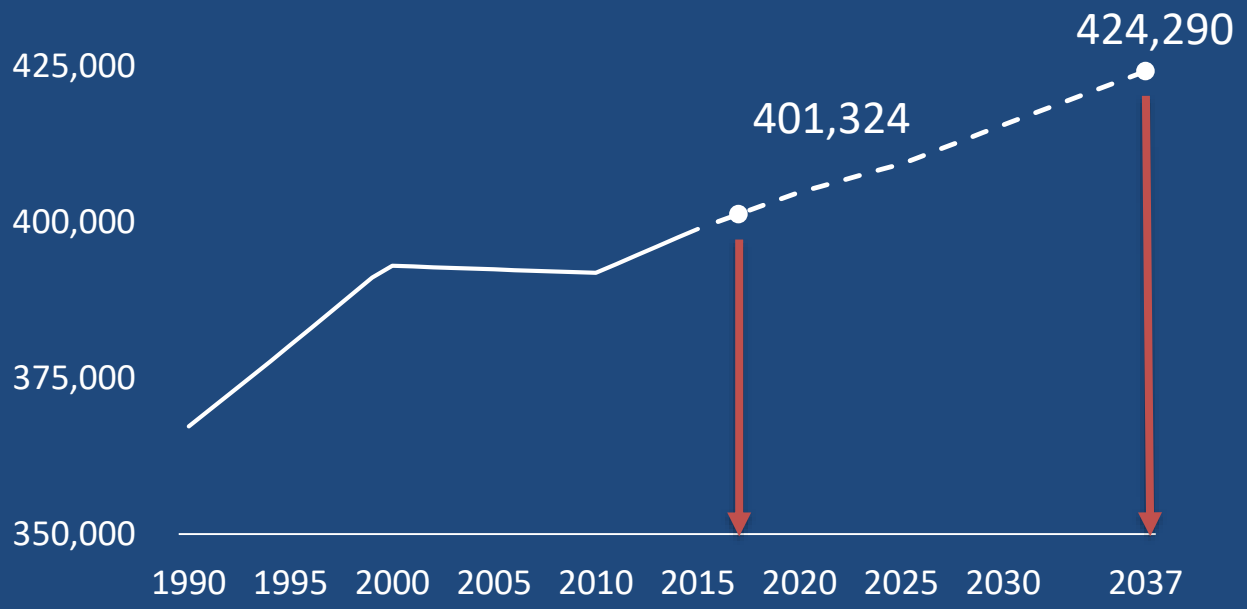
Fiscal Impact Model
Tulsa, Oklahoma

Population & employment forecast

Population Forecast

2017 estimates

Residents: 401,324
Employment: 251,551



- 20-year forecast
- Assuming .2% to .3% annual gain vs 0% to .4% last 10 years.
- 22,966 more people (5.7% increase)
- 22,640 additional jobs (9% increase)

Source: U.S. Decennial Census 1990, 2000, 2010, ACS 2015 5-Year Community Survey, SGA Projection

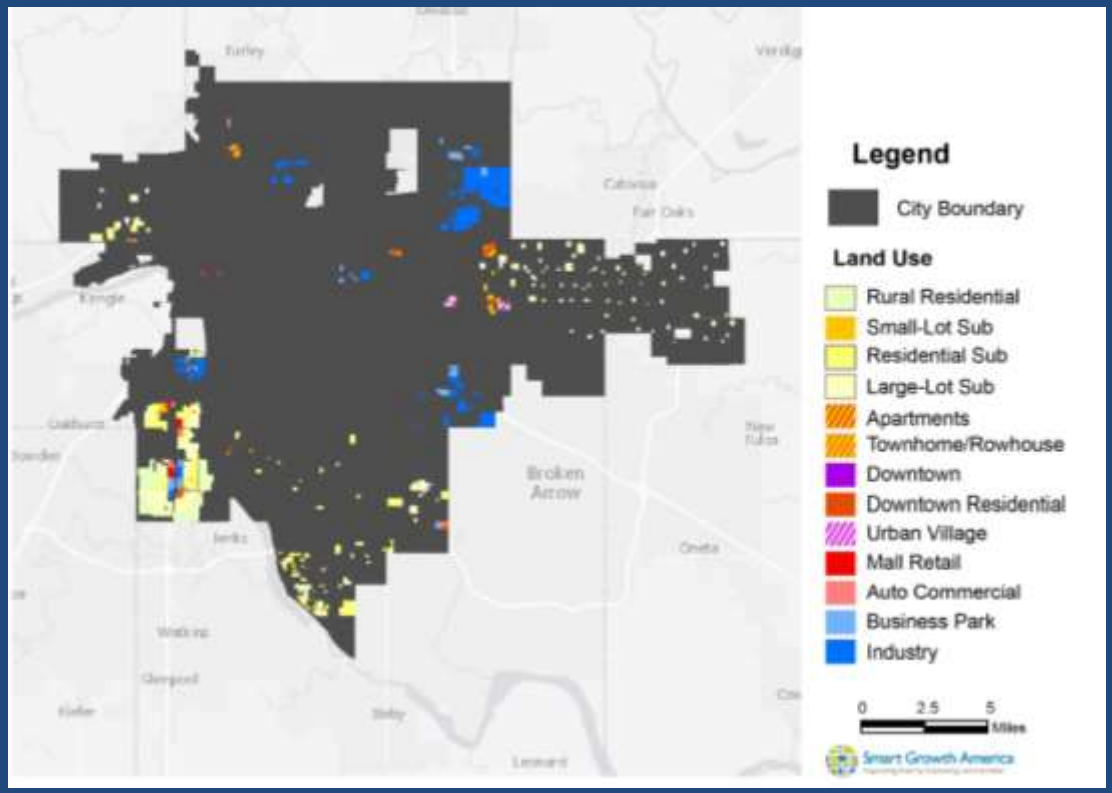
Fiscal Impact Model
Tulsa, Oklahoma

Scenarios

Scenario 1: Trends Continue

Scattered, Low Density Suburbs

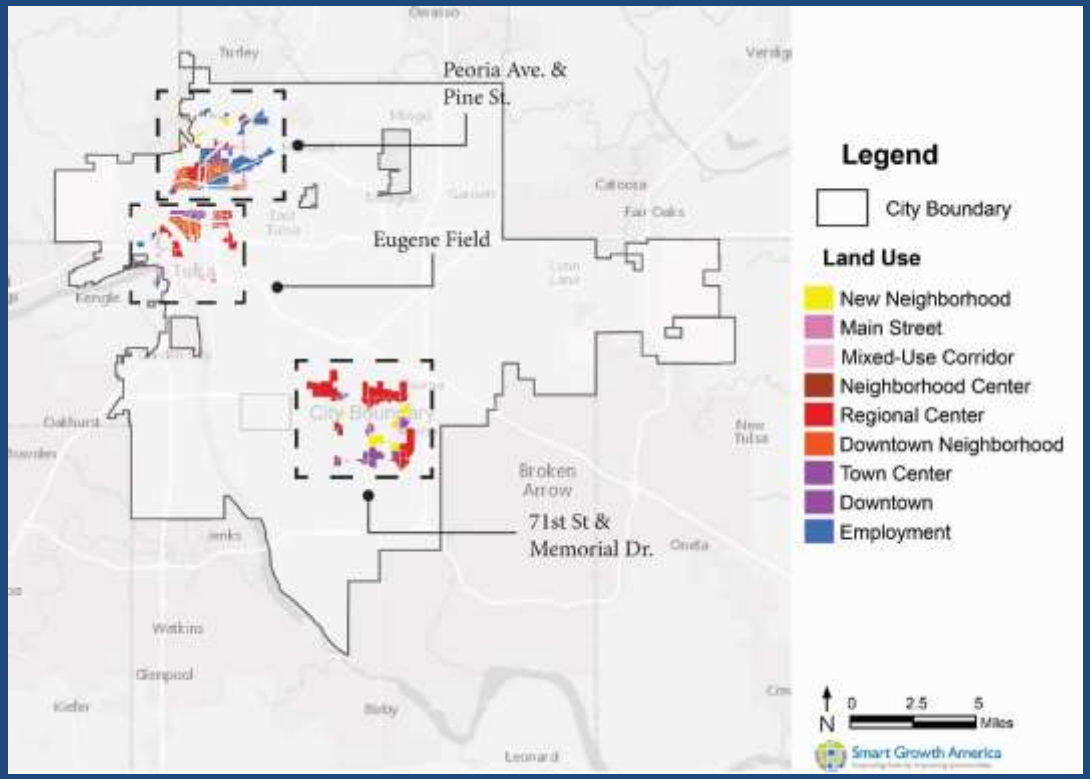
- Total area of potential development:
  ~ 8,500 Acres
- Developed by 2037:
  ~ 3,315 (39%)



Scenario 2: Comp. Plan Focus Areas

Targeted Focus Areas

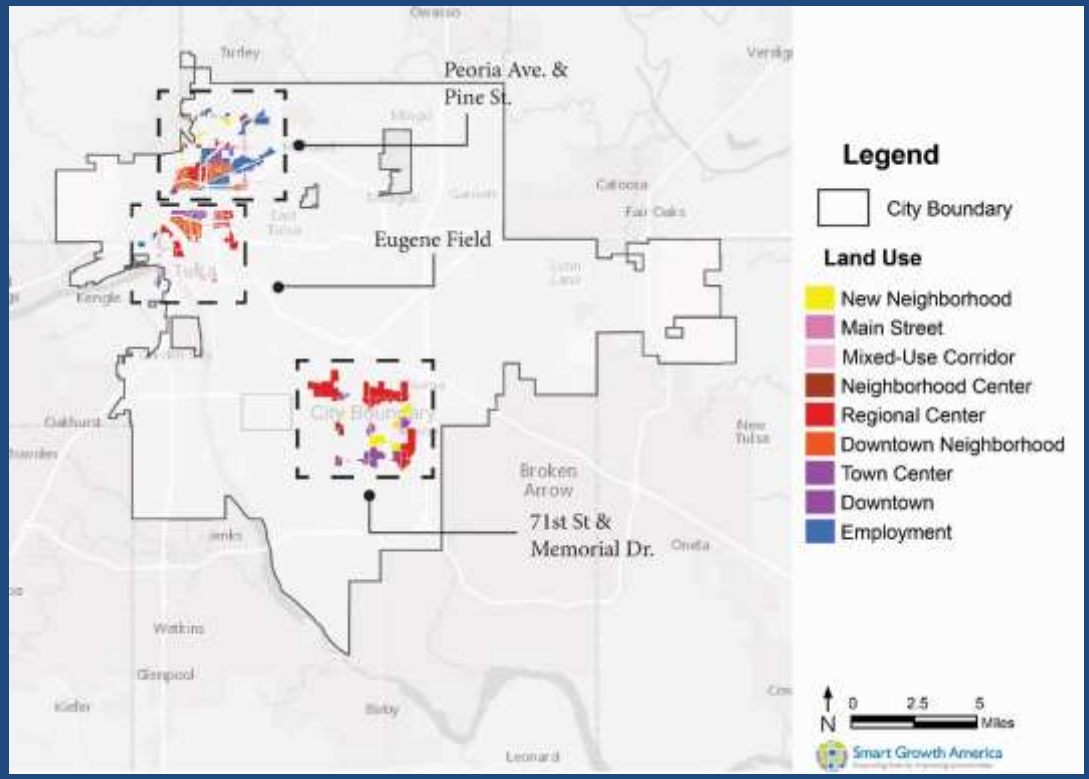
- More Dense Land Use
- Total area of potential development:
  ~ 4,000 Acres
- Developed by 2037:
  ~ 1,040 (26%)



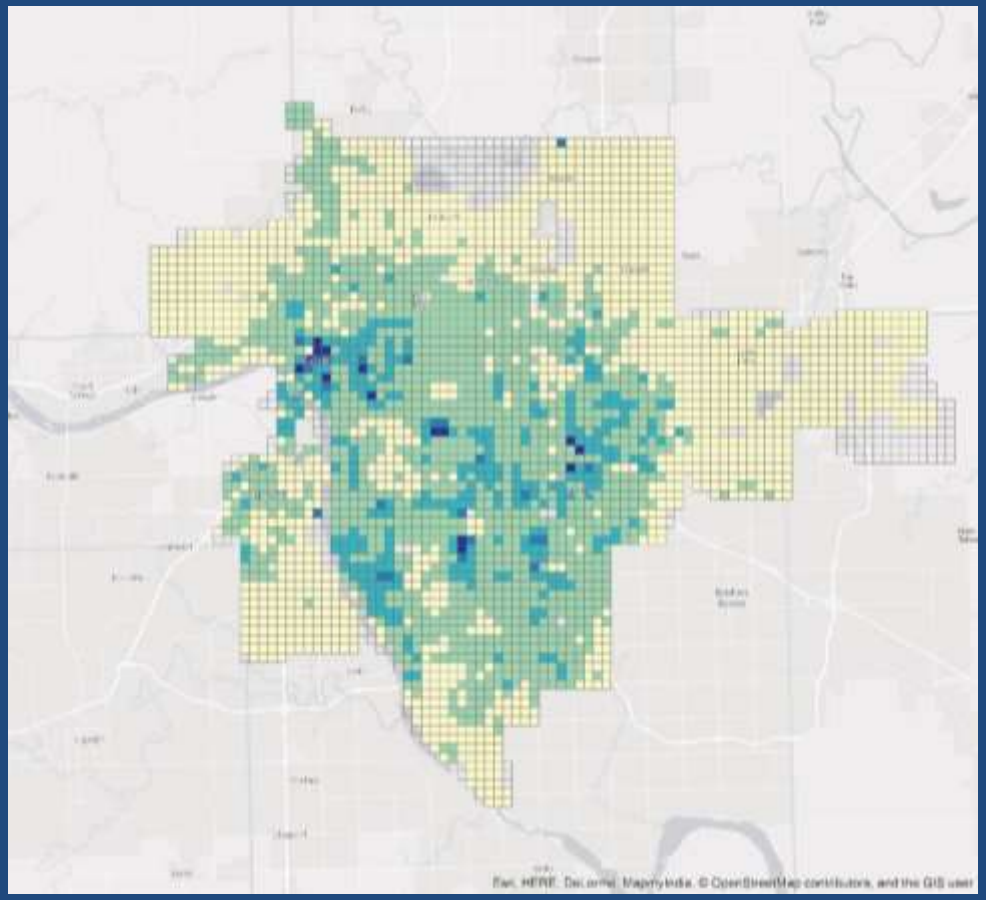
Scenario 3: Focus Areas w/ Increased Density

Same as Scenario 2 but w/ higher density targets

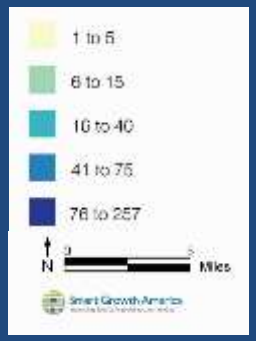
- Total area of potential development:
  ~ 4,000 Acres
- Developed by 2037:
  ~ 840 (21%)



Density Options – Density Levels



Persons & Jobs per Acre



- Methodology: Divide the City into 40 acre squares to use as unit of measurement.
- Average density ~ 5.92 persons + jobs per acre
- Maximum density ~ 257 persons & jobs per acre

City Costs Considered

Roads

Water Lines

Sidewalks

Sewer

Fiscal Model Theory

- Denser development
  - distributes costs over more households.
  - requires less infrastructure per housing unit
  - requires less infrastructure, overall
- How might Tulsa accommodate 45,606 additional jobs and people in 20 years?
- Choose to build more or less infrastructure?
  - Density matters

City of Tulsa Budget 2017

Total Budget

Incl. non-general fund

$764 Million Total

= $2,933 per Household

The Total Budget ($764 M) is the basis for comparison, in particular because of the role of infrastructure items.

Roads, sidewalks, water lines, and sewer are paid for by combination of general fund, as well as other sources.

Results



	Trends Continue	Focus Areas	Focus Areas + Density
Capital Costs – 20 years	$695.9 M	$377.2 M	$287.6 M
Amortized Costs (20 years at 2.2% rate)	$867.6 M	$470.3 M	$358.6 M
Maintenance Costs – 20 years	$34.8 M	$18.9 M	$14.4 M
Total Costs – 20 year	$902.4 M	$489.1 M	$373 M
Fiscal Cost per year	$33.6 M (+4.5% of budget)	$18.2 M (+2.4% of budget)	$13.9 M (+1.9% of budget)

Study costs to accommodate 45,606 additional people and jobs.

Net Fiscal Impact



	Baseline	Focus Areas	Focus Areas + Density
Total Costs – 20 years	$902.4 M	$489.1 M	$373 M
Est. Tax Revenue – 20 Years	$511 M	$511 M	$511 M
Net Fiscal Impact– 20 years	**($391.40) M**	**$21.90 M**	**$138.10 M**
Total Costs – Annual	$45.10 M	$24.50 M	$18.60 M
Est. Tax Revenue – Annual	$25.60 M	$25.60 M	$25.60 M
Net Fiscal Impact – Annual	**($19.60) M**	**$1.10 M**	**$6.90 M**

Study costs to accommodate 45,606 additional people and jobs.

Net Fiscal Impact



	Baseline	Focus Areas	Focus Areas + Density
Total Costs – 20 years	$902.4 M	$489.1 M	$373 M
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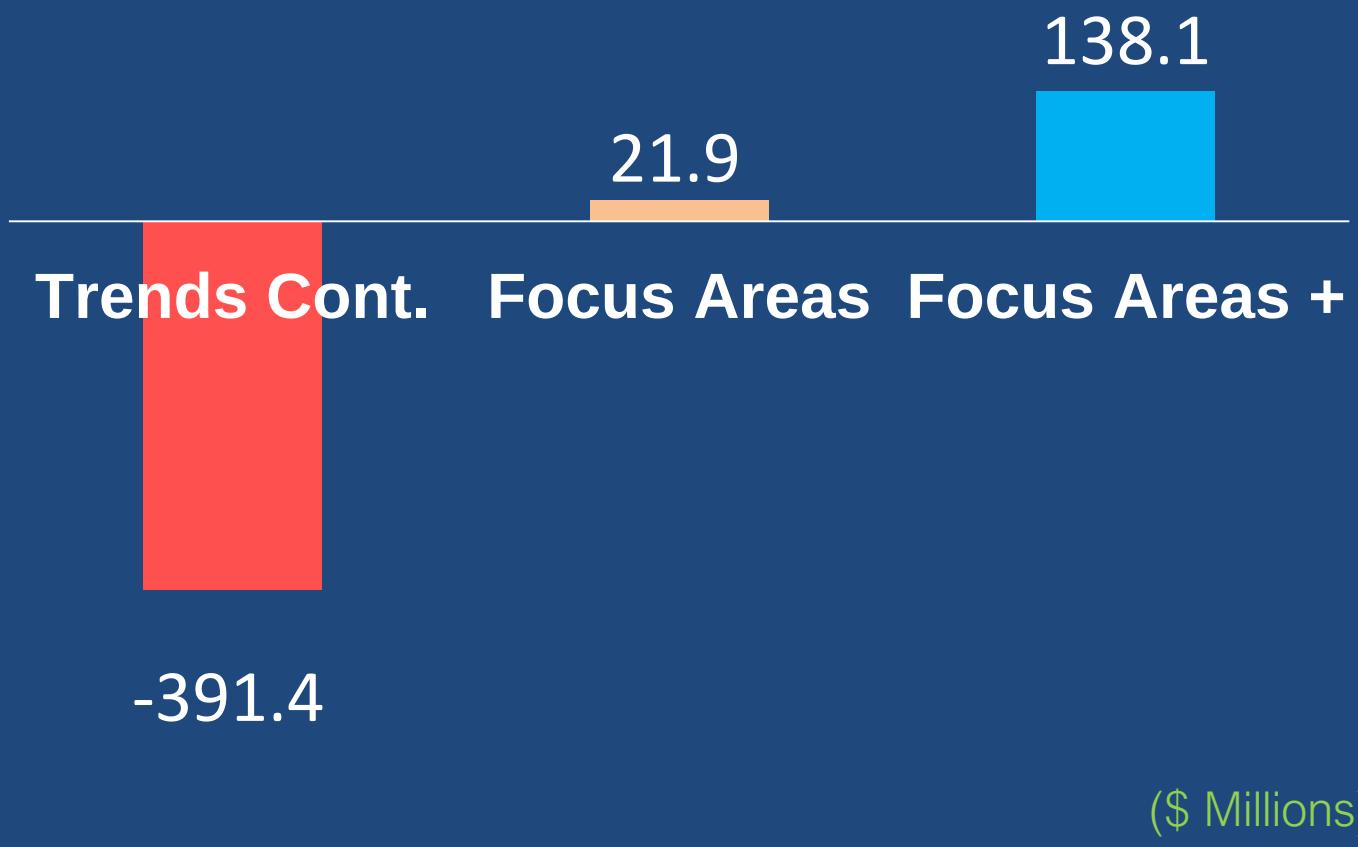
Study costs to accommodate 45,606 additional people and jobs.

Net Fiscal Impact – 20 Years



($ Millions)

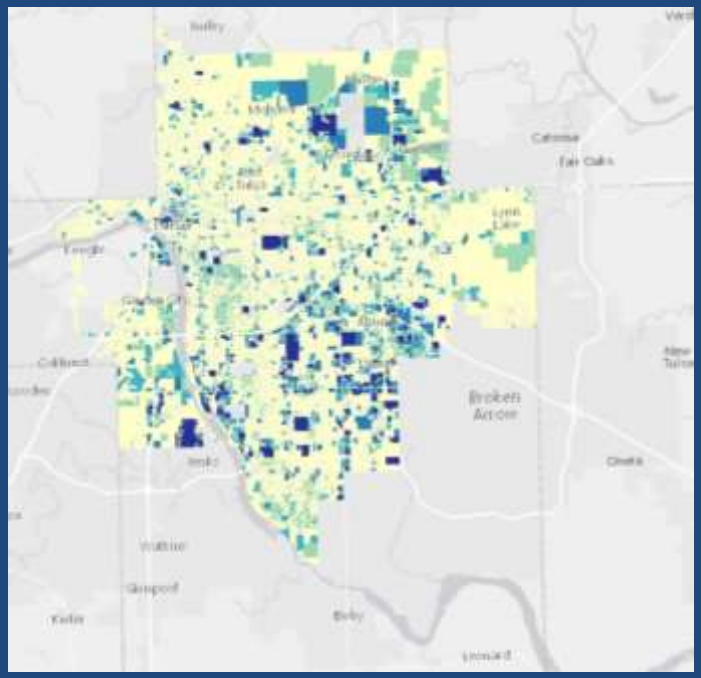
Remember

This is all very conservative.

- Only includes some costs.
- Doesn’t account for revenue effects (almost certainly positive) of denser scenarios.

Let’s look at revenues.

Value by Total Parcel
City of Tulsa

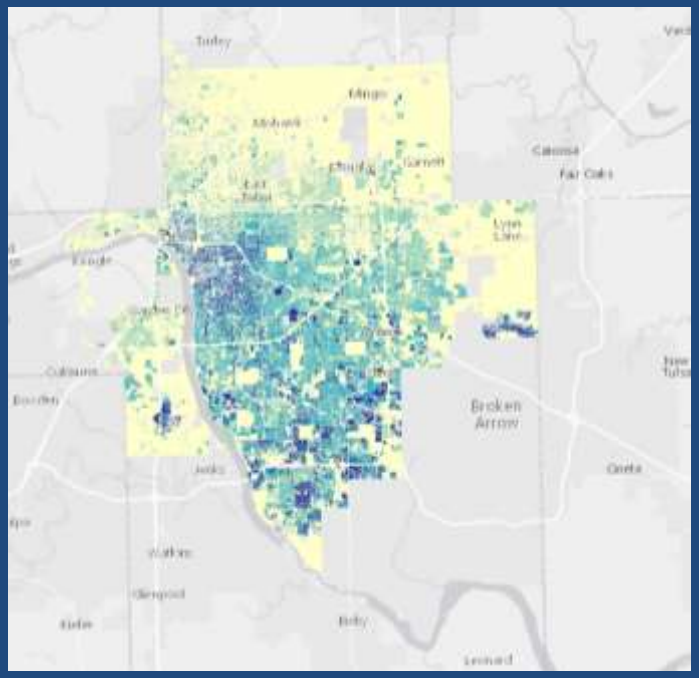


Total Value of Each Parcel

- $0 - $500,000
- $500,001 - $1,500,000
- $1, 500,000- $3,000,000
- $3,000,001 - $8,000,000
- $8,000,001 - $21,900,000

Parcel Value by Acre

City of Tulsa

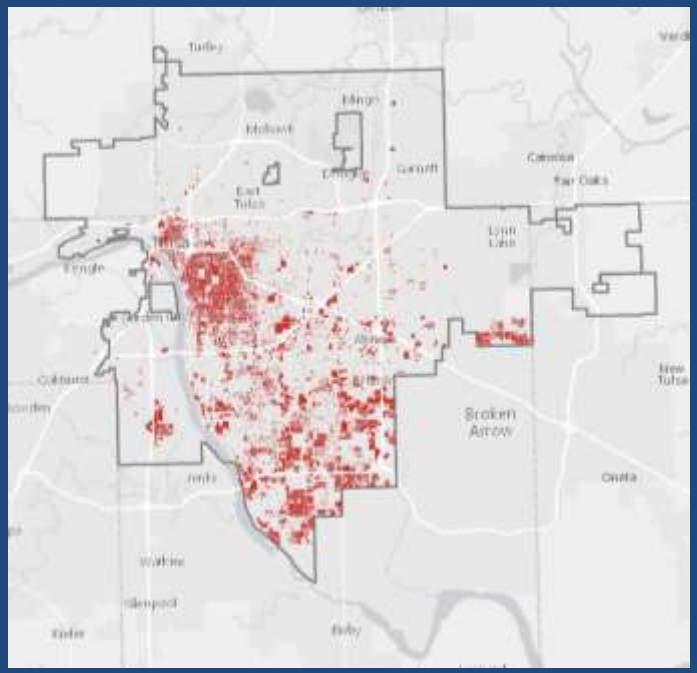


Parcel Value by $ per Acre

- $0 - $250,000
- $250,001 - $500,000
- $500,001 - $750,000
- $750,001 - $1,000,000
- $1,000,001 - $1,639,964

Half of the Total Land Value

City of Tulsa



Parcels that make up 50% of the entire land value of Tulsa when prioritized by Value per Acre

- 11,117 Acres Total
- 6.7% of the total area of the City

Hot Spot Analysis

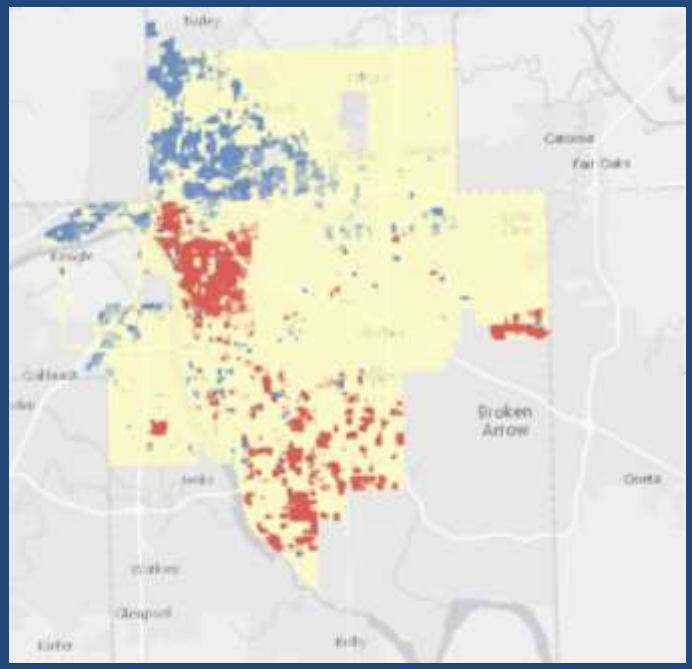
Definition - A hot spot analysis visualizes geographically where a higher density or cluster of activity occurs.

When looking at the value of land in a community, a hot spot analysis is another way of describing the relationship a development pattern has upon the land value around it.

Hot/Cold: Indicates a statistical significance between the various development areas. (i.e. - If one area is higher in value (hot) those around it are likely to be higher as well.)

Not Significant: Indicates there is not a statistical relationship between the value of a parcel, and the value of its neighbors.

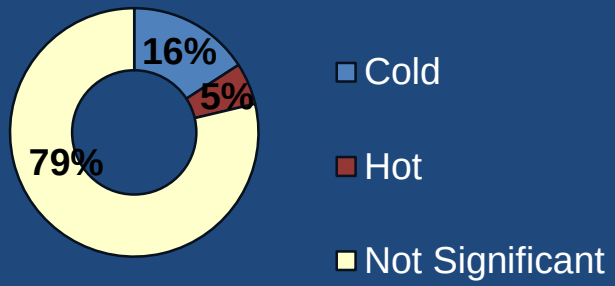
Hot Spot Analysis
City of Tulsa



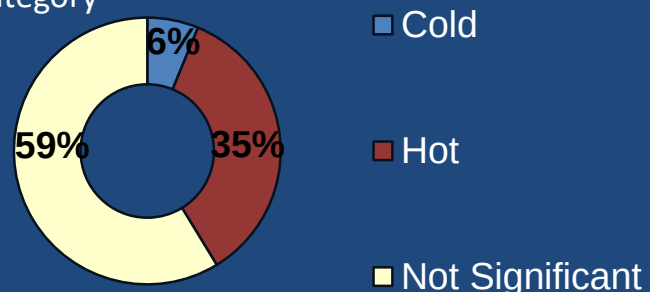
(Property Values Normalized by Using Value per Acre)

Cold — Hot

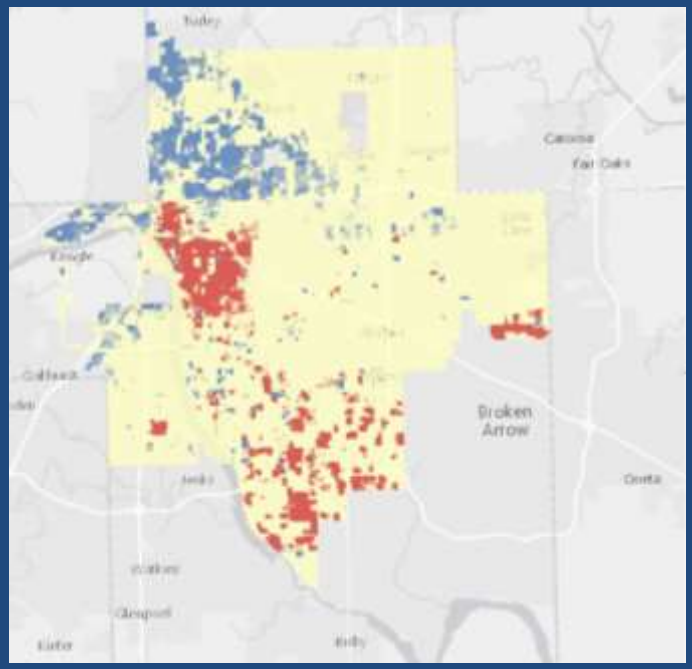
Share of Total Land Area Per Hotspot Category



Share of Total Value Per Hotspot Category

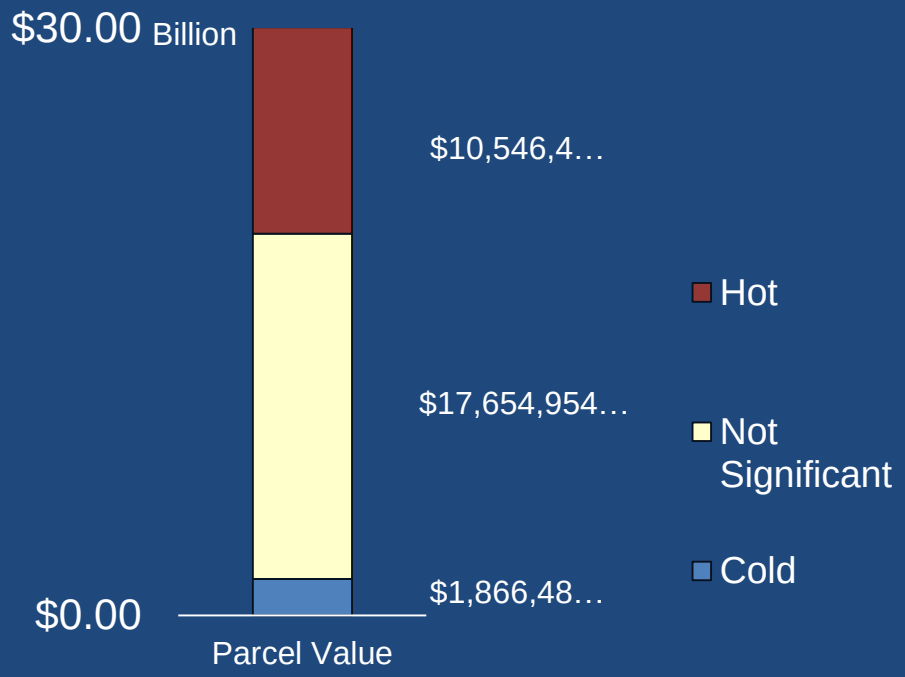


Hot Spot Analysis
City of Tulsa



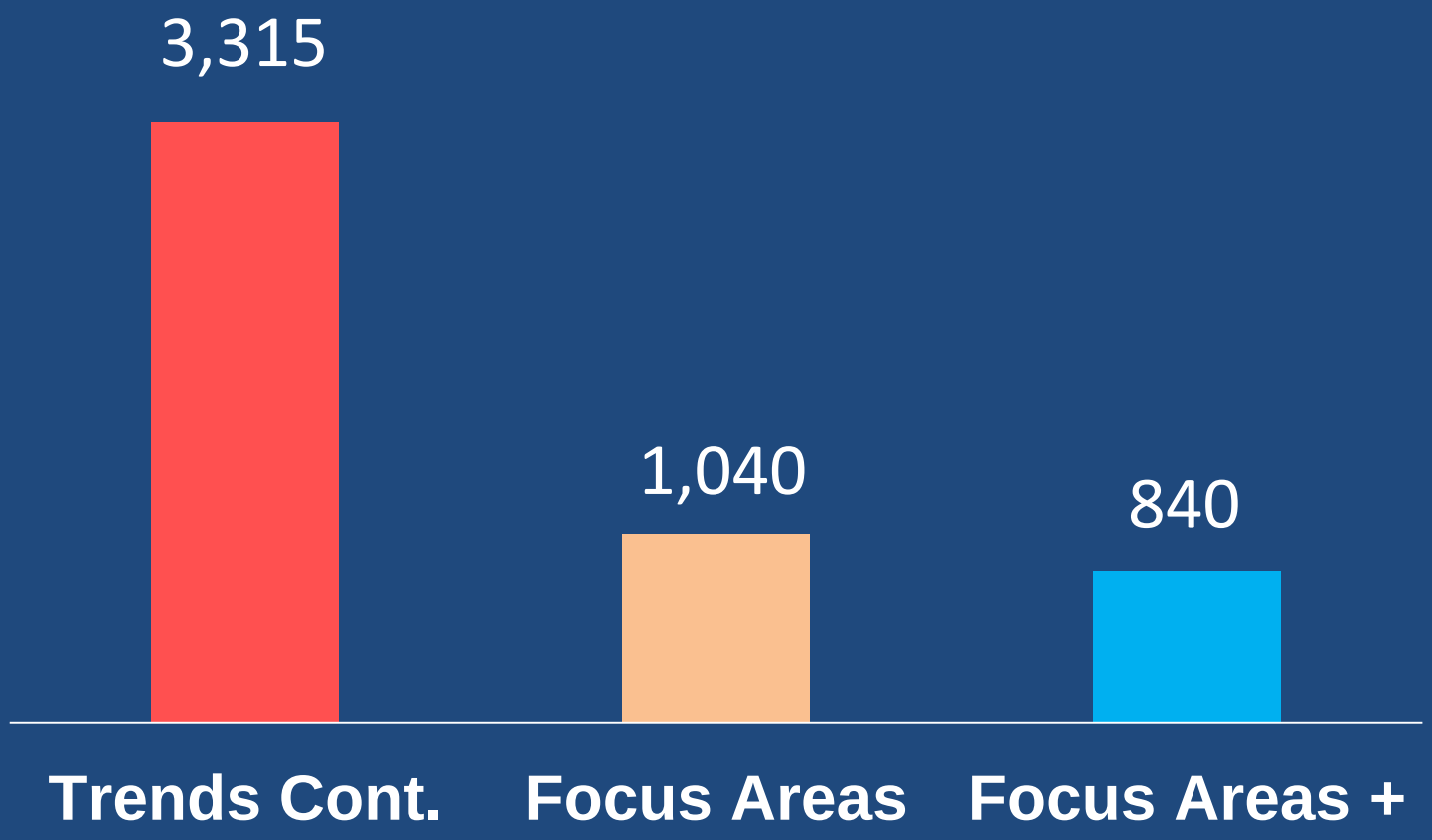
(Property Values Normalized by Using Value per Acre)

Cold — Hot



Land consumed by 2037

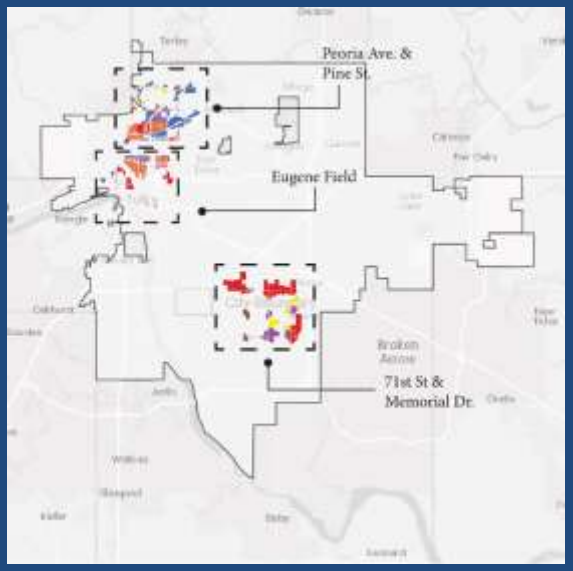
under each scenario (acres)



Comparing Parcel Value Downtown vs Focus Areas

Downtown Tulsa

950 Acres
Value: $ 1.7 Billion
5% of the City's total value



Focus Areas

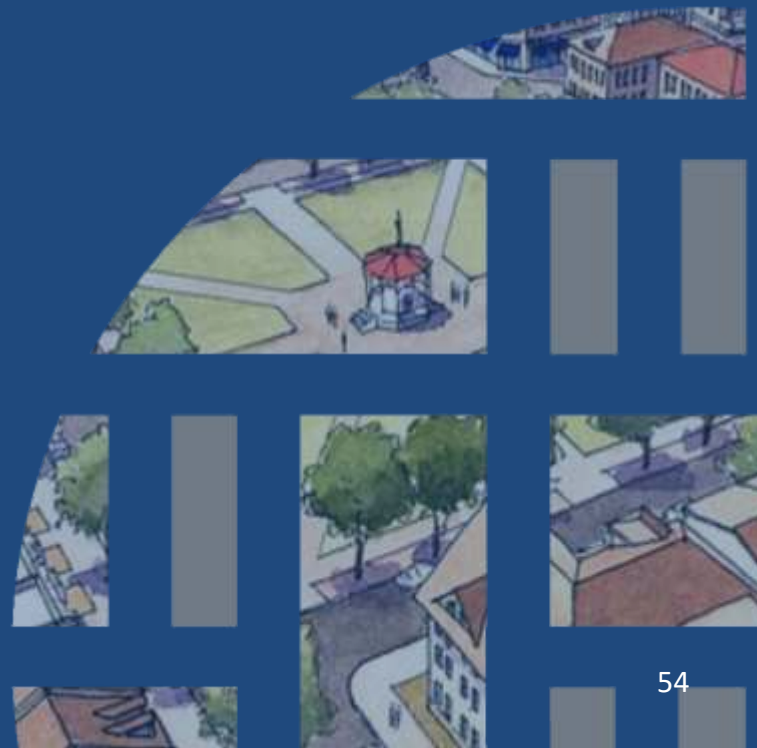
4,024 Acres
Value: $ 3.6 Billion
11% of the City's total value

Why does this matter?

Return on investment

- Infrastructure investments
- Locating government facilities
- Incentivizing development

Questions?



Smart Growth America
Improving lives by improving communities

Thank you!

John Robert Smith
Chris Zimmerman

Tulsa, Oklahoma
July 19, 2017

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