

Urban<sup>3</sup>

Joe Minicozzi, AICP







**65%**

of the population  
are visual learners



**65%**

of the population  
are visual learners



**90%**

information transmitted  
to the brain is visual



**Powerpoint**



# How do you show data



Edward Tufte





TEMPERATURE CONCERN ON

SRM JOINTS

27 JAN 1986

HISTORY OF O-RING DAMAGE ON SRM FIELD JOINTS

1169

OCT 30, 1985  
85

AFT

July

SRM No.	Cross Sectional View			Top View		Clocking Location (deg)	
	Erosion Depth (in.)	Perimeter Affected (deg)	Nominal Dia. (in.)	Length Of Max Erosion (in.)	Total Heat Affected Length (in.)		
61A LH Center Field**	22A	None	None	0.280	None	None	36° -- 66°
61A LH <del>CENTER</del> FIELD**	22A	NONE	NONE	0.280	NONE	NONE	338° - 18°
51C LH Forward Field**	15A	0.010	154.0	0.280	4.25	5.25	163
51C RH Center Field (prim)***	15B	0.038	130.0	0.280	12.50	58.75	354
51C RH Center Field (sec)***	15B	None	45.0	0.280	None	29.50	354
41D RH Forward Field	13B	0.028	110.0	0.280	3.00	None	275
41C LH Aft Field*	11A	None	None	0.280	None	None	--
41B LH Forward Field	10A	0.040	217.0	0.280	3.00	14.50	351
STS-2 RH Aft Field	2B	0.053	116.0	0.280	--	--	90

\*Hot gas path detected in putty. Indication of heat on O-ring, but no damage.  
 \*\*Soot behind primary O-ring.  
 \*\*\*Soot behind primary O-ring, heat affected secondary O-ring.

Clocking location of leak check port - 0 deg.

OTHER SRM-15 FIELD JOINTS HAD NO BLOWHOLES IN PUTTY AND NO SOOT NEAR OR BEYOND THE PRIMARY O-RING.

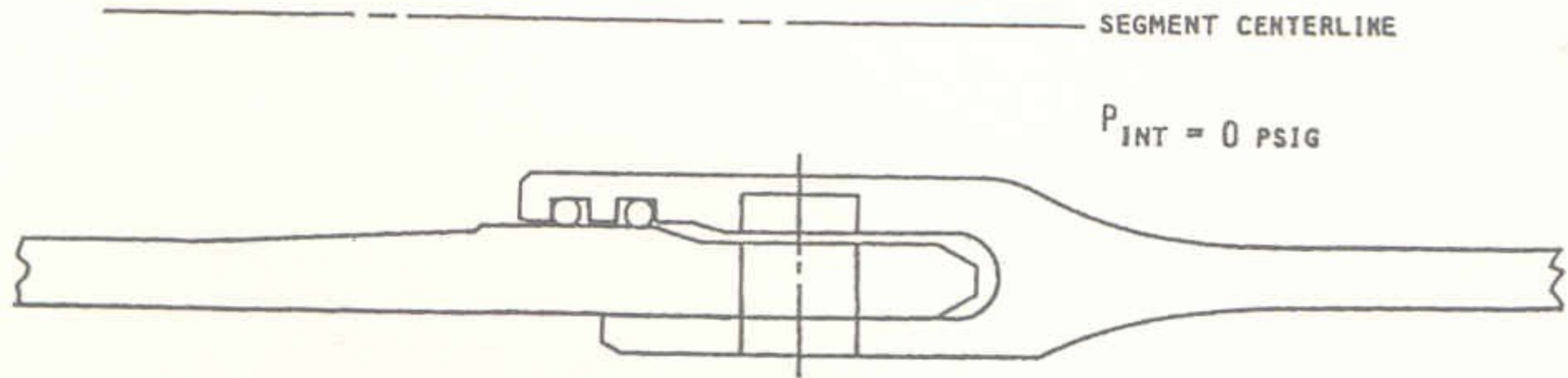
SRM-22 FORWARD FIELD JOINT HAD PUTTY PATH TO PRIMARY O-RING, BUT NO O-RING EROSION AND NO SOOT BLOWBY. OTHER SRM-22 FIELD JOINTS HAD NO BLOWHOLES IN PUTTY.

## PRIMARY CONCERNS -

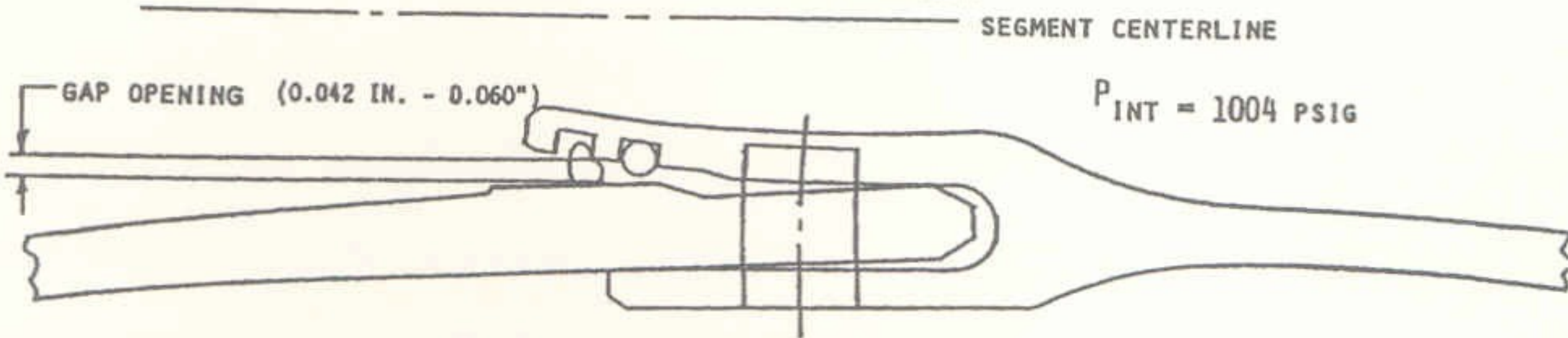
### FIELD JOINT - HIGHEST CONCERN

- o EROSION PENETRATION OF PRIMARY SEAL REQUIRES RELIABLE SECONDARY SEAL FOR PRESSURE INTEGRITY
  - o IGNITION TRANSIENT - (0-600 MS)
    - o (0-170 MS) HIGH PROBABILITY OF RELIABLE SECONDARY SEAL
    - o (170-330 MS) REDUCED PROBABILITY OF RELIABLE SECONDARY SEAL
    - o (330-600 MS) HIGH PROBABILITY OF NO SECONDARY SEAL CAPABILITY
- o STEADY STATE - (600 MS - 2 MINUTES)
  - o IF EROSION PENETRATES PRIMARY O-RING SEAL - HIGH PROBABILITY OF NO SECONDARY SEAL CAPABILITY
    - o BENCH TESTING SHOWED O-RING NOT CAPABLE OF MAINTAINING CONTACT WITH METAL PARTS GAP OPENING RATE TO MEOP
    - o BENCH TESTING SHOWED CAPABILITY TO MAINTAIN O-RING CONTACT DURING INITIAL PHASE (0-170 MS) OF TRANSIENT

PRIMARY CONCERNS - CONT



UNPRESSURIZED JOINT - NO ROTATION



PRESSURIZED JOINT - ROTATION EFFECT (EXAGGERATED)

## BLOW BY HISTORY

### SRM-15 WORST BLOW-BY

- 2 CASE JOINTS ( $80^\circ$ ), ( $110^\circ$ ) ARC
- MUCH WORSE VISUALLY THAN SRM-22

### SRM 22 BLOW-BY

- 2 CASE JOINTS ( $30-40^\circ$ )

### SRM-13A, 15, 16A, 18, 23A 24A

- NOZZLE BLOW-BY



# HISTORY OF O-RING TEMPERATURES (DEGREES - F)

<u>MOTOR</u>	<u>MBT</u>	<u>AMB</u>	<u>O-RING</u>	<u>WIND</u>
DM-4	68	36	47	10 MPH
DM-2	76	45	52	10 MPH
QM-3	72.5	40	48	10 MPH
QM-4	76	48	51	10 MPH
SRM-15	52	64	53	10 MPH
SRM-22	77	78	75	10 MPH
SRM-25	55	26	29	10 MPH
			27	25 MPH

<u>MOTOR</u>	<u>O-RING</u>	
DM-4	47	Test rockets ignited on fixed horizontal platforms in Utah.
DM-2	52	
QM-3	48	
QM-4	51	
SRM-15	53	The only 2 shuttle launches (of 24) for which temperatures were shown in the 13 Challenger charts.
SRM-22	75	
SRM-25	29 27	Forecasted O-ring temperatures for the Challenger.

## CONCLUSIONS :

- 0 TEMPERATURE OF O-RING IS NOT ONLY PARAMETER CONTROLLING BLOW-BY

SRM 15 WITH BLOW-BY HAD AN O-RING TEMP AT 53°F  
SRM 22 WITH BLOW-BY HAD AN O-RING TEMP AT 75°F  
FOUR DEVELOPMENT MOTORS WITH NO BLOW-BY  
WERE TESTED AT O-RING TEMP OF 47° TO 52°F

DEVELOPMENT MOTORS HAD PUTTY PACKING WHICH RESULTED IN BETTER PERFORMANCE

- 0 AT ABOUT 50°F BLOW-BY COULD BE EXPERIENCED IN CASE JOINTS
- 0 TEMP FOR SRM 25 ON 1-28-86 LAUNCH WILL  
BE 29°F 9 AM  
38°F 2 PM
- 0 HAVE NO DATA THAT WOULD INDICATE SRM 25 IS DIFFERENT THAN SRM 15 OTHER THAN TEMP

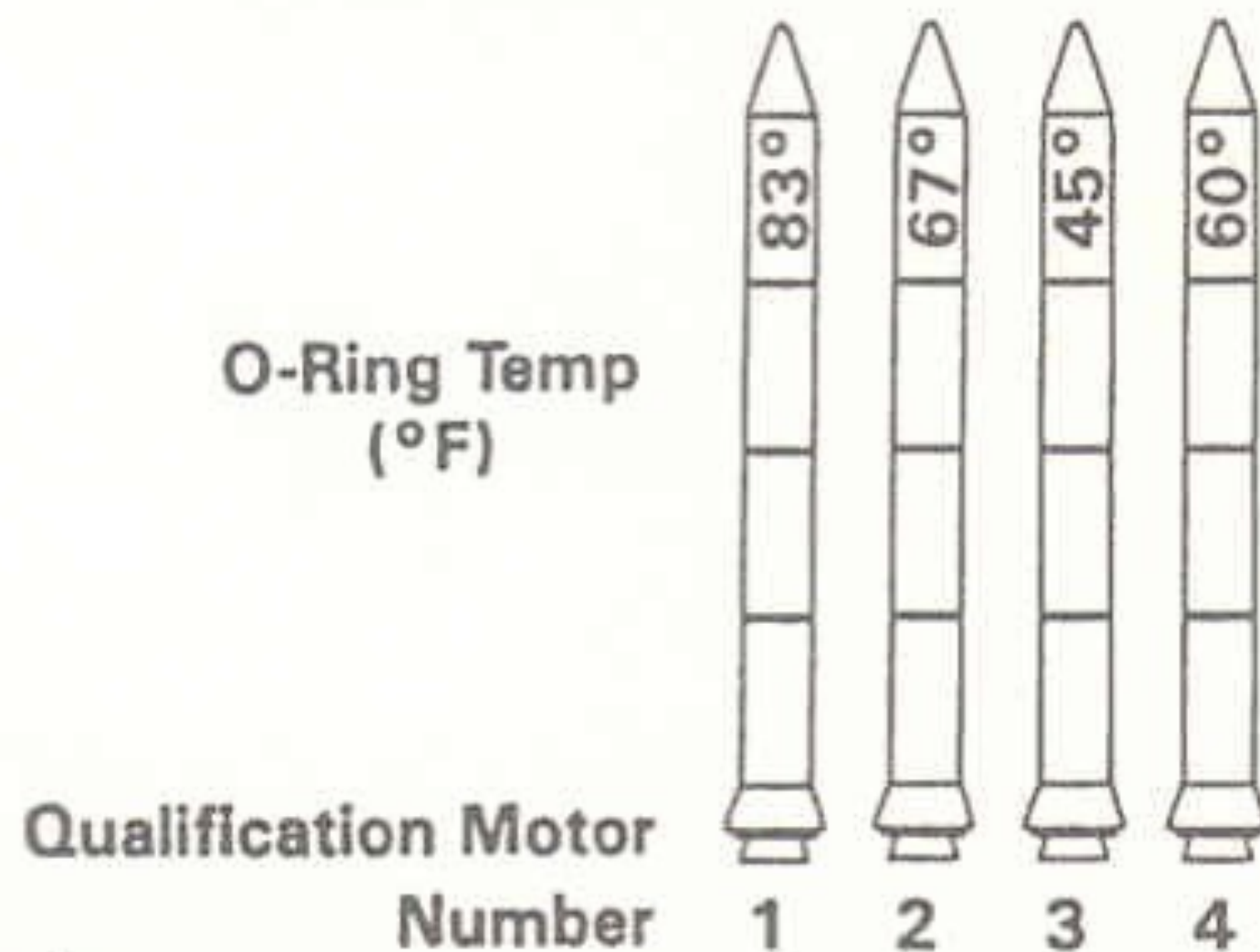
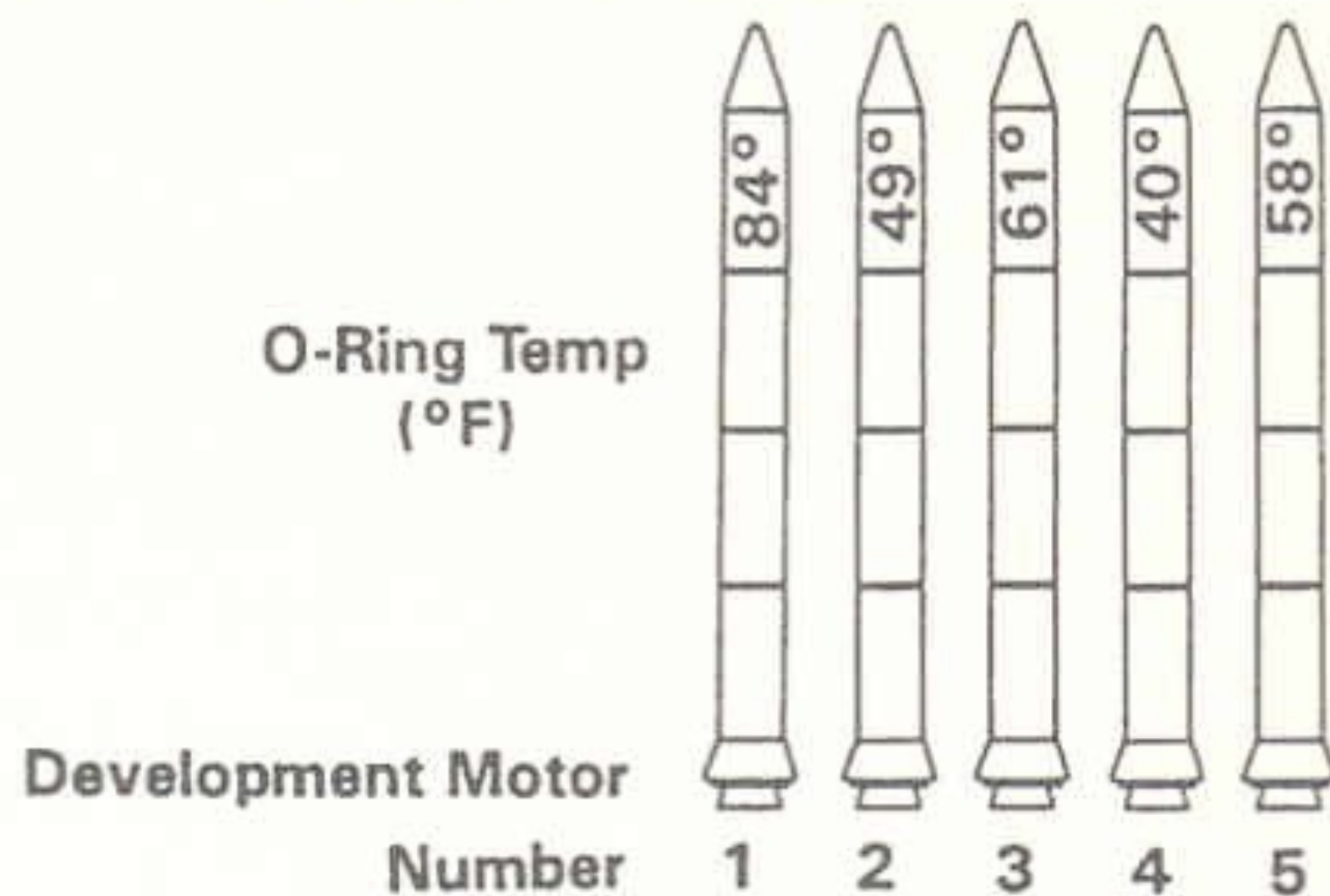
## RECOMMENDATIONS :

◦ O-RING TEMP MUST BE  $\geq 53^{\circ}\text{F}$  AT LAUNCH

DEVELOPMENT MOTORS AT  $47^{\circ}$  TO  $52^{\circ}\text{F}$  WITH  
PUTTY PACKING HAD NO BLOW-BY  
SRM 15 (THE BEST SIMULATION) WORKED AT  $53^{\circ}\text{F}$

◦ PROJECT AMBIENT CONDITIONS (TEMP & WIND)  
TO DETERMINE LAUNCH TIME

# History of O-Ring Damage in Field Joints



Code	
	= Heating of Secondary O-Ring
	= Primary O-Ring Blowby
	= Primary O-Ring Erosion
	= Heating of Primary O-Ring
	= No Damage

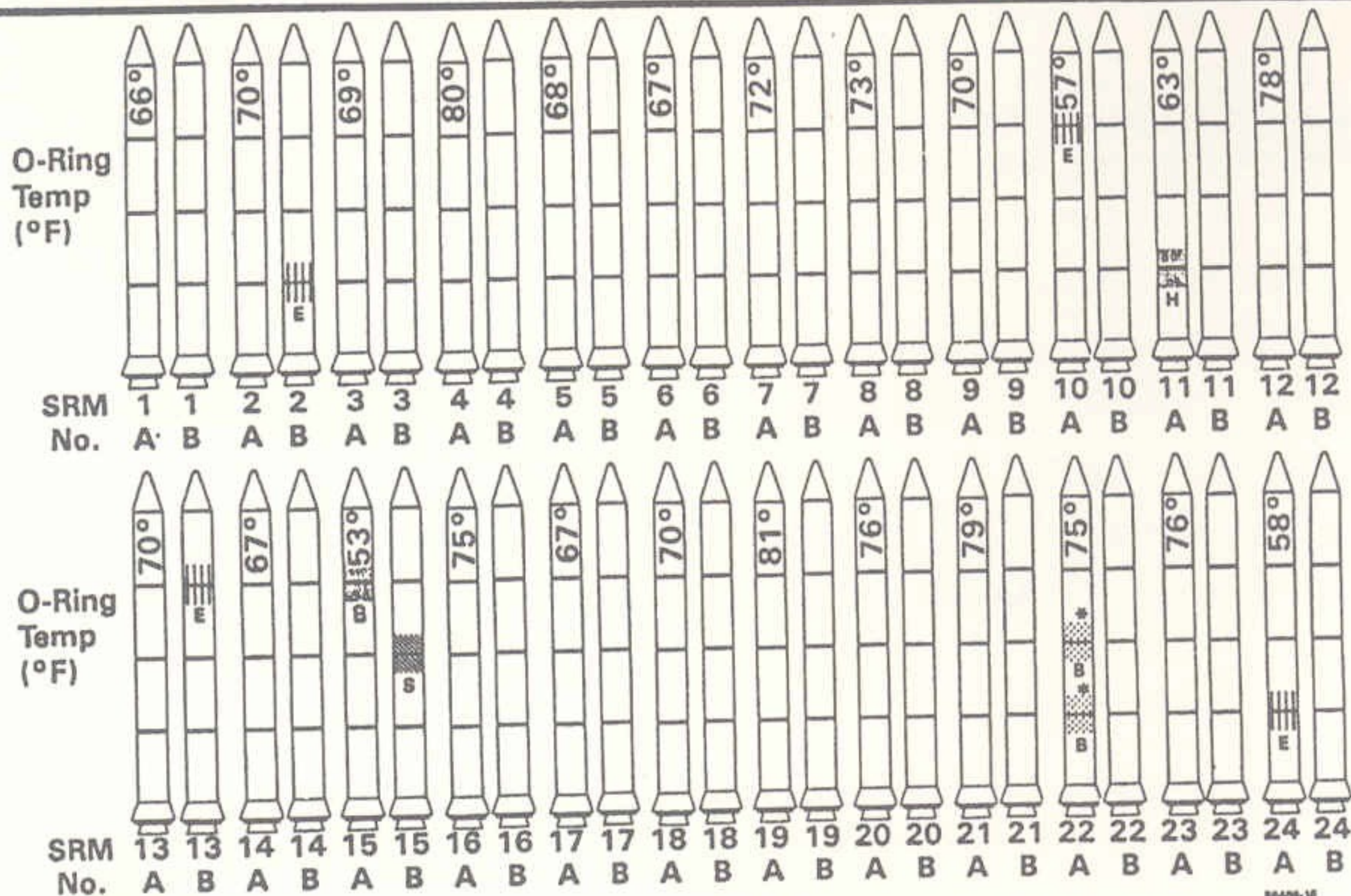
## STATIC TEST MOTORS

- HORIZONTAL ASSEMBLY
- SOME PUTTY REPAIRED

MORTON THIOKOL, INC.  
Wasatch Operations

INFORMATION ON THIS PAGE WAS PREPARED TO SUPPORT AN ORAL PRESENTATION AND CANNOT BE CONSIDERED COMPLETE WITHOUT THE ORAL DISCUSSION

## History of O-Ring Damage in Field Joints (Cont)

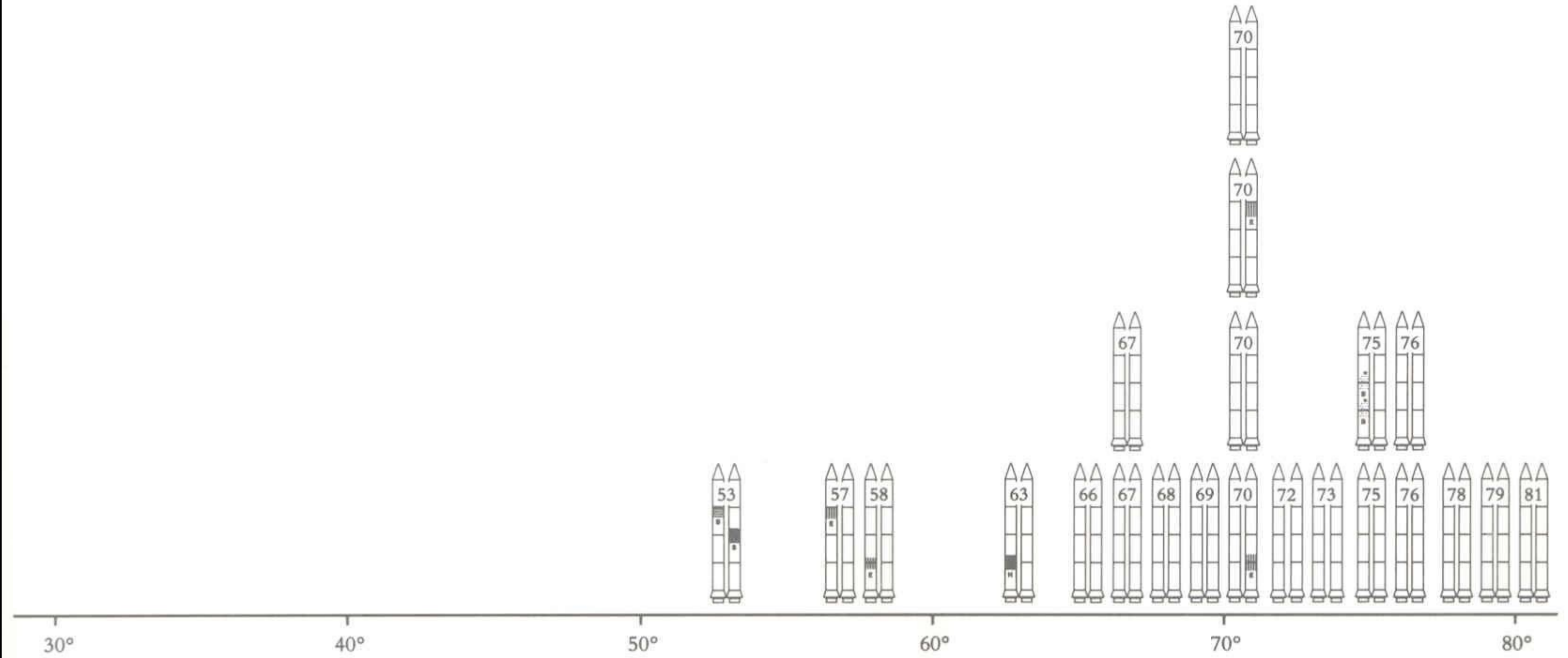


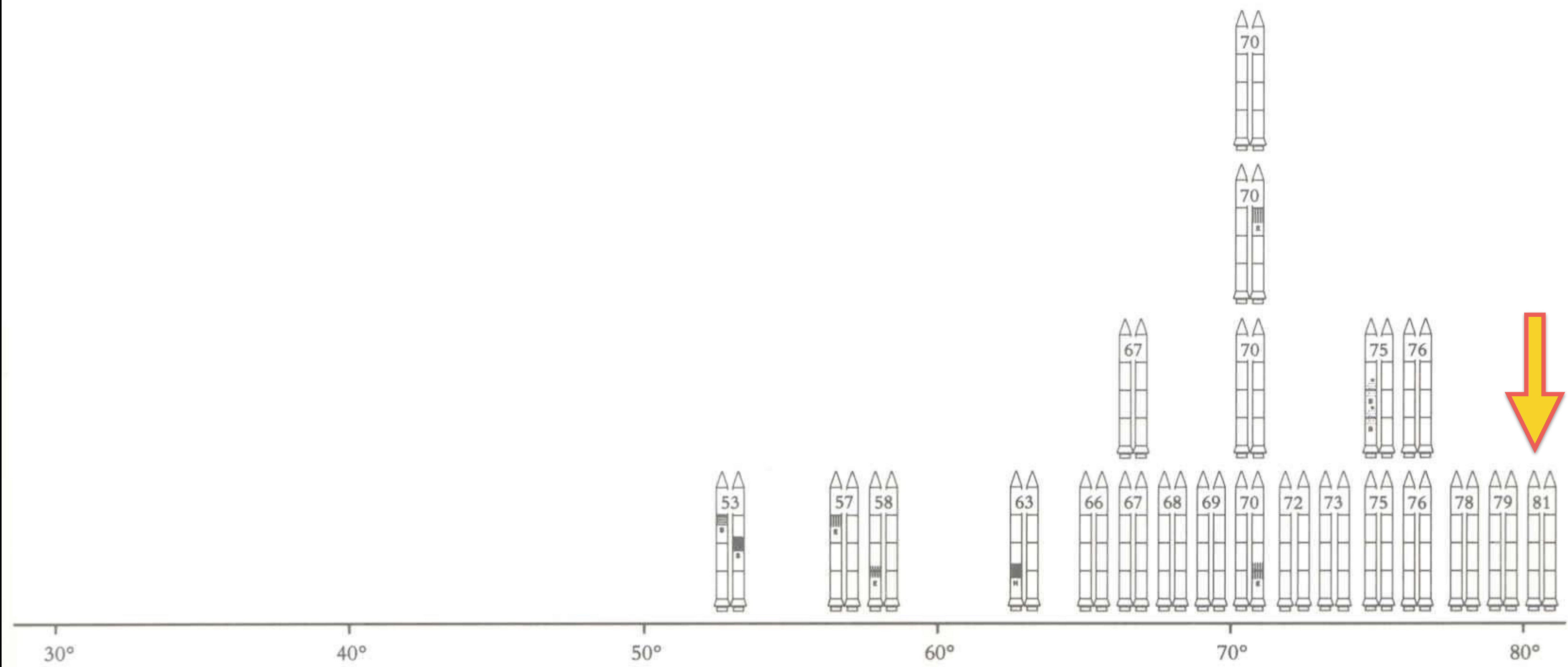
MORTON THIOKOL, INC.  
Wasatch Operations

\* No Erosion

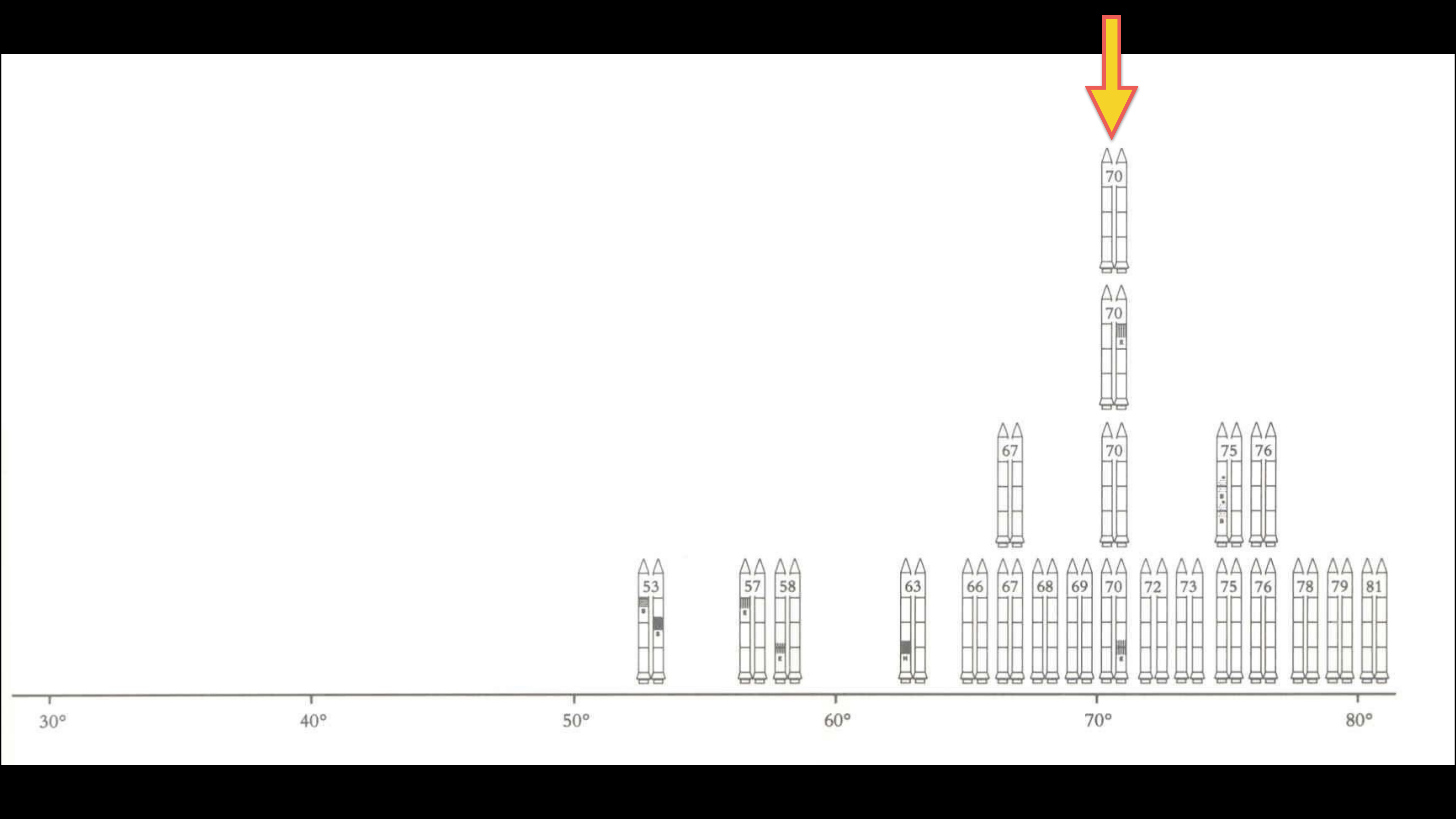
88408-14

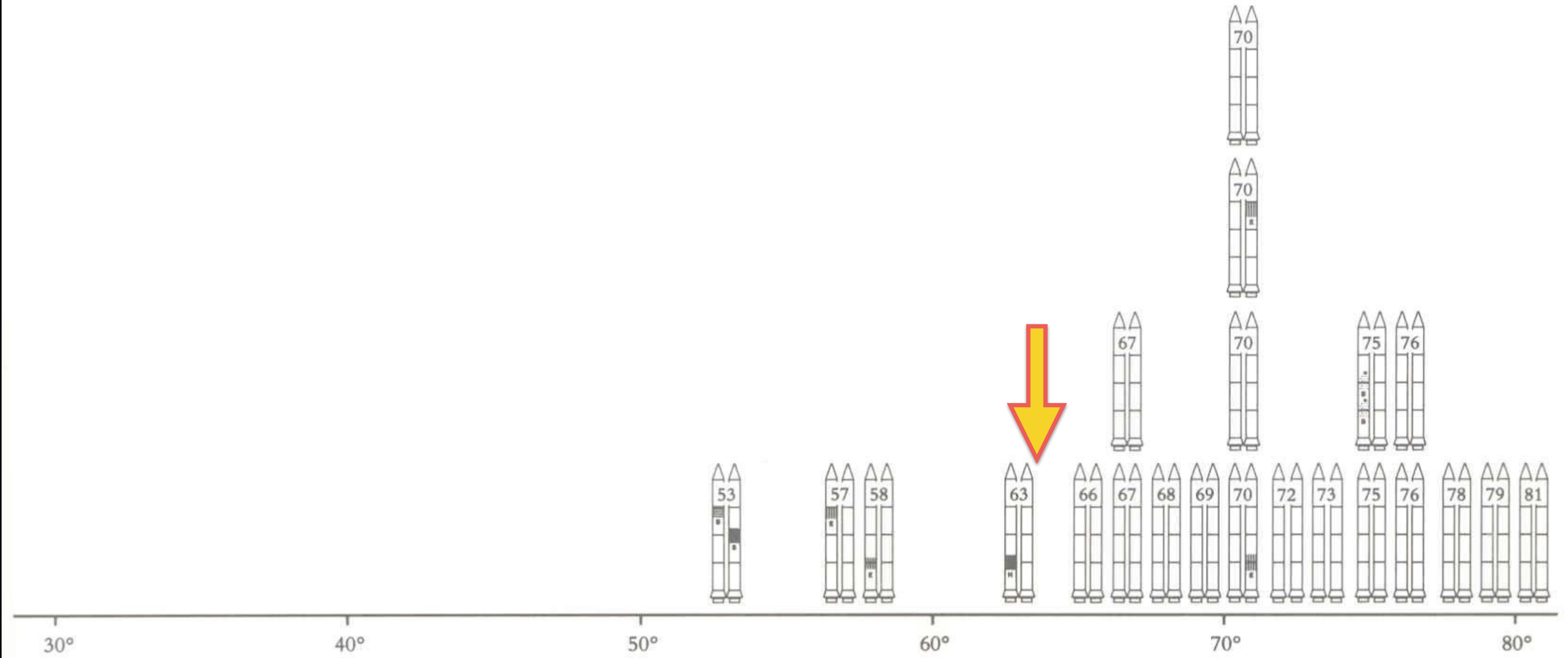
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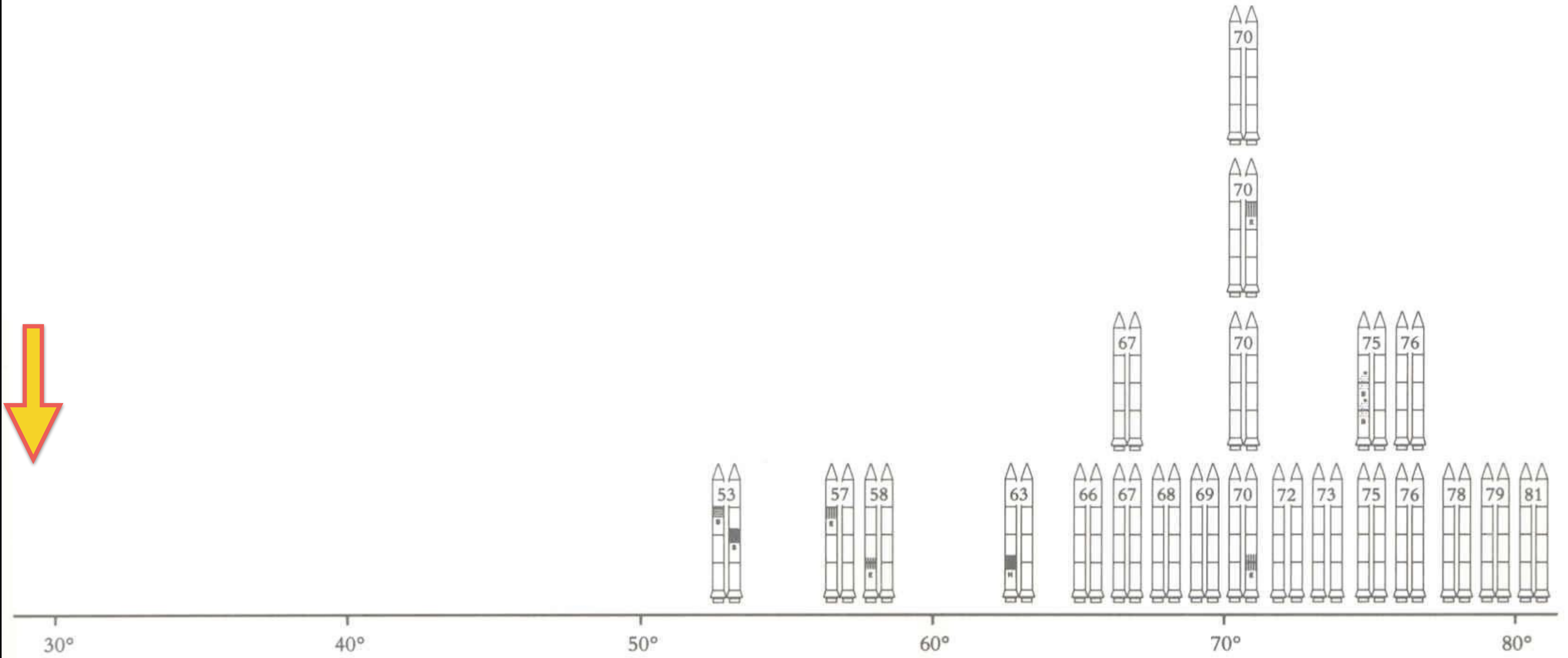
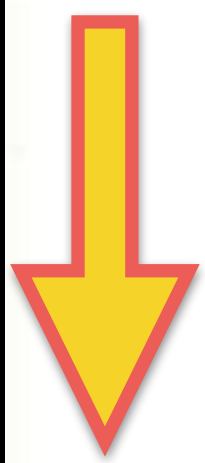


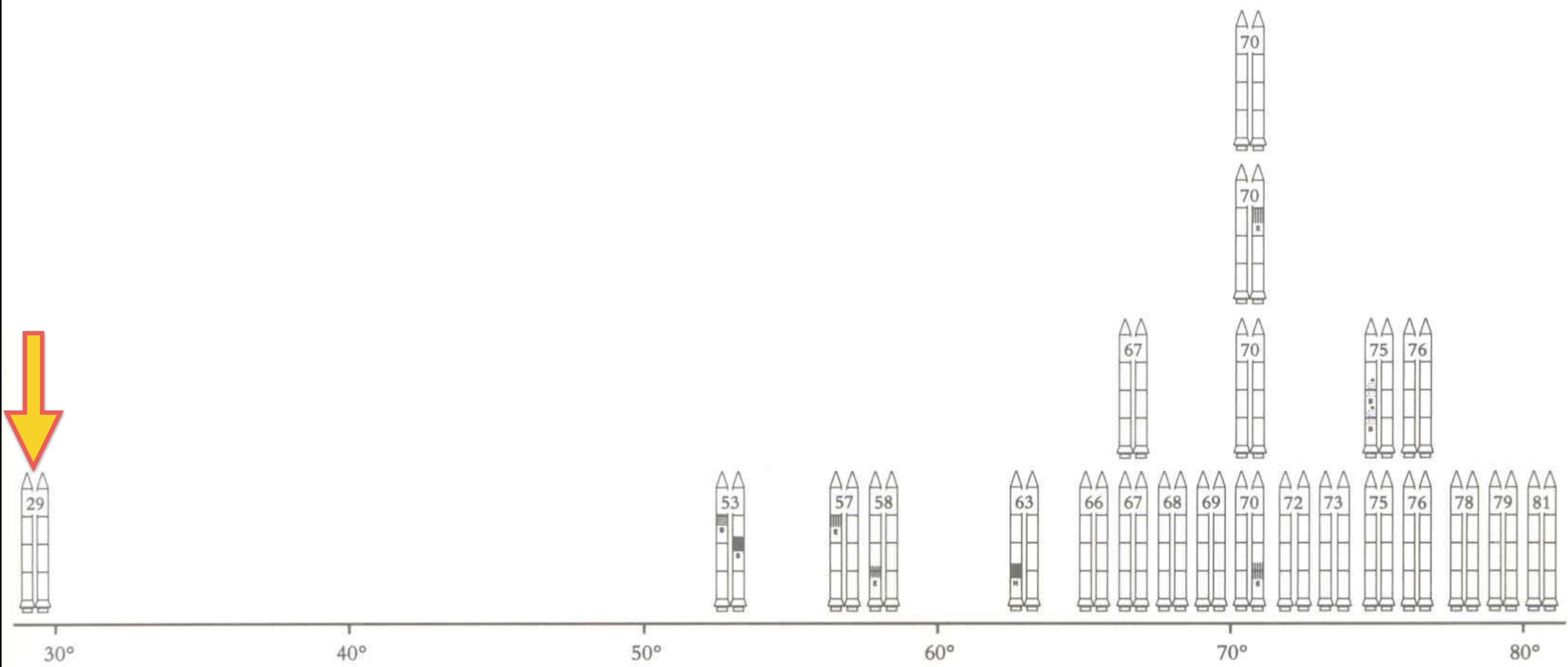
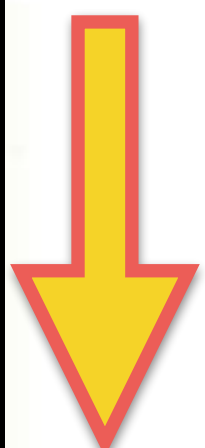














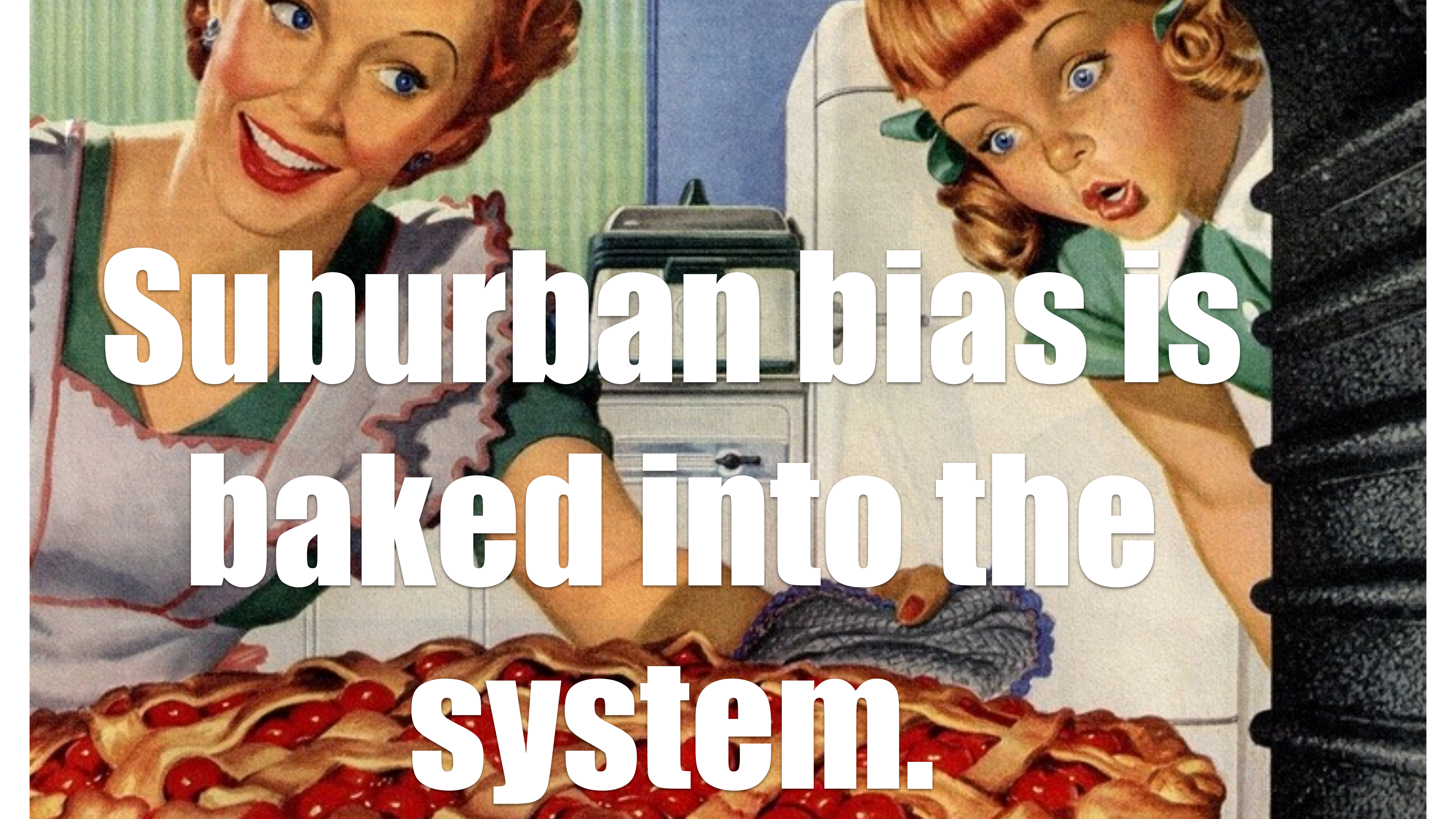
show. don't tell.

# Storytelling





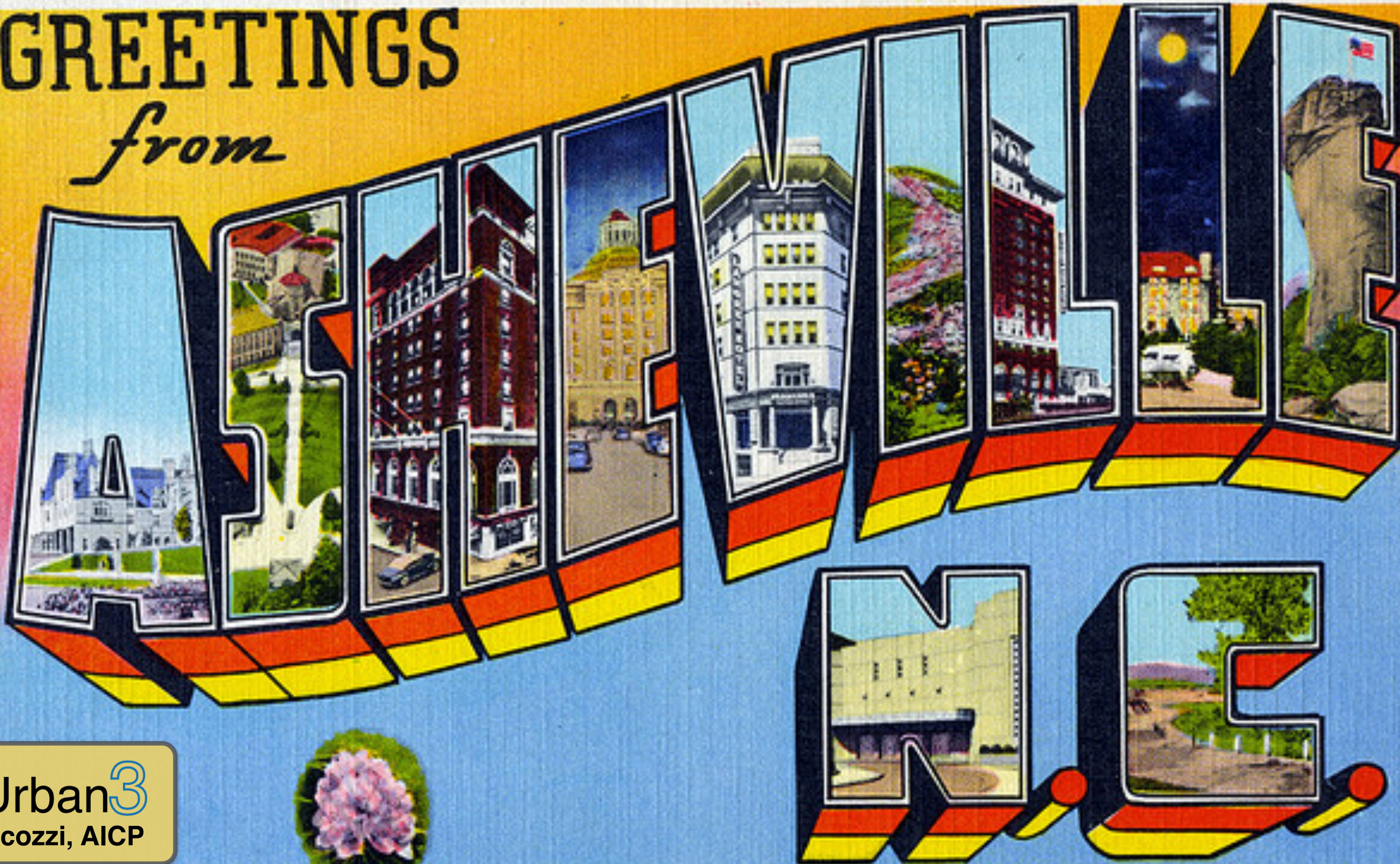




**Suburban bias is  
baked into the  
system.**

# GREETINGS

*from*



Urban<sup>3</sup>  
Joe Minicozzi, AICP



New York City

Kansas City

Asheville

Memphis

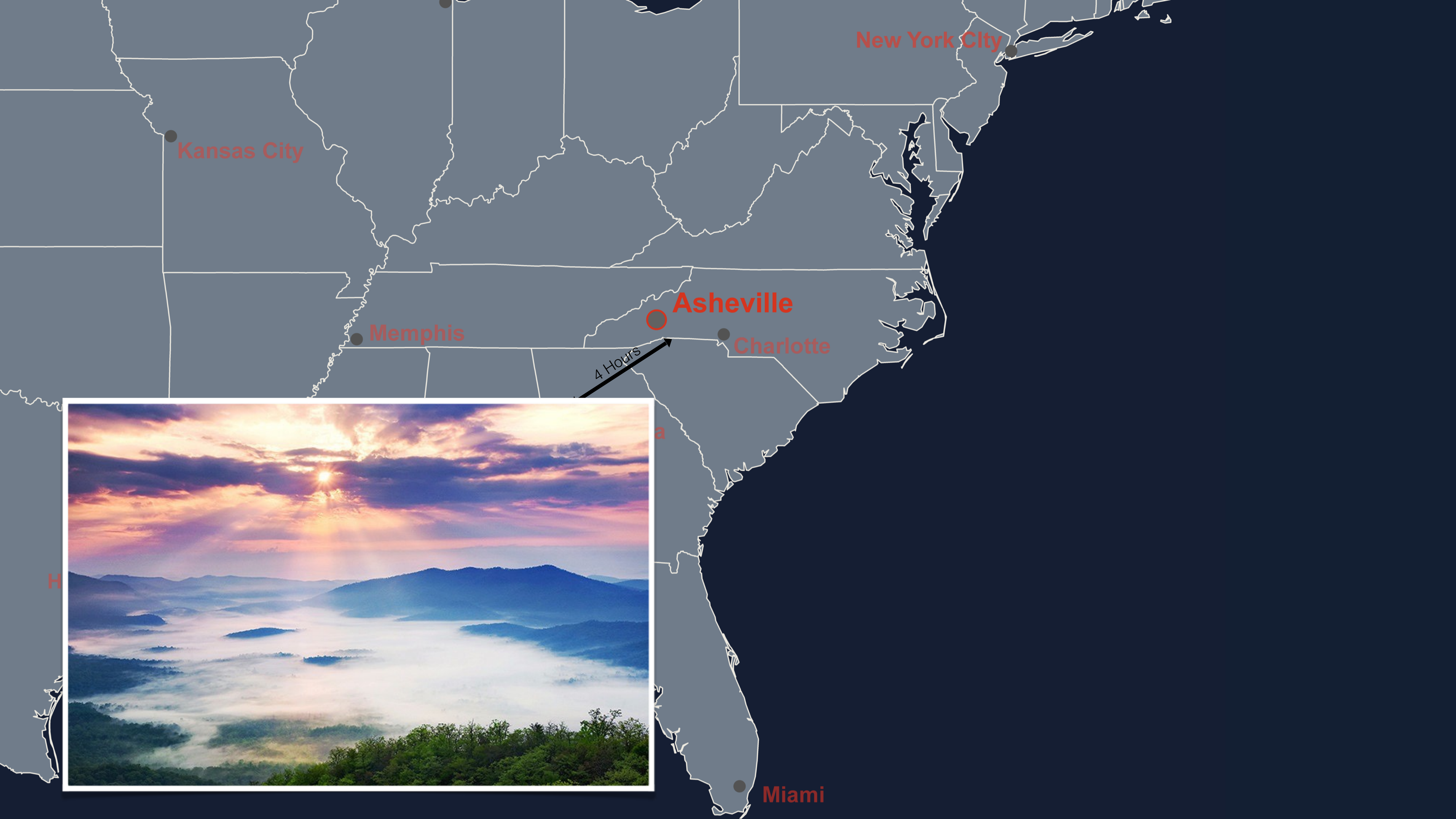
Charlotte

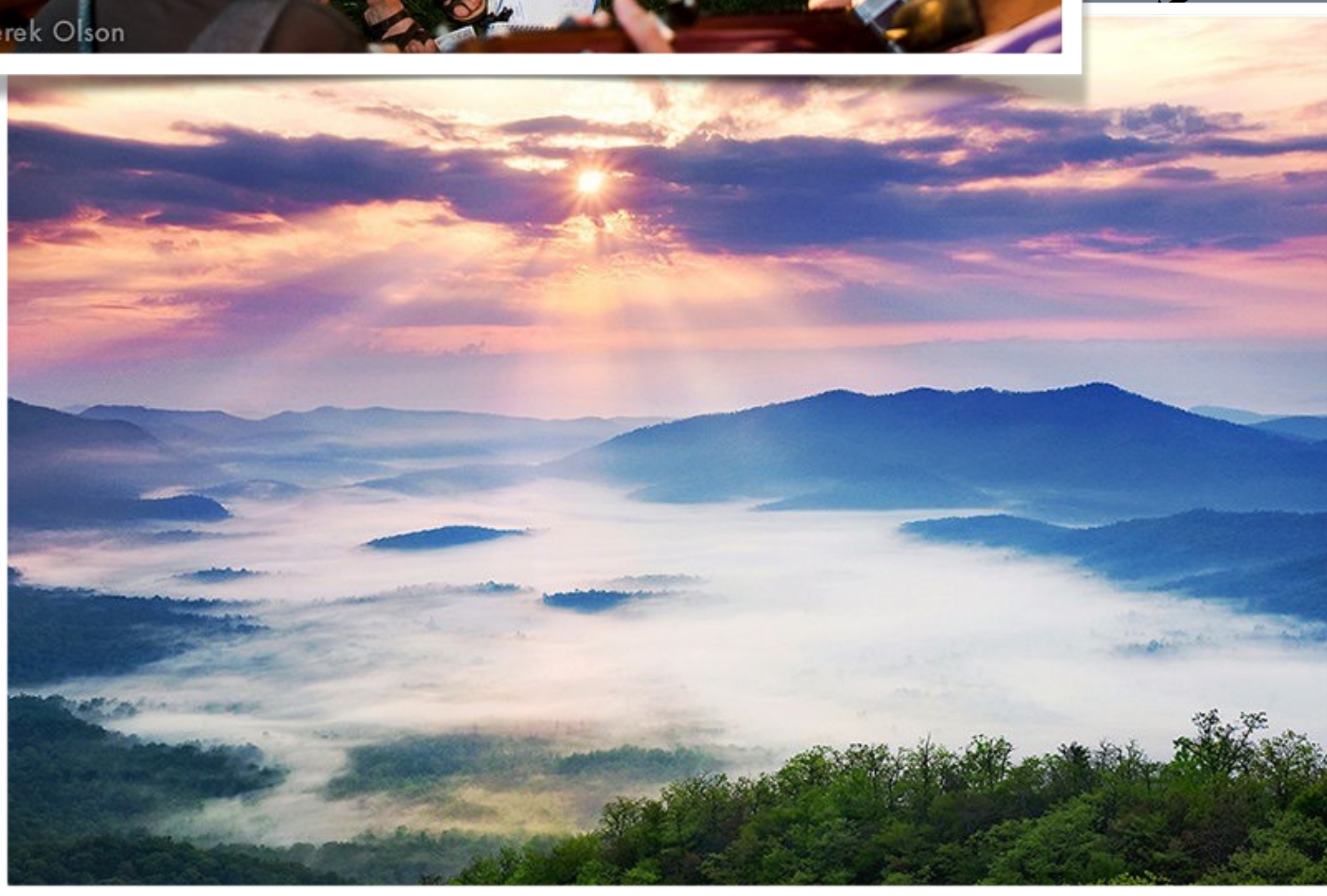
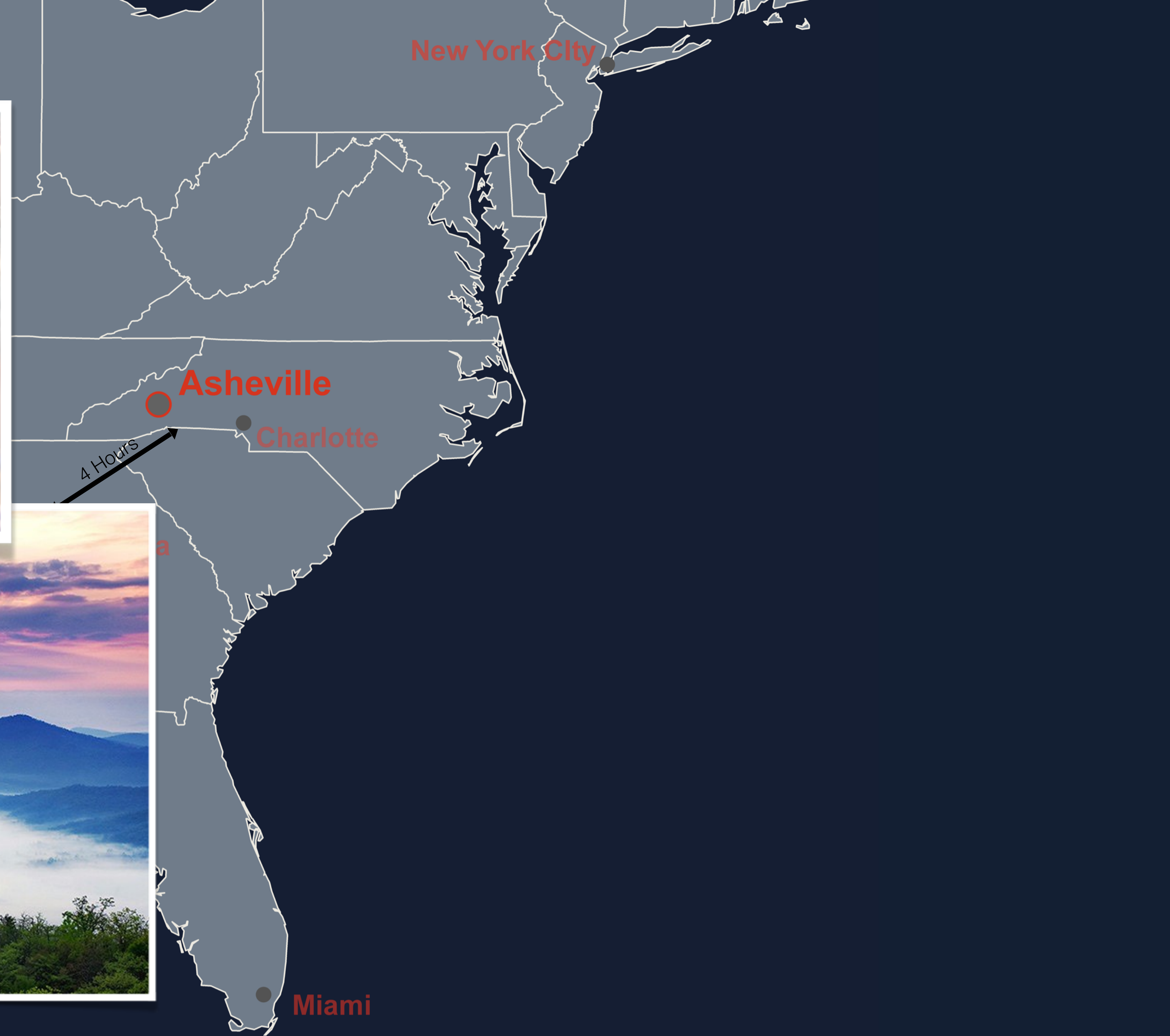
4 Hours

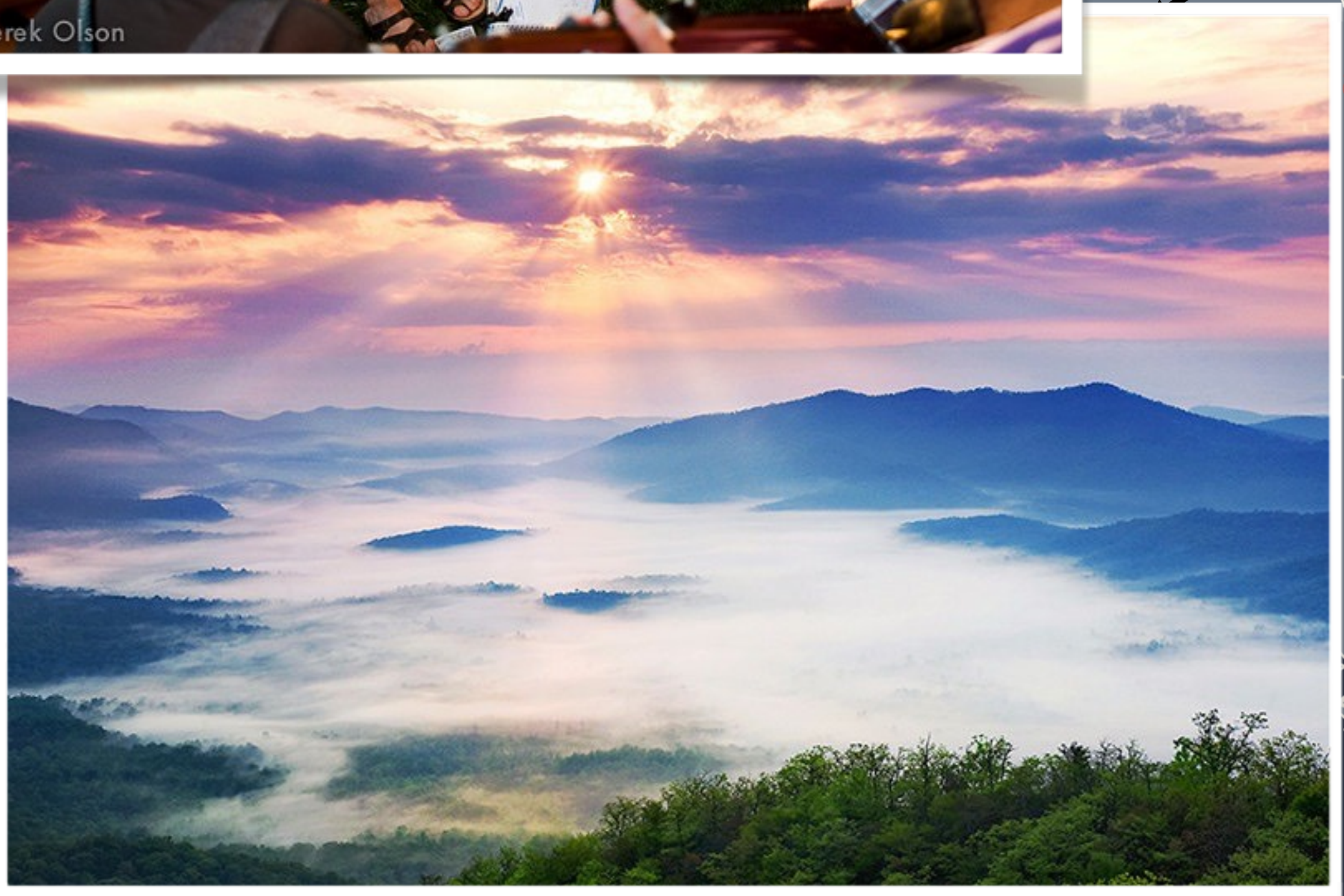
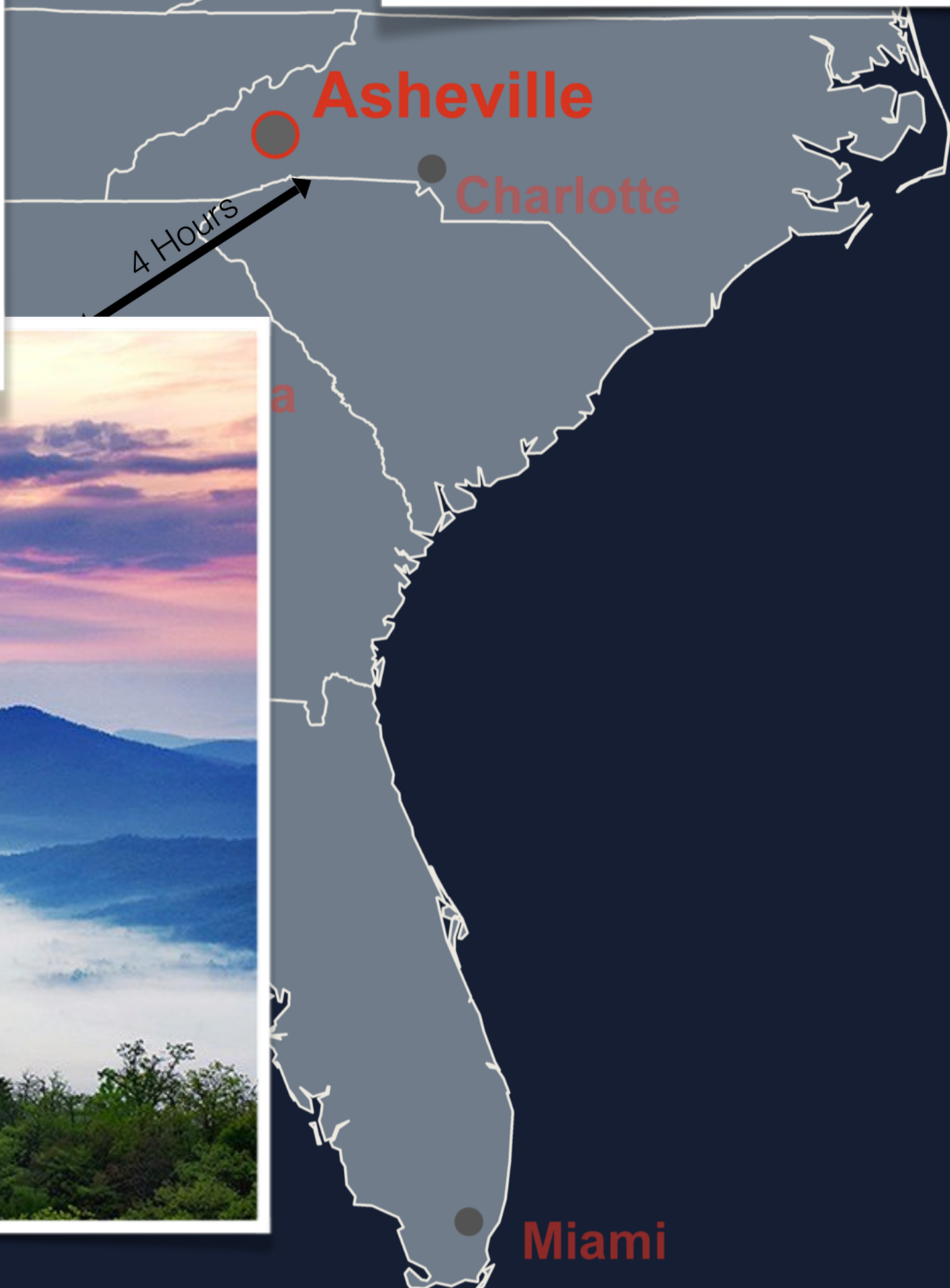
Atlanta

Houston

Miami







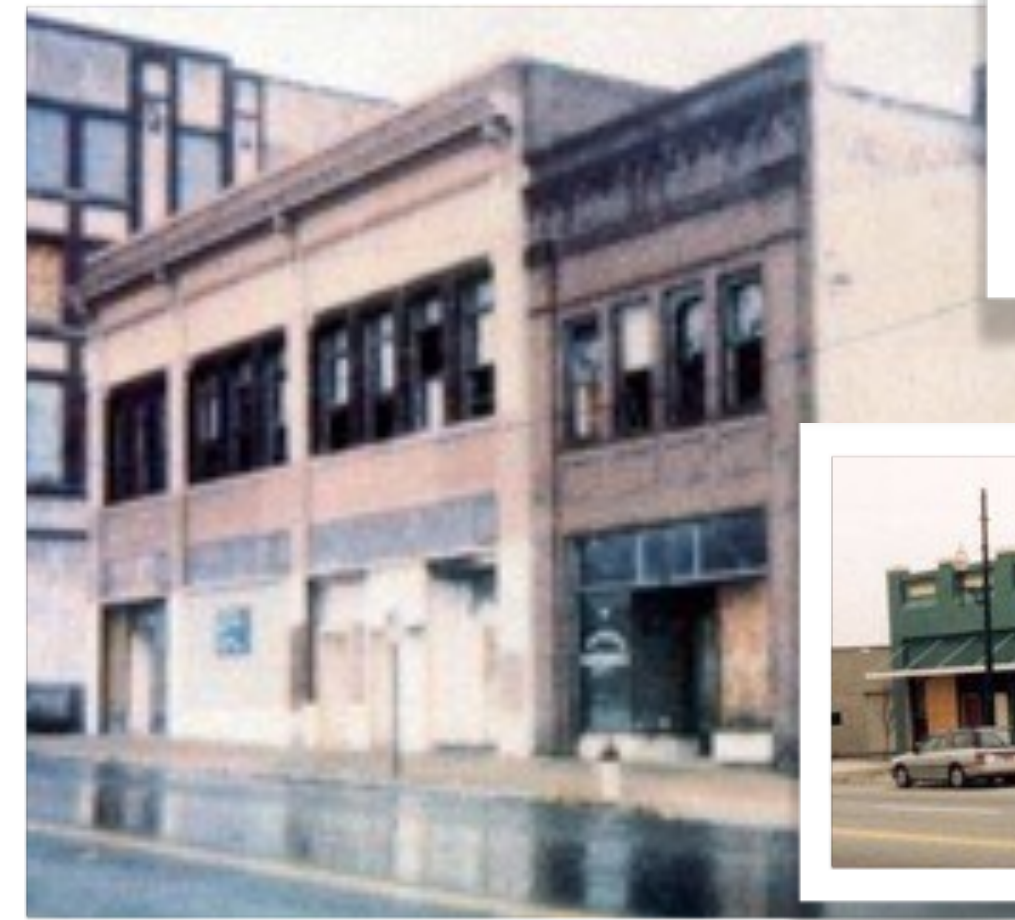




Miami



In the 70's and 80's  
our downtown died.



Asheville's de facto motto was:

**“That will never work here - don't even try.”**



Julian Price

1941 - 11/19/2001



**the Alternative Reading Room**

**The Mountain Xpress**

# Public Interest Projects

**Salsa's & Zambras**

**City Seeds**



**Urban3**



**51 Biltmore**



**Downtown benches**



**the Dogwood Fund**



**The Orange Peel**

**YWCA**

**The Public Service Building**



**The Laughing Seed**

JACK SCHULMAN

53

BUYERS MARKET





**In God we trust;  
everyone else,  
bring data.**

Mayor Michael Bloomberg





**Incorporate** (in'kôrpə,rāt)

**VERB**

Constitute (a company, city, or other organization) as a legal corporation.

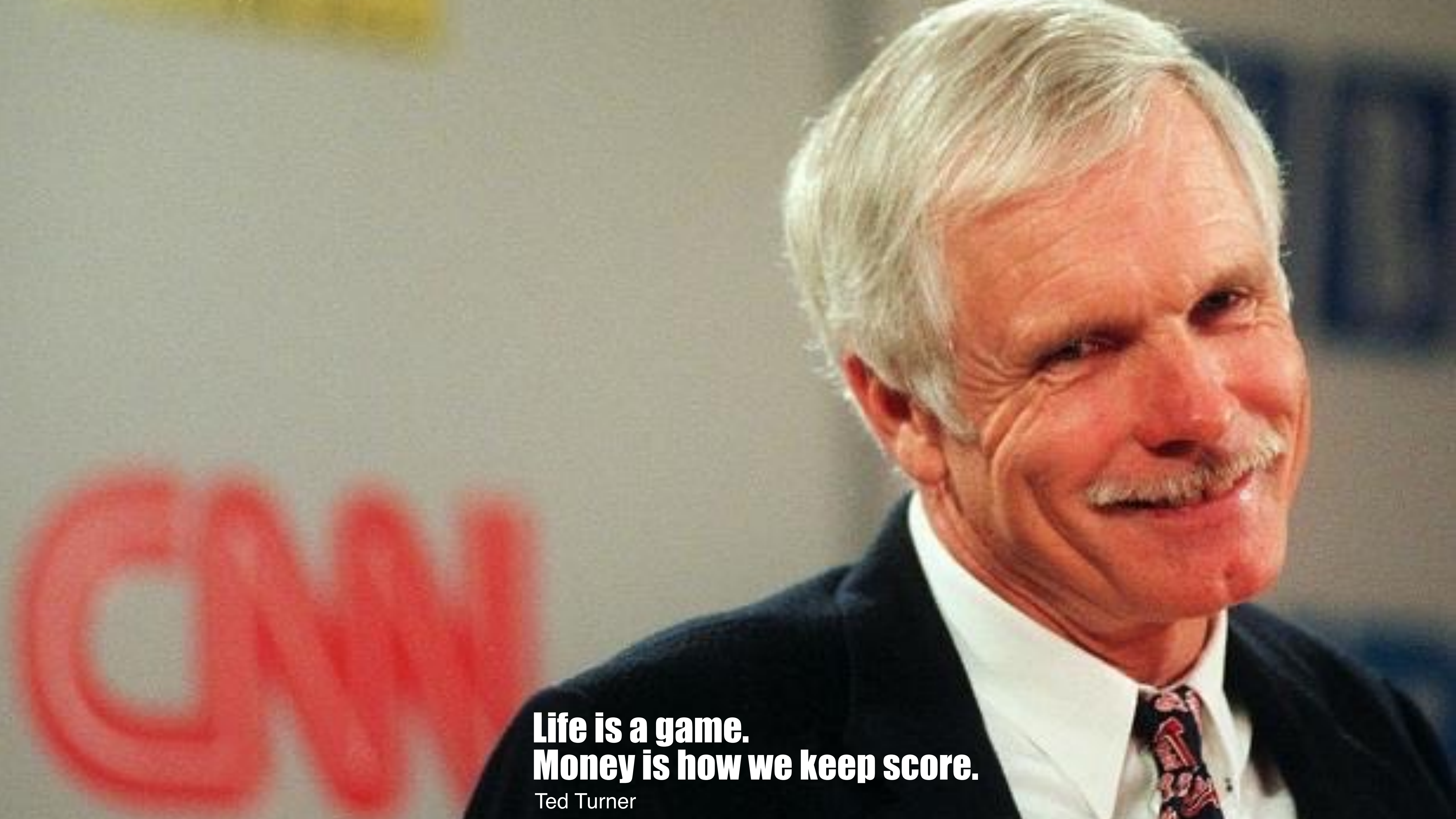
Source: Oxford Dictionary

A photograph of Joe Biden and Stephen Colbert on the set of the Late Show. Joe Biden is seated on the left, wearing a dark suit and a blue and white striped tie. Stephen Colbert is seated on the right, wearing a dark suit and glasses. They are both looking towards each other. The background is a cityscape at night with lights reflecting on water. A blue mug with the 'Late Show' logo is on the table in front of them.

“The United States  
is the largest  
**corporation**  
in the world.”

**Joe Biden**

United States Vice President  
Late Show: 12/6/2016



**Life is a game.  
Money is how we keep score.**

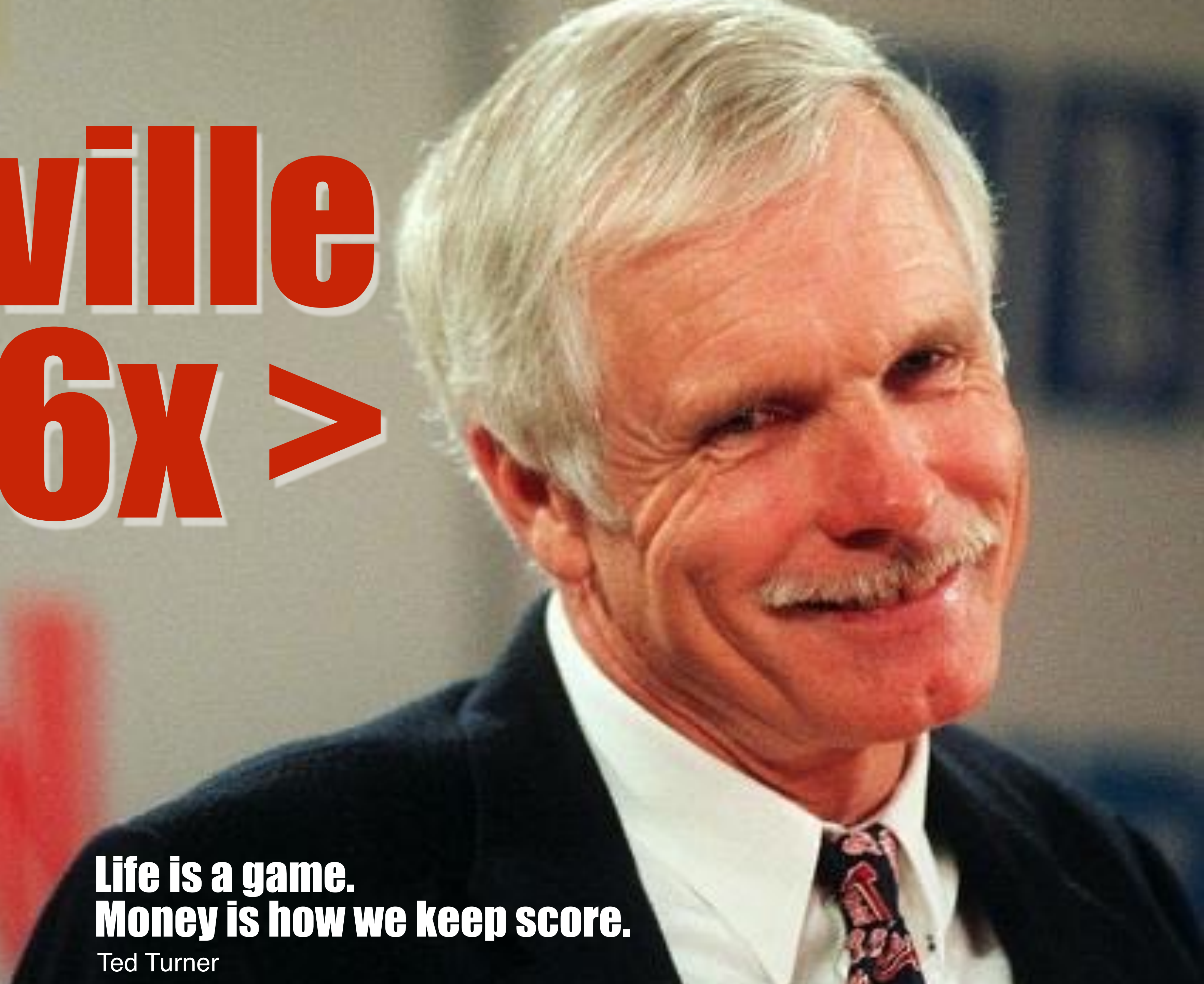
Ted Turner



**Asheville**  
**is 6X >**

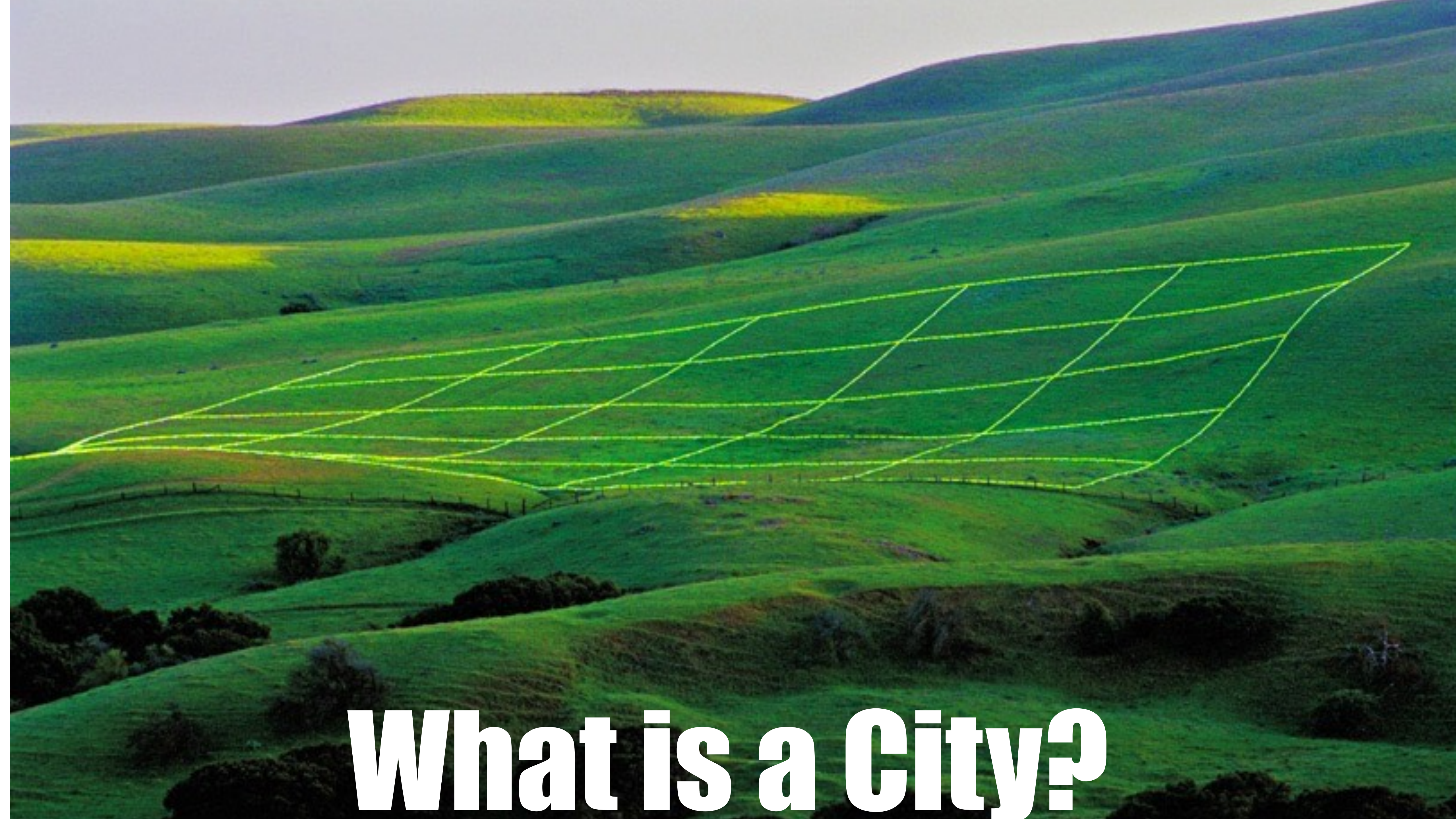
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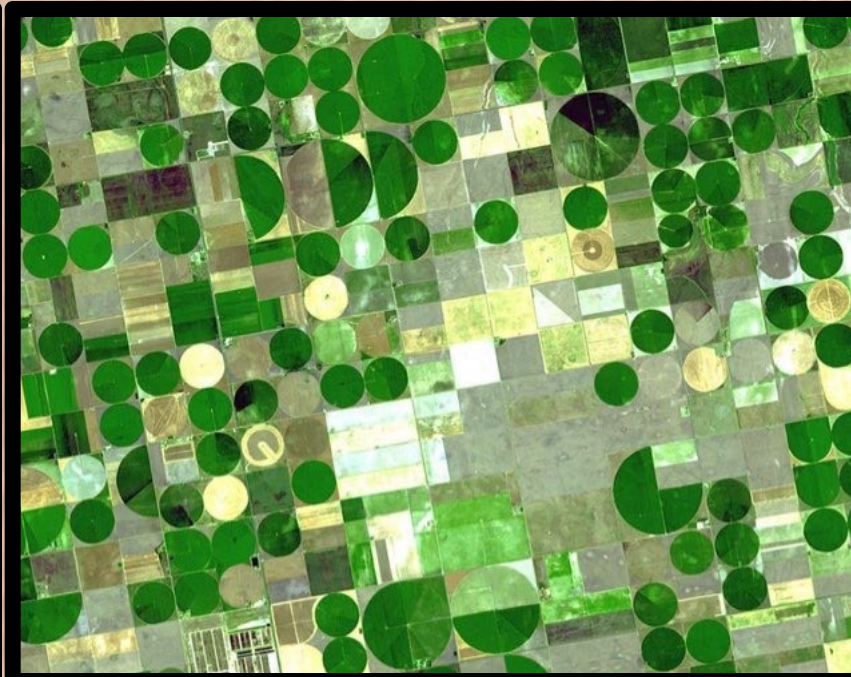


**What is a city?**



**What is a City?**

# Land Production



# Urban3



**Land Consumed (Acres):** **34.0**

**00.2**

**Total Property Taxes/Acre:** **\$ 6,500**

**City Retail Taxes/Acre:** **\$ 47,500**

**Residents per Acre:** **0.0**

**Jobs per Acre:** **5.9**

# Urban3



<b>Land Consumed (Acres):</b>	<b>34.0</b>	<b>00.2</b>
<b>Total Property Taxes/Acre:</b>	<b>\$ 6,500</b>	<b>\$634,000</b>
<b>City Retail Taxes/Acre:</b>	<b>\$ 47,500</b>	
<b>Residents per Acre:</b>	<b>0.0</b>	
<b>Jobs per Acre:</b>	<b>5.9</b>	

# Urban3



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<b>Total Property Taxes/Acre:</b>	<b>\$ 6,500</b>	<b>\$634,000</b>
<b>City Retail Taxes/Acre:</b>	<b>\$ 47,500</b>	<b>\$ 83,600</b>
<b>Residents per Acre:</b>	<b>0.0</b>	
<b>Jobs per Acre:</b>	<b>5.9</b>	

# Urban3



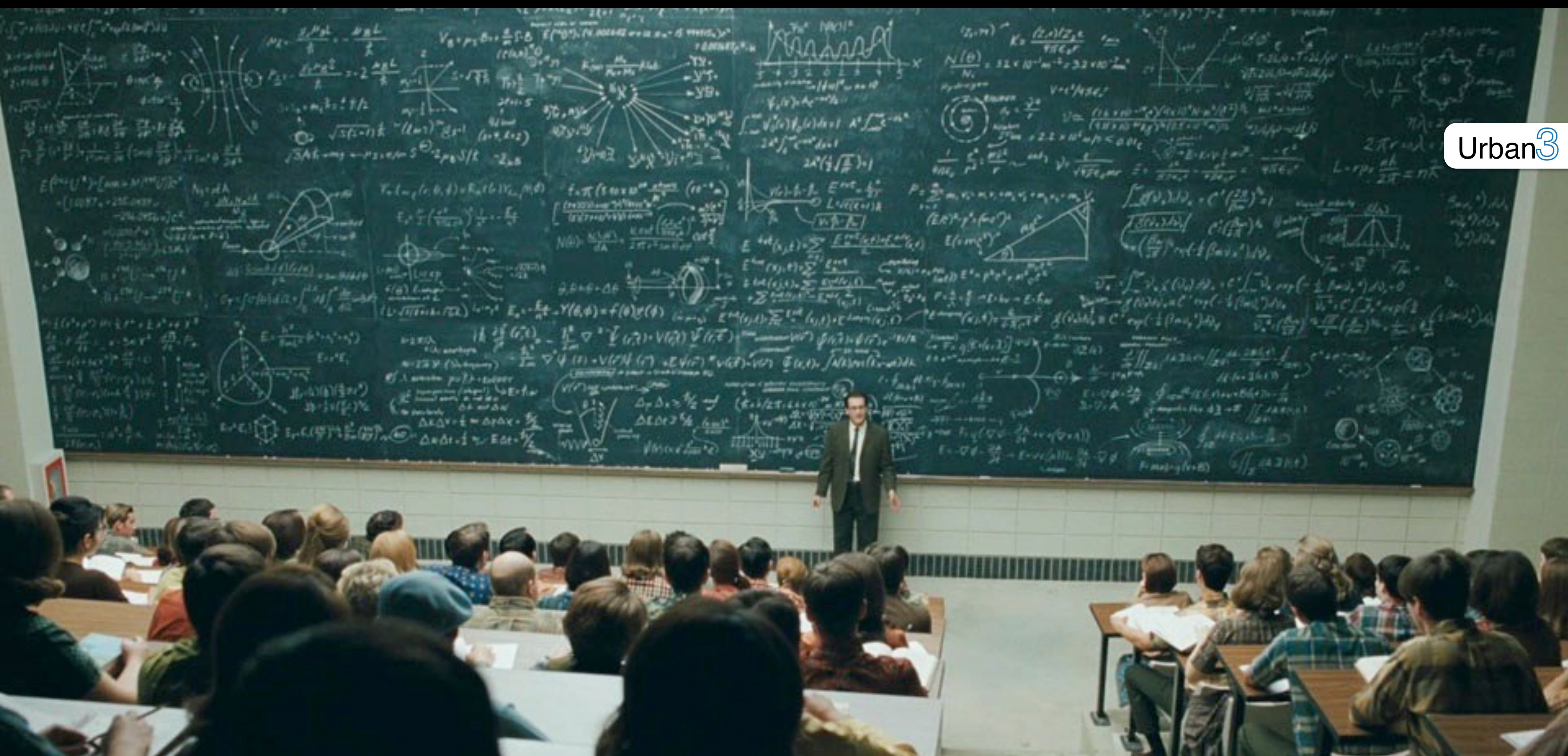
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<b>Residents per Acre:</b>	<b>0.0</b>	
<b>Jobs per Acre:</b>	<b>5.9</b>	<b>73.7</b>



# Urban3



<b>Land Consumed (Acres):</b>	<b>34.0</b>	<b>00.2</b>
<b>Total Property Taxes/Acre:</b>	<b>\$ 6,500</b>	<b>\$634,000</b>
<b>City Retail Taxes/Acre:</b>	<b>\$ 47,500</b>	<b>\$ 83,600</b>
<b>Residents per Acre:</b>	<b>0.0</b>	<b>90.0</b>
<b>Jobs per Acre:</b>	<b>5.9</b>	<b>73.7</b>



**We Do Scary Math**

# International Association of Assessing Officers

80th International Conference

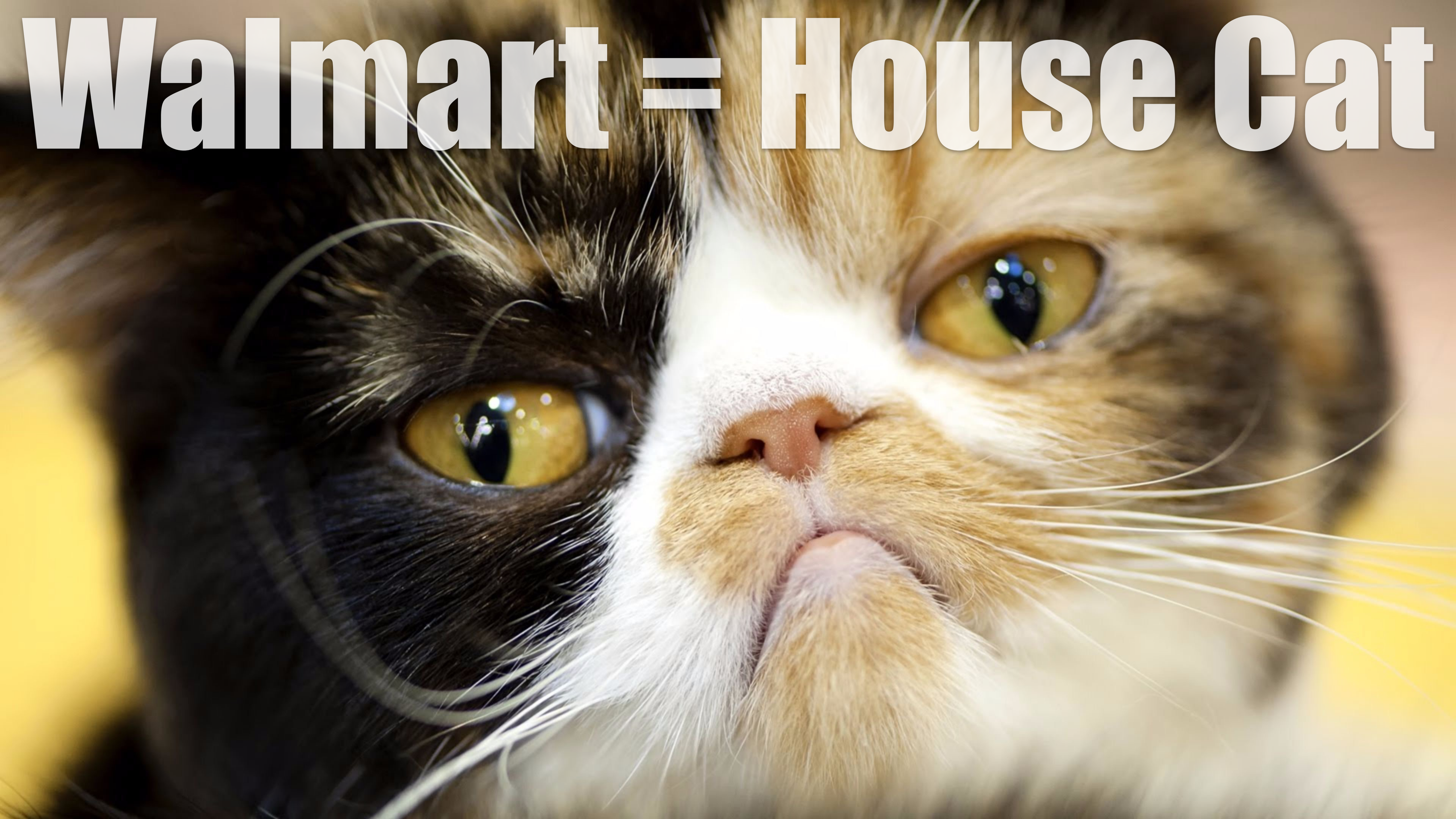
Sacramento, CA

August 26, 2014



**Charles Terrell, CMI**  
**Walmart**  
Director of Property Tax





**Walmart = House Cat**

# What are the numbers for Buncombe County?

N-662

# GREETINGS

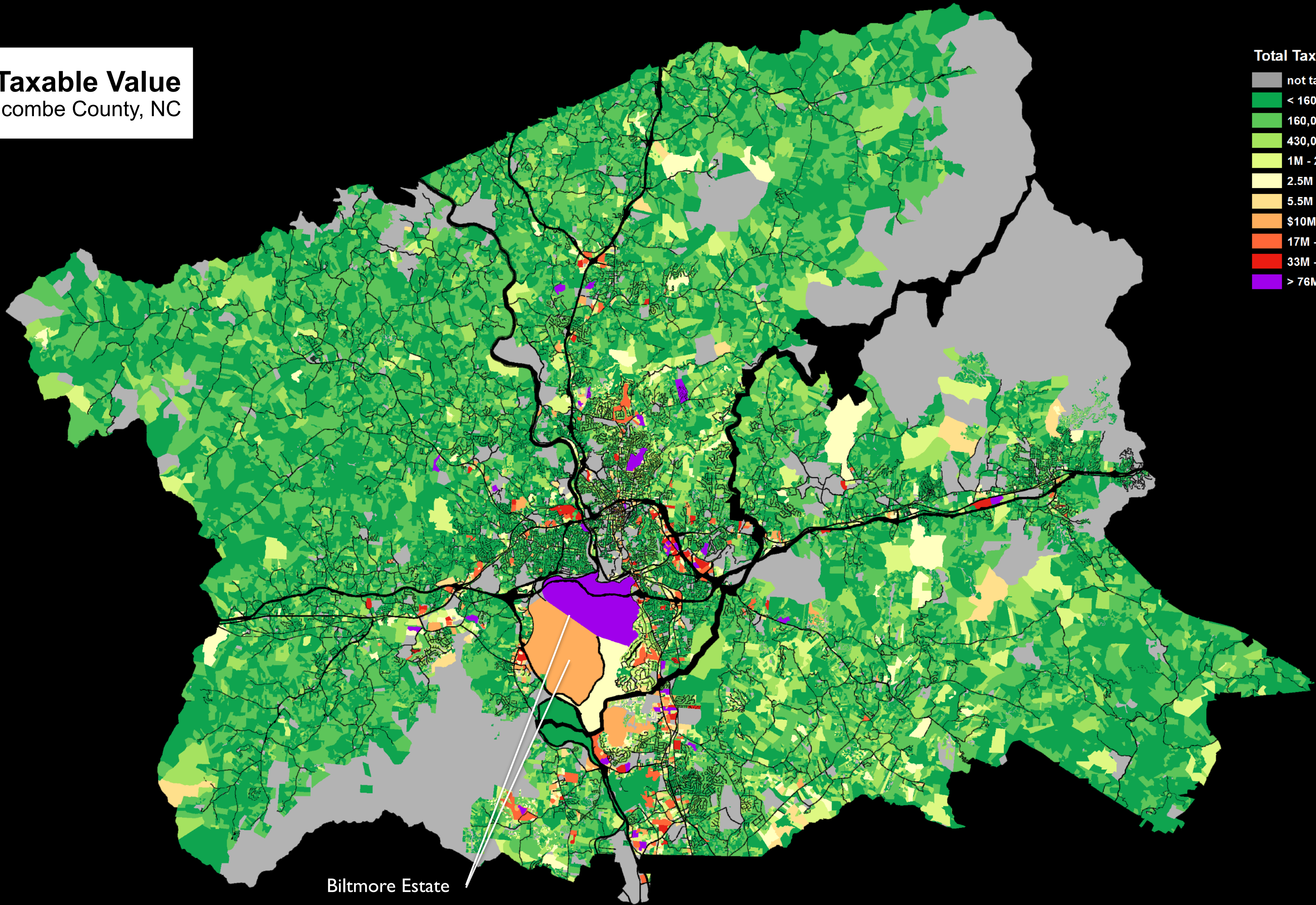
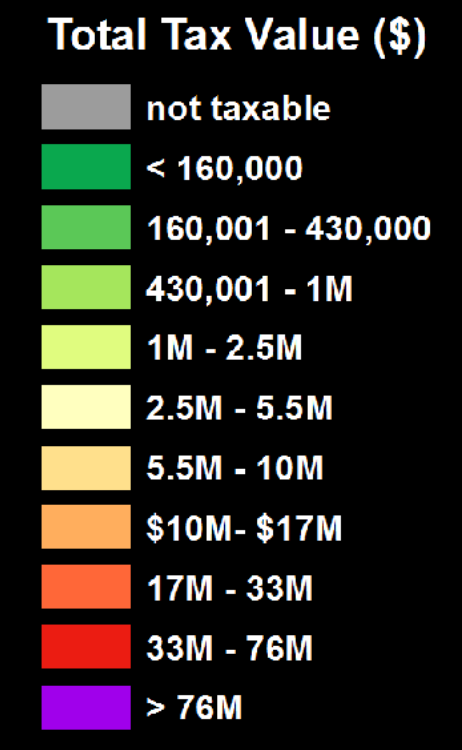
*from*



E-6264

# Total Taxable Value

Buncombe County, NC



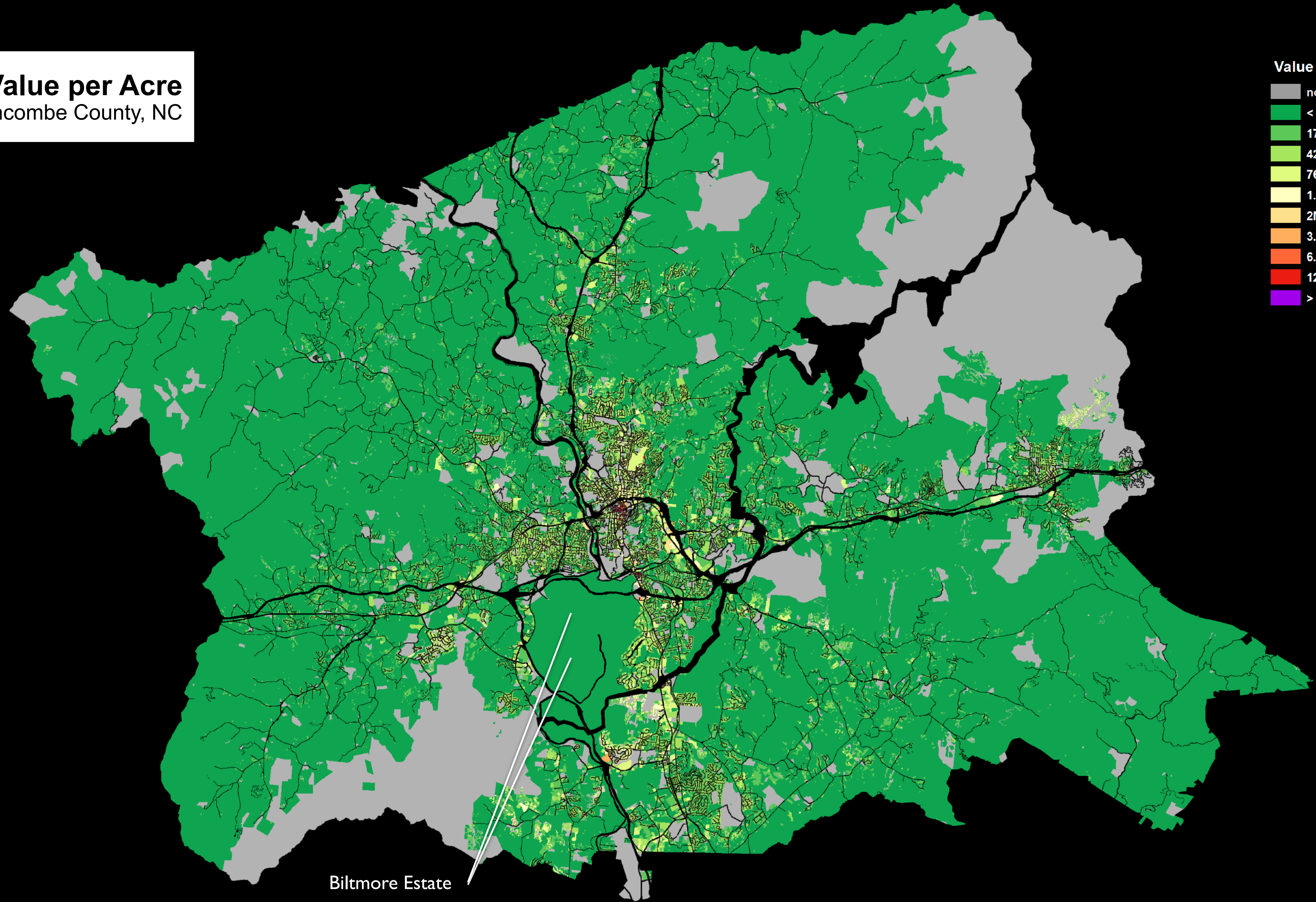
Biltmore Estate

# Taxable Value per Acre

Buncombe County, NC

## Value per Acre (\$)

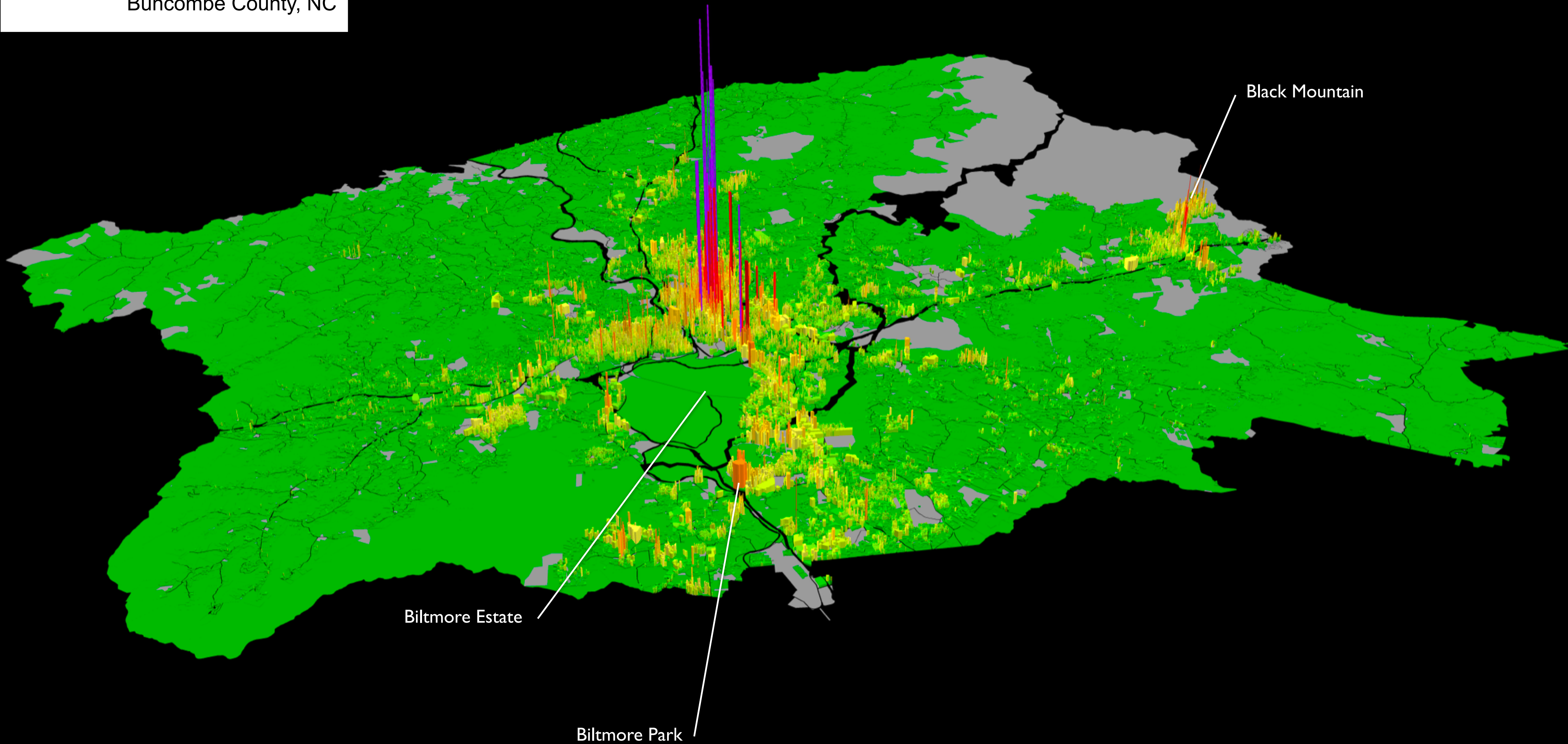
- not taxable
- < 170,000
- 170,001 - 420,000
- 420,001 - 760,000
- 760,001 - 1.2M
- 1.2M - 2M
- 2M - 3.5M
- 3.5M - 6.2M
- 6.2M - 12M
- 12M - 20M
- > 20M



Biltmore Estate

# Taxable Value per Acre

Buncombe County, NC





What are the numbers for Travis County?

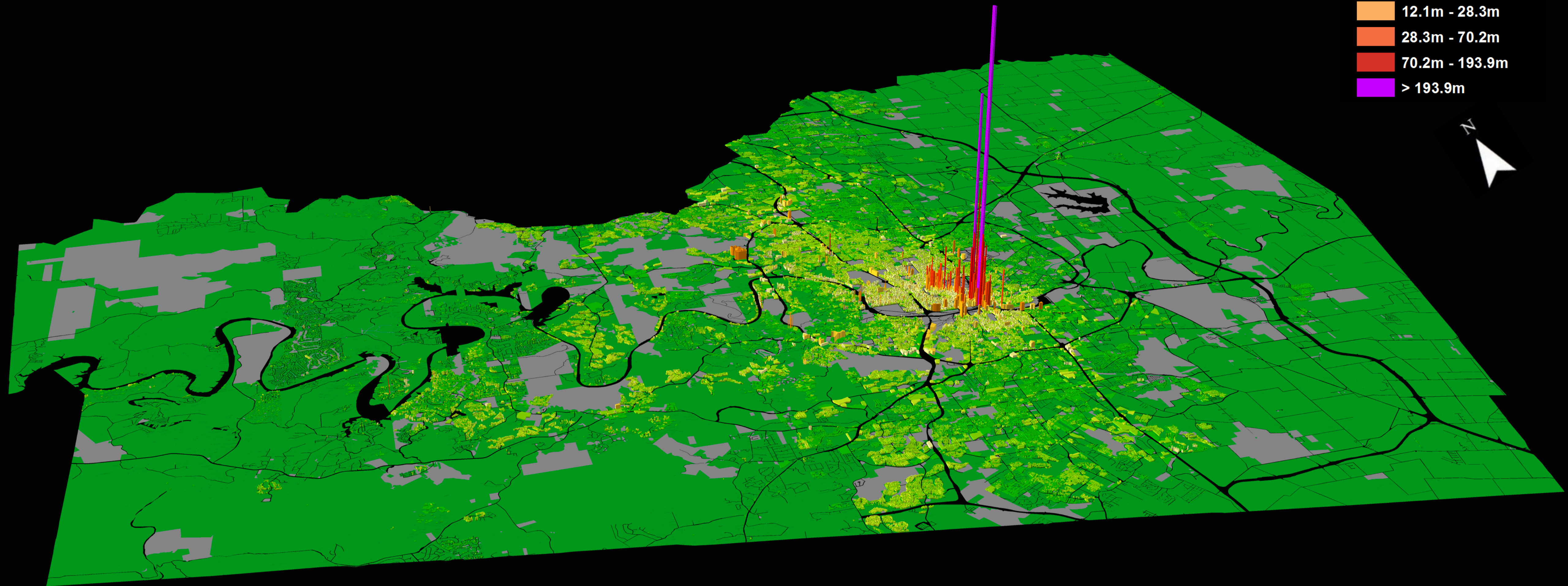


# Taxable Value Per Acre

Travis County, TX

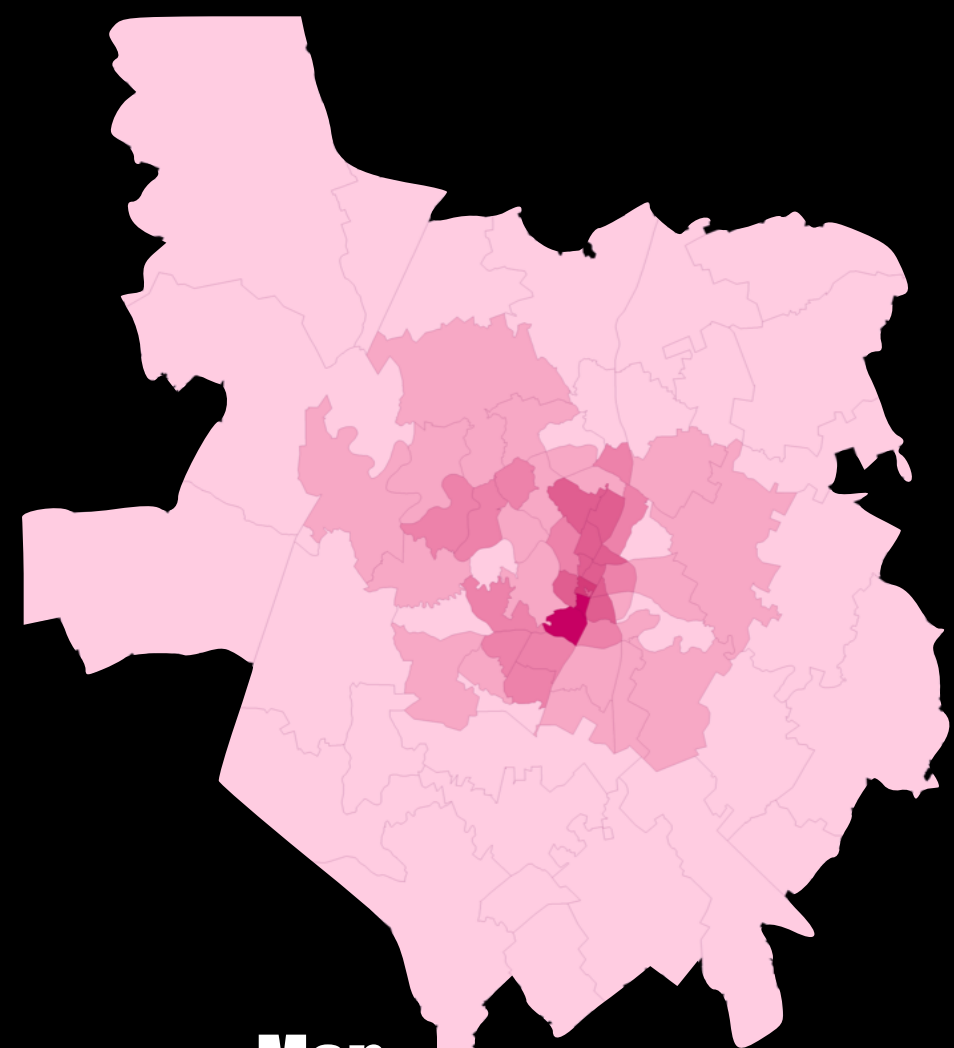
## Value per Acre (\$)

- not taxable
- < 460,000
- 460,001 - 1.1m
- 1.1m - 1.8m
- 1.8m - 3.1m
- 3.1m - 5.9m
- 5.9m - 12m
- 12.1m - 28.3m
- 28.3m - 70.2m
- 70.2m - 193.9m
- > 193.9m



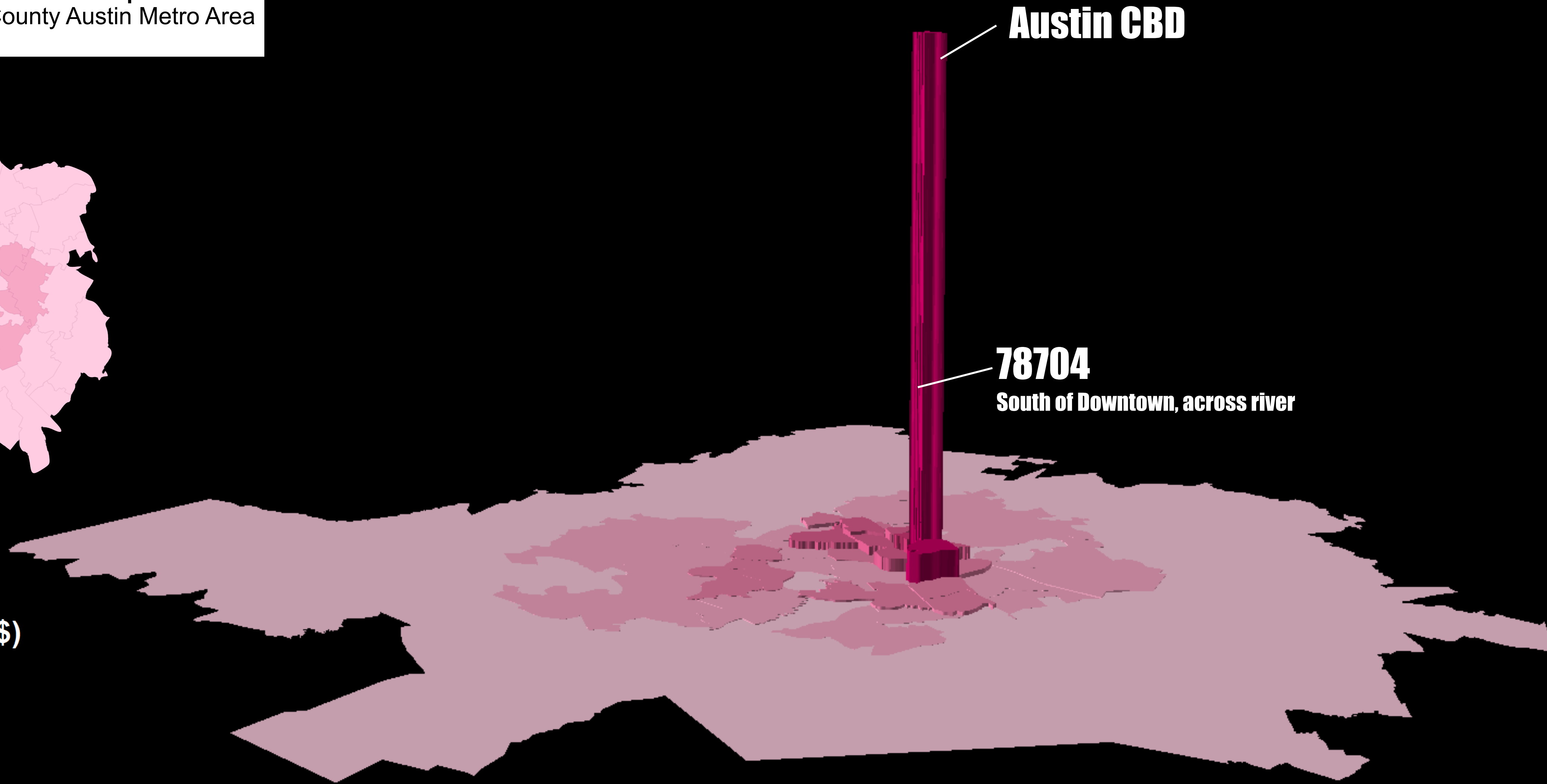
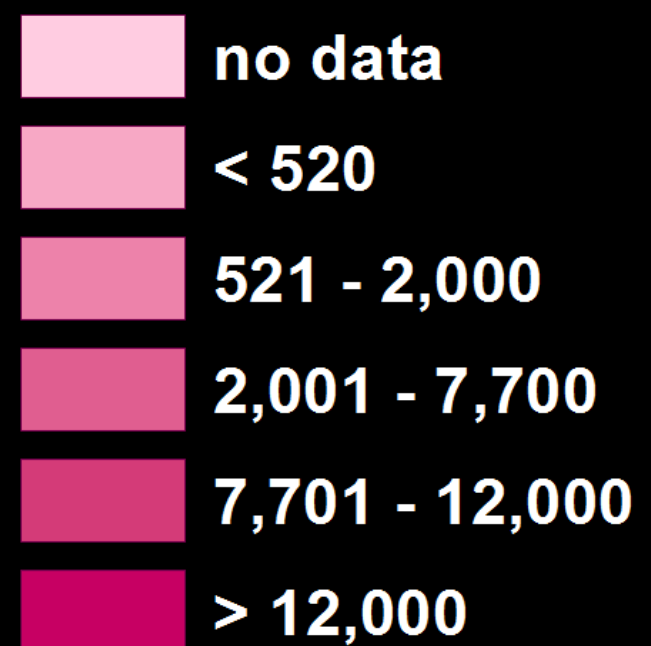
# Mixed Beverage Sales per Acre

Six County Austin Metro Area



Map

## Sales per Acre (\$)



**Austin CBD**

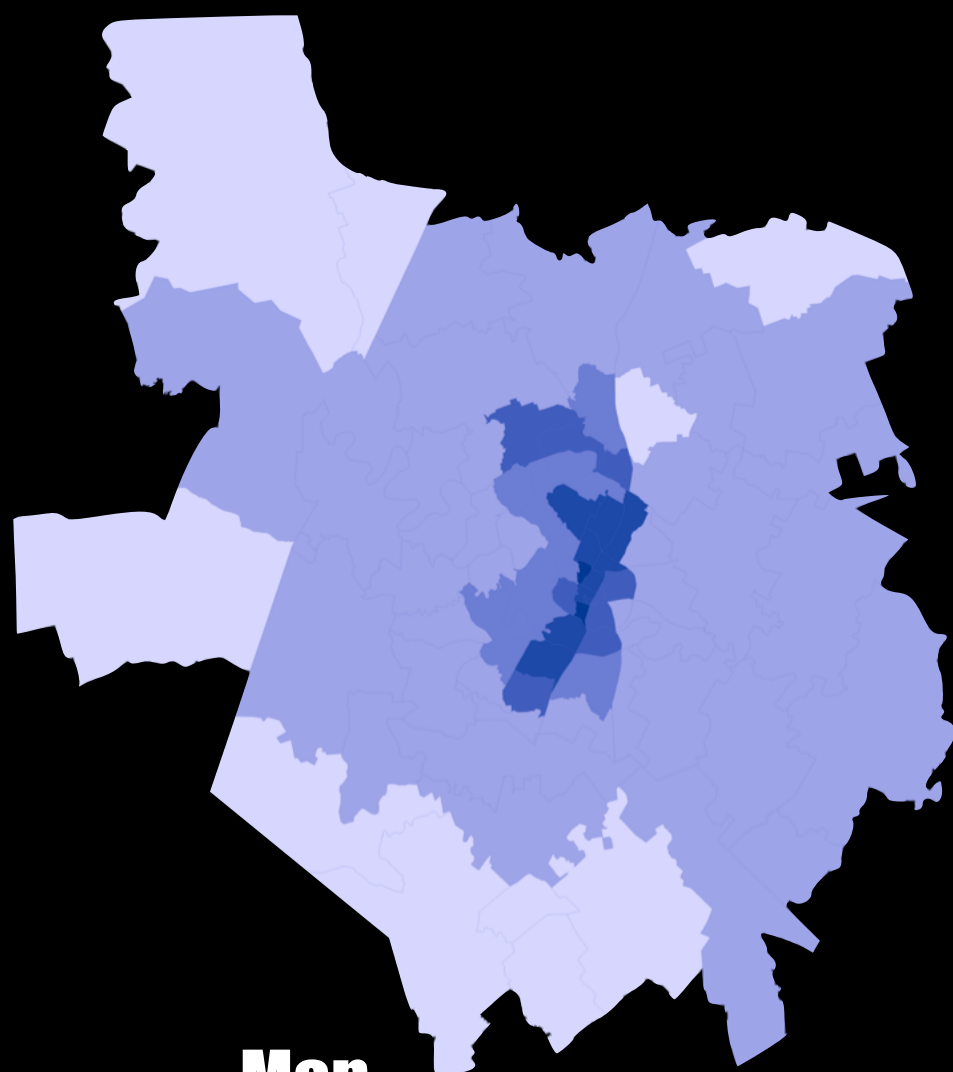
**78704**

**South of Downtown, across river**

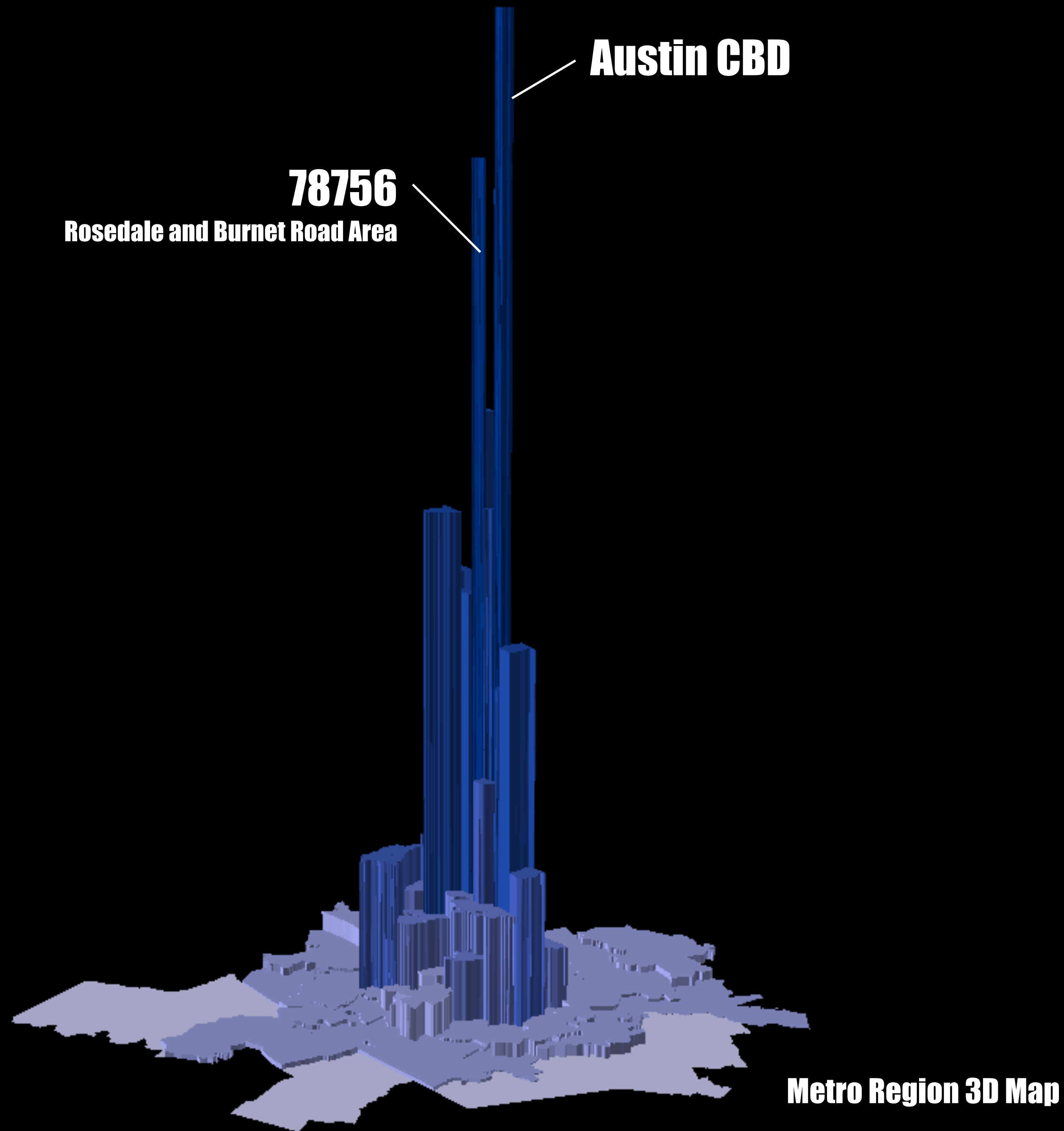
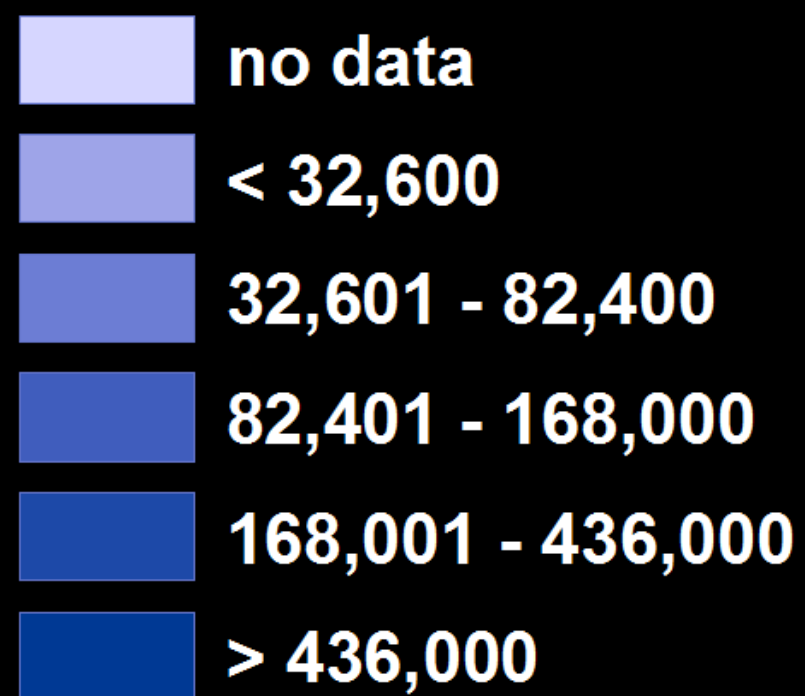
Metro Region 3D Map

# Retail & Food Sales per Acre

Six County Austin Metro Area

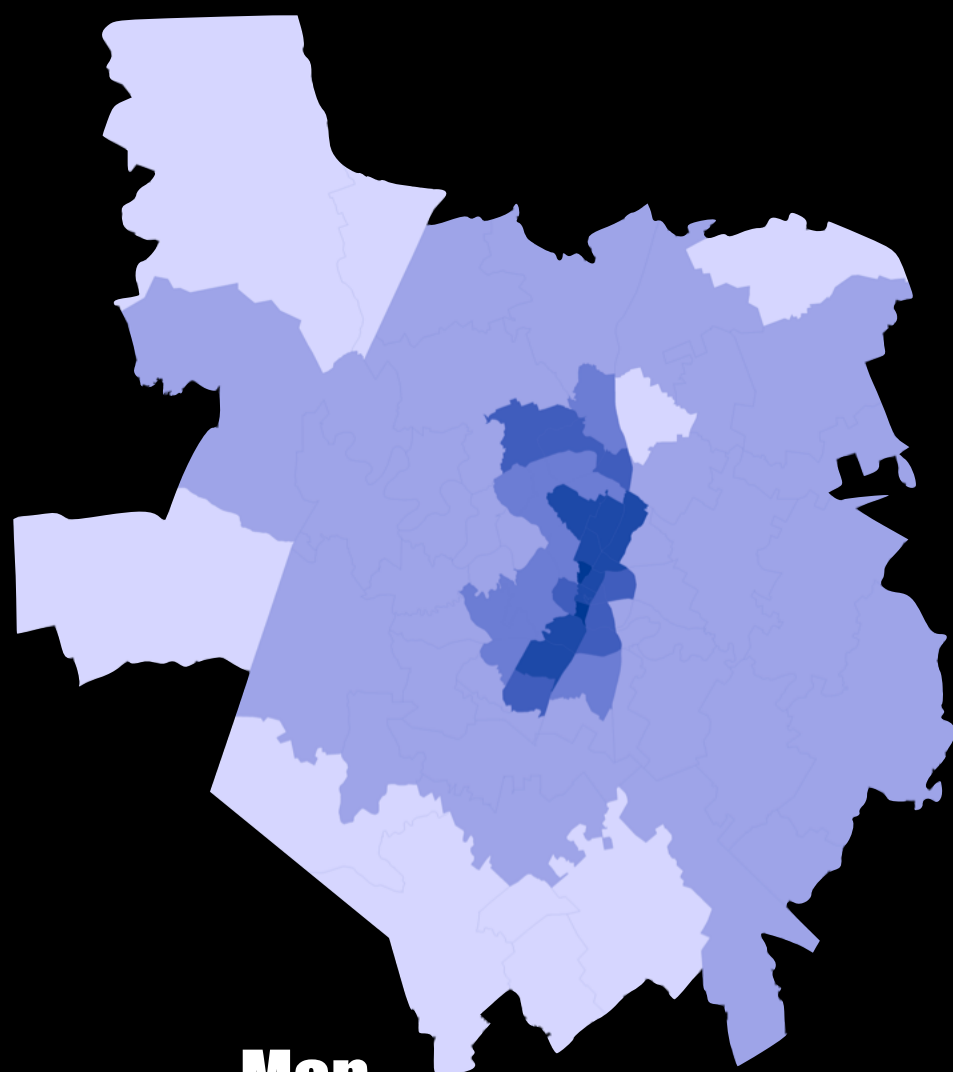


## Sales per Acre (\$)



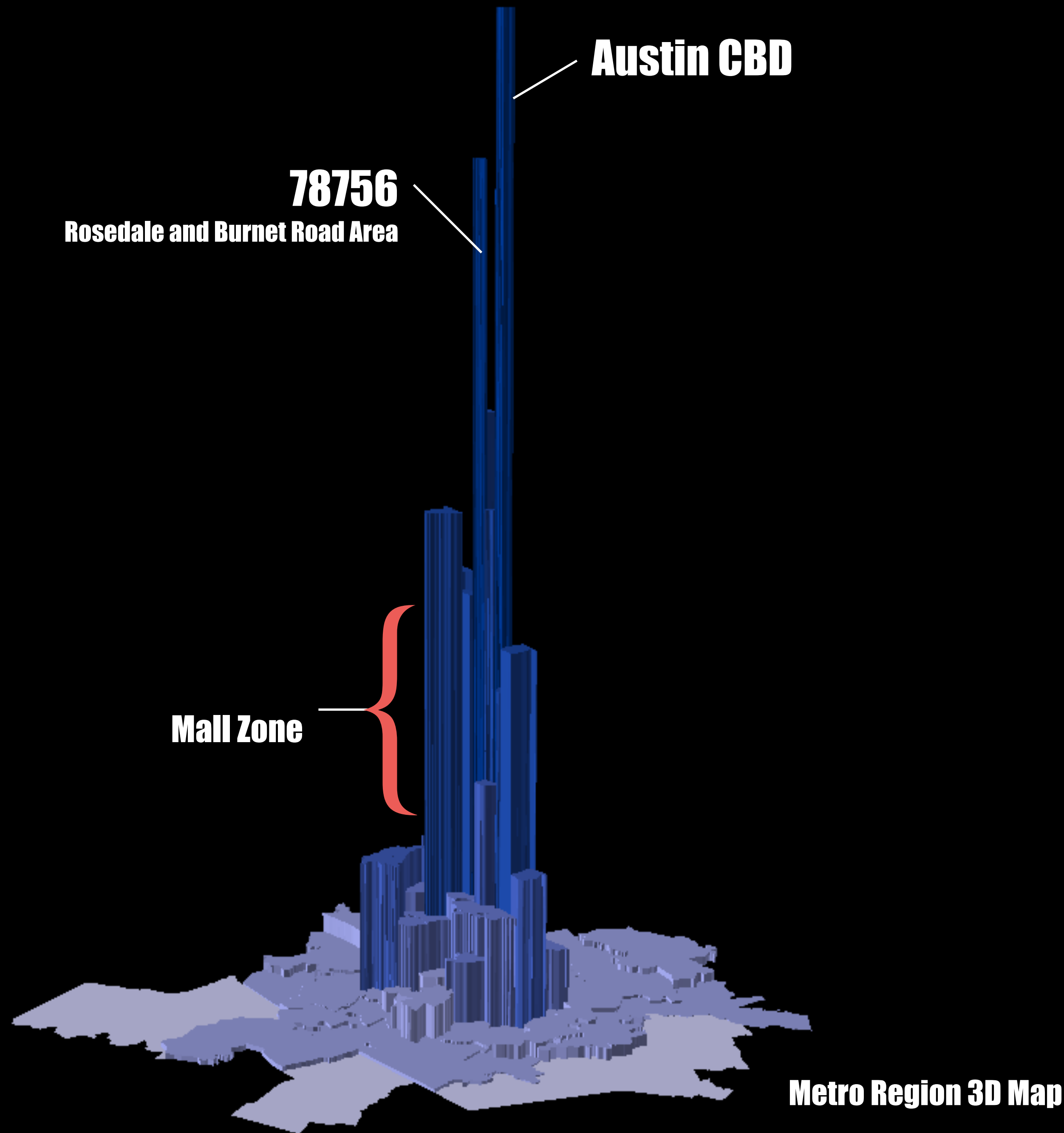
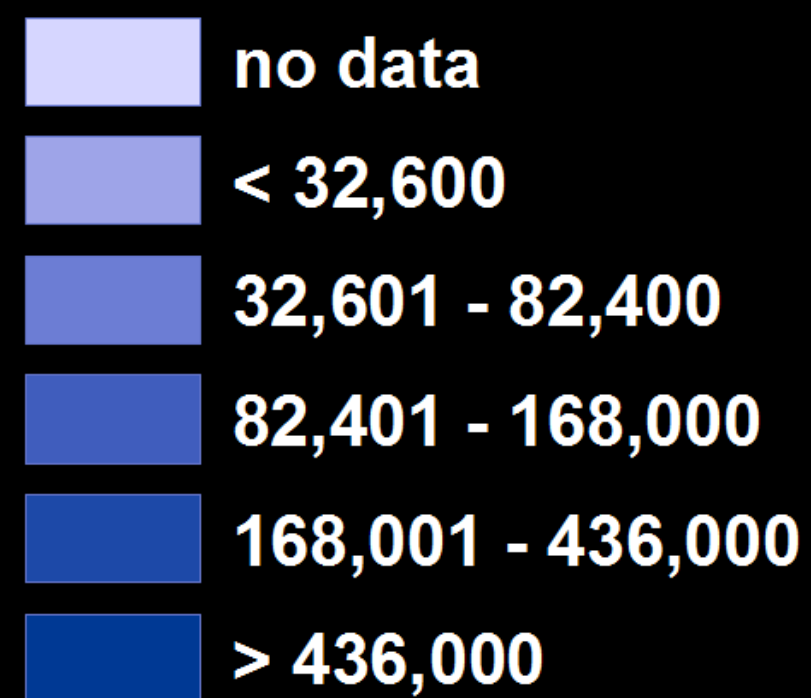
# Retail & Food Sales per Acre

Six County Austin Metro Area



Map

## Sales per Acre (\$)

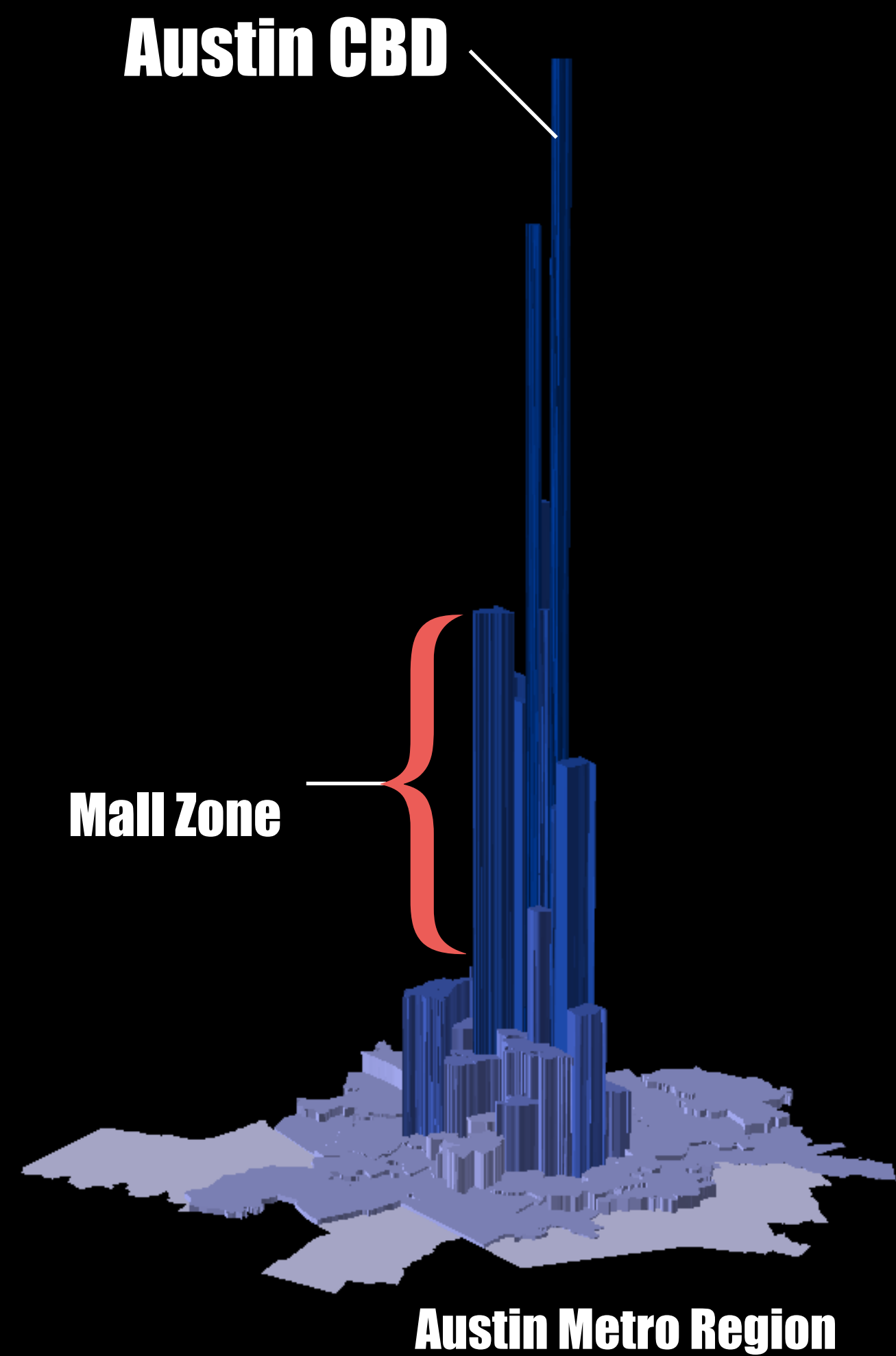


# Retail Model Comparables

Metro Retail Sales Models

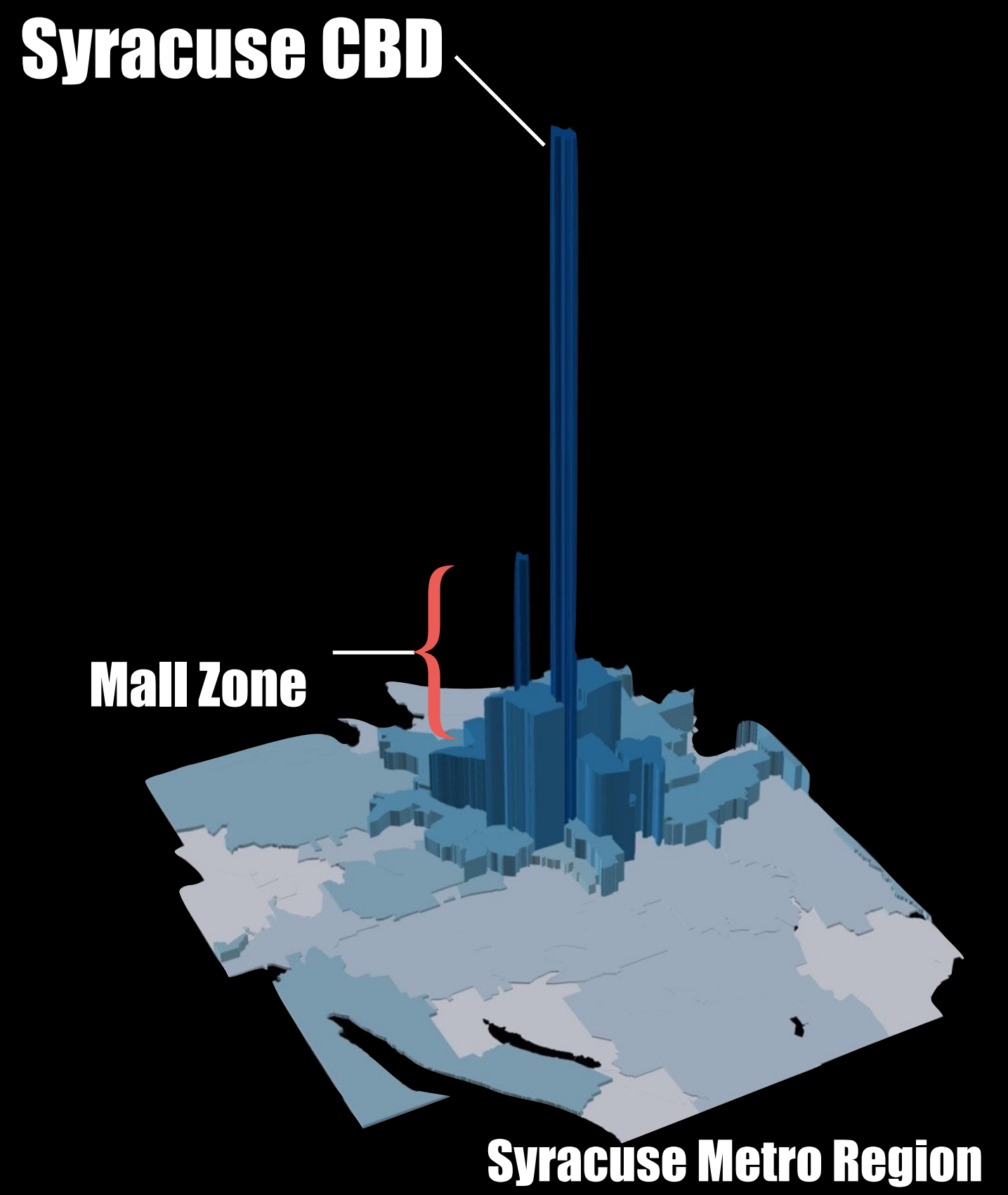
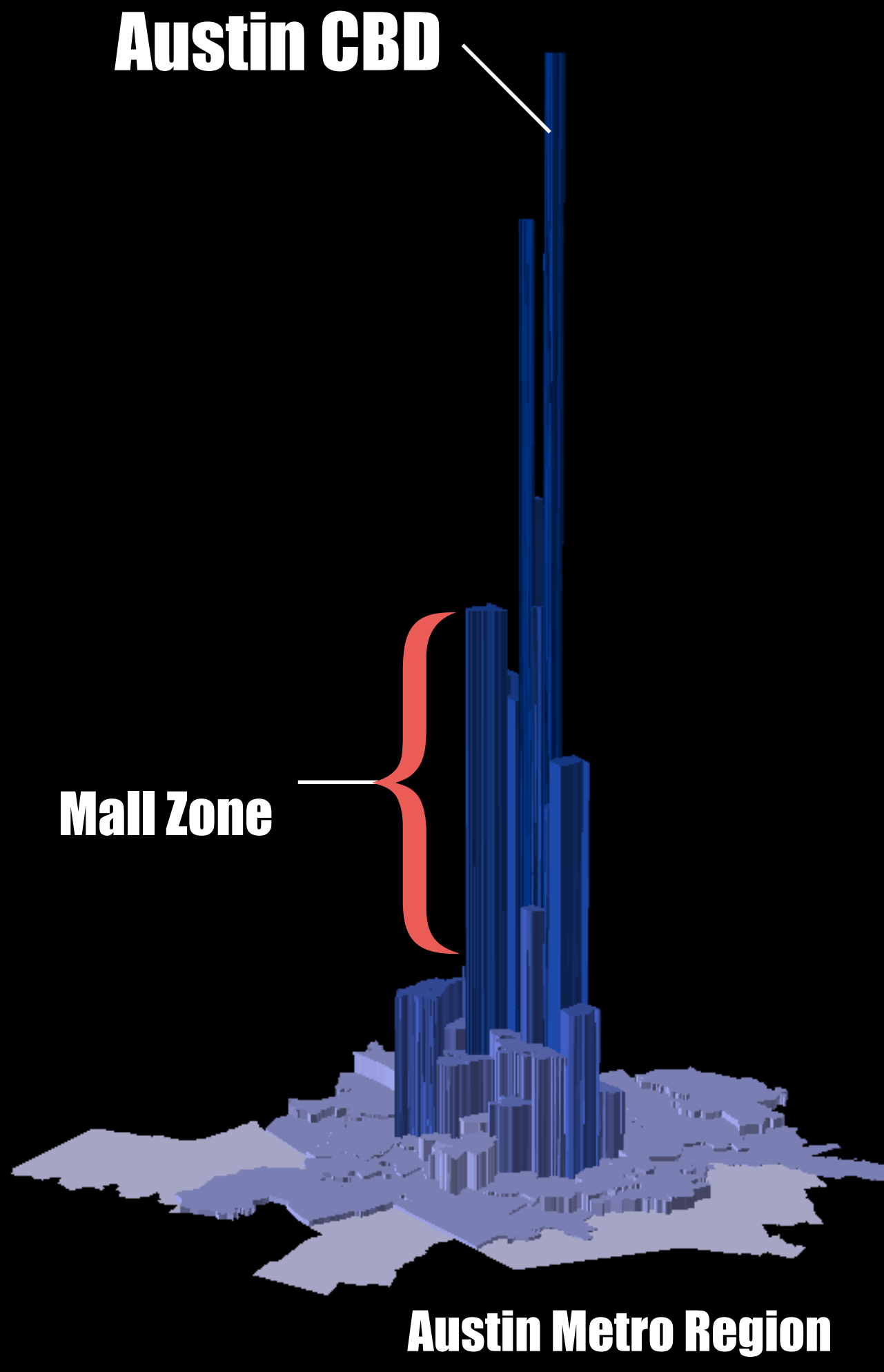
# Retail Model Comparables

Metro Retail Sales Models



# Retail Model Comparables

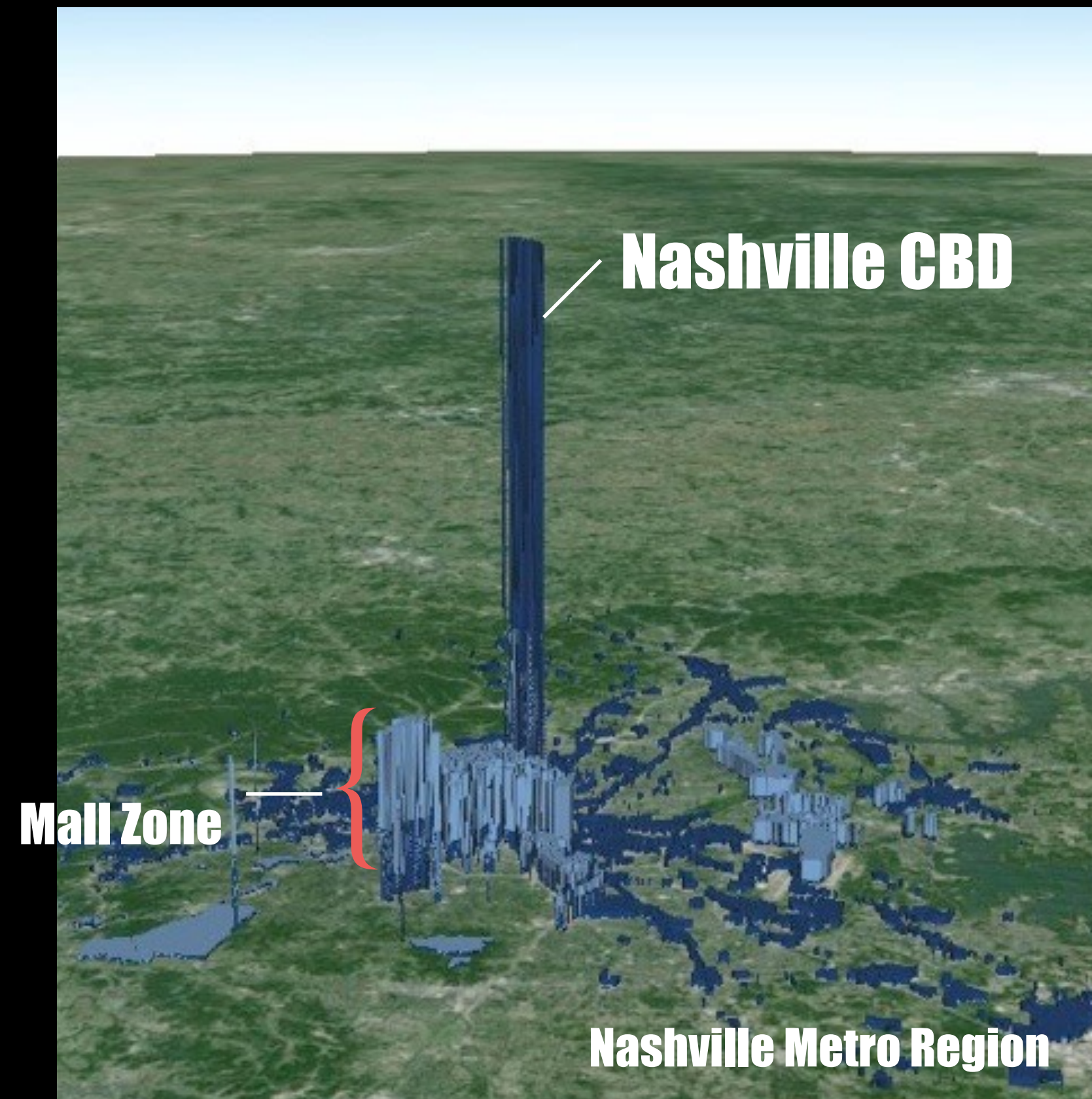
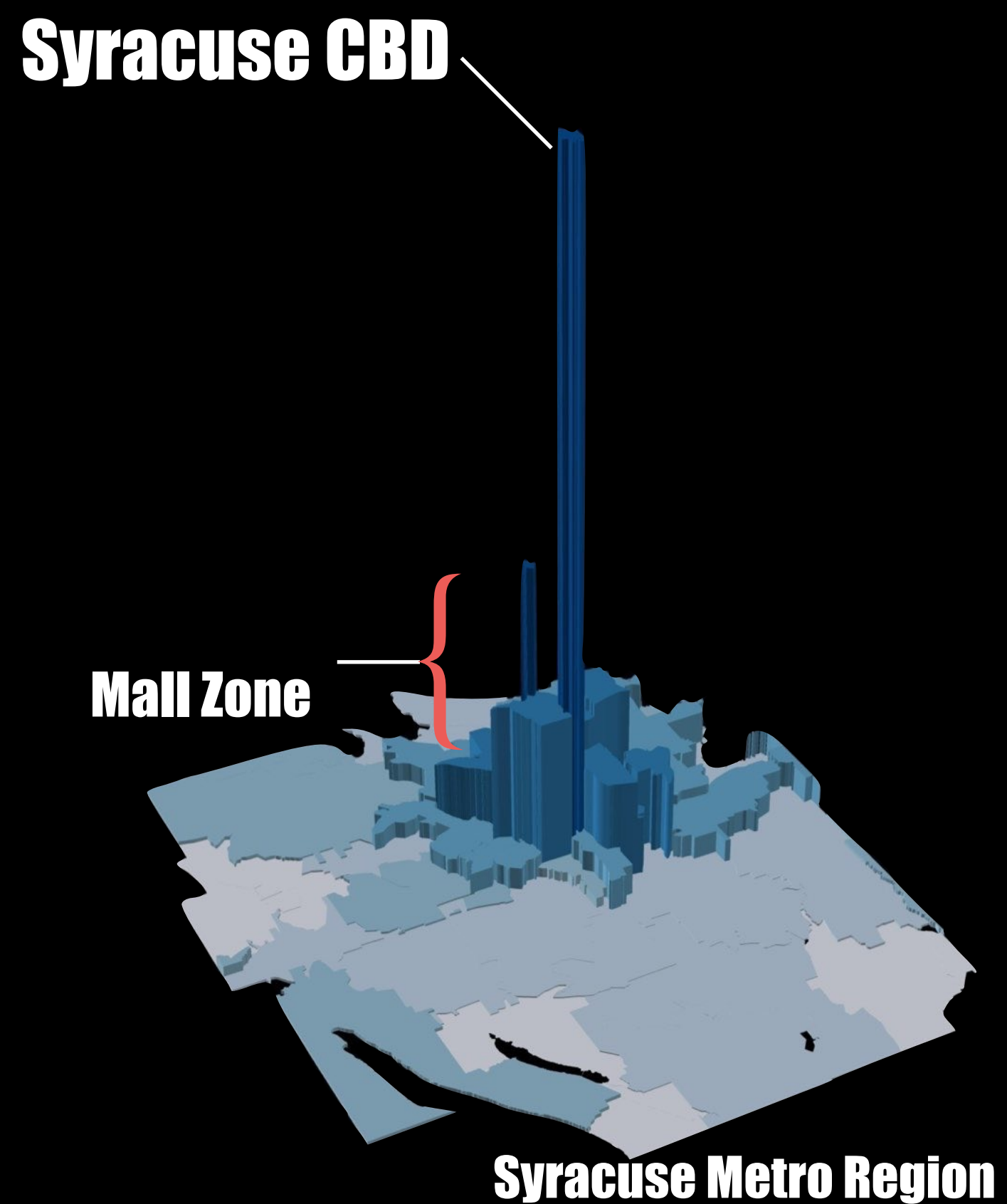
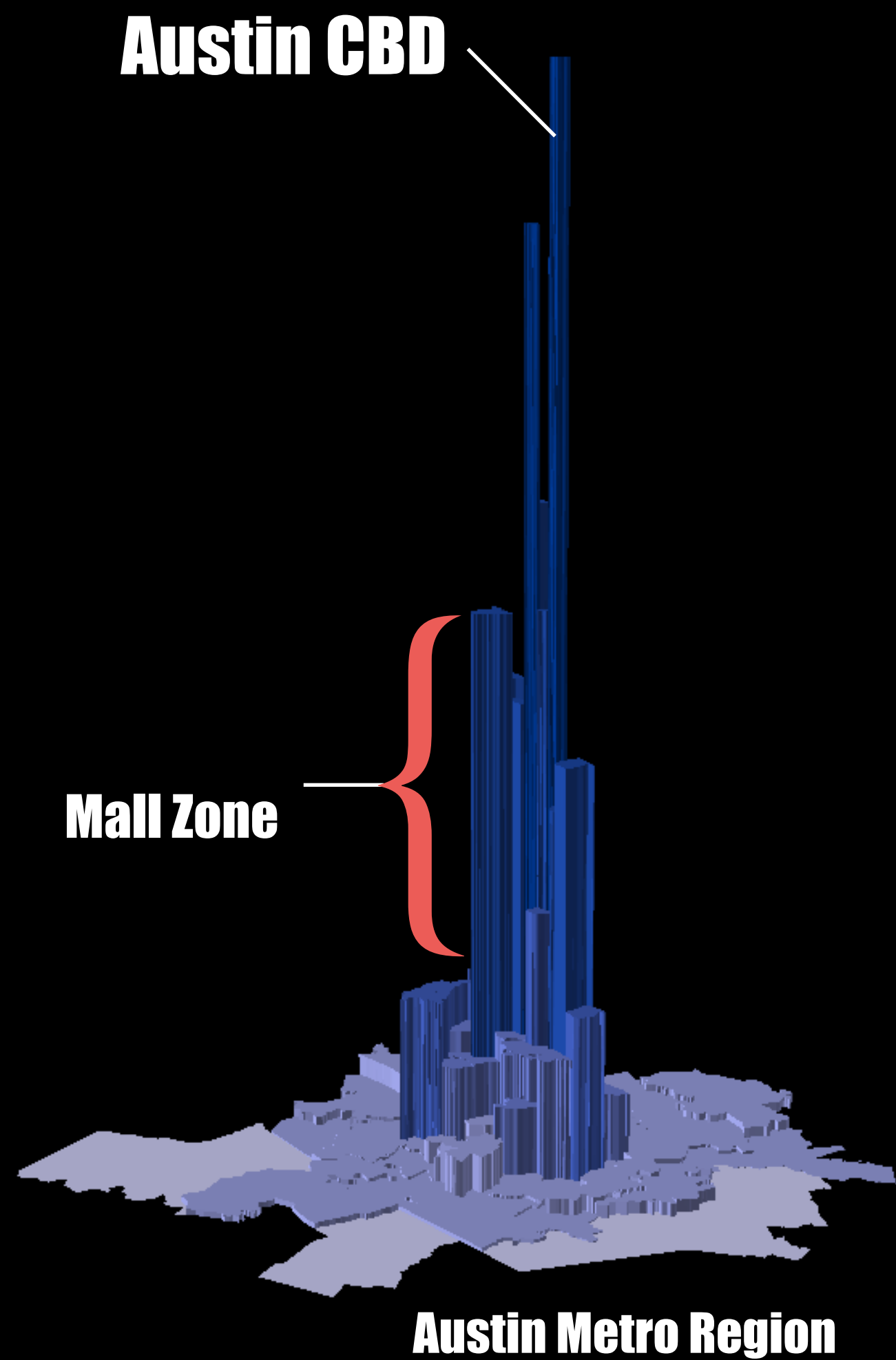
Metro Retail Sales Models





# Retail Model Comparables

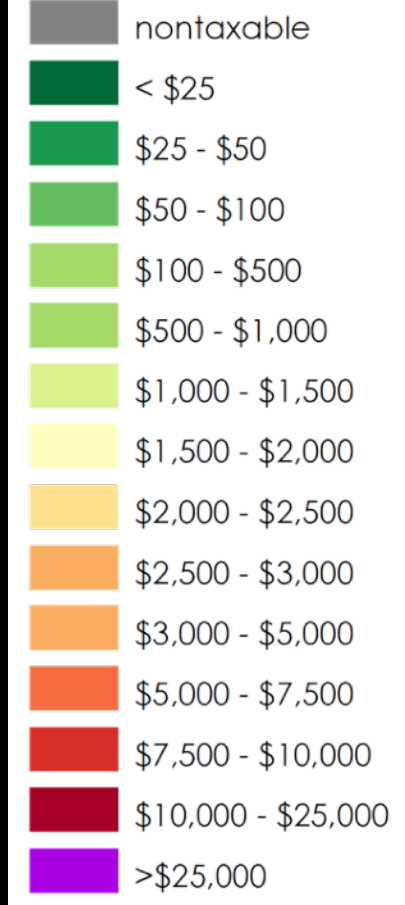
Metro Retail Sales Models





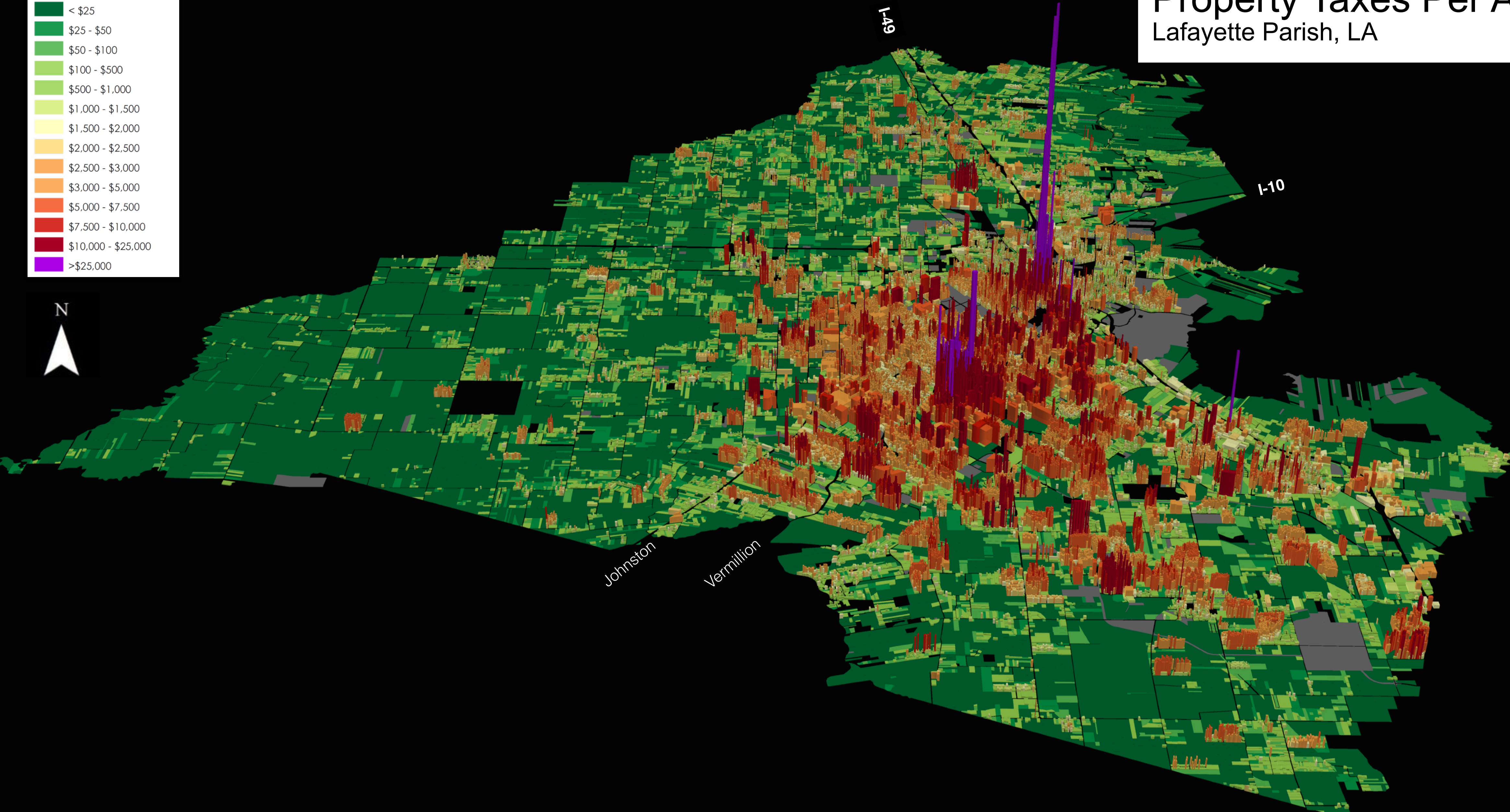
**Lafayette, LA**

property tax per acre



# Property Taxes Per Acre

Lafayette Parish, LA



Johnston

Vermillion

I-49

I-10



**Pavement**

# Network Distribution Methodology

Lafayette Parish, LA



This is the relative necessity of all trips in the network.

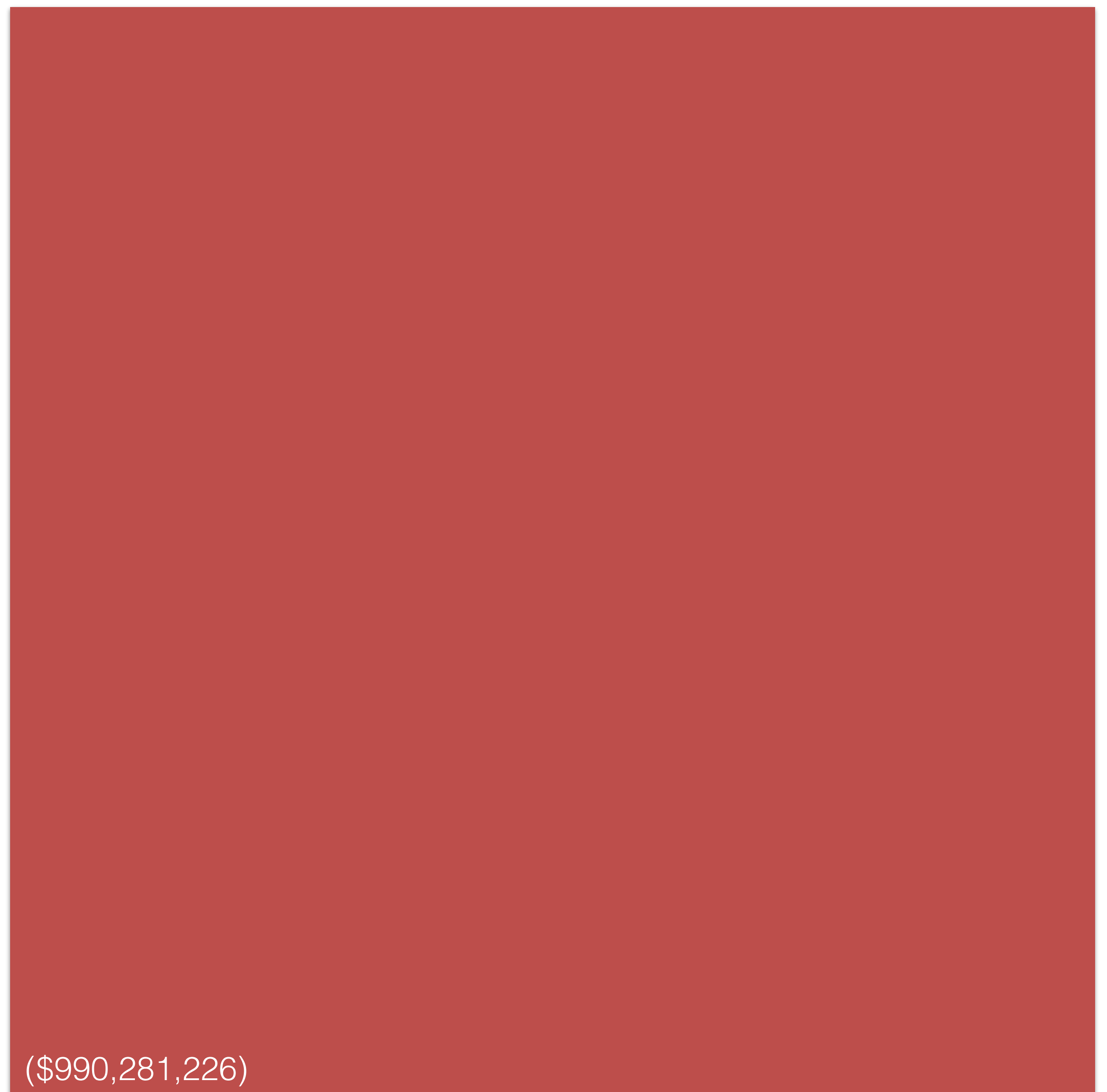
**System Weighted**

# Accumulated 50 Year Total

(2015) Lafayette, LA



Capital Revenue



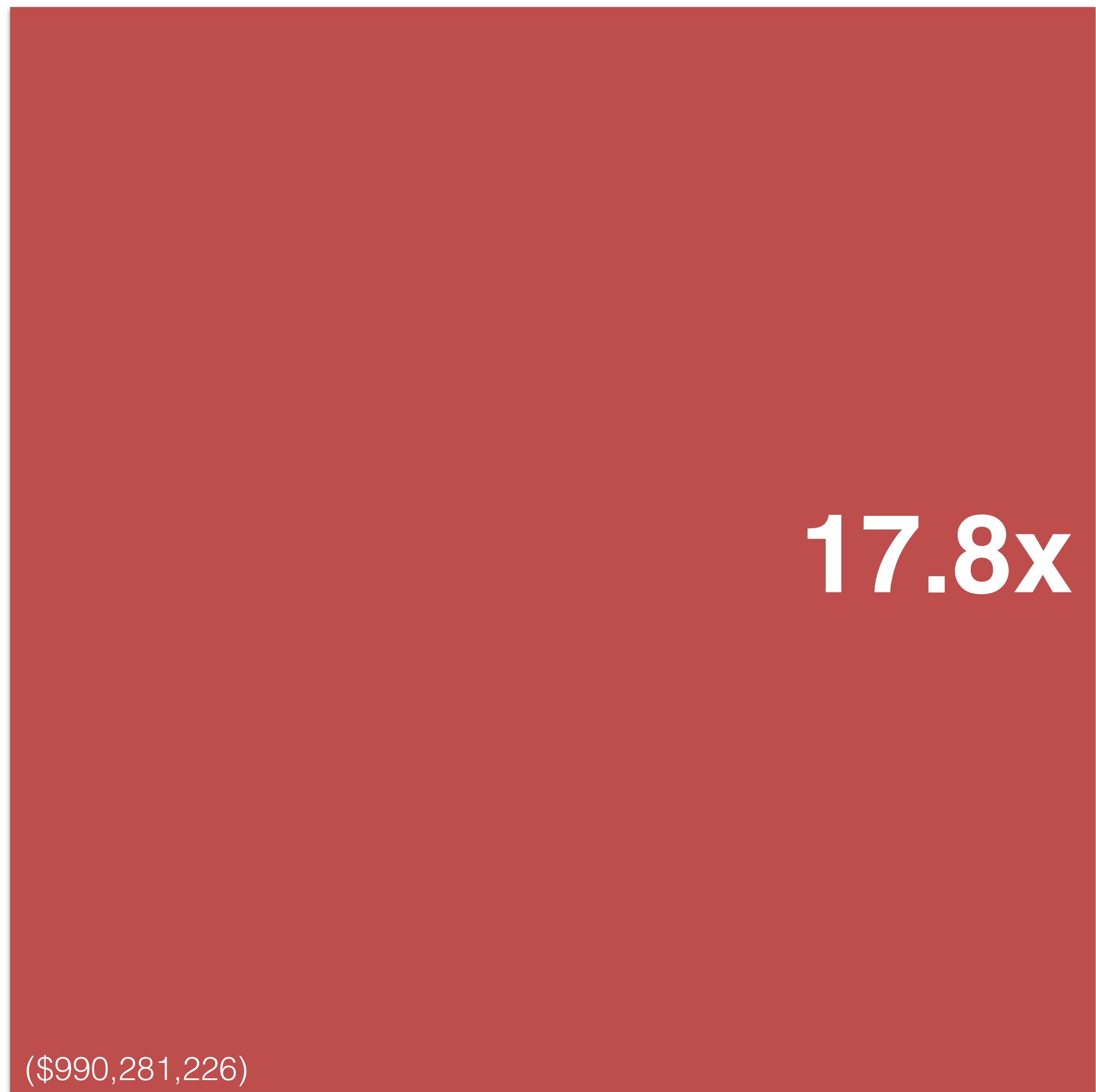
Road Cost

# Accumulated 50 Year Total

(2015) Lafayette, LA



\$55,585,797  
Capital Revenue



(\$990,281,226)  
Road Cost

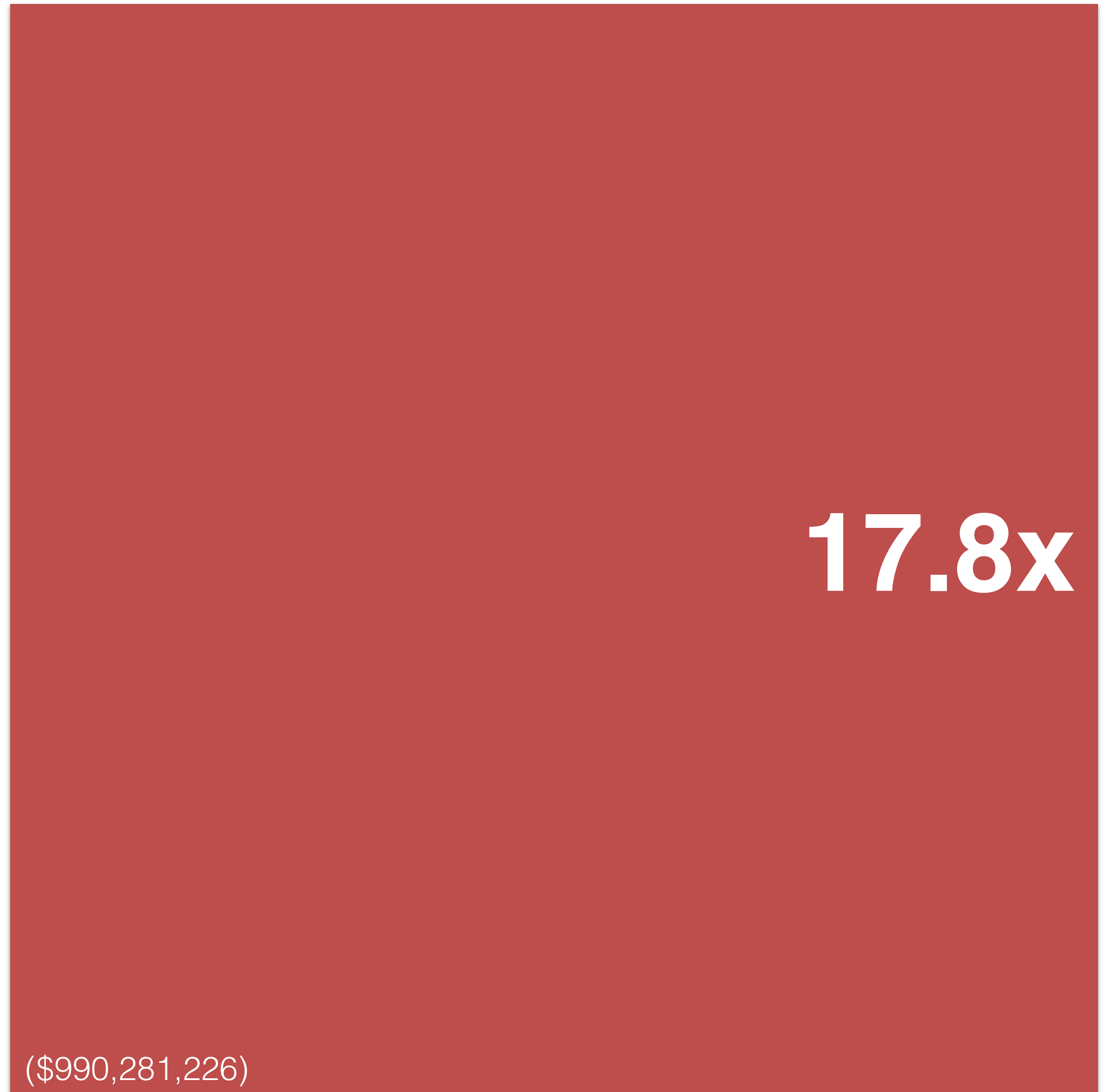
17.8x

# Accumulated 50 Year Total

(2015) Lafayette, LA



Capital Revenue



Road Cost





**“It’s not where you live;  
it’s what you believe.”**

Jared Bellerd  
Lafayette Councilman



**“It’s not where you live;  
it’s what you believe.”**

Jared Bellerd  
Lafayette Coucilman



**There is no such thing as an infrastructure fairy.**

Kevin Blanchard  
World’s Greatest Public Works Director



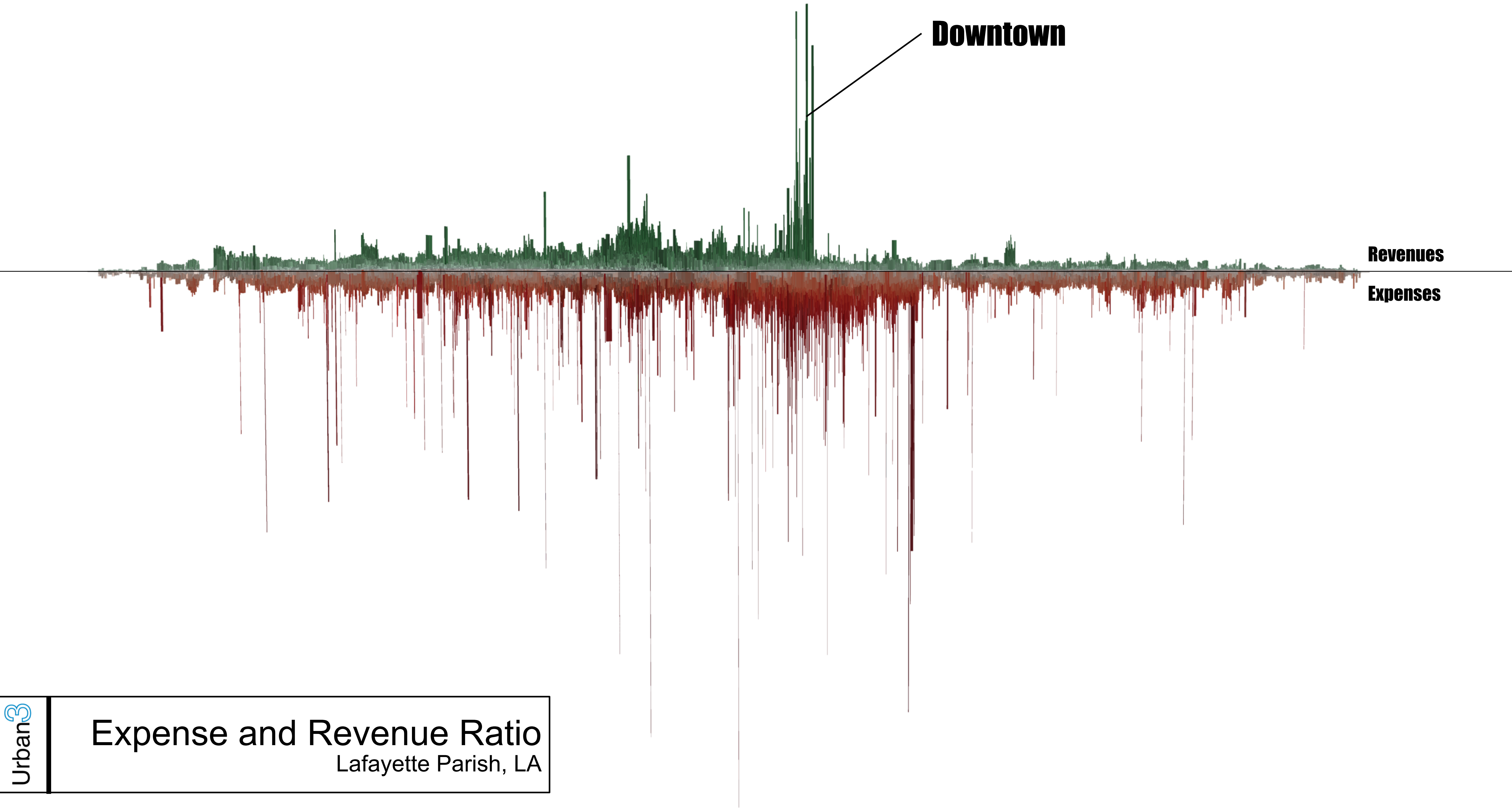
**“It’s not where you live;  
it’s what you believe.”**

Jared Bellerd  
Lafayette Coucilman



**There is no such thing as an infrastructure fairy.**

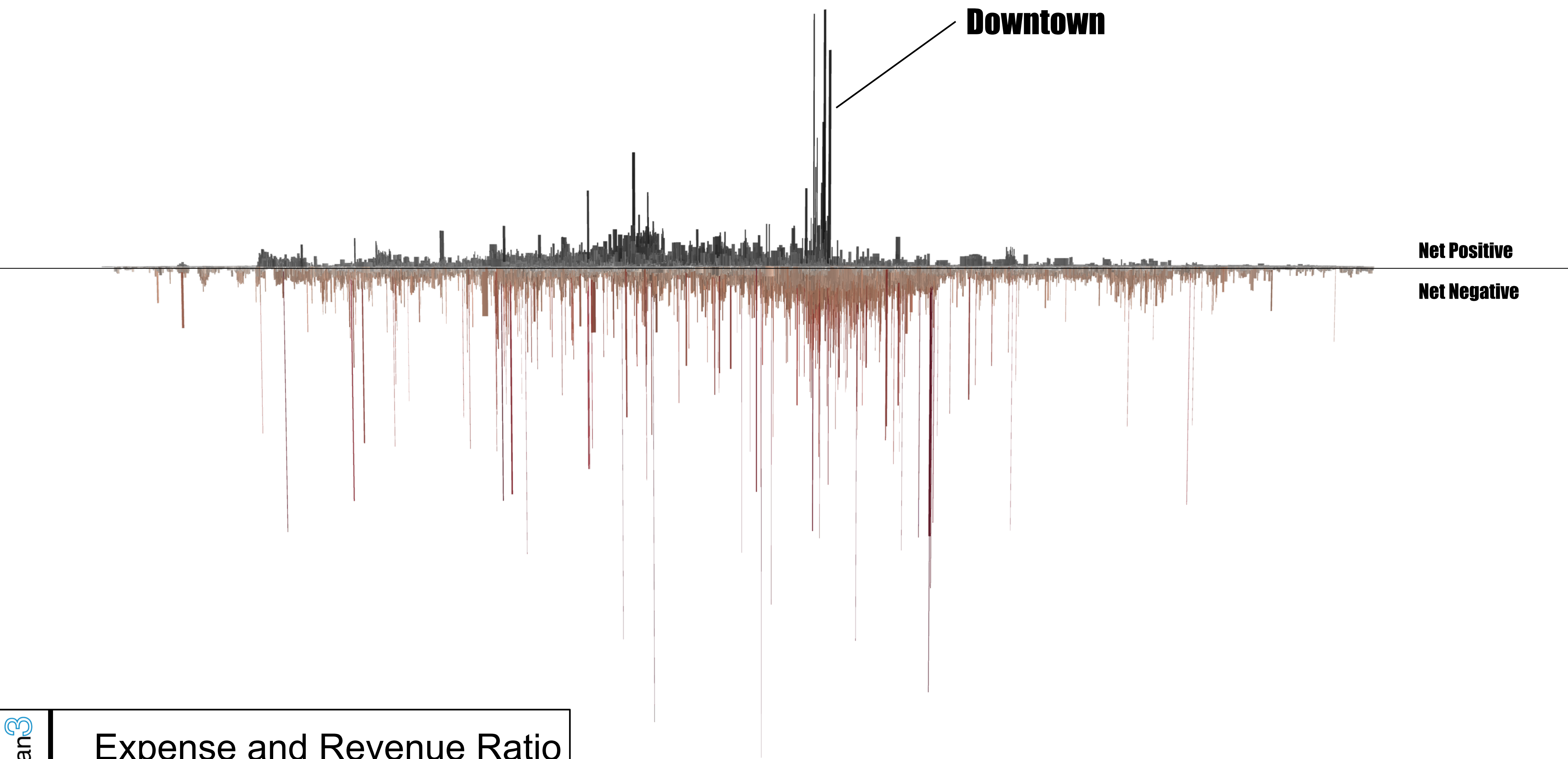
Kevin Blanchard  
World’s Greatest Public Works Director



**Downtown**

**Revenues**

**Expenses**



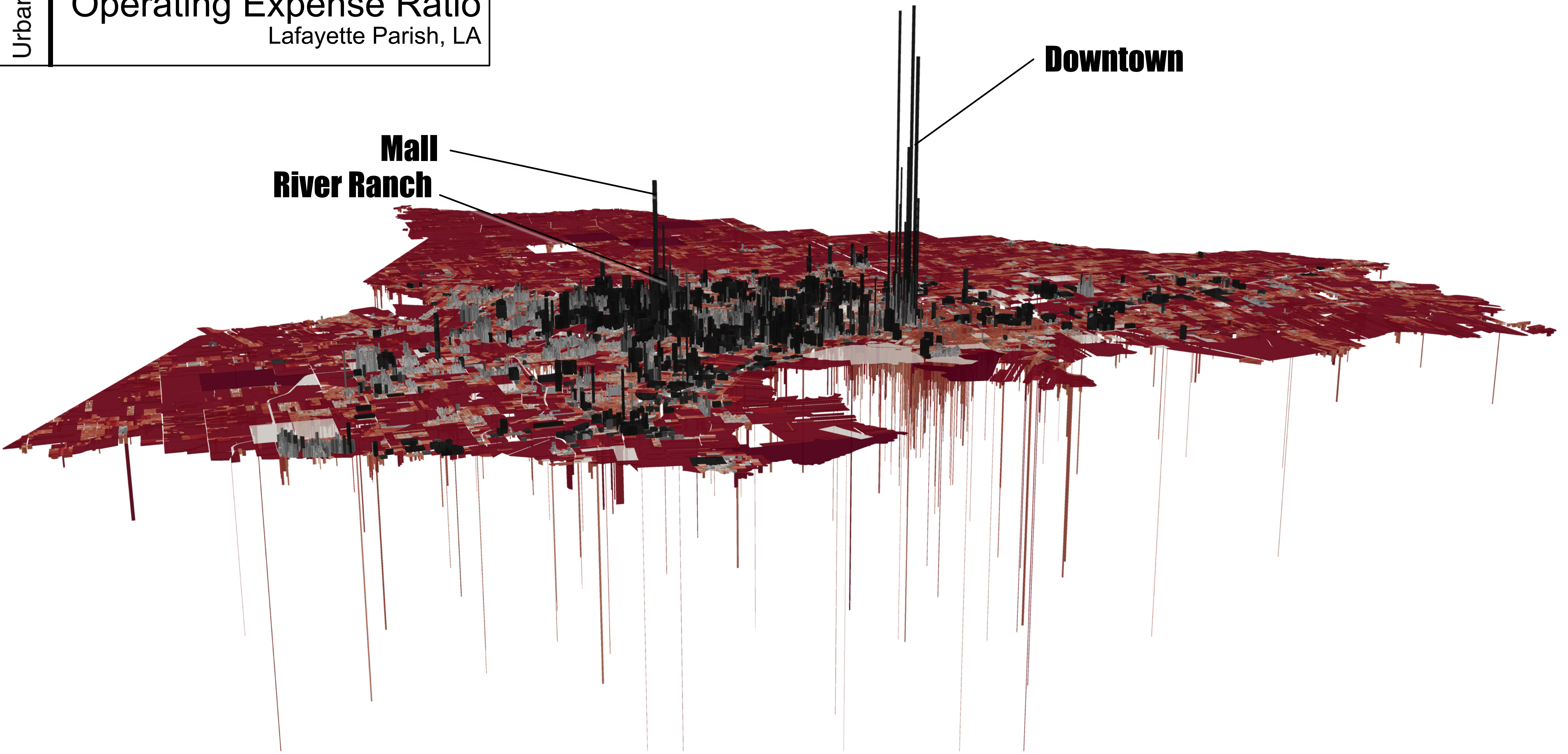
**Downtown**

**Net Positive**

**Net Negative**

# Operating Expense Ratio

Lafayette Parish, LA

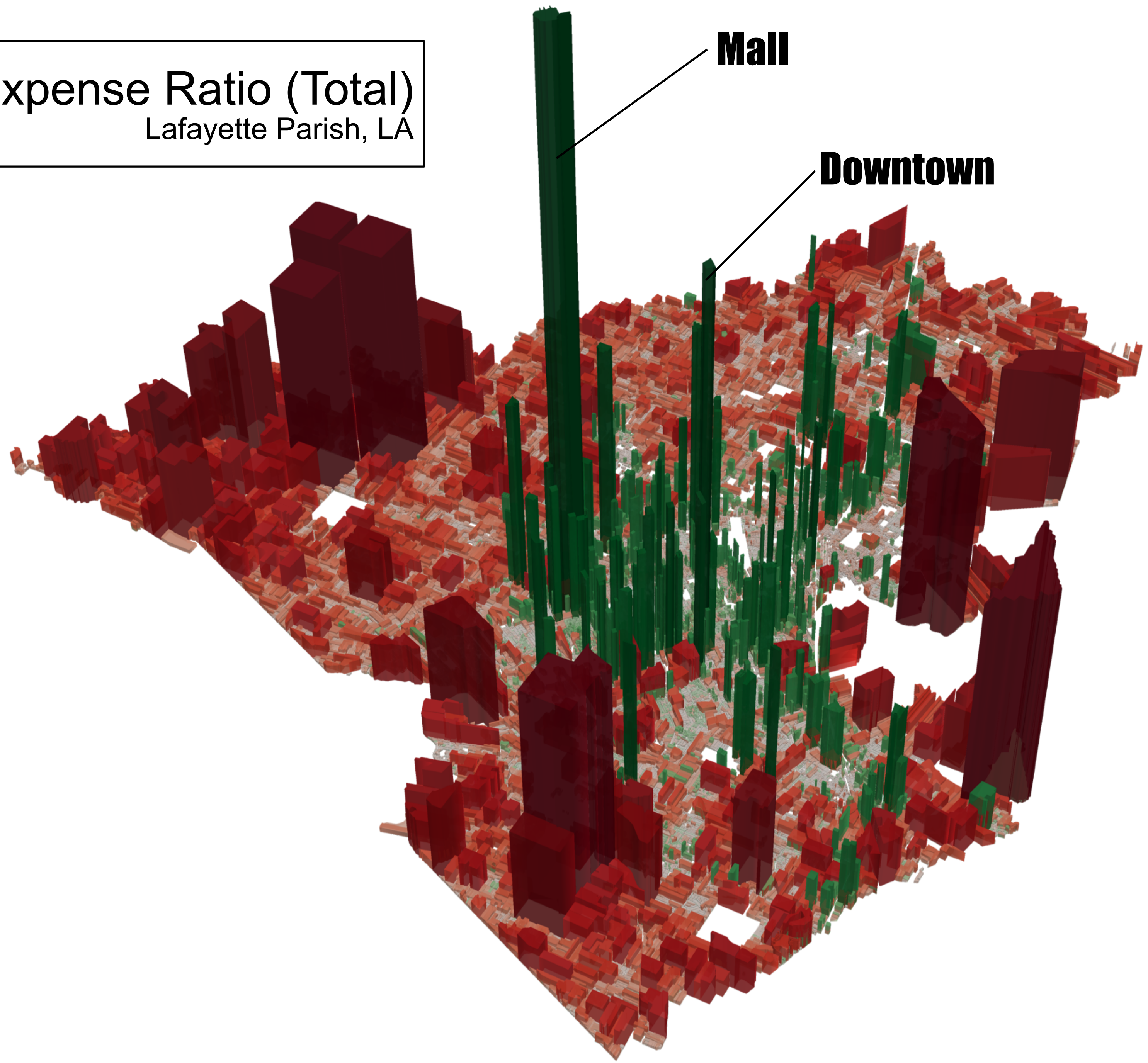


**Mall**  
**River Ranch**

**Downtown**

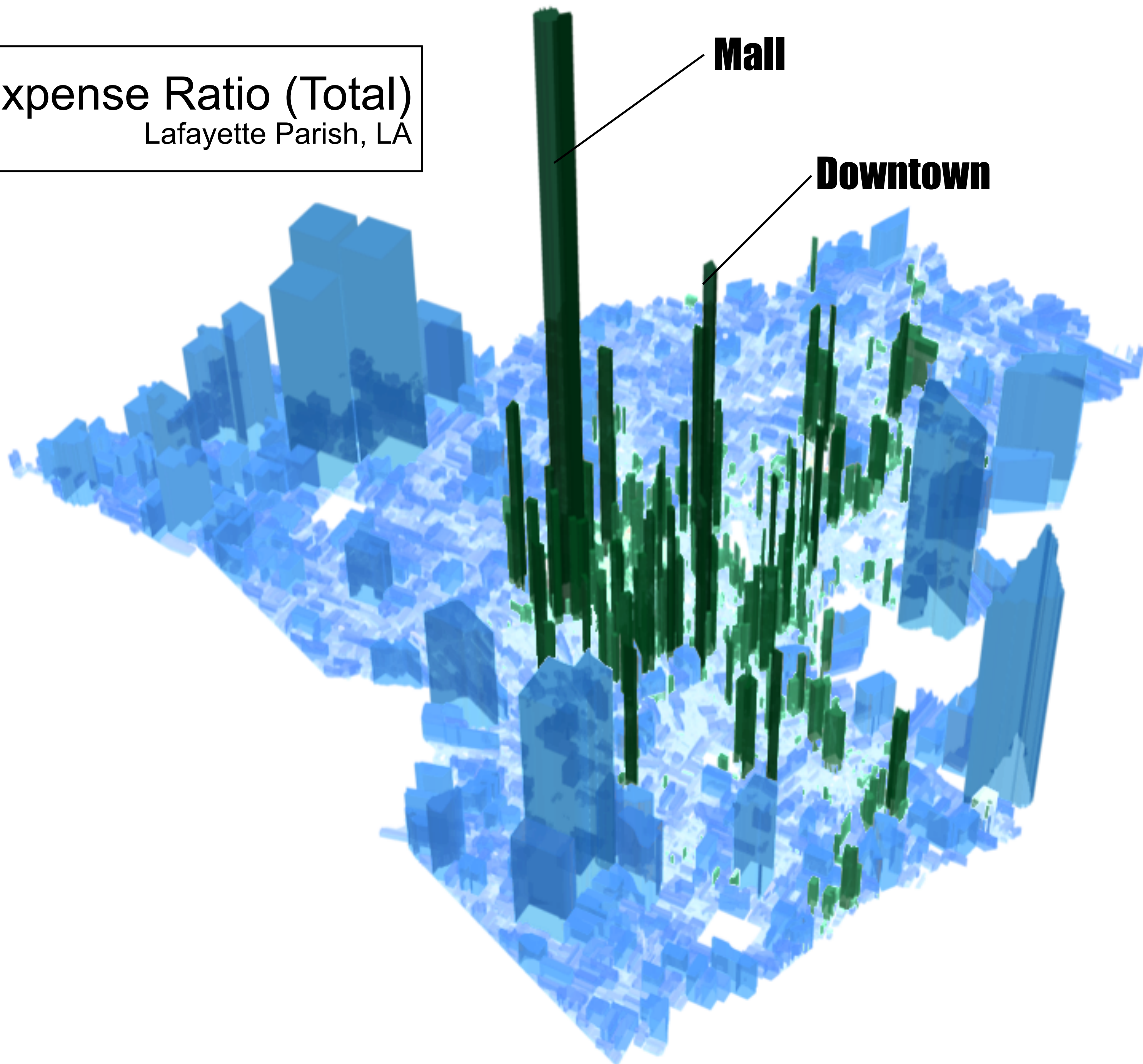
# Operating Expense Ratio (Total)

Lafayette Parish, LA

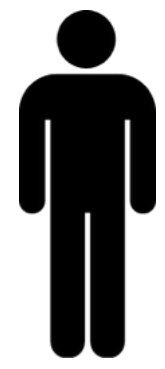


# Operating Expense Ratio (Total)

Lafayette Parish, LA







**Population**

**1949**

33,500

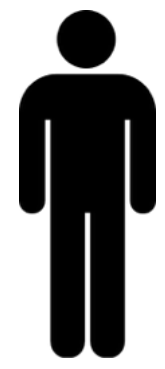


**Feet of pipe/person**



**Fire Hydrants/1,000 people**

Source: Sanborn Maps and LCG Records



**Population**

**1949**

33,500

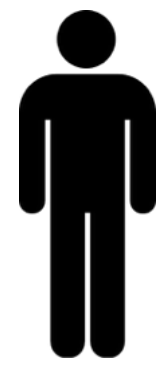


**Feet of pipe/person**



**Fire Hydrants/1,000 people**

Source: Sanborn Maps and LCG Records



**Population**

**1949**

33,500

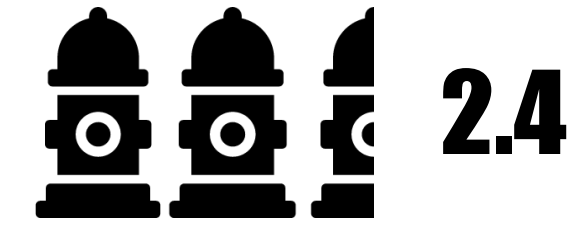


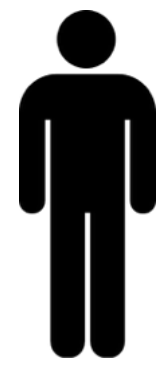
**Feet of pipe/person**



**Fire Hydrants/1,000 people**

Source: Sanborn Maps and LCG Records





**Population**



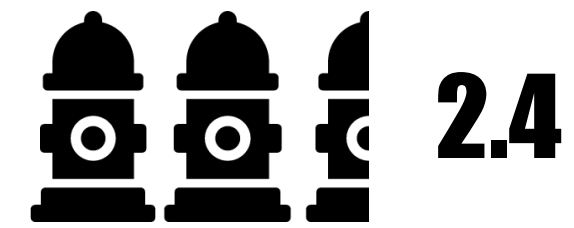
**Feet of pipe/person**



**Fire Hydrants/1,000 people**

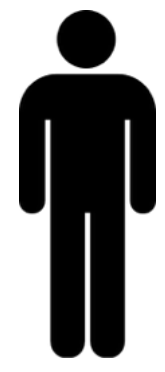
**1949**

33,500



Source: Sanborn Maps and LCG Records

**2015**



### Population



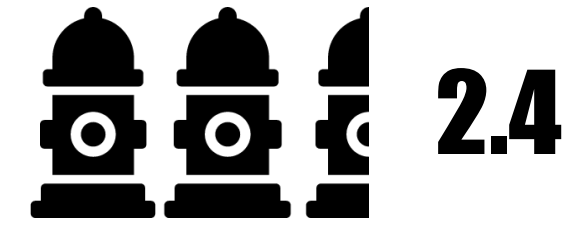
### Feet of pipe/person



### Fire Hydrants/1,000 people

# 1949

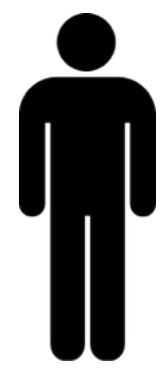
33,500



Source: Sanborn Maps and LCG Records

# 2015

121,000



**Population**



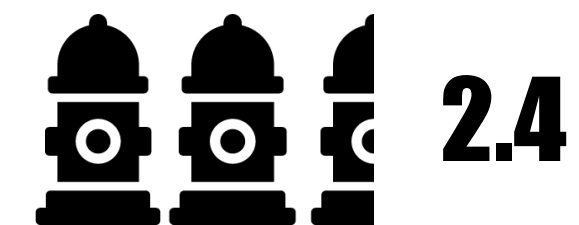
**Feet of pipe/person**



**Fire Hydrants/1,000 people**

**1949**

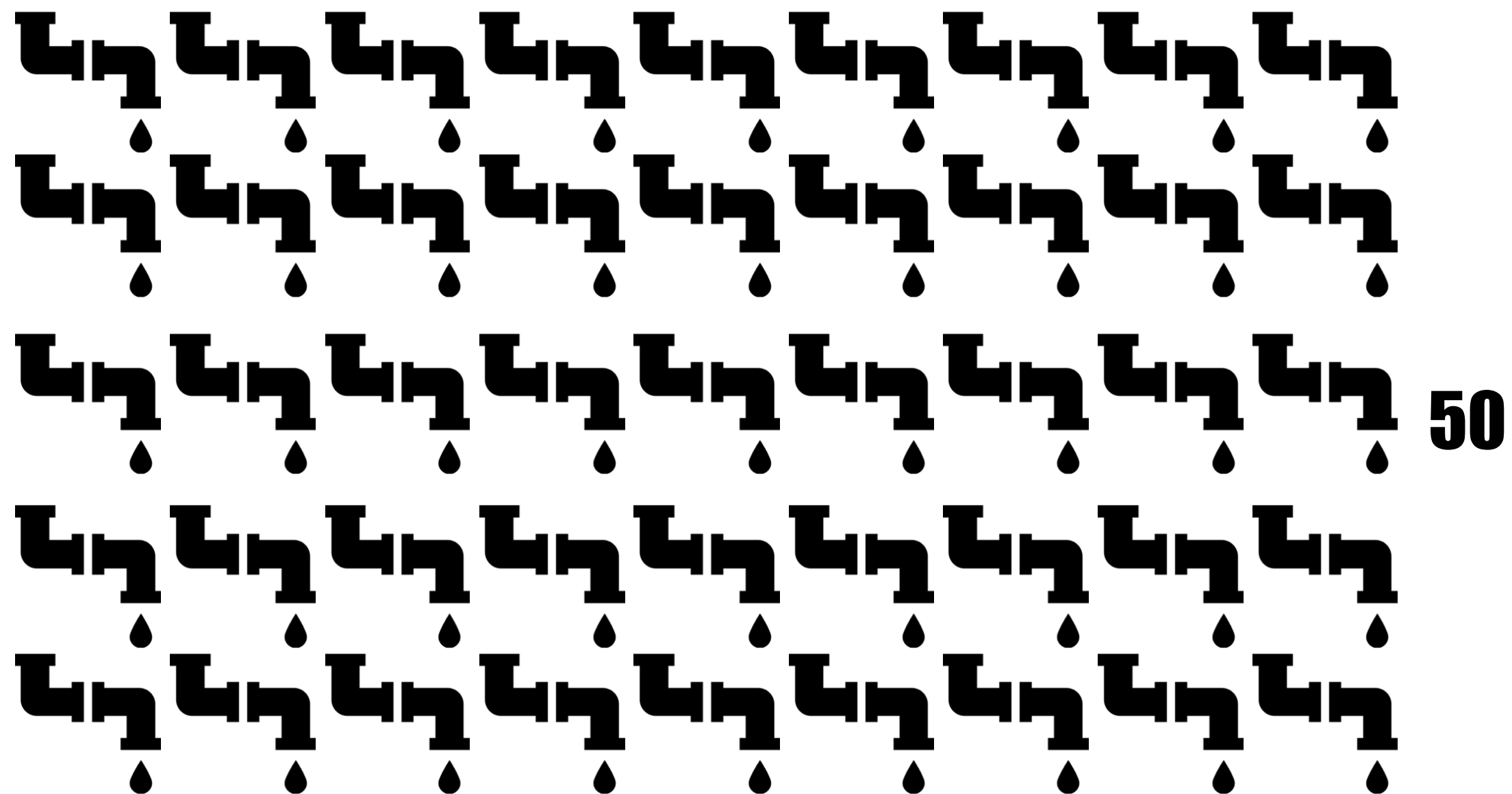
33,500

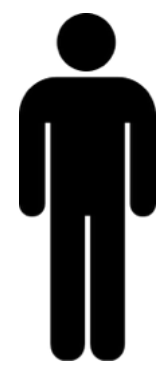


Source: Sanborn Maps and LCG Records

**2015**

121,000





### Population

# 1949

33,500

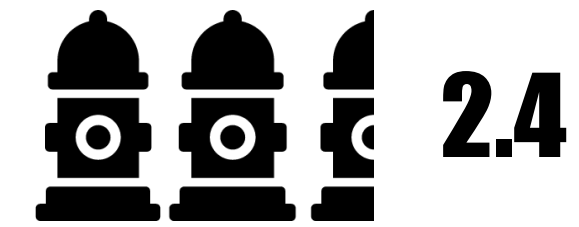


### Feet of pipe/person



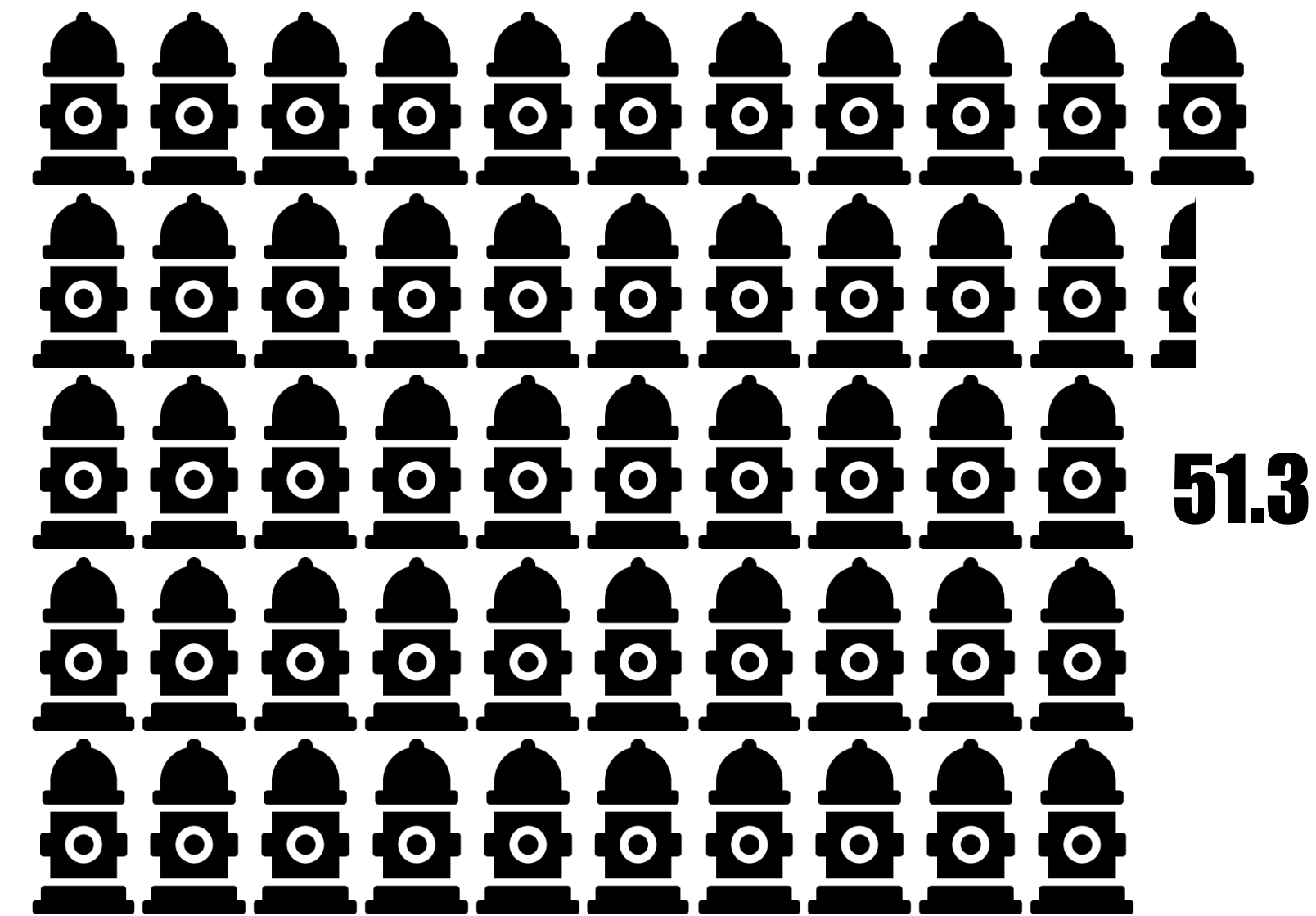
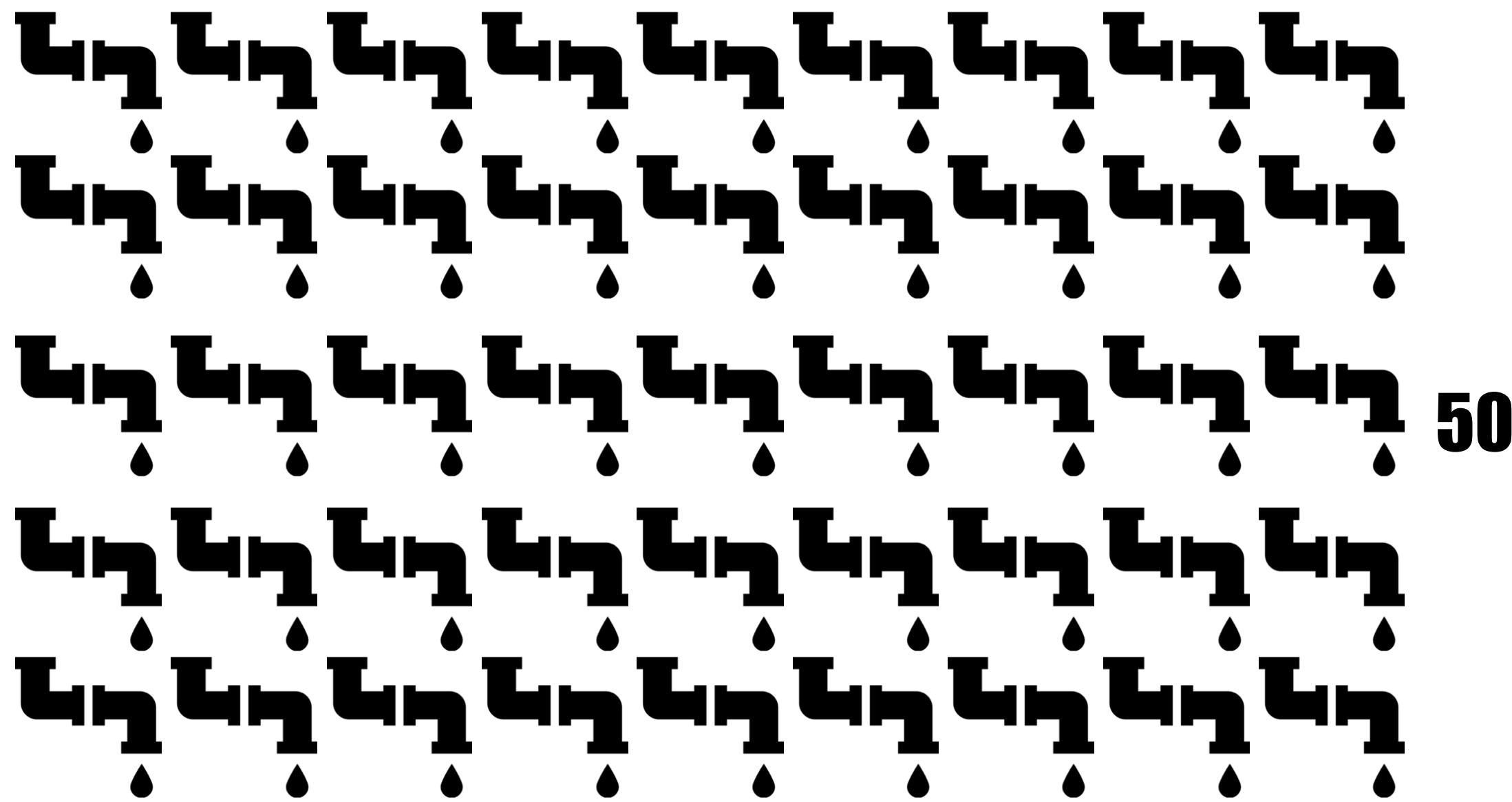
### Fire Hydrants/1,000 people

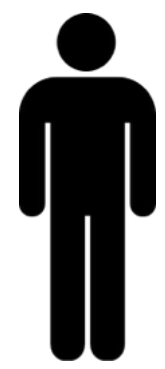
Source: Sanborn Maps and LCG Records



# 2015

121,000





### Population

# 1949

33,500



### Feet of pipe/person

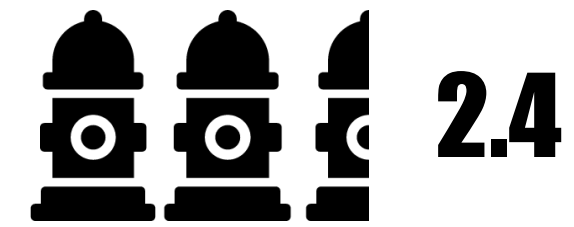


5



### Fire Hydrants/1,000 people

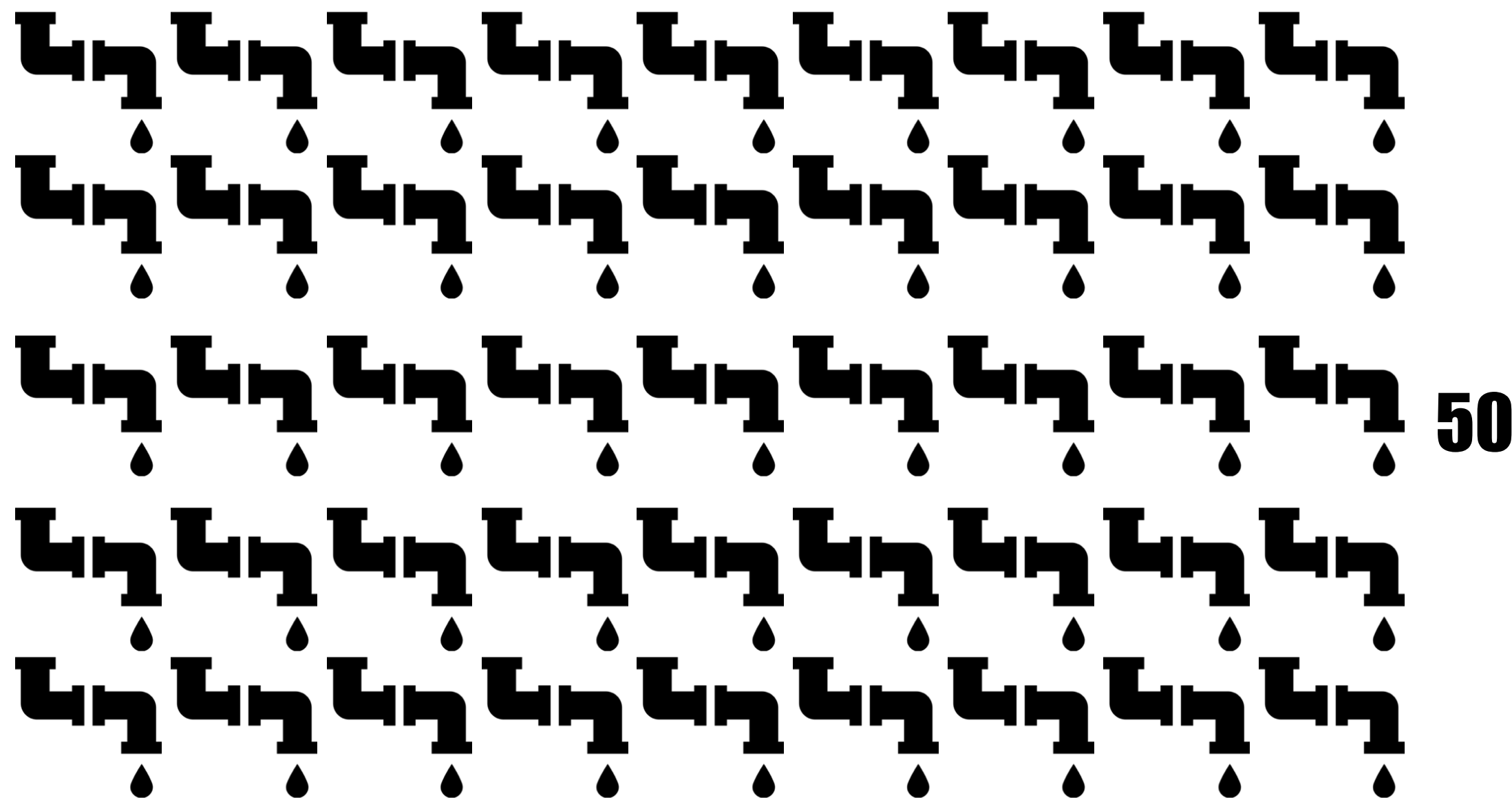
Source: Sanborn Maps and LCG Records



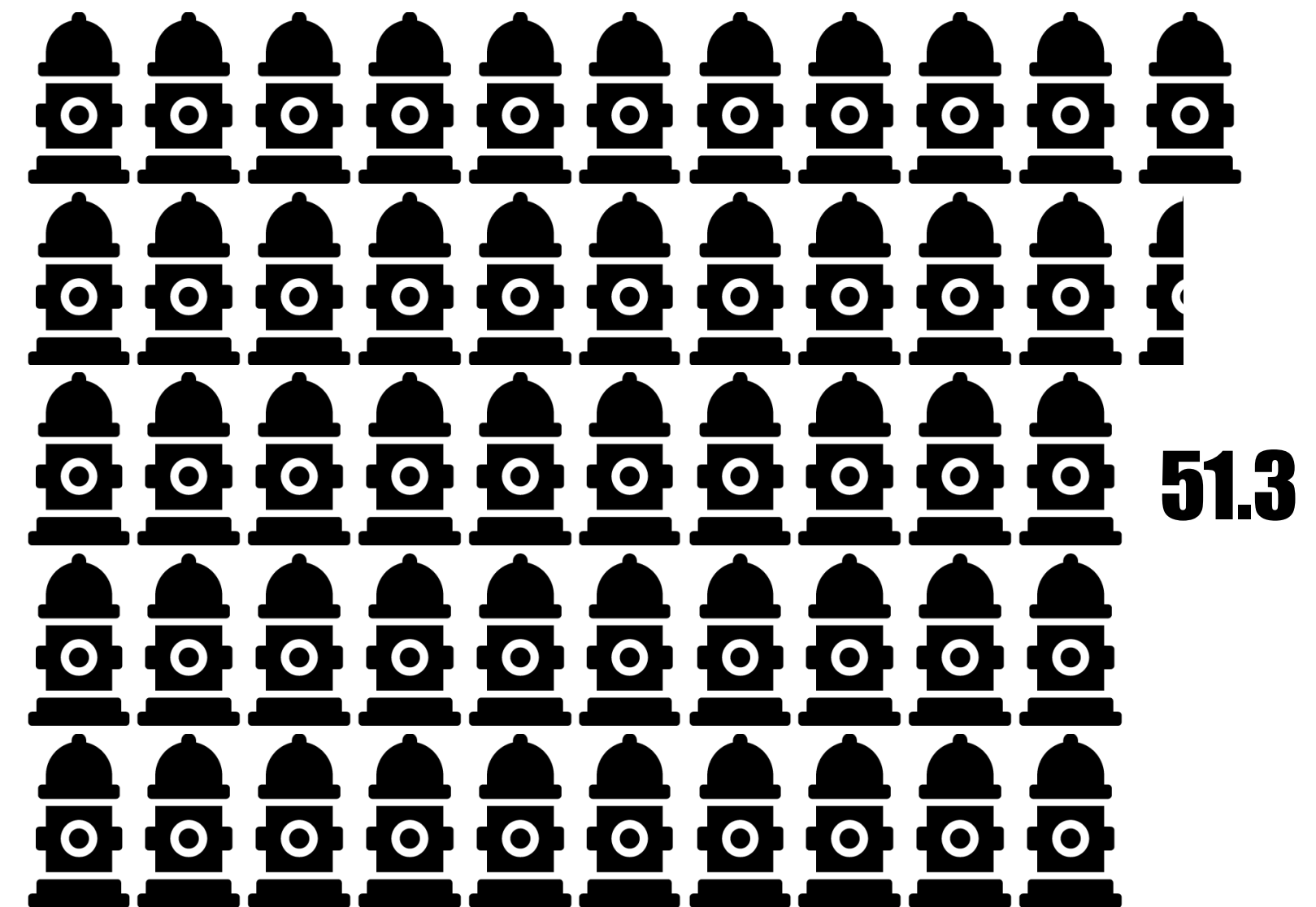
2.4

# 2015

121,000



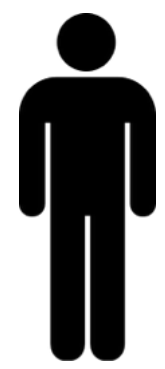
50



51.3

# 350%





### Population

# 1949

33,500

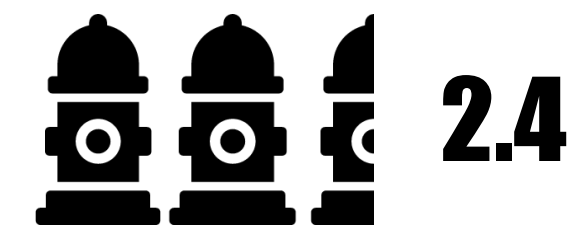


### Feet of pipe/person



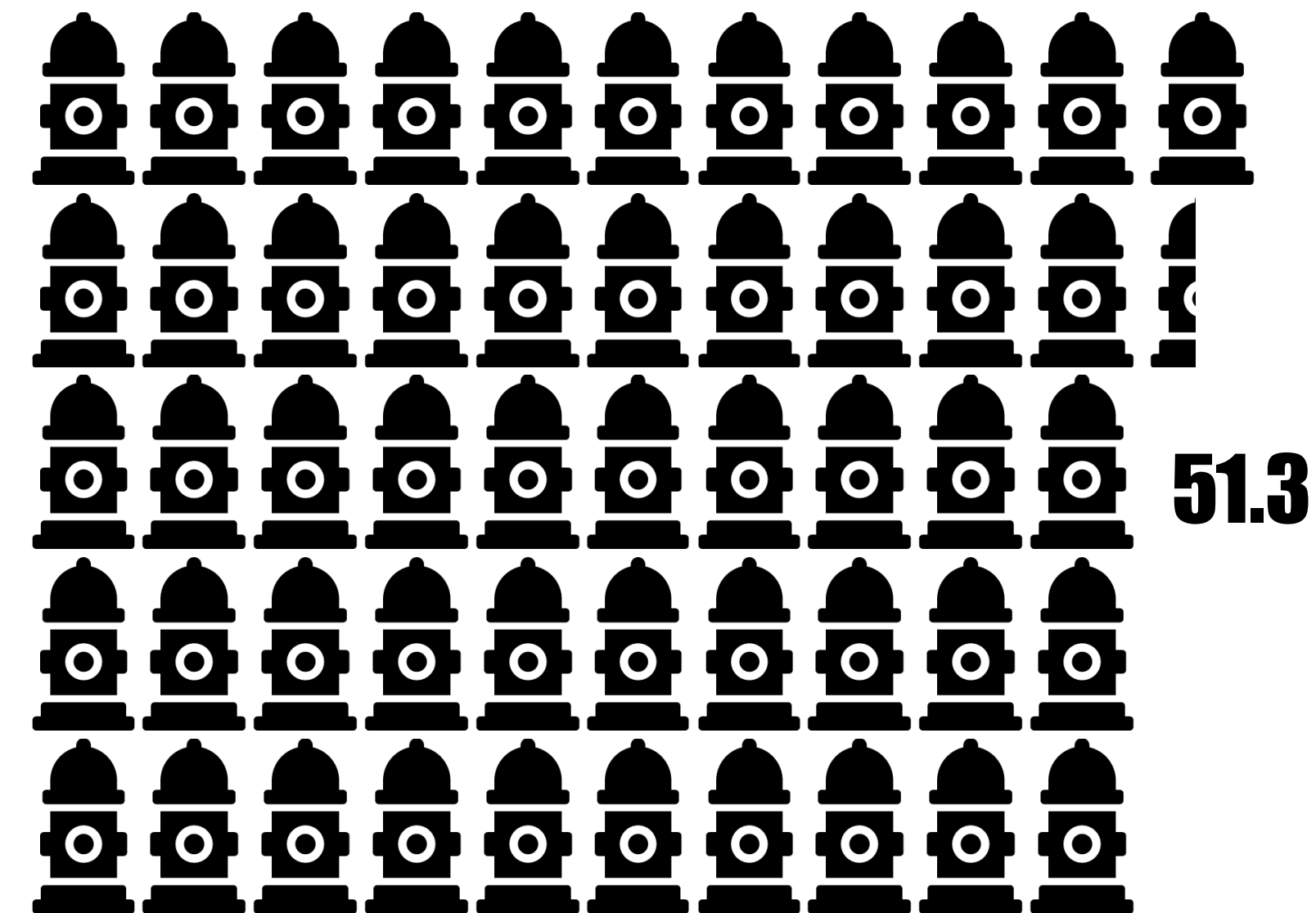
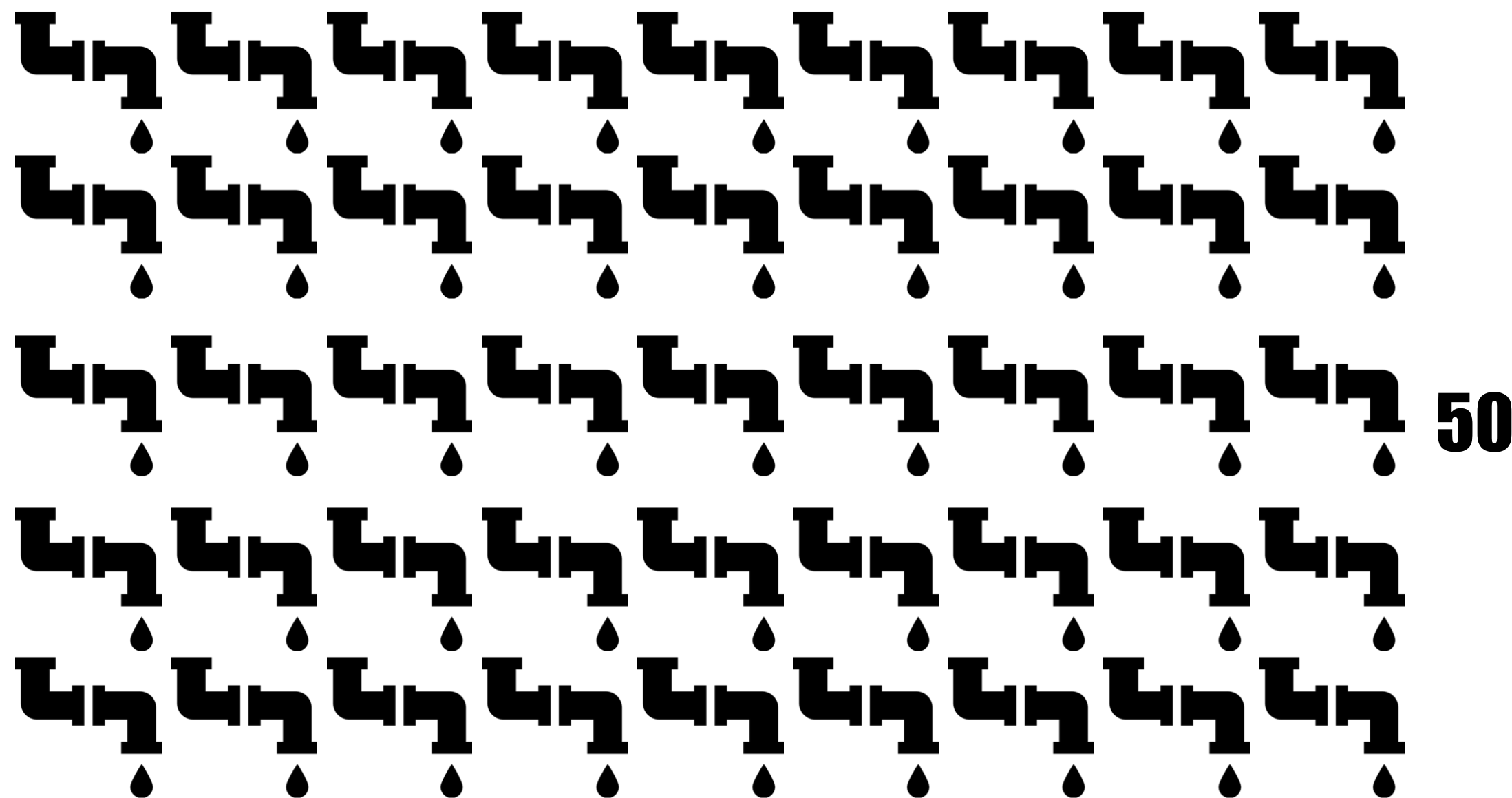
### Fire Hydrants/1,000 people

Source: Sanborn Maps and LCG Records



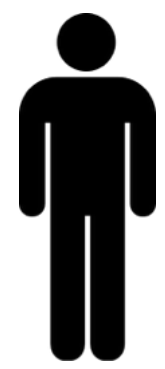
# 2015

121,000



# 350%

# 1,000%



### Population

# 1949

33,500

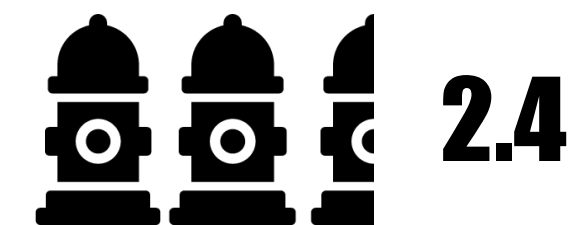


### Feet of pipe/person



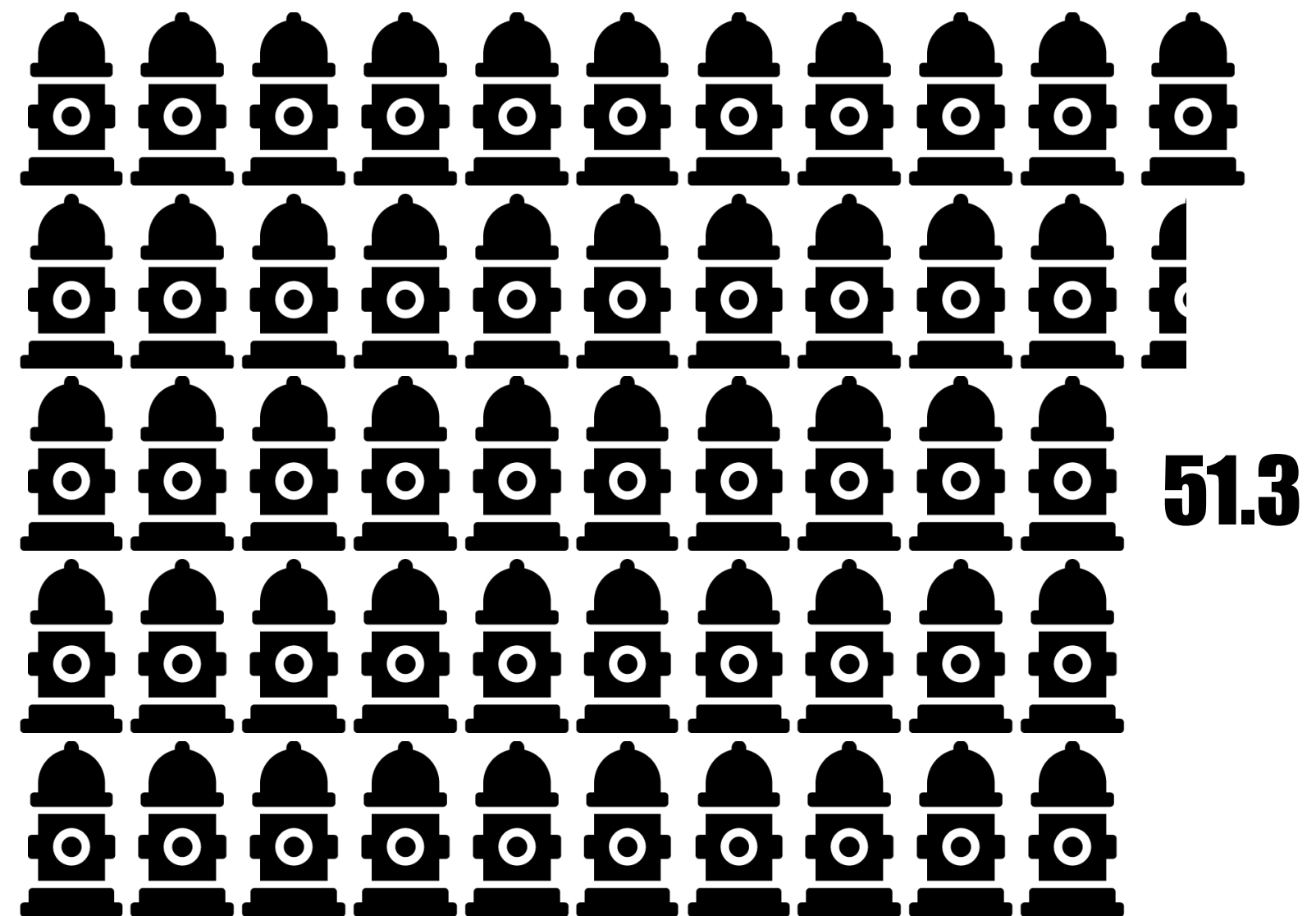
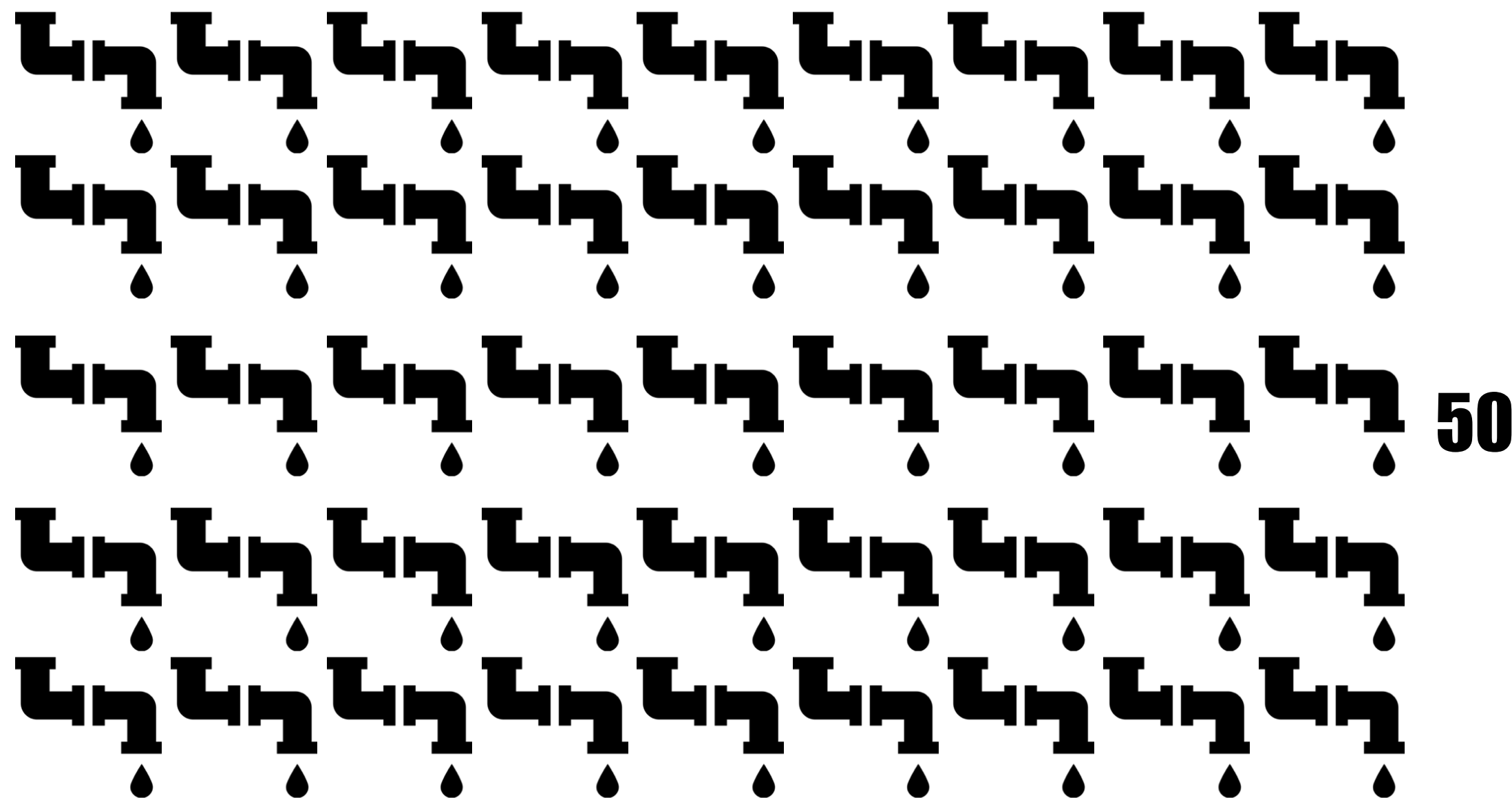
### Fire Hydrants/1,000 people

Source: Sanborn Maps and LCG Records



# 2015

121,000

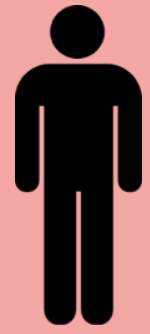


# 350%

# 1,000%

# 2,140%

Population



**350%**

Feet of pipe/person



**1,000%**

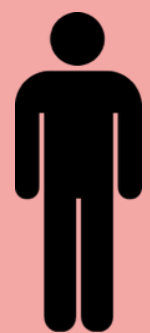
Fire Hydrants/1,000 people



**2,140%**

# Your Median Household income

Population



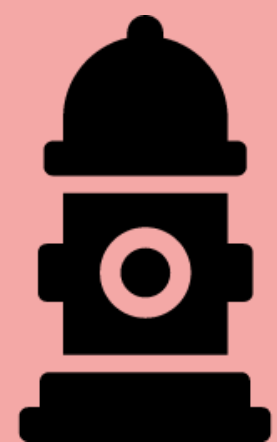
**350%**

Feet of pipe/person



**1,000%**

Fire Hydrants/1,000 people

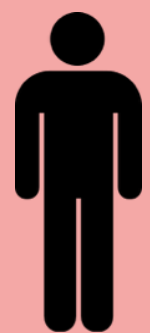


**2,140%**

# Your Median Household income



Population



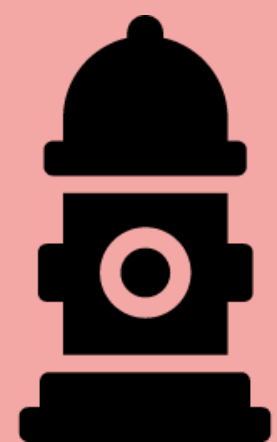
350%

Feet of pipe/person



1,000%

Fire Hydrants/1,000 people



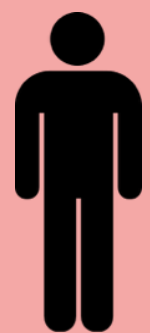
2,140%

# Your Median Household income



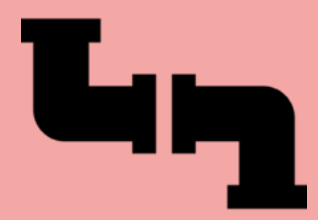
\$27,700

Population



350%

Feet of pipe/person



1,000%

Fire Hydrants/1,000 people



2,140%

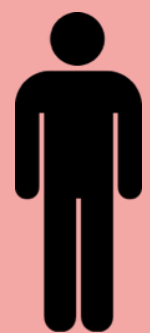
# Your Median Household income



**\$27,700**



Population



350%

Feet of pipe/person



1,000%

Fire Hydrants/1,000 people



2,140%

# Your Median Household income

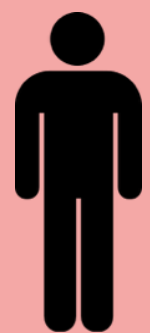


**\$27,700**



**\$45,000**

Population



350%

Feet of pipe/person



1,000%

Fire Hydrants/1,000 people



2,140%

# Your Median Household income



\$27,700



\$45,000

160%



A photograph of a desert landscape with a sign in the foreground. The sign is yellow with a red border and black text. The text reads "BUY NOW" in blue and "PAY LATER" in red. The sign is supported by two wooden posts. The background shows a vast, flat desert with sparse vegetation and a blue sky with light clouds.

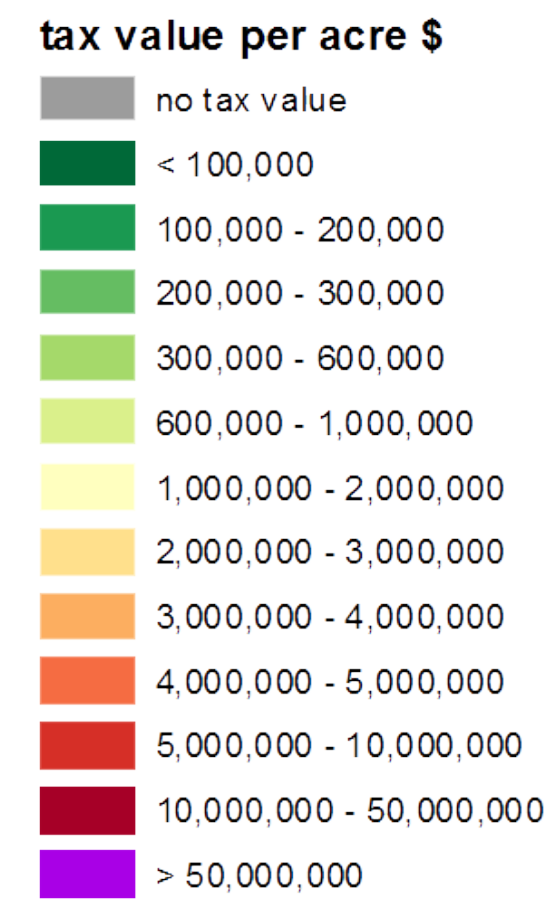
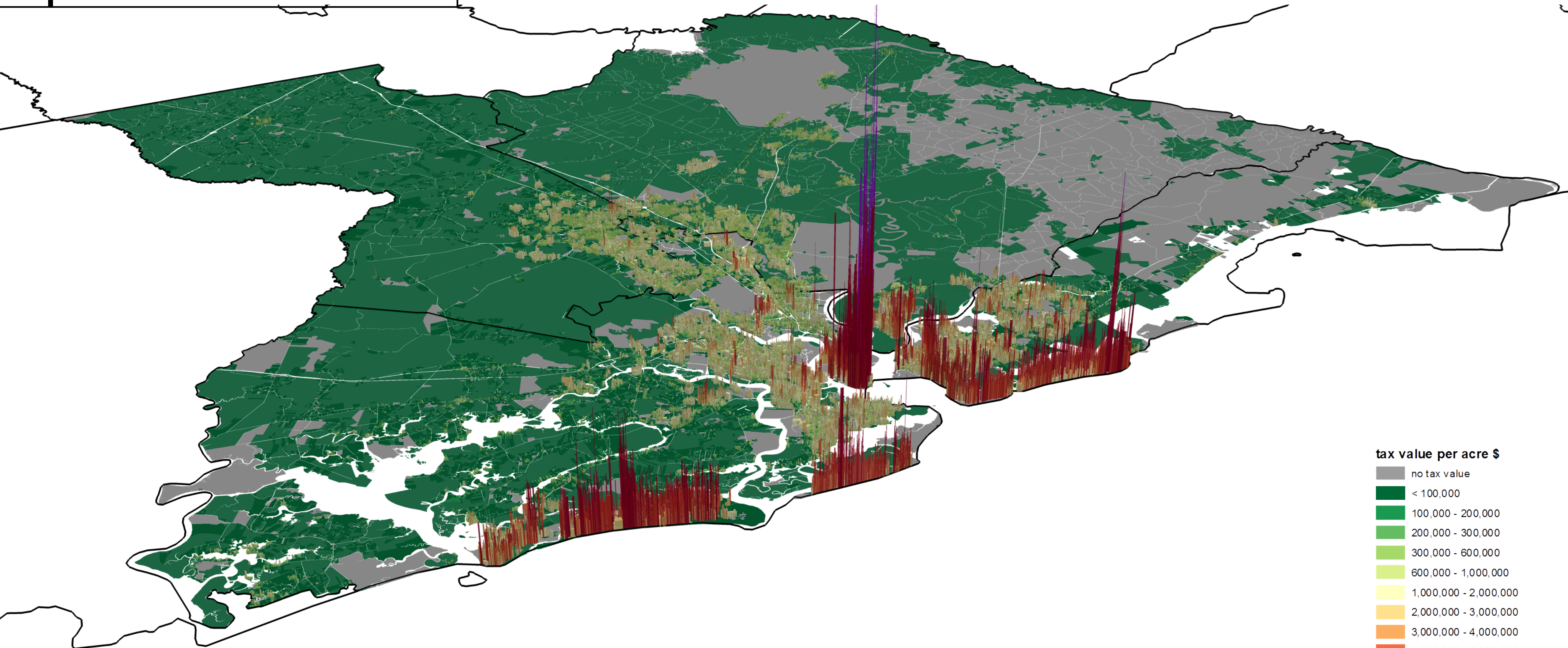
**BUY NOW**  
**PAY LATER**

What are the numbers for Charleston County?



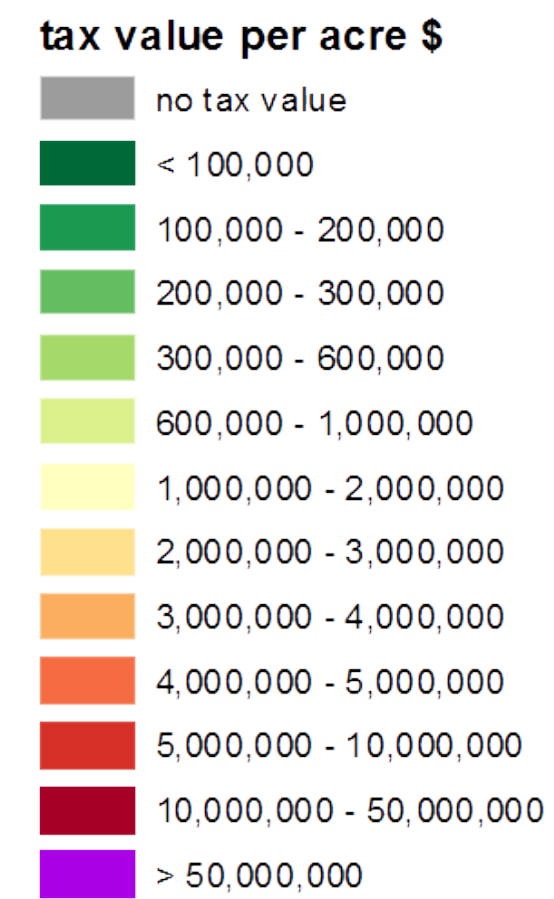
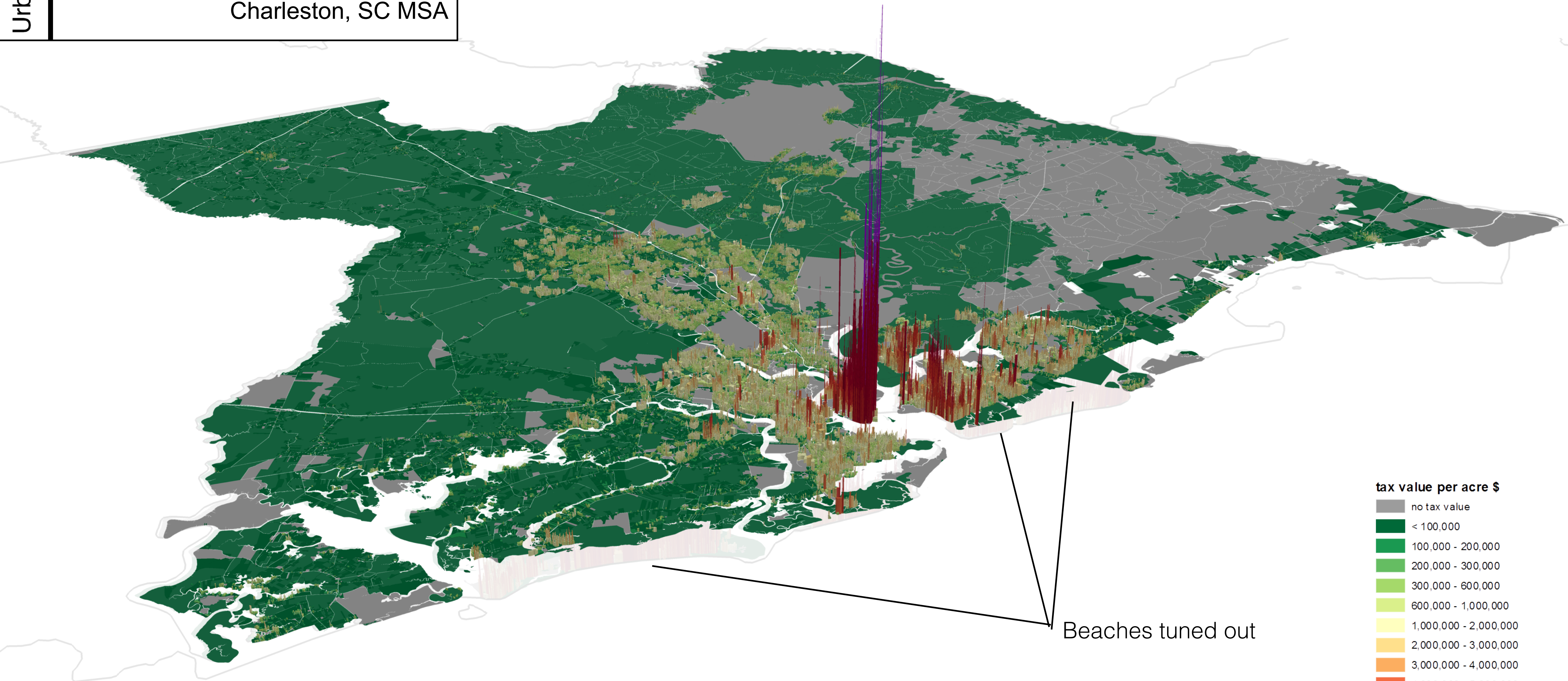
# Taxable Value Per Acre

Charleston, SC MSA



# Taxable Value Per Acre

Charleston, SC MSA



Beaches tuned out



# Declaration of Independence

July 4, 1776

240 years ago





**Built ca: 1686**

Revolutionary



**Walmart**  
\$866,760 value per acre



**Tavern Wine and Spirits**  
\$13,394,415 Value per Acre

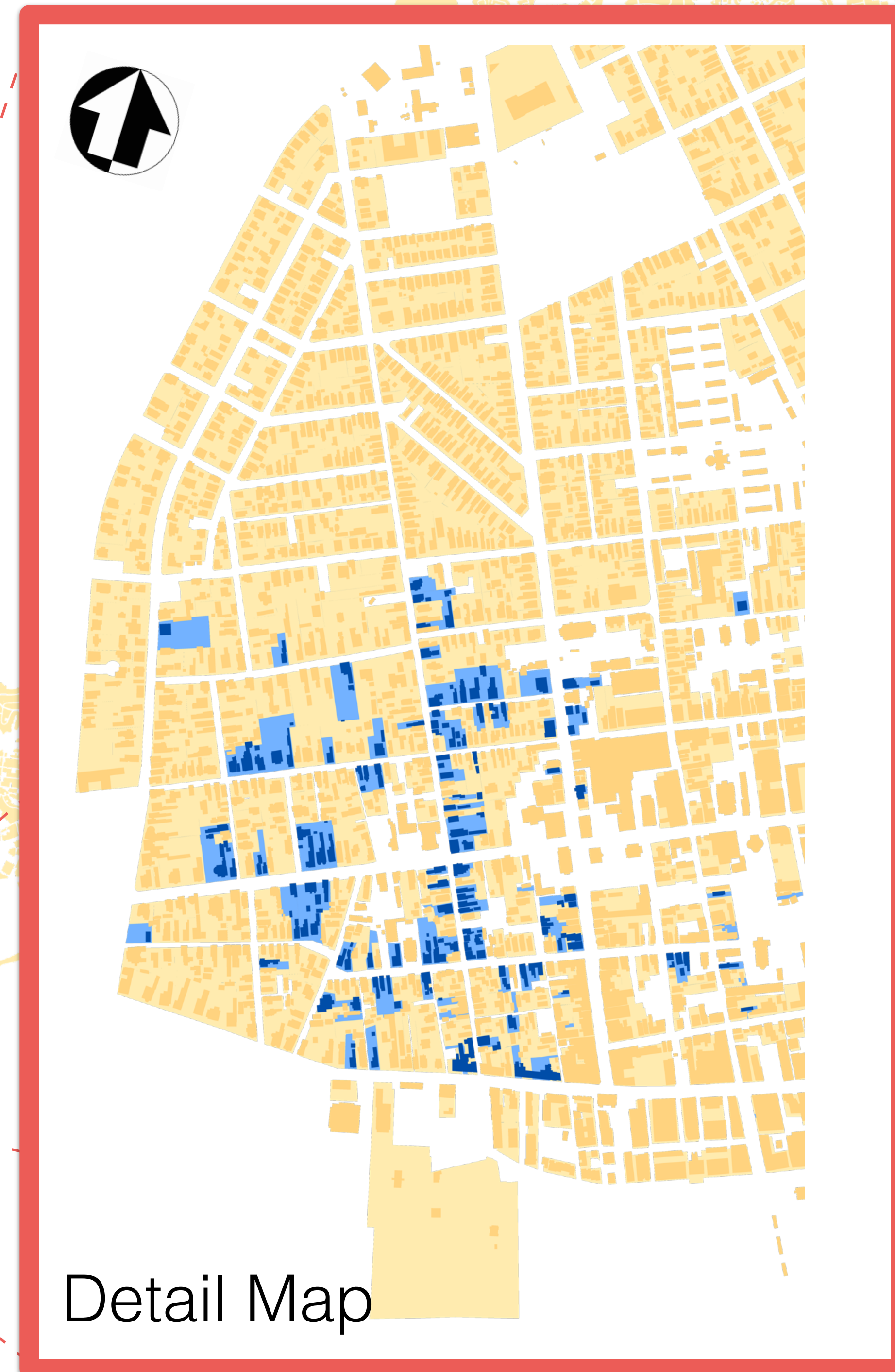
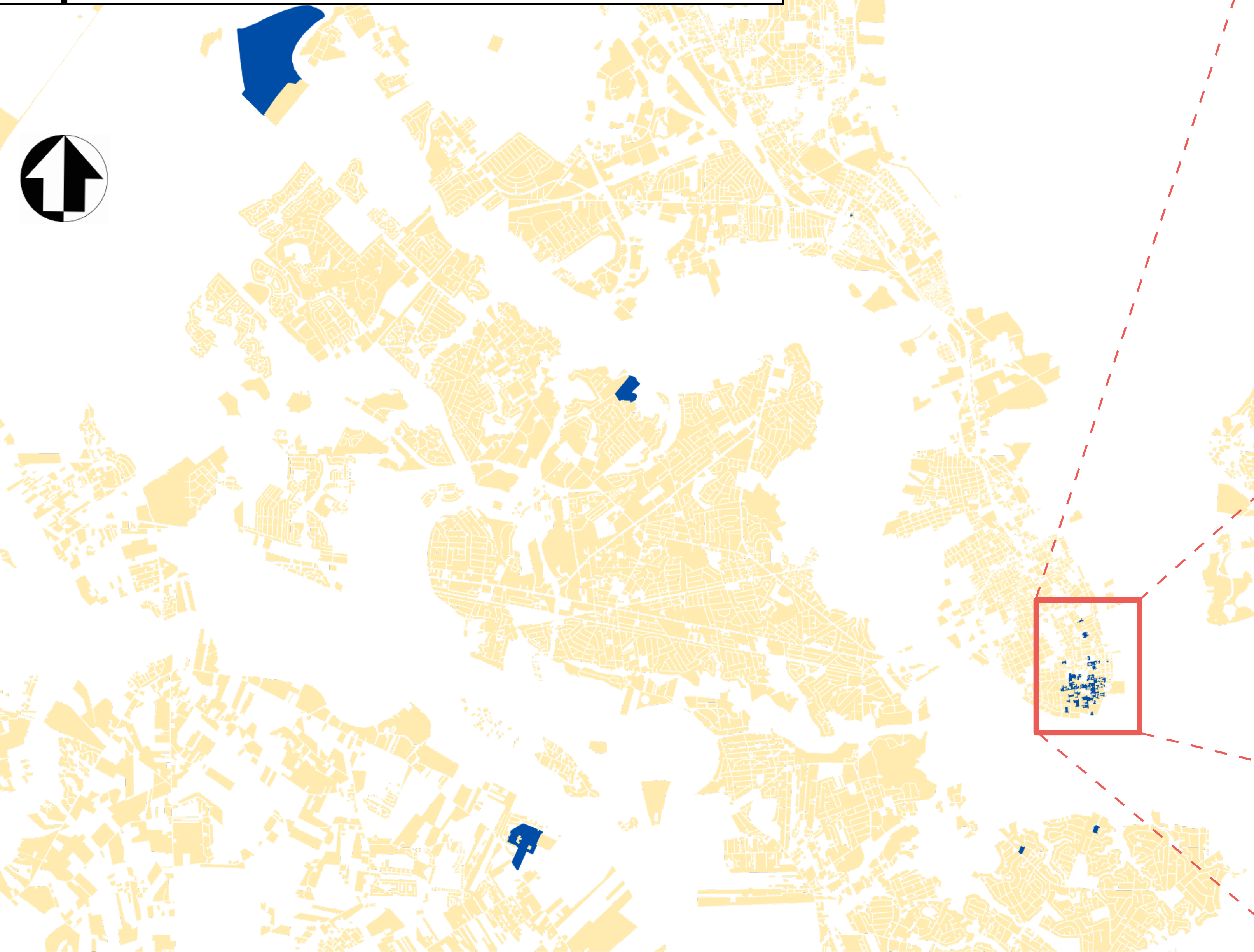
# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA



# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA





# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

> 1776

Acres

20.95

Value

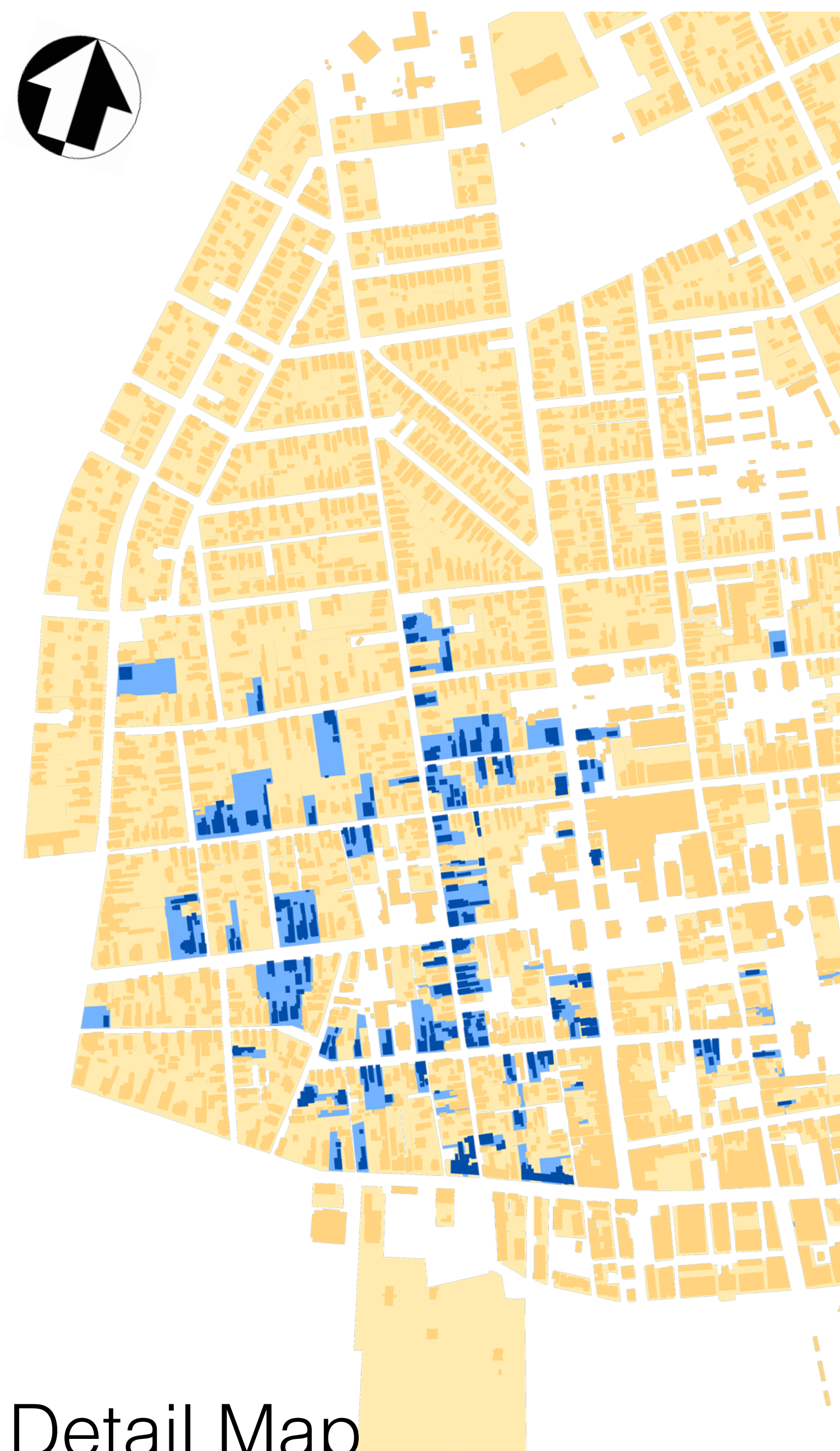
\$344M

Value/Acre

\$16,440,700

County Taxes 2015

**\$631,000**



Detail Map

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

> 1776

Acres

20.95

Value

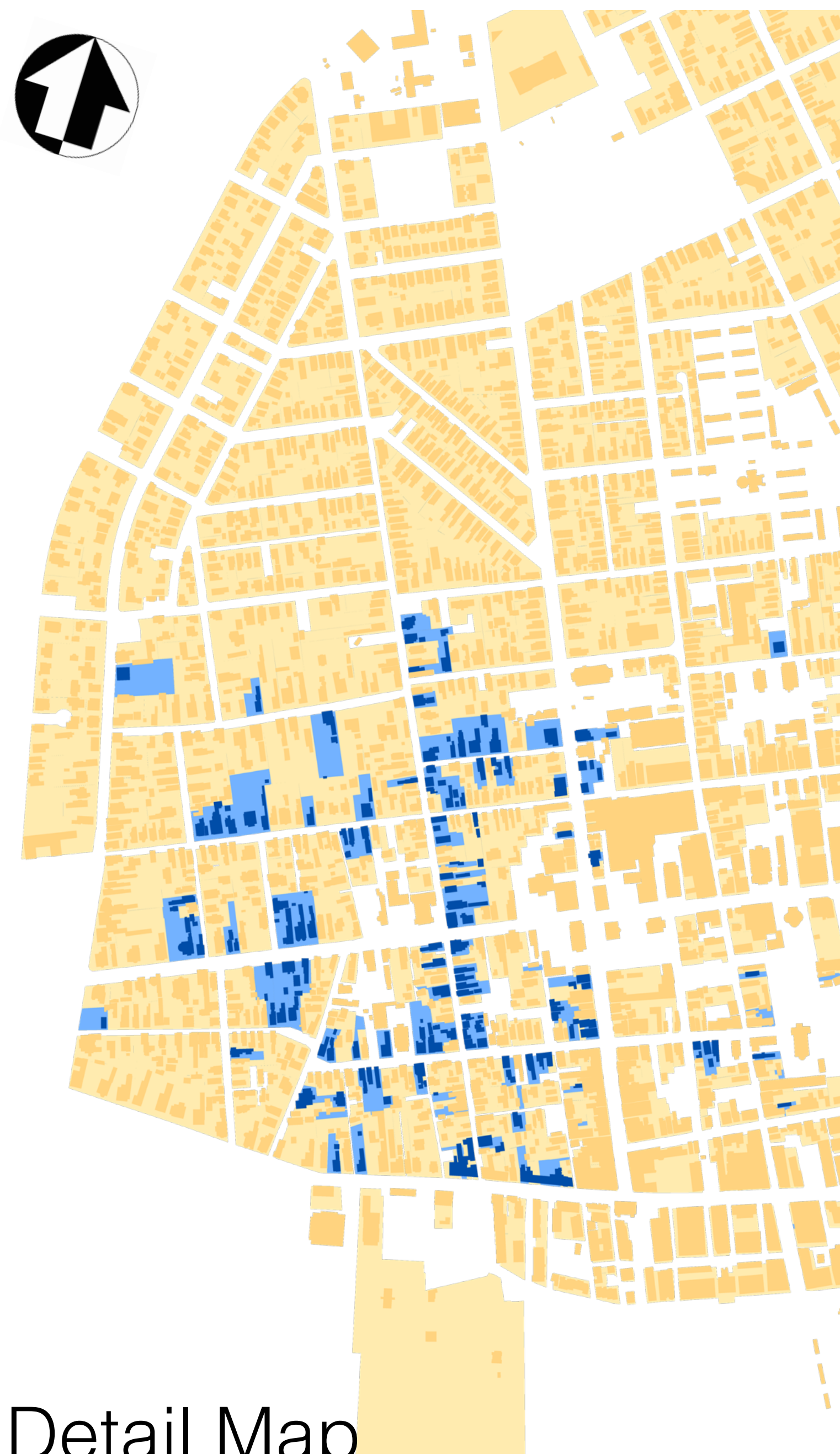
\$344M

Value/Acre

\$16,440,700

County Taxes 2015

**\$631,000**



Detail Map

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

> 1776

Acres

20.95

Value

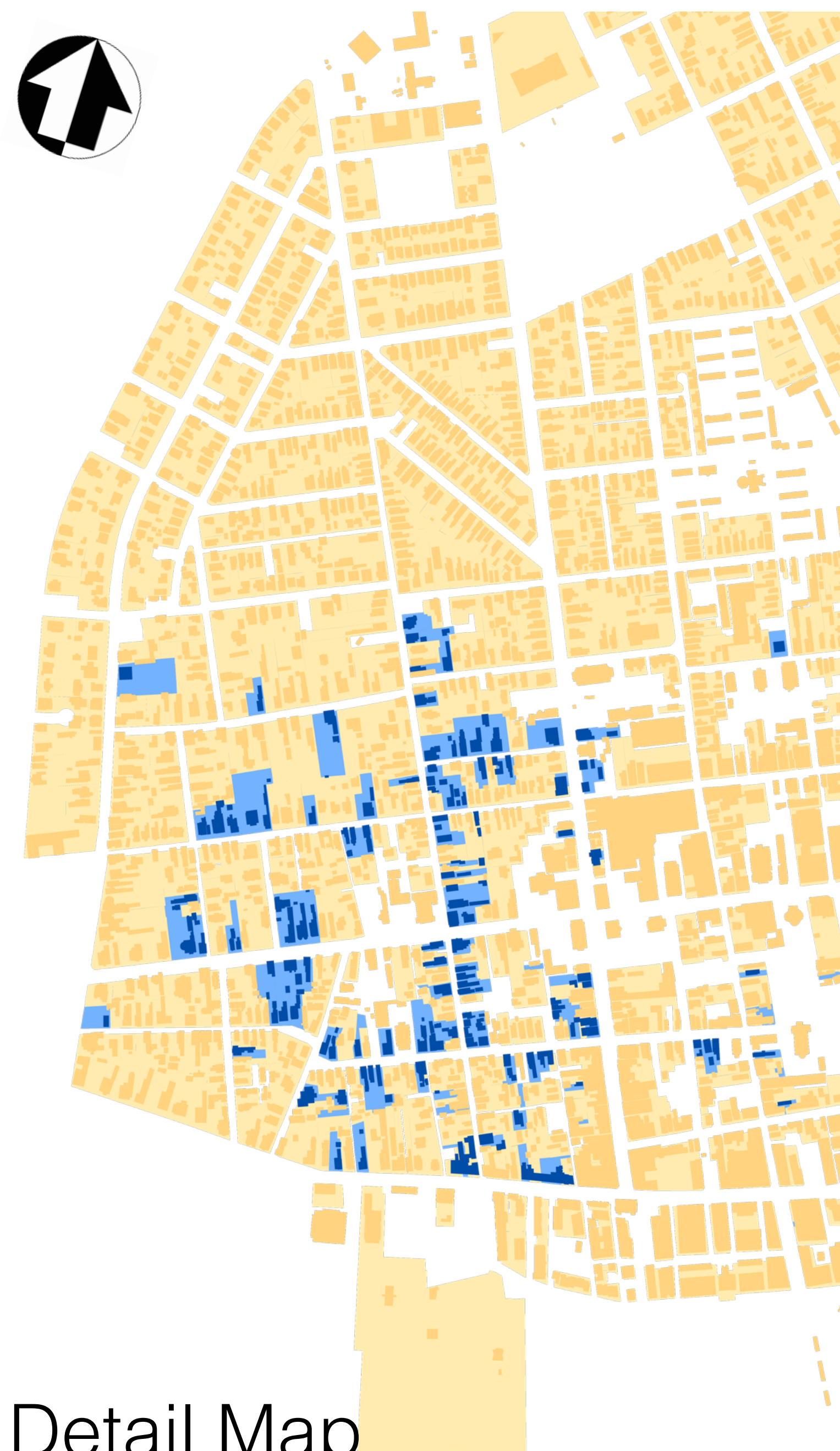
\$344M

Value/Acre

\$16,440,700

County Taxes 2015

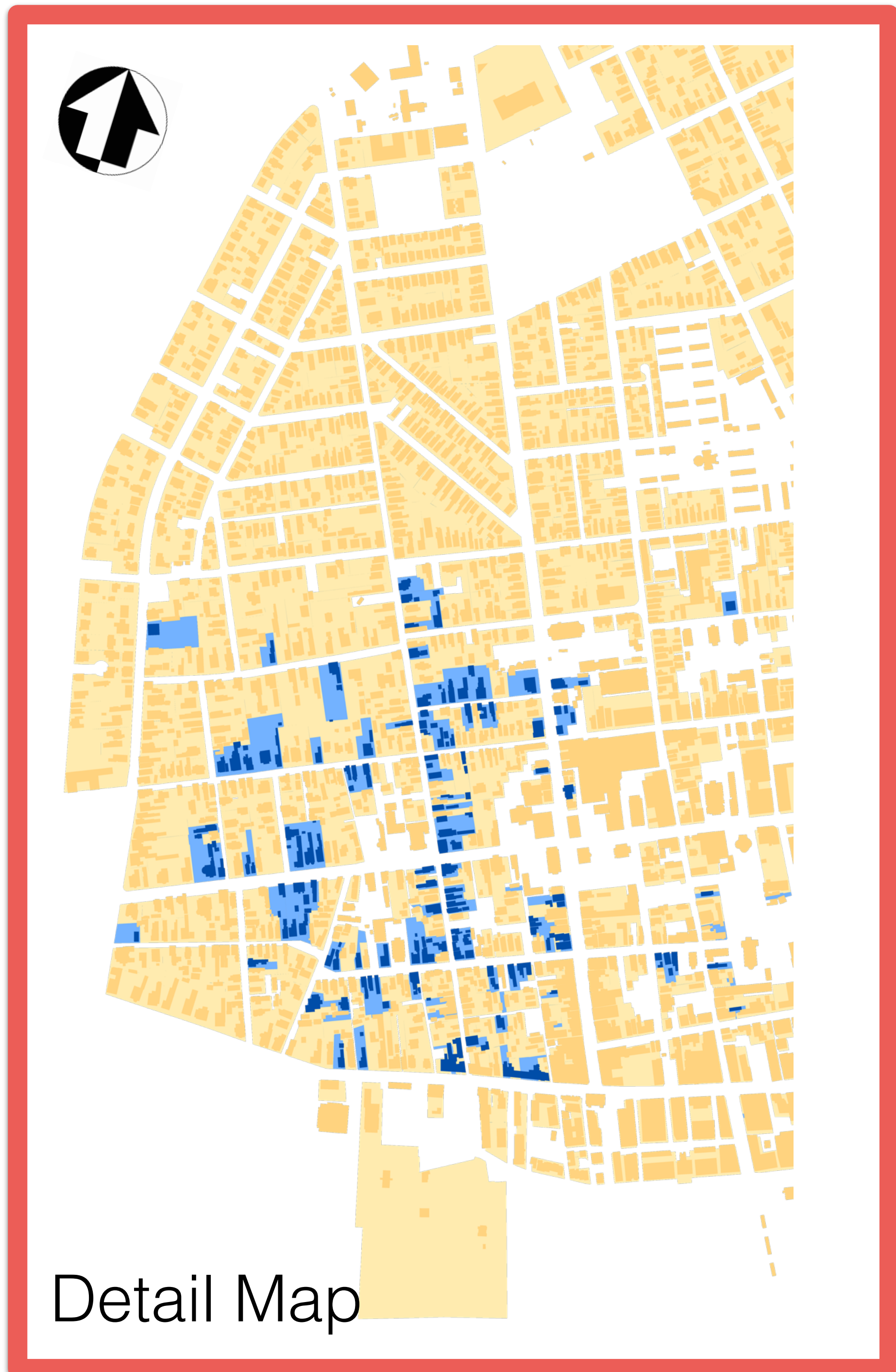
**\$631,000**



Detail Map

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

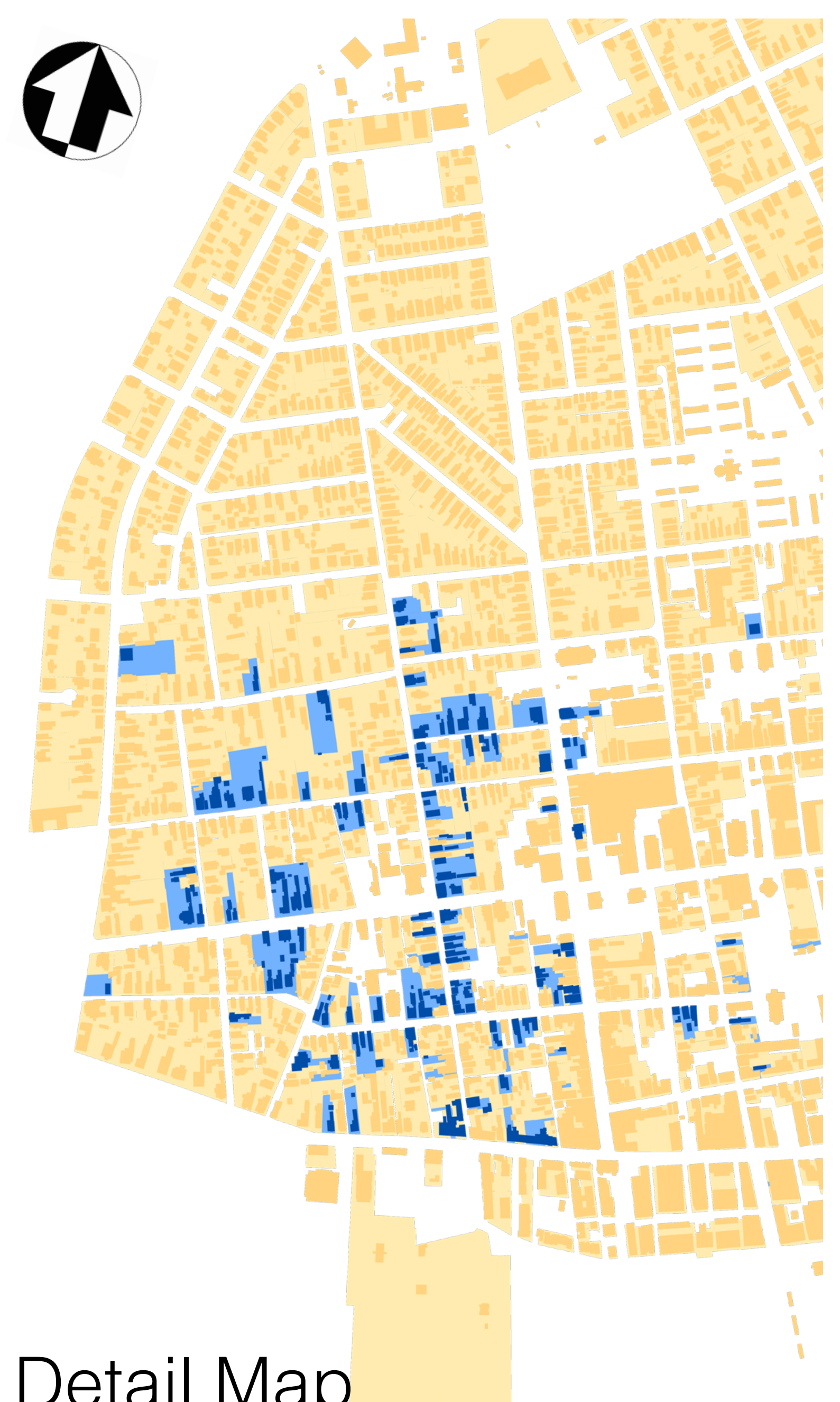


Detail Map

	> 1776
Acres	20.95
Value	\$344M
Value/Acre	\$16,440,700
County Taxes 2015	<b>\$631,000</b>

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

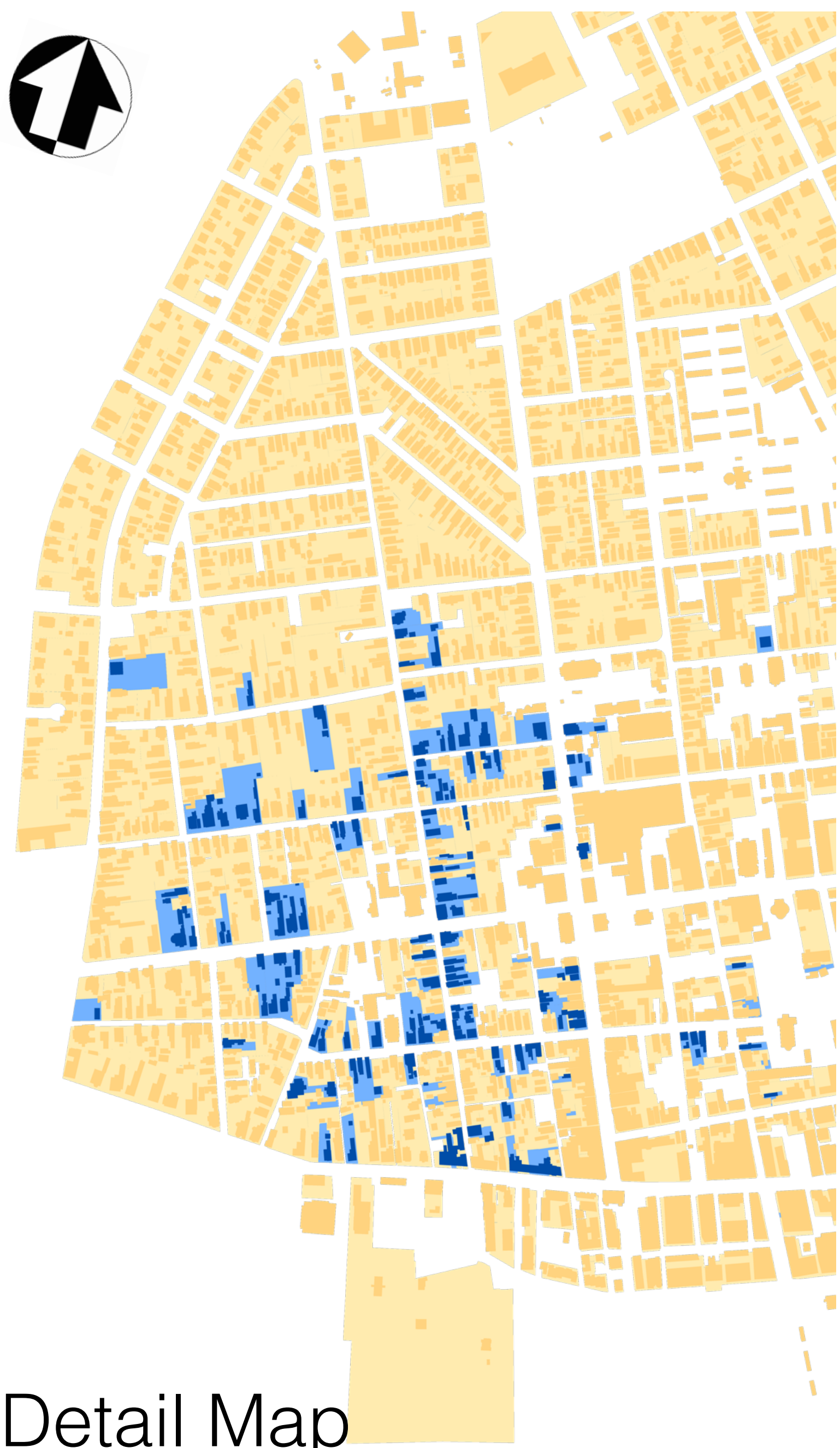


Detail Map

	Walmart	> 1776
Acres	20.58	20.95
Value	\$18M	\$344M
Value/Acre	\$866,760	\$16,440,700
County Taxes 2015	\$47,000	<b>\$631,000</b>

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

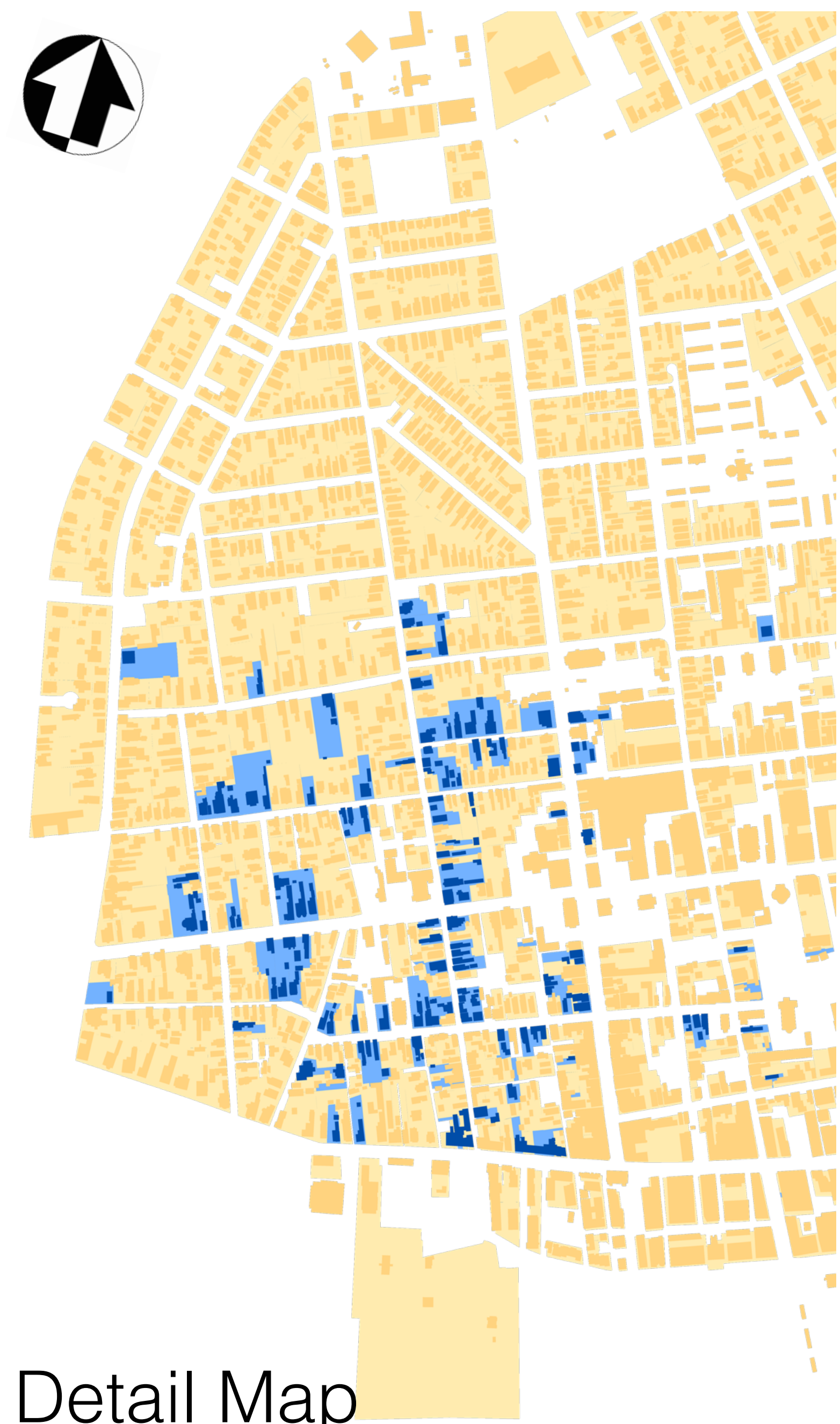


Detail Map

	Walmart	> 1776
Acres	20.58	20.95
Value	\$18M	\$344M
Value/Acre	\$866,760	\$16,440,700
County Taxes 2015	\$47,000	\$631,000

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA

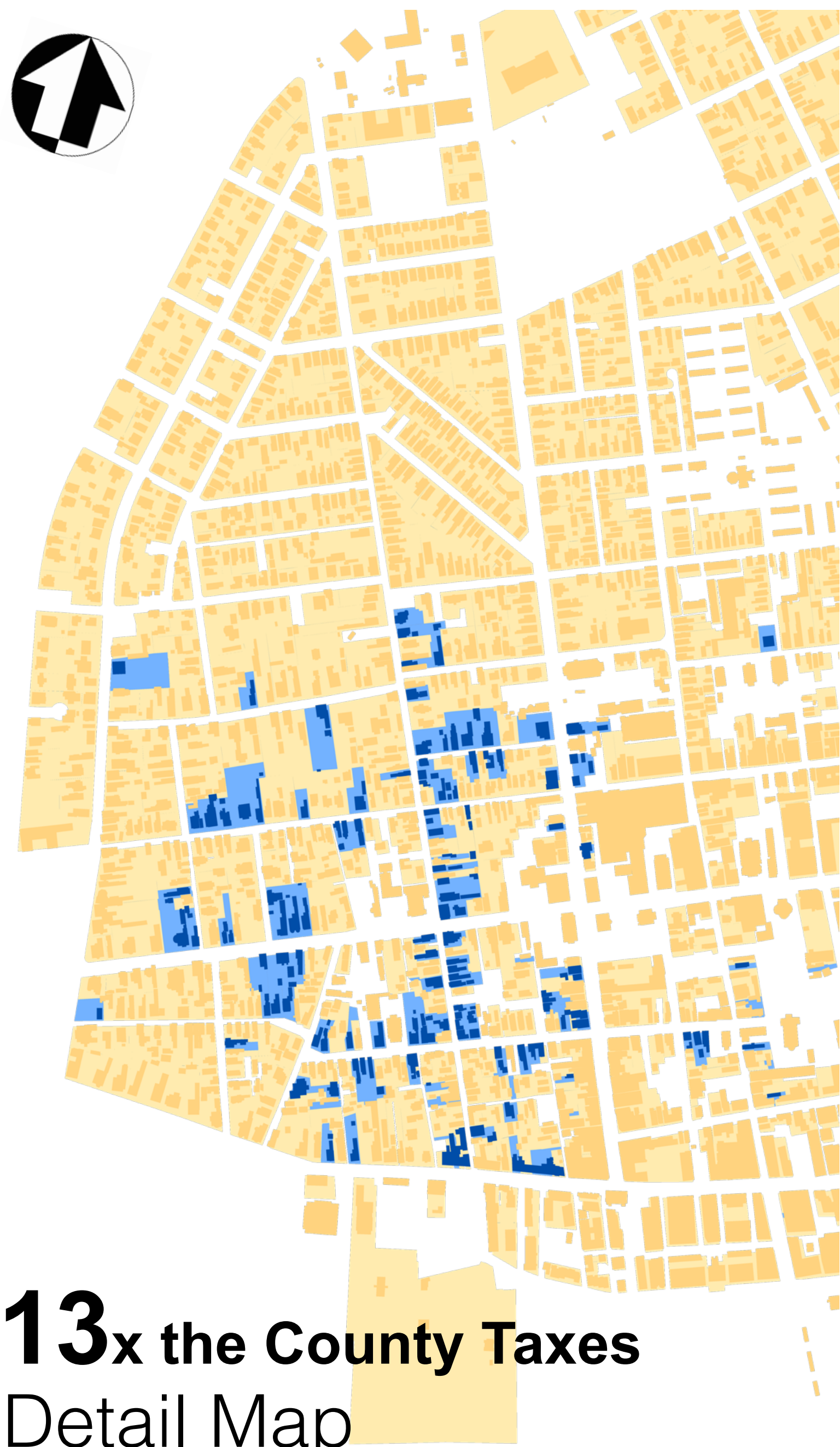


Detail Map

	Walmart	> 1776
Acres	20.58	20.95
Value	\$18M	\$344M
Value/Acre	\$866,760	\$16,440,700
County Taxes 2015	<b>\$47,000</b>	<b>\$631,000</b>

# Pre-1776 Taxable Value Per Acre

Charleston, SC MSA



**13x the County Taxes**  
Detail Map

	Walmart	> 1776
Acres	20.58	20.95
Value	\$18M	\$344M
Value/Acre	\$866,760	\$16,440,700
County Taxes 2015	<b>\$47,000</b>	<b>\$631,000</b>





**IT'S HIDING IN PLAIN SIGHT**



**MARKET FORCES**



**Tax  
Code**

44444444

44444444

44444444  
44444444

show. don't tell.

# Precision



A 493 kilogram object of organic matter traveling at a velocity of 33 feet per second<sup>2</sup> will collide with your cranium in approximately 1.27 seconds!



# Precision



A 493 kilogram object of organic matter traveling at a velocity of 33 feet per second<sup>2</sup> will collide with your cranium in approximately 1.27 seconds!

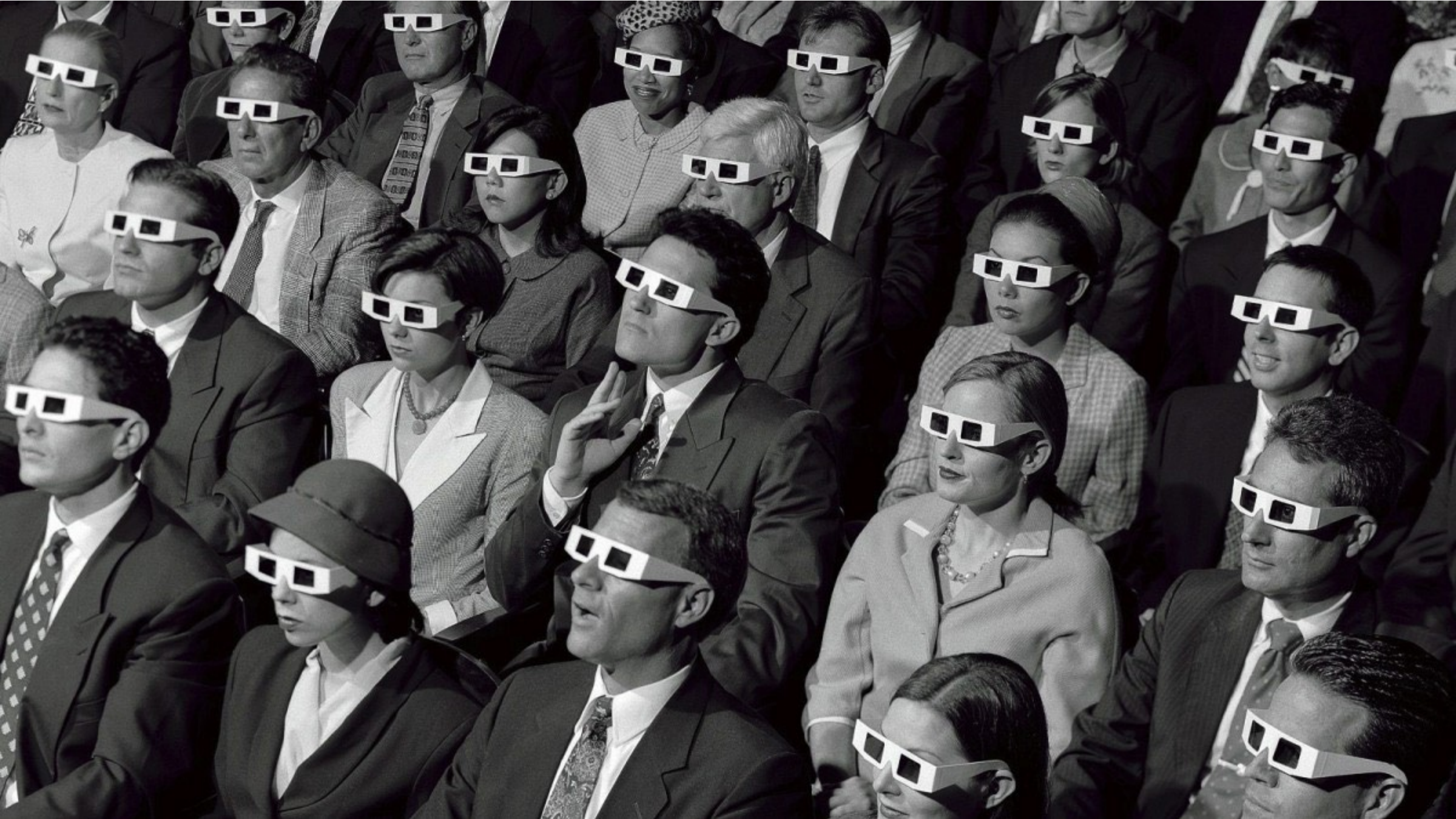


# Accuracy



**LOOK OUT!**











SMARTER THAN THE AVERAGE GUIDE


# HBR Guide to

## Persuasive Presentations

Inspire action  
Engage the audience  
**Sell your ideas**

By Nancy Duarte





Making the simple complicated is commonplace;  
making the complicated simple,  
awesomely simple,  
that's creativity.

- Charles Mingus

**DO THE MATH**

