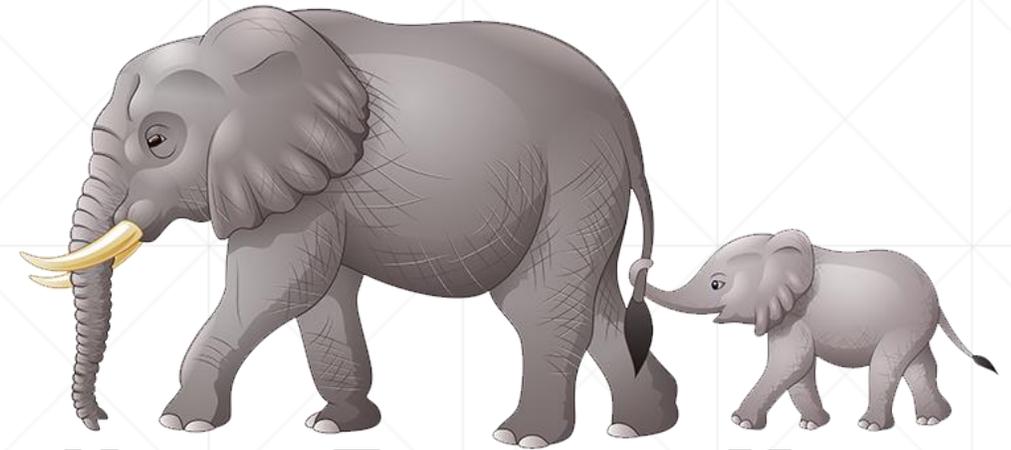


Thursday, June 16, 2022



**URBAN ELEPHANT MEDIA**

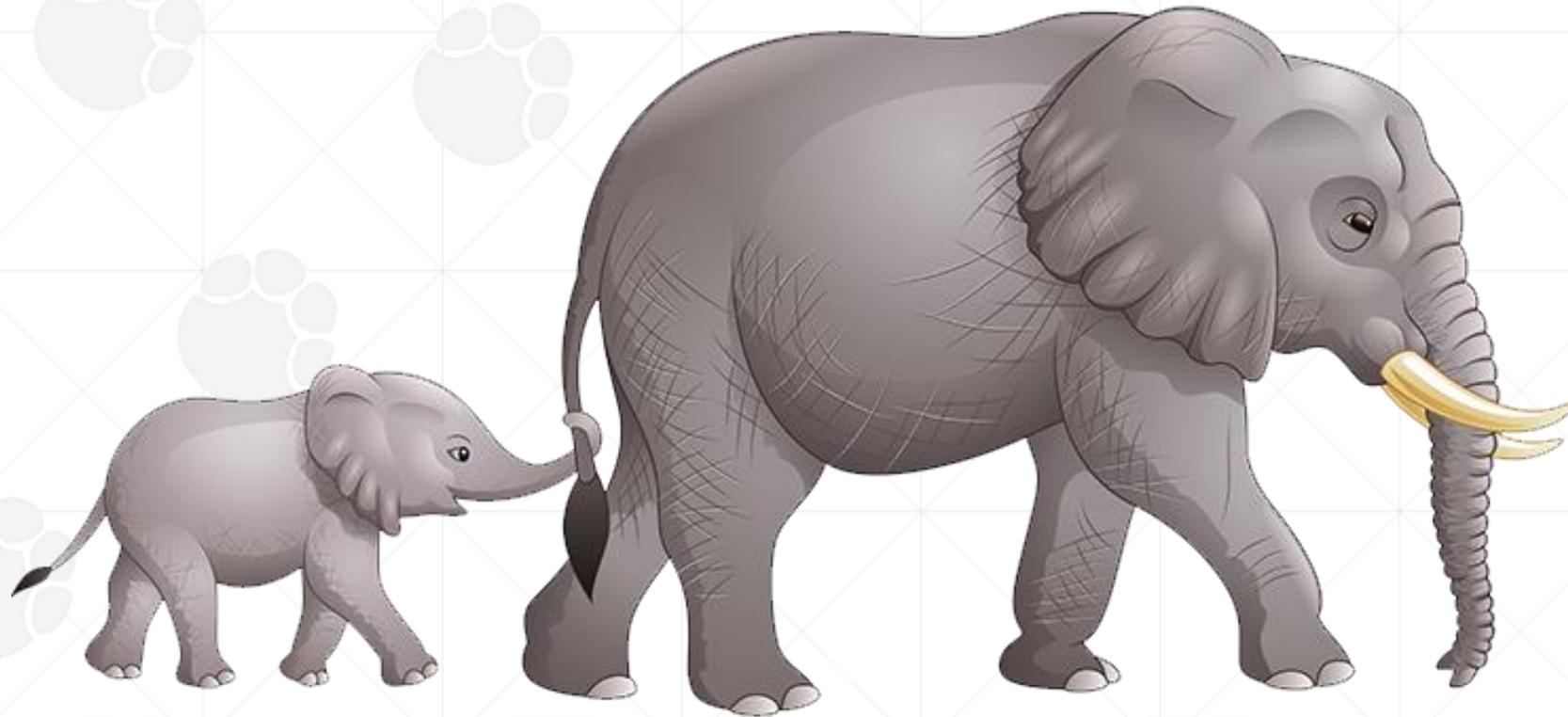
~ PRESENTS ~

# ***Sustainability in Oklahoma City***

---

Featuring T.O. Bowman, sustainability program planner, City of Oklahoma City

*Sponsored by the Growing Sustainable Communities Conference*



# URBAN ELEPHANT MEDIA

*PEER-TO-PEER LEARNING MADE EASY*

Sustainability Training for Urban Designers and Policymakers

**Randy Rodgers**, Director of Big Ideas  
Randy@UrbanElephantMedia.com  
563-562-2925

UrbanElephantMedia.com

Sponsored by

# GROWING SUSTAINABLE COMMUNITIES CONFERENCE

OCTOBER 17-18, 2022

Hosted by:  
 **SUSTAINABLE  
DUBUQUE**  
viable • livable • equitable

<http://GSCDubuque.com>

Our Presenter



**T.O. Bowman**  
*Sustainability Program Planner*  
City of Oklahoma City  
sustainability@okc.gov

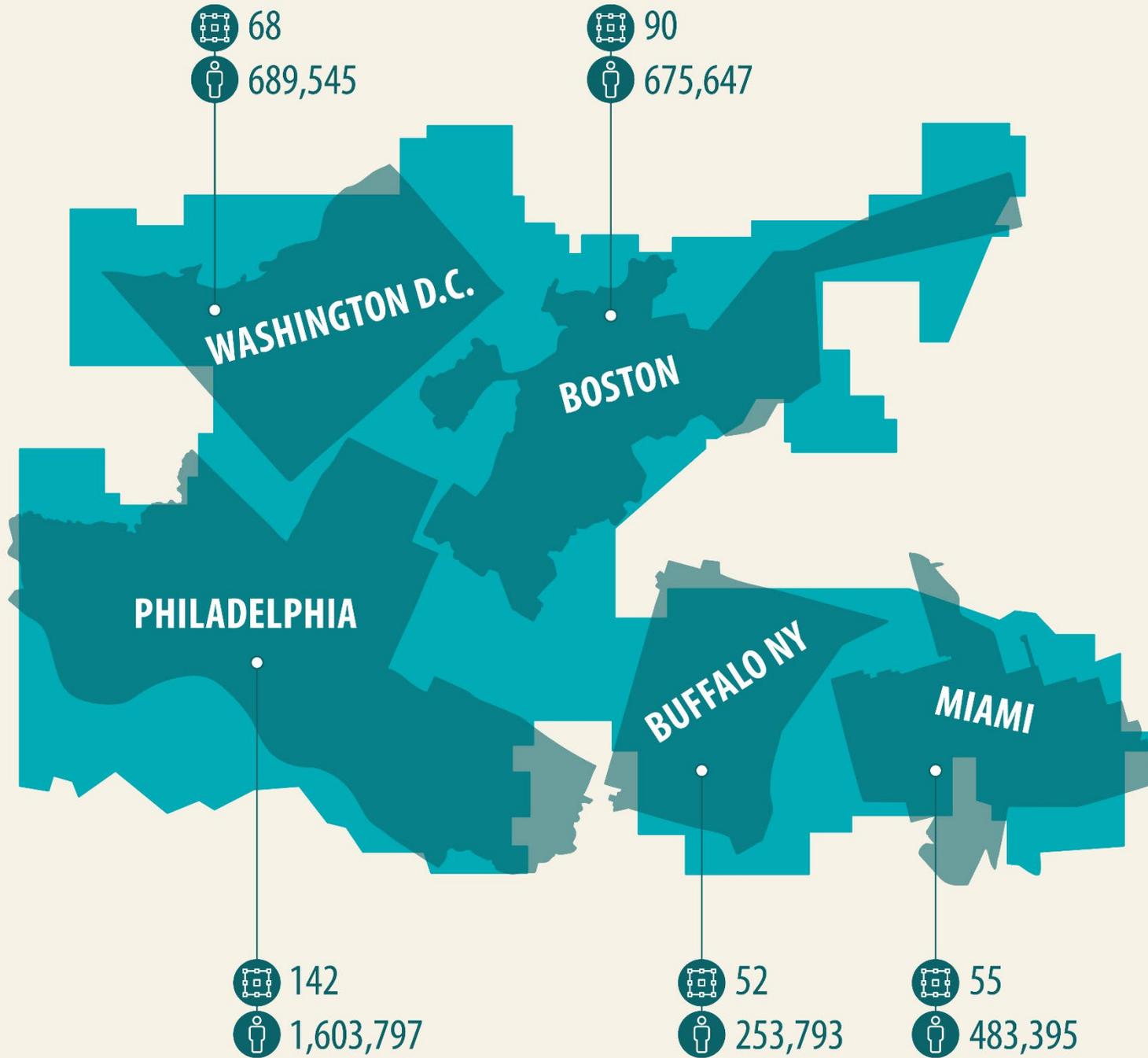
# OKLAHOMA CITY SUSTAINABILITY



**T.O. Bowman**  
**Program Planner**  
**City of Oklahoma City**  
**6/16/2022**

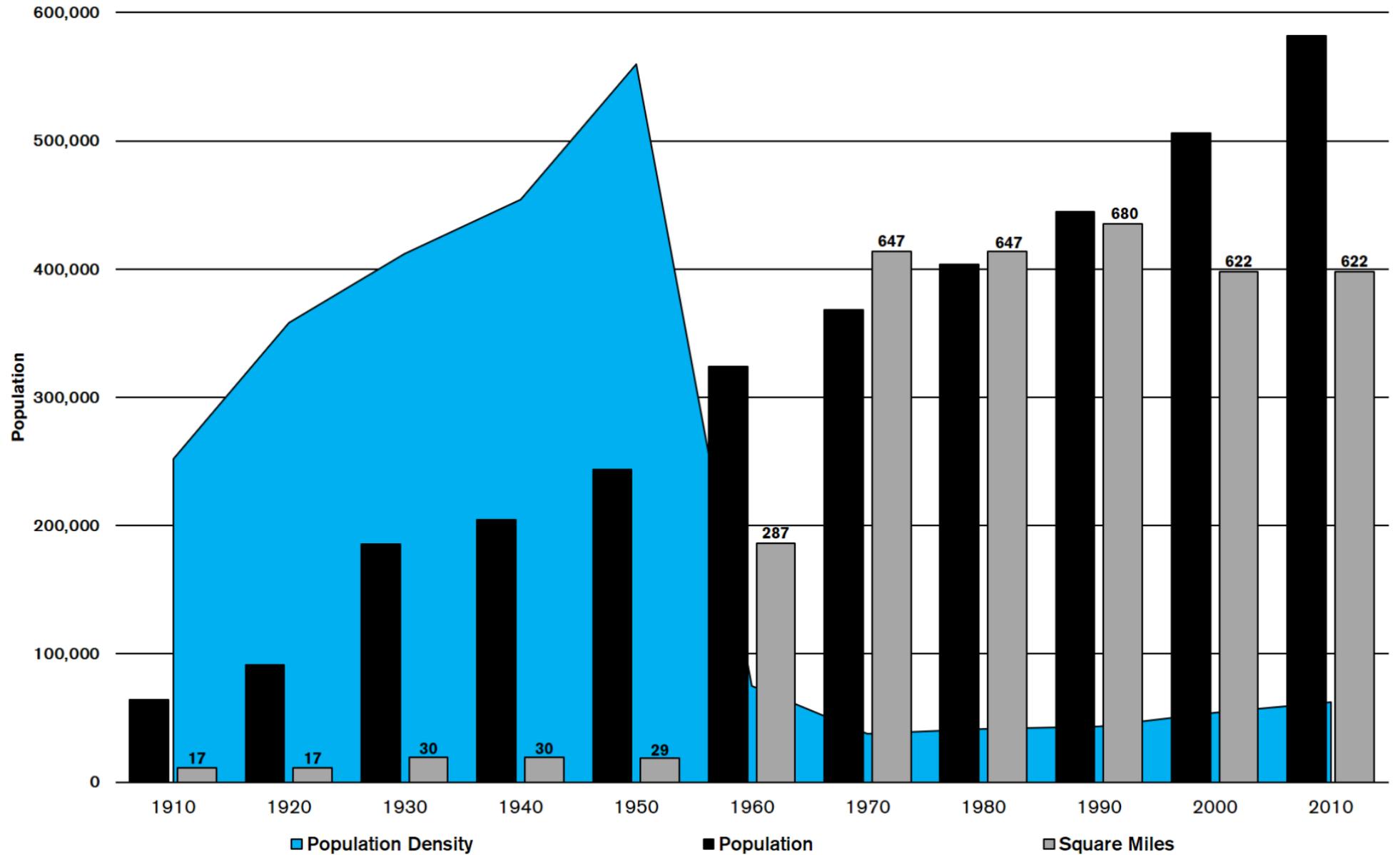
621 SQ MI

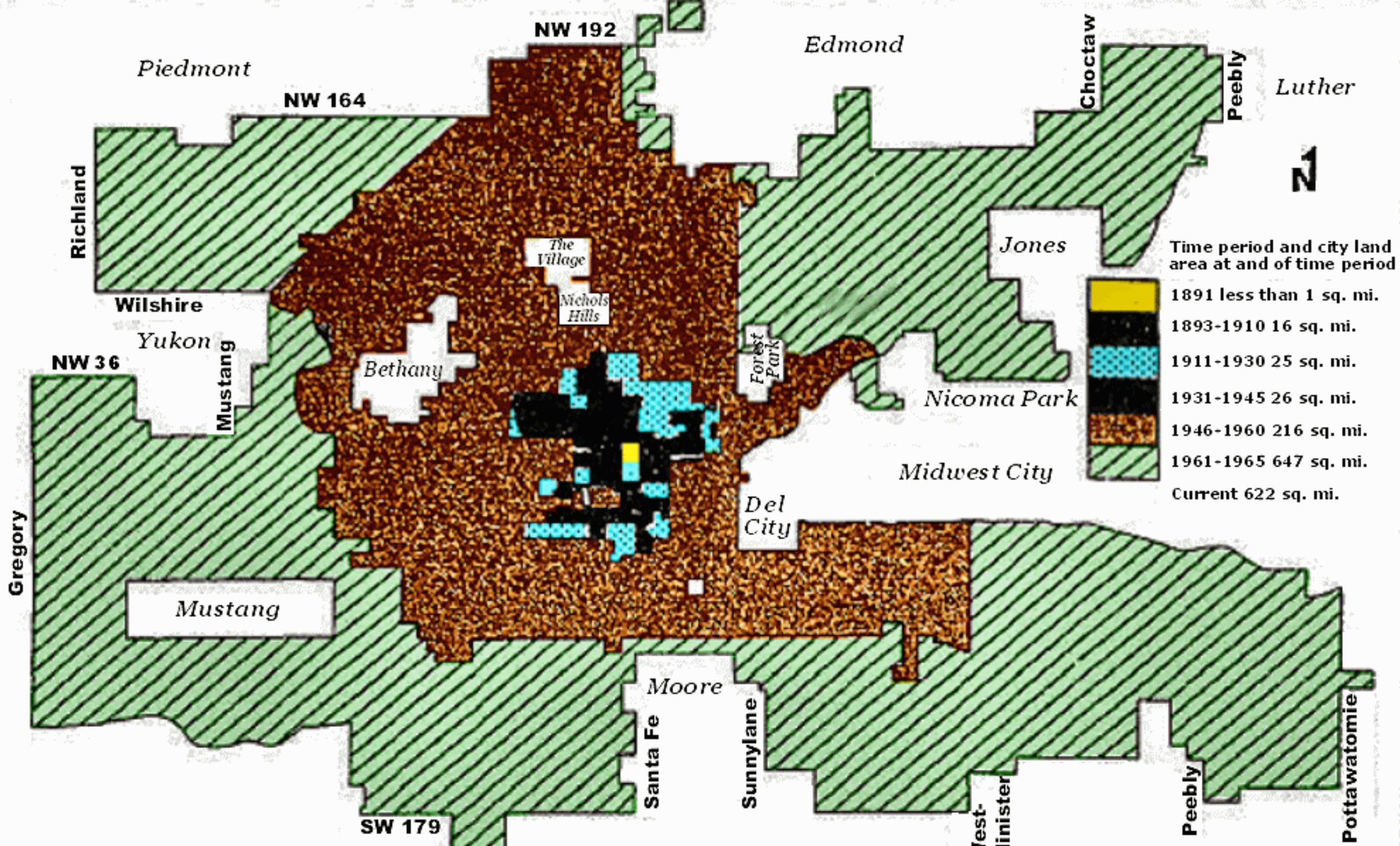




---

# 1910 - 2010





---

# PLANOKC

## greenokc Element

- ...assesses the impacts of development on ecological systems and recommends policies and practices that minimize negative impacts of land use and development on those systems.



# PLANOKC

## SUPPORTING STUDIES, ANALYSES, & SURVEYS (2010-2014)

- > Growth Scenarios Analysis
- > Employment Land Needs Assessment & Action Plan
- > Oklahoma City Retail Plan
- > COTPA Fixed Guideway Study
- > COTPA Transit Service Analysis
- > Downtown Housing Strategies & Implementation Plan

- > Addressing Vacant & Abandoned Buildings in Oklahoma City
- > Oklahoma City Parks Master Plan
- > Oklahoma City Community Appearance Survey
- > Oklahoma City Housing Market Preference & Demand Study
- > planokc Health Impact Assessment

## PUBLIC INPUT (2010-2014)

Input & feedback on issues, goals, policies Public Awareness & Engagement



### PUBLIC MEETINGS

- > Neighborhood Workshop
- > Meeting in a Box
- > Community Updates & Open Houses
- > Kickoff Meeting



### STAKEHOLDER & LEADERSHIP MEETINGS

- > Citizen Stakeholder Groups (CSG)
- > Healthy Communities Oversight Group (HCOG)
- > Citizen Advisory Team (CAT)
- > City Staff Working Groups
- > Greater Oklahoma City Chamber of Commerce Retreat
- > Joint Commission / Committee Workshop
- > Special Presentation to School Districts & City Managers
- > Presentation Circuit
- > Focus Groups

### ON-LINE FEEDBACK

- > Goals Review
- > CrowdGauge Survey
- > Mindmiser
- > Public review of planokc draft

### SURVEYS

- > planokc Vision Survey
- > Issue Importance Survey
- > Housing Survey
- > Community Appearance Survey
- > Parks Survey
- > planokc Citizen Survey
- > planokc Business Survey

### OTHER OUTREACH

- > Mailings
- > Radio interviews
- > Articles
- > Newsletters

KICKOFF: INITIAL PUBLIC OUTREACH

PHASE 1: ISSUE IDENTIFICATION

PHASE 2: PLANOKC GOALS

PHASE 3: POLICY DEVELOPMENT

May 2013 - 2014

DRAFT PLAN DEVELOPMENT

late 2014 - early 2015

FINALIZATION & ADOPTION

Starting in 2015

IMPLEMENTATION



Public Kick-off



Presentation Circuit



Free Coffee Monday



Neighborhood Workshop



Summer Update & Public Open House



Goal Development Workshop



Ward Meeting



Citizen Advisory Team Meeting



CrowdGauge



Symposium



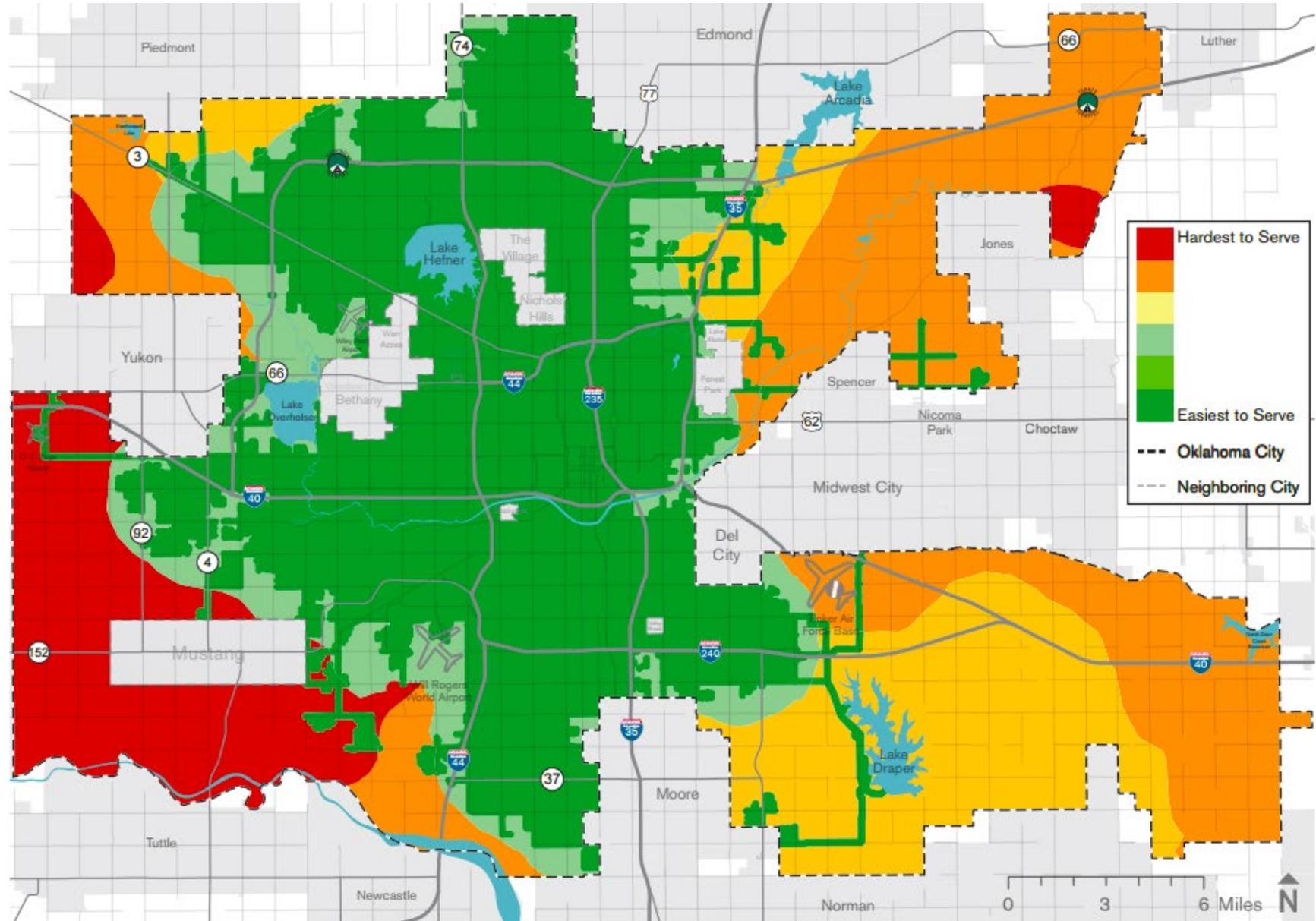
Growth Scenarios Workshop



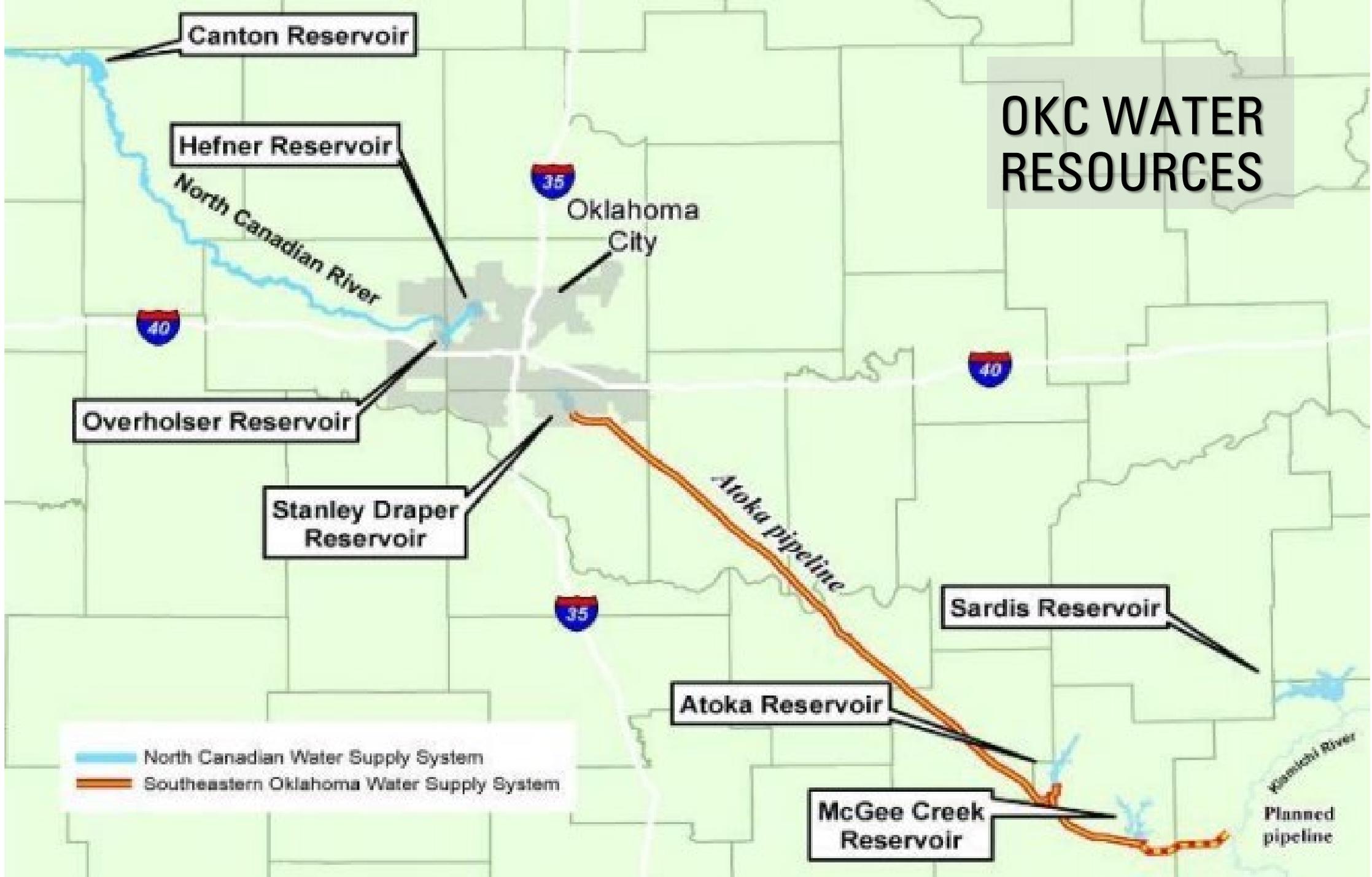
Focus Group

---

# OKC WATER SERVICE AVAILABILITY

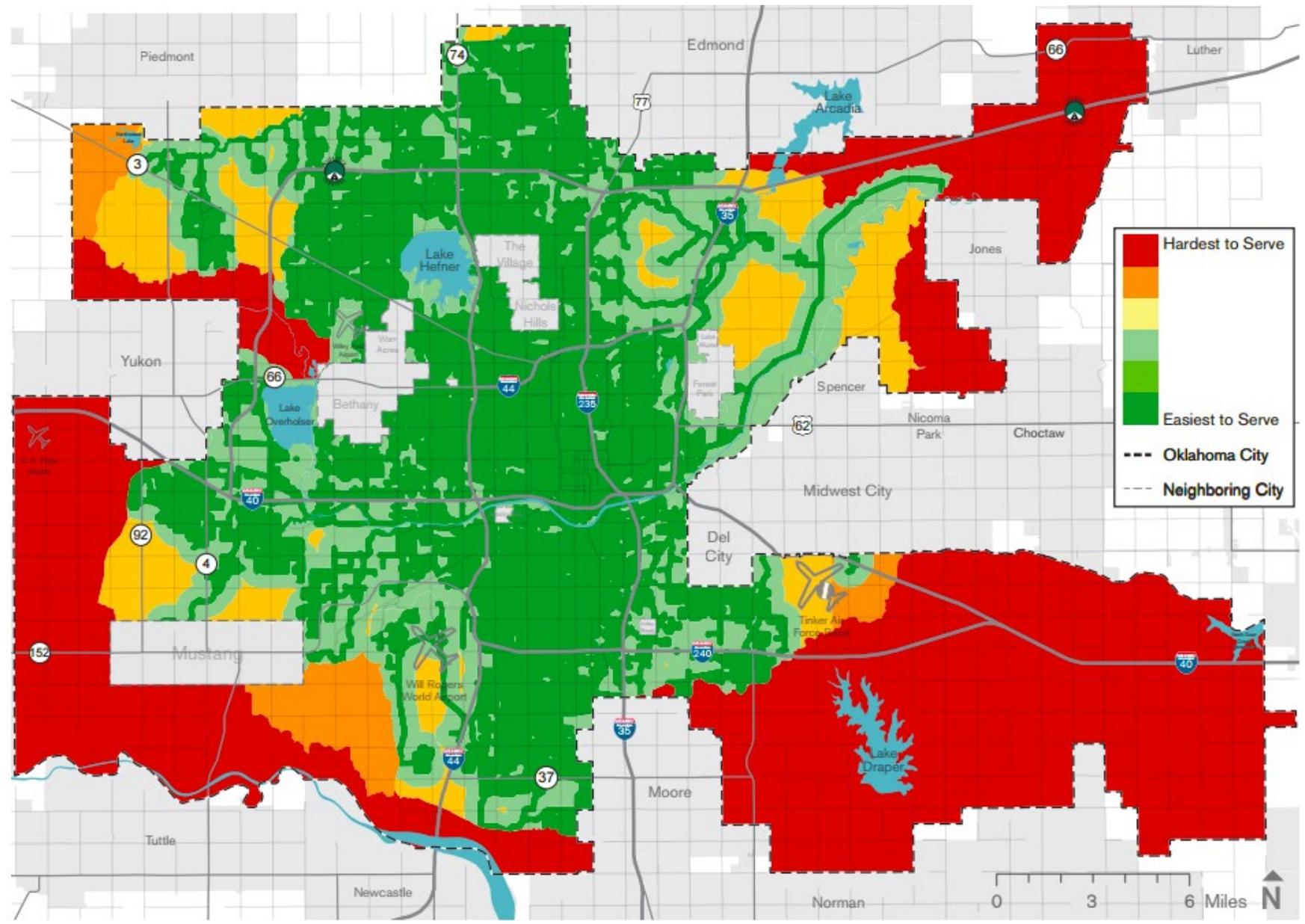


# OKC WATER RESOURCES



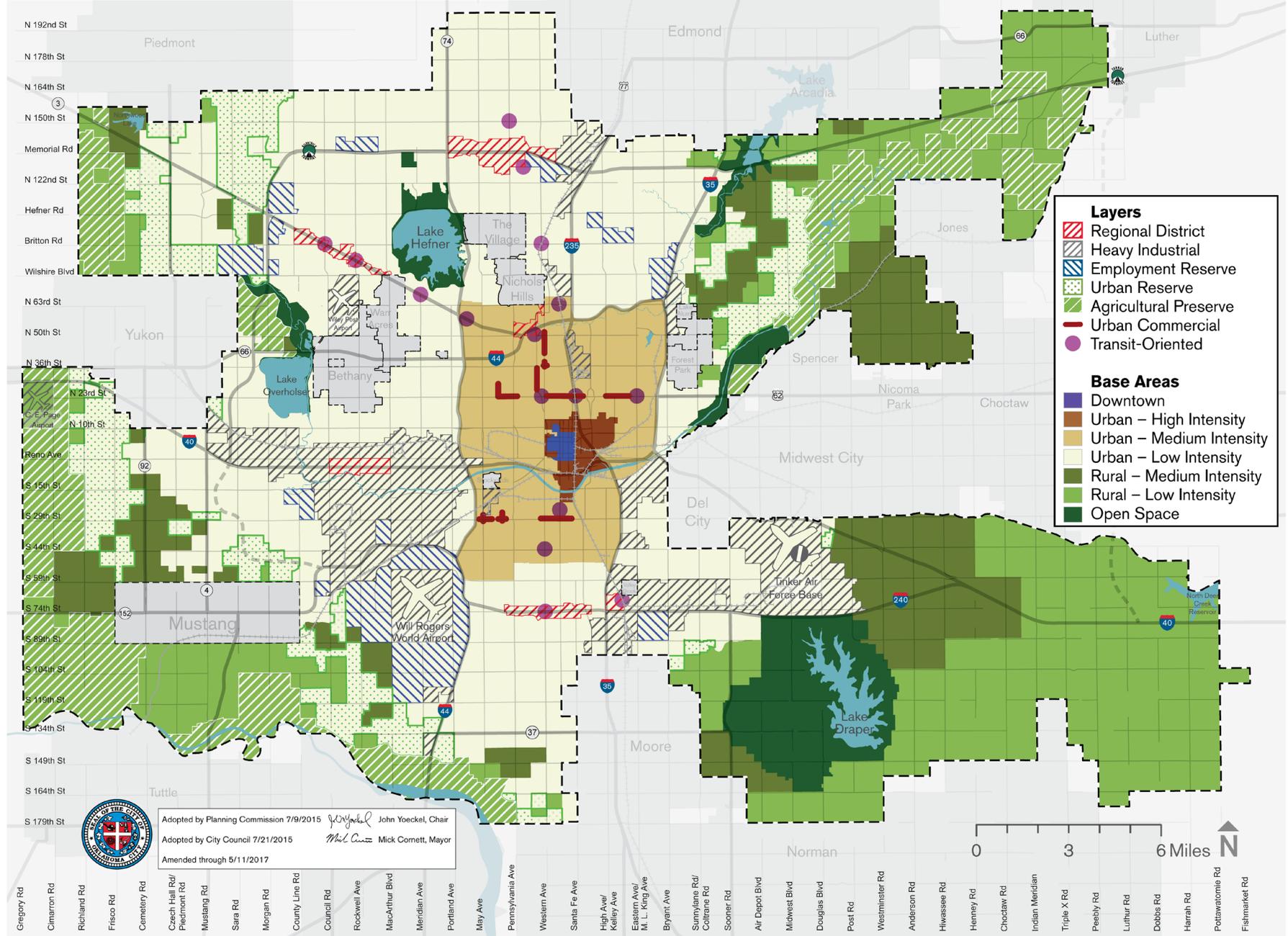
---

# OKC SEWER SERVICE AVAILABILITY



# LUTAS

## LAND USE TYPOLOGY AREAS (LUTAs)





adaptokc

adapting for a healthy future

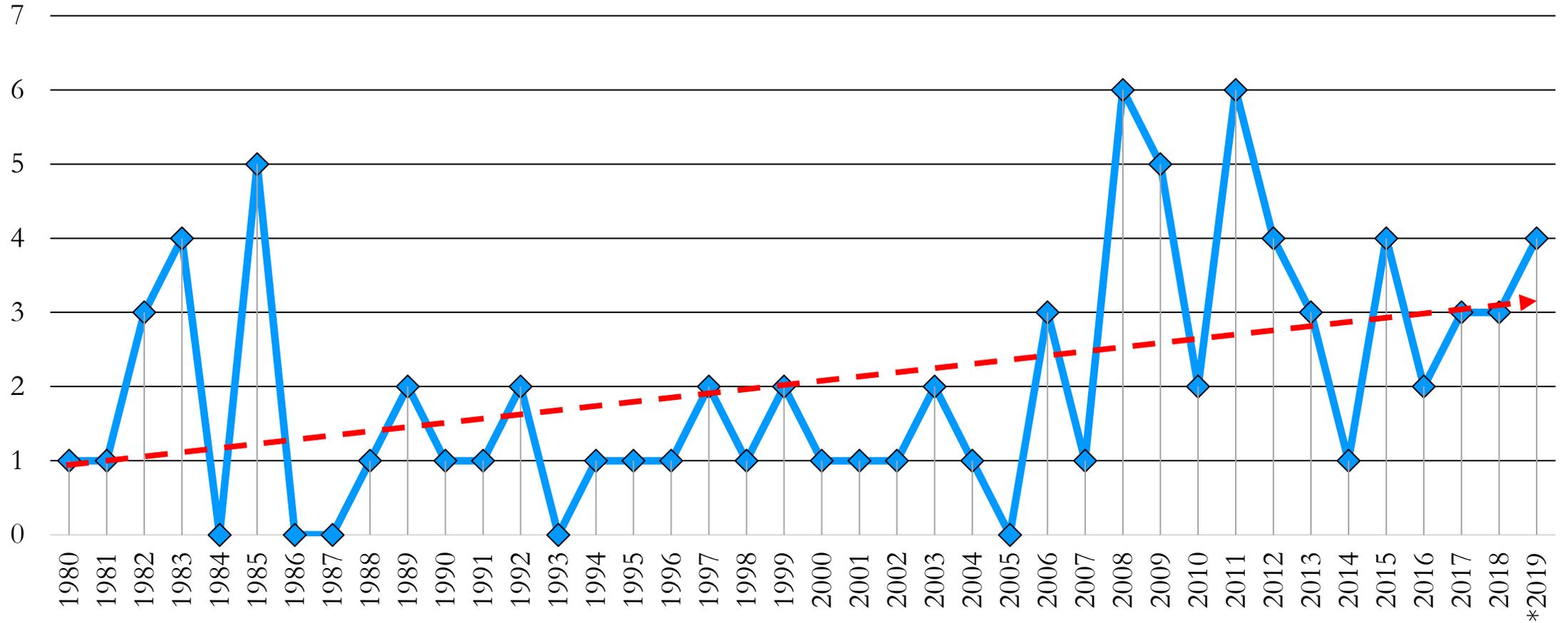
---

MOODY'S  
INVESTOR  
SERVICES 2019  
WHITE PAPER

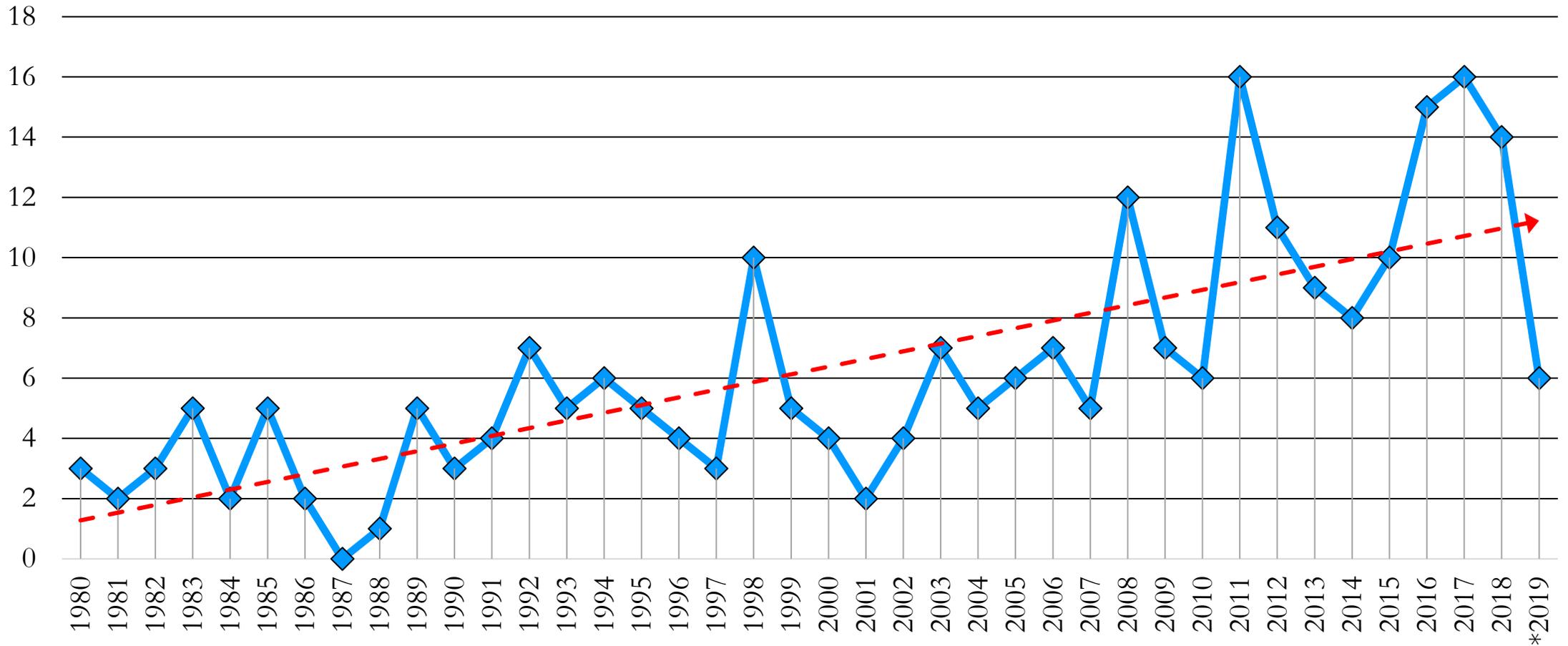
These plans indicate “how a city manages infrastructure vulnerabilities, current and future capital costs, mitigation of potential economic impacts and risk of population loss.”

If federal government support declines for cities contending with the costs of natural disasters, **it will result in greater state and/or municipal debt to finance recovery and adaptation.**

# BILLION-DOLLAR CLIMATE DISASTERS IN OKLAHOMA



# BILLION-DOLLAR CLIMATE DISASTERS, U.S.

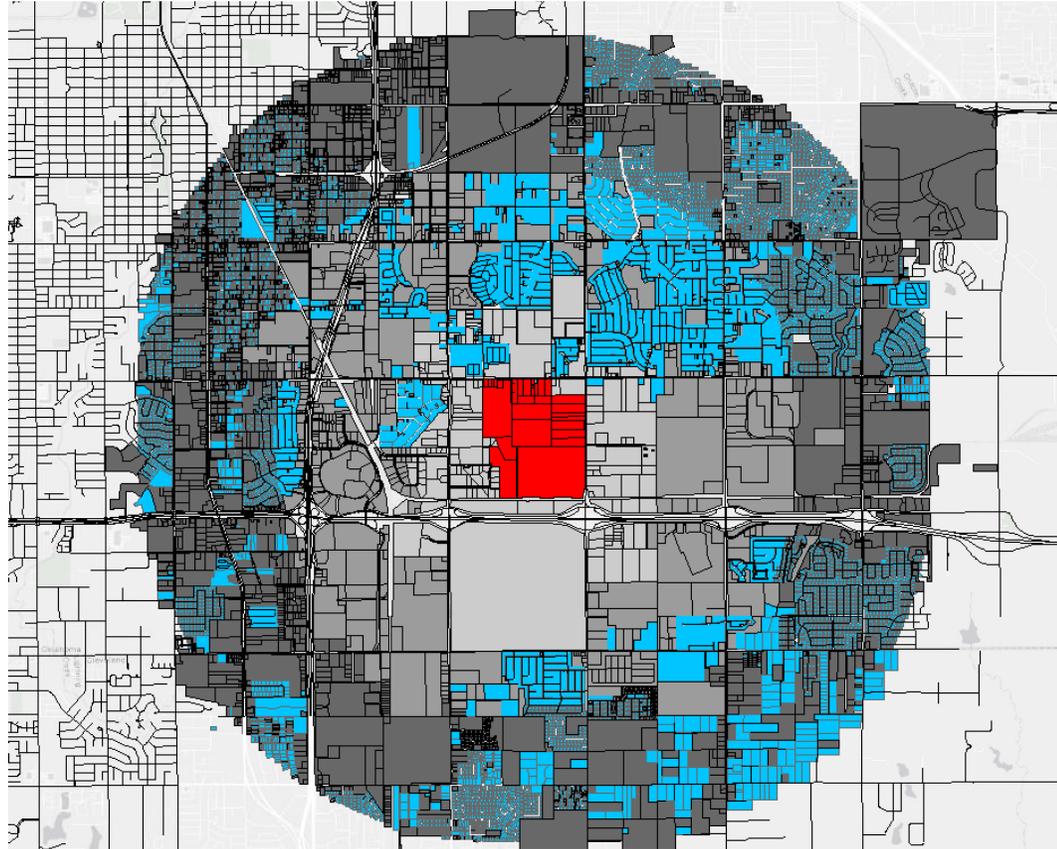




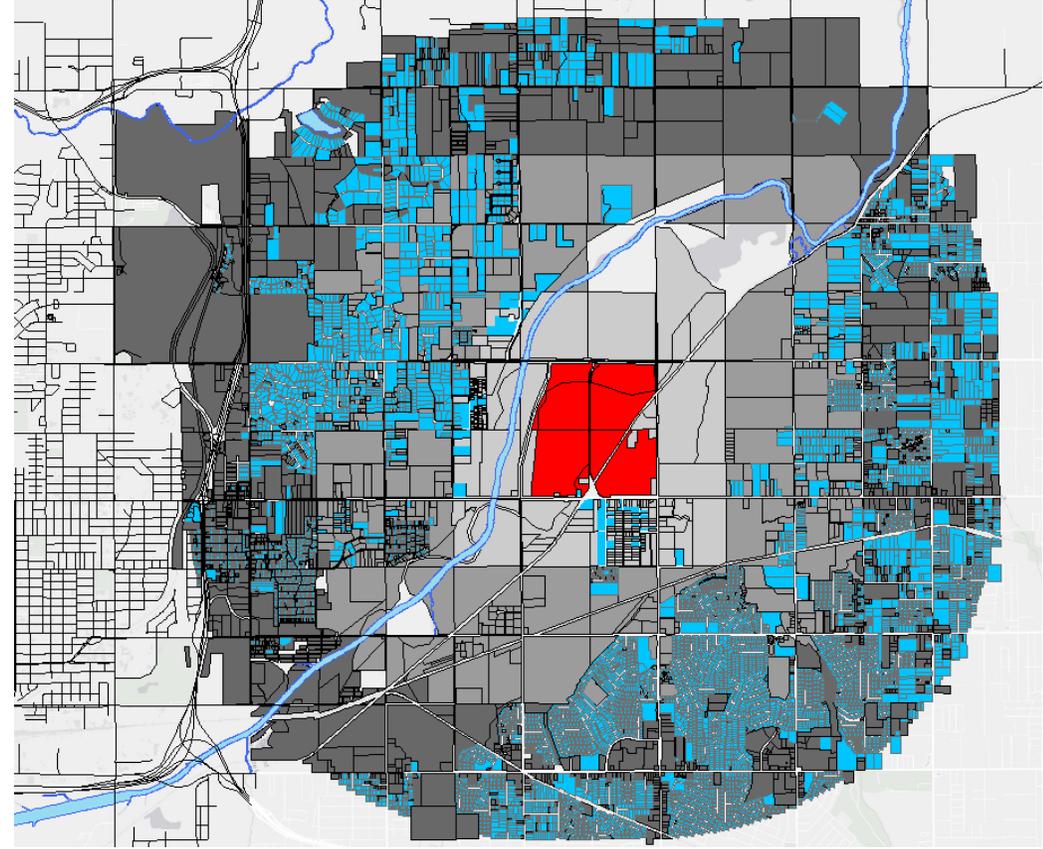
CLIMATE IMPACT:  
CASCADING  
COSTS

---

# RESIDENTIAL LAND USE NEAR LANDFILLS IN OKC



Southeast



East Oak

- Landfill Parcels
- 0 to 0.5 Miles from Landfill Parcels
- 0.5 to 1.5 Miles from Landfill Parcels

- 1.5 to 2.5 Miles from Landfill Parcels
- Residential Parcels

# WASTE REDUCTION

---

SENATE BILL 1001: SIGNED APRIL 23, 2019

**“...no political subdivision shall restrict, tax, prohibit or regulate the use, disposition or sale of auxiliary containers,” other than on county or city property.**

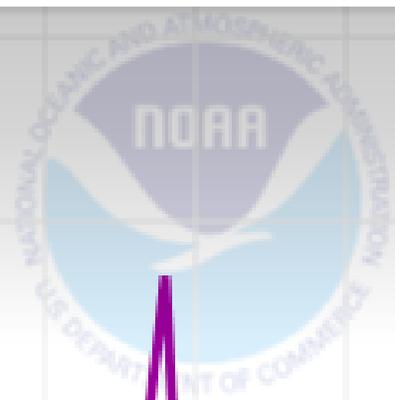
---



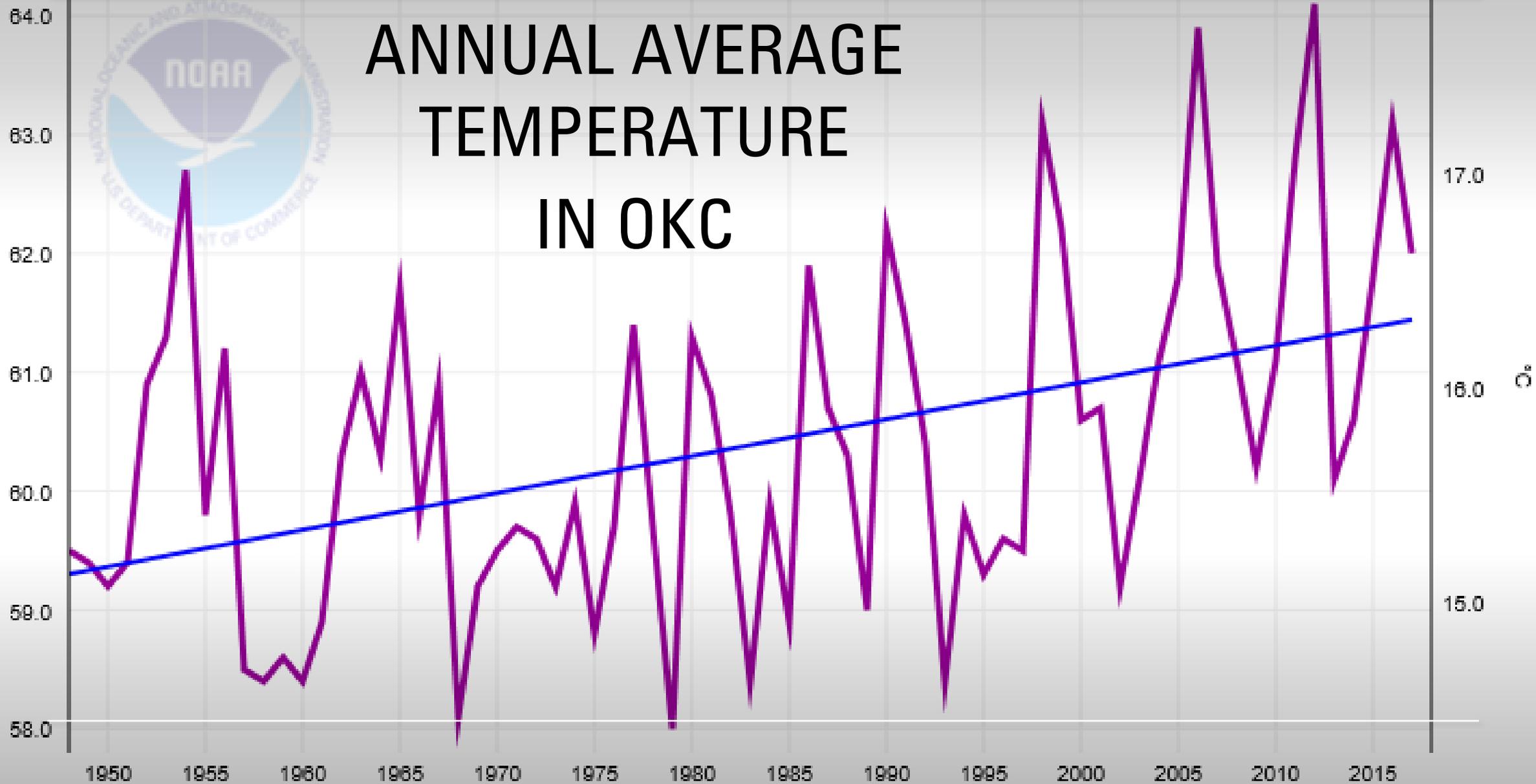


Avg Temperature

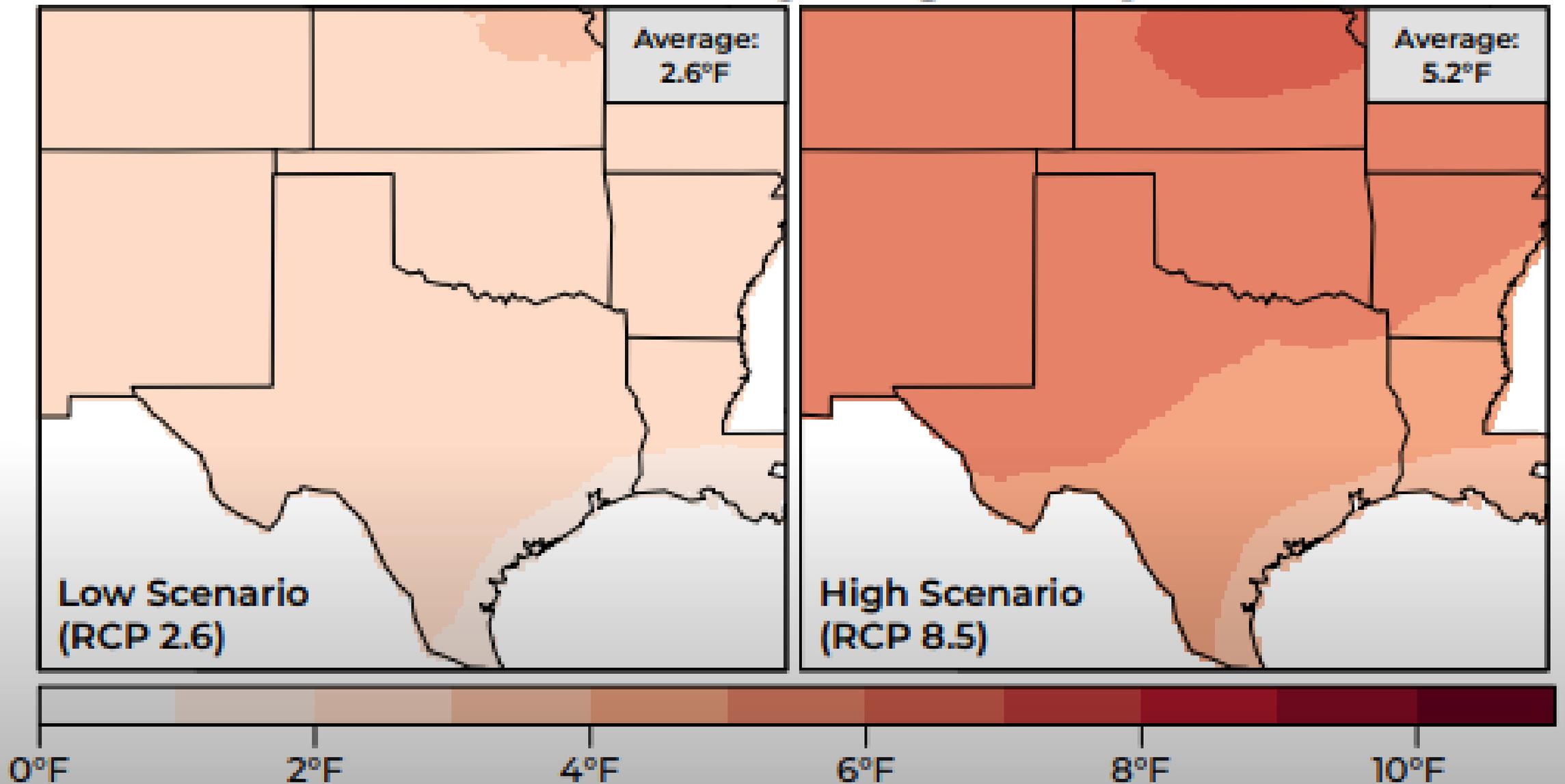
1948-2017 Trend +0.3°F/Decade



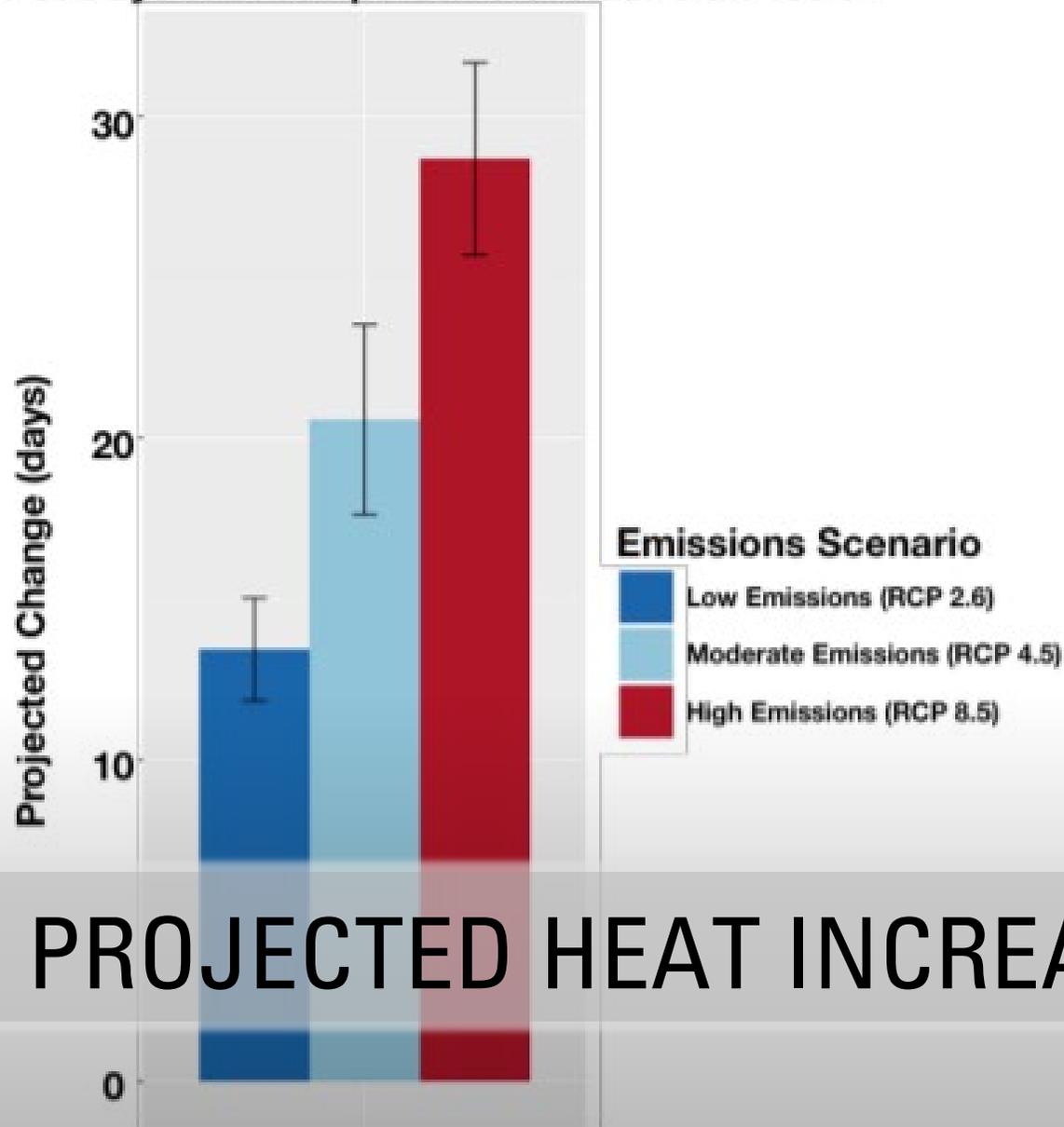
# ANNUAL AVERAGE TEMPERATURE IN OKC



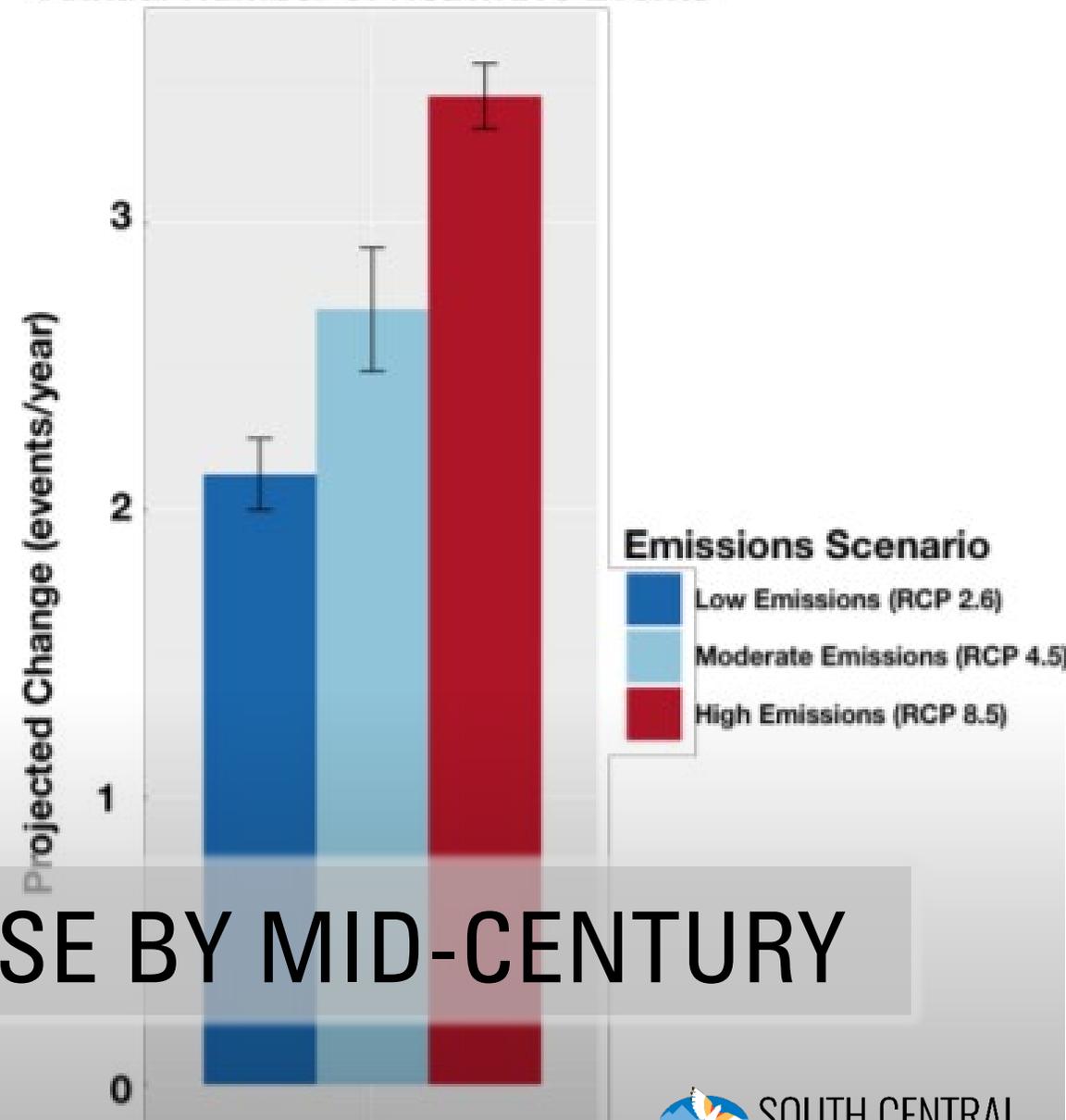
# Mid-Century Projected Change of the Annual Average High Temperature



2036-2065 Projected Change in the Average Annual Number of Days with Temperature Greater than 100°F



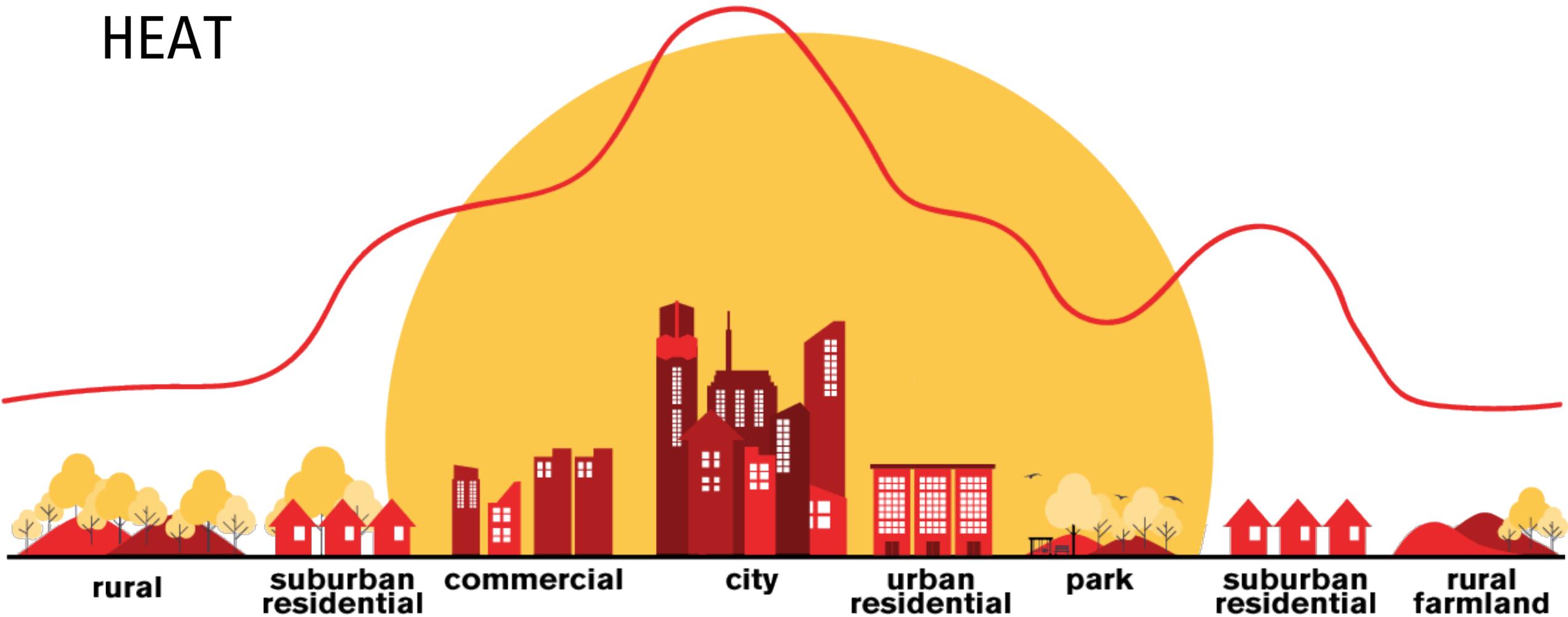
2036-2065 Projected Change in the Average Annual Number of Heatwave Events



PROJECTED HEAT INCREASE BY MID-CENTURY

---

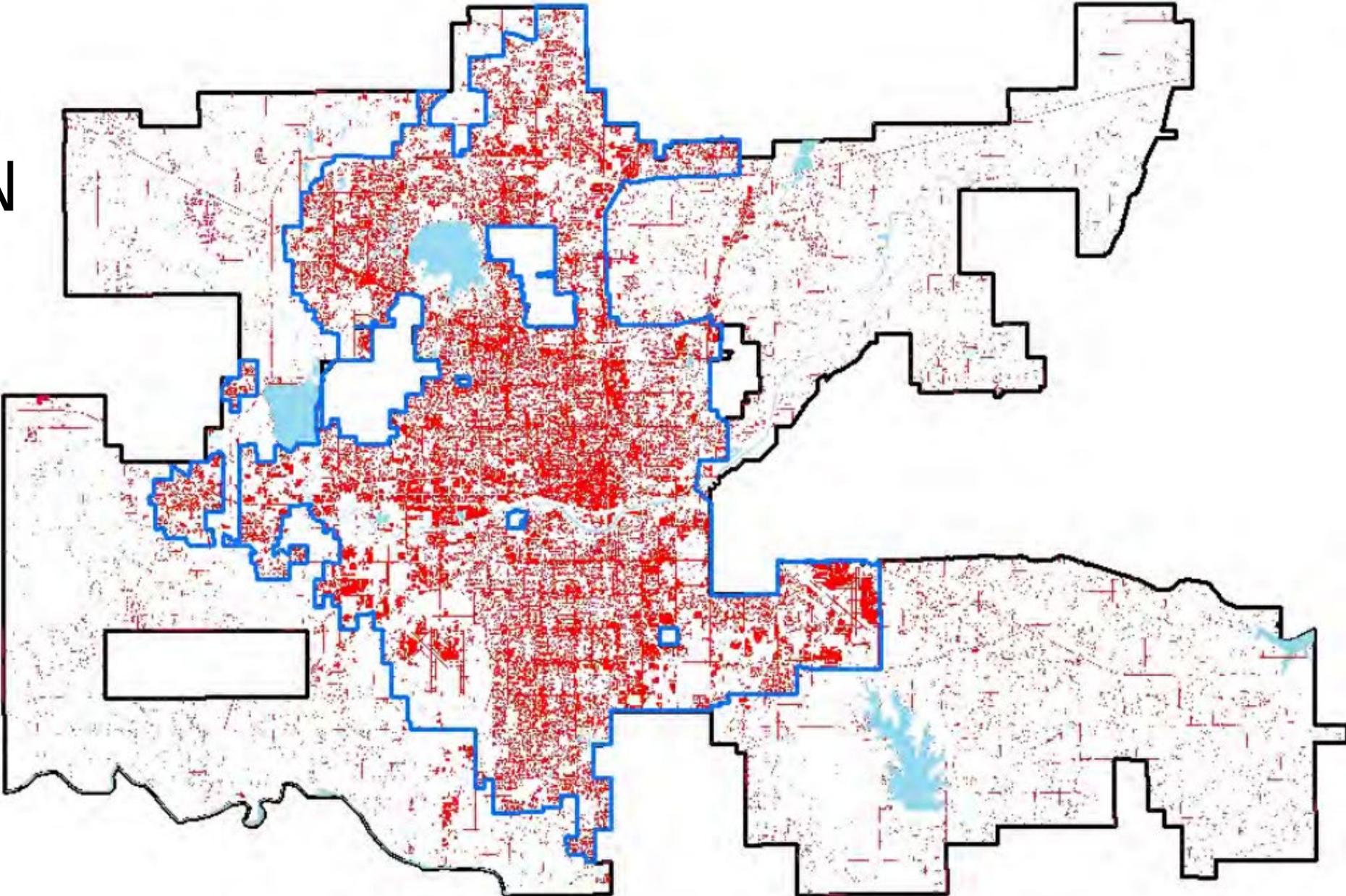
# EXTREME HEAT



---

# IMPERVIOUS SURFACES IN OKC

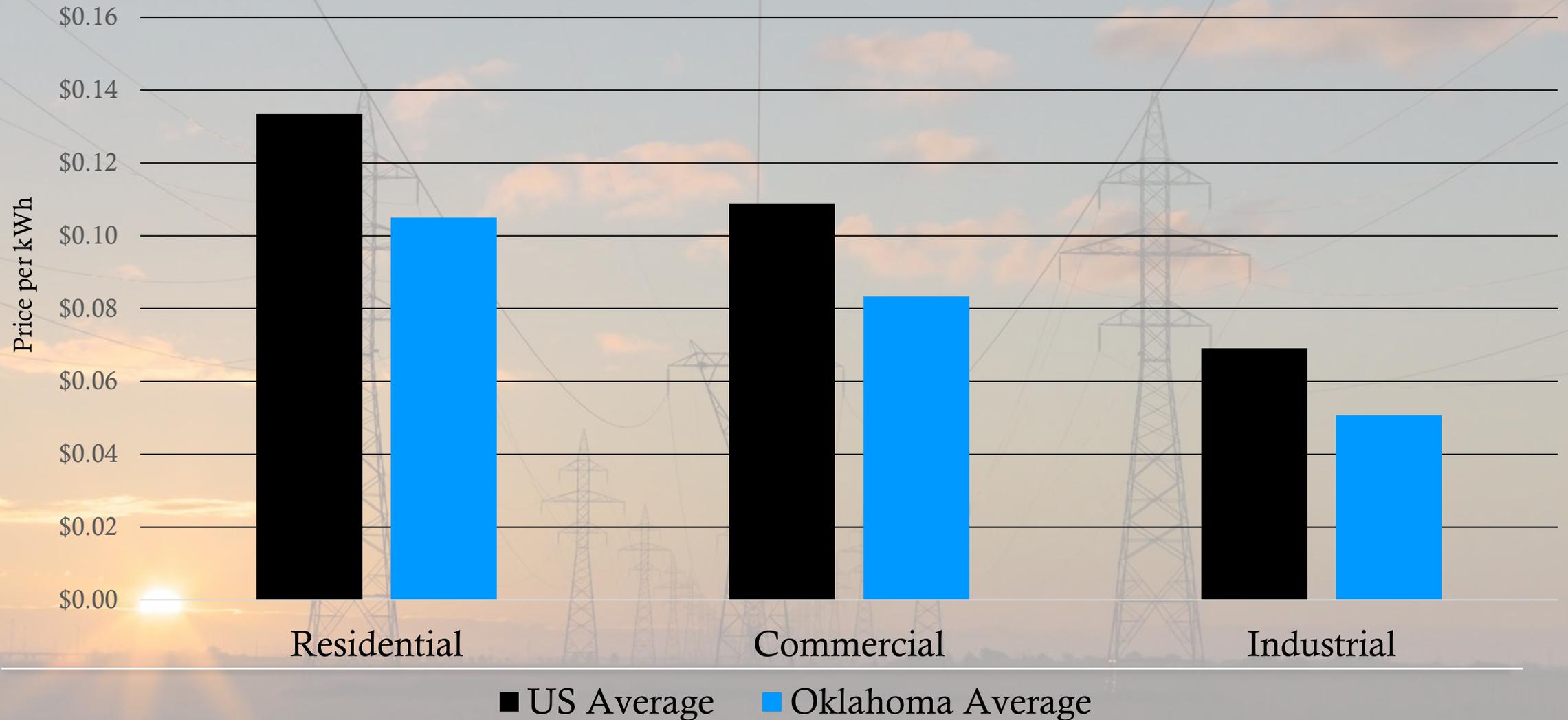
-  Impervious Surface
-  Body of Water
-  Urban Area
-  City Limits



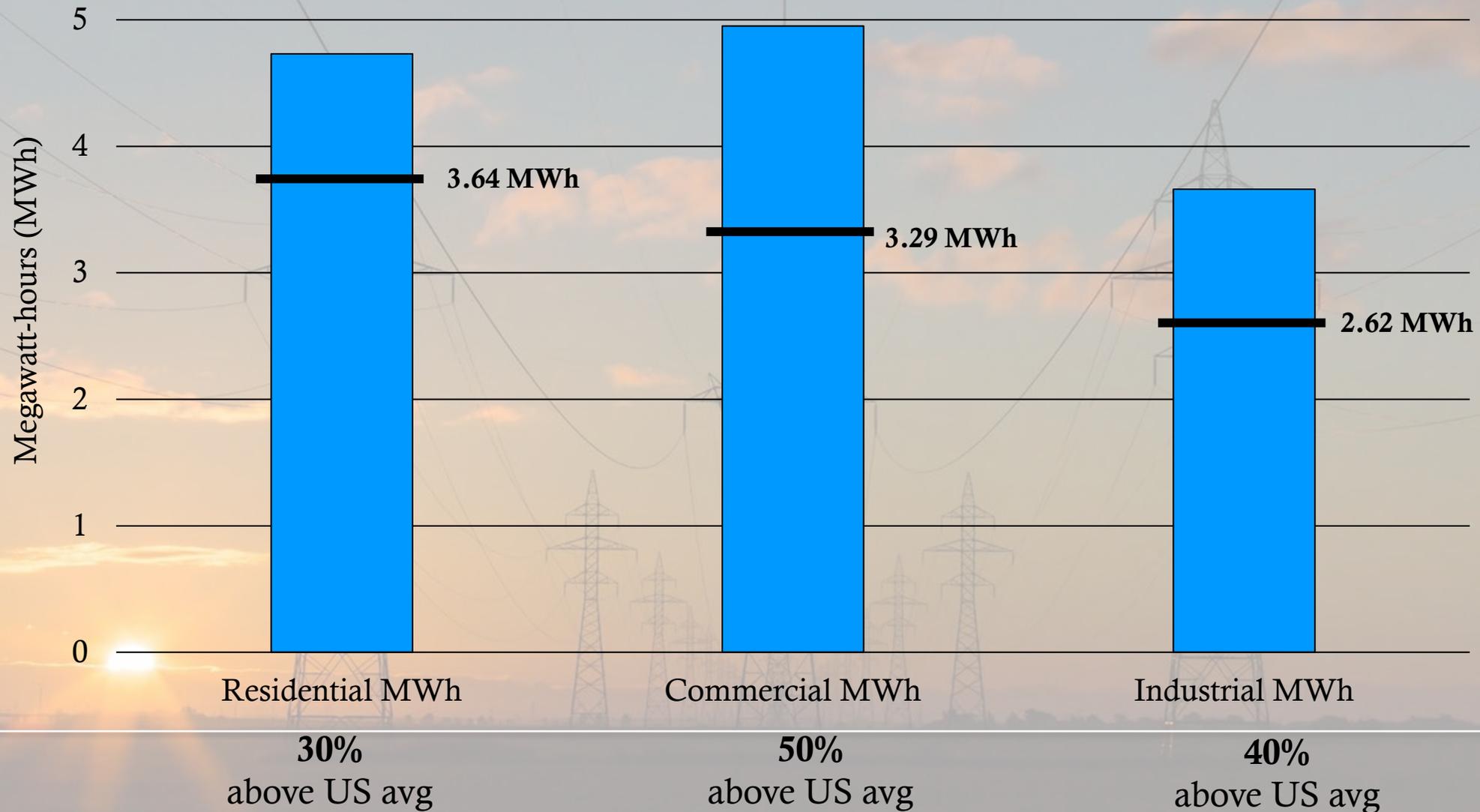


# ENERGY PRODUCTIVITY

# LOW-PRICED ELECTRICITY



# ELECTRICITY USE PER CAPITA, OKC VS. NATIONAL AVG



# ENERGY PRODUCTIVITY

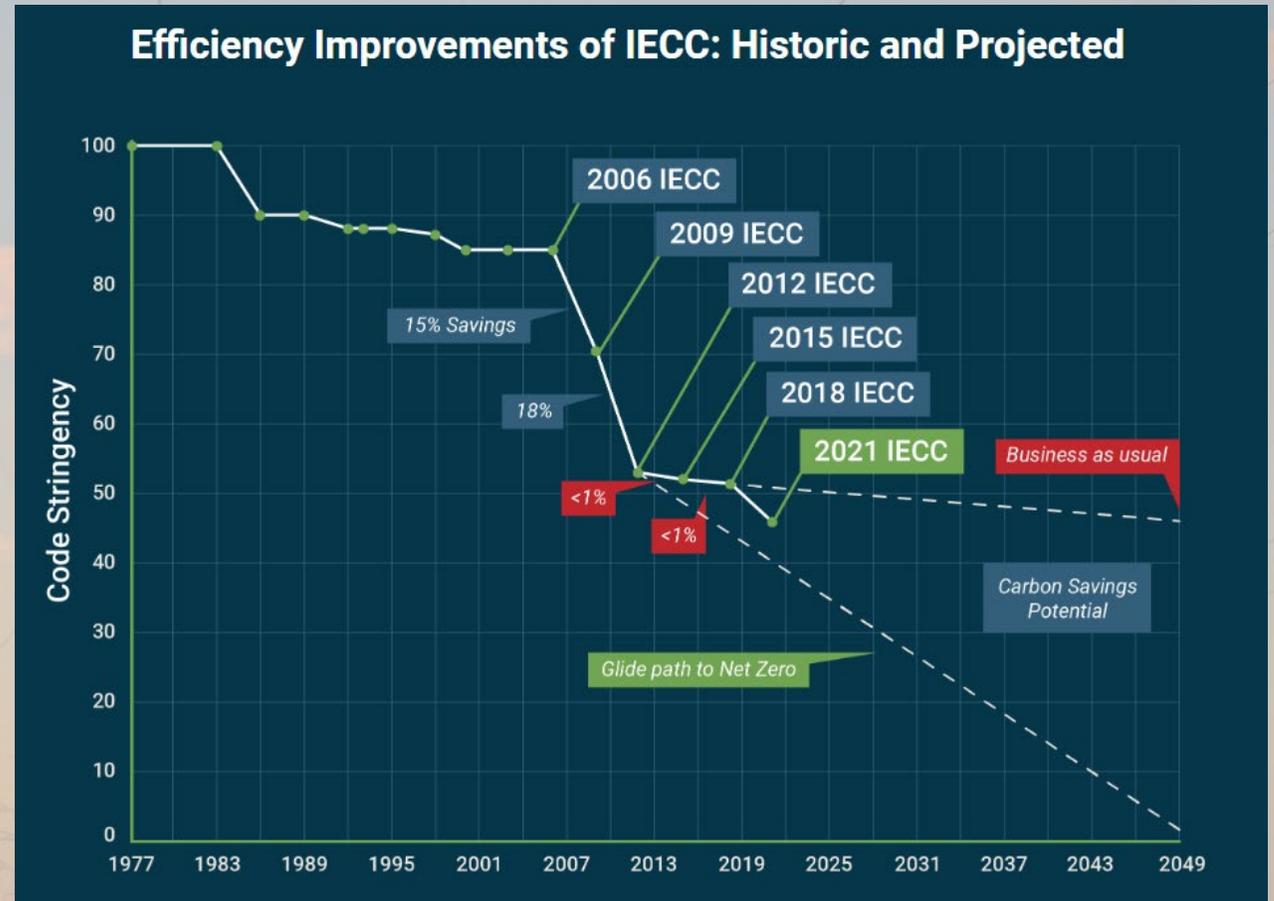
## New Construction & Major Renovation

### 1. Design Phase

- Energy Code Design Criteria
- Modeled Energy Use & Life-Cycle Costing
- Solar-Ready
- EV-Ready
- Choice Architecture & Occupant Behavior

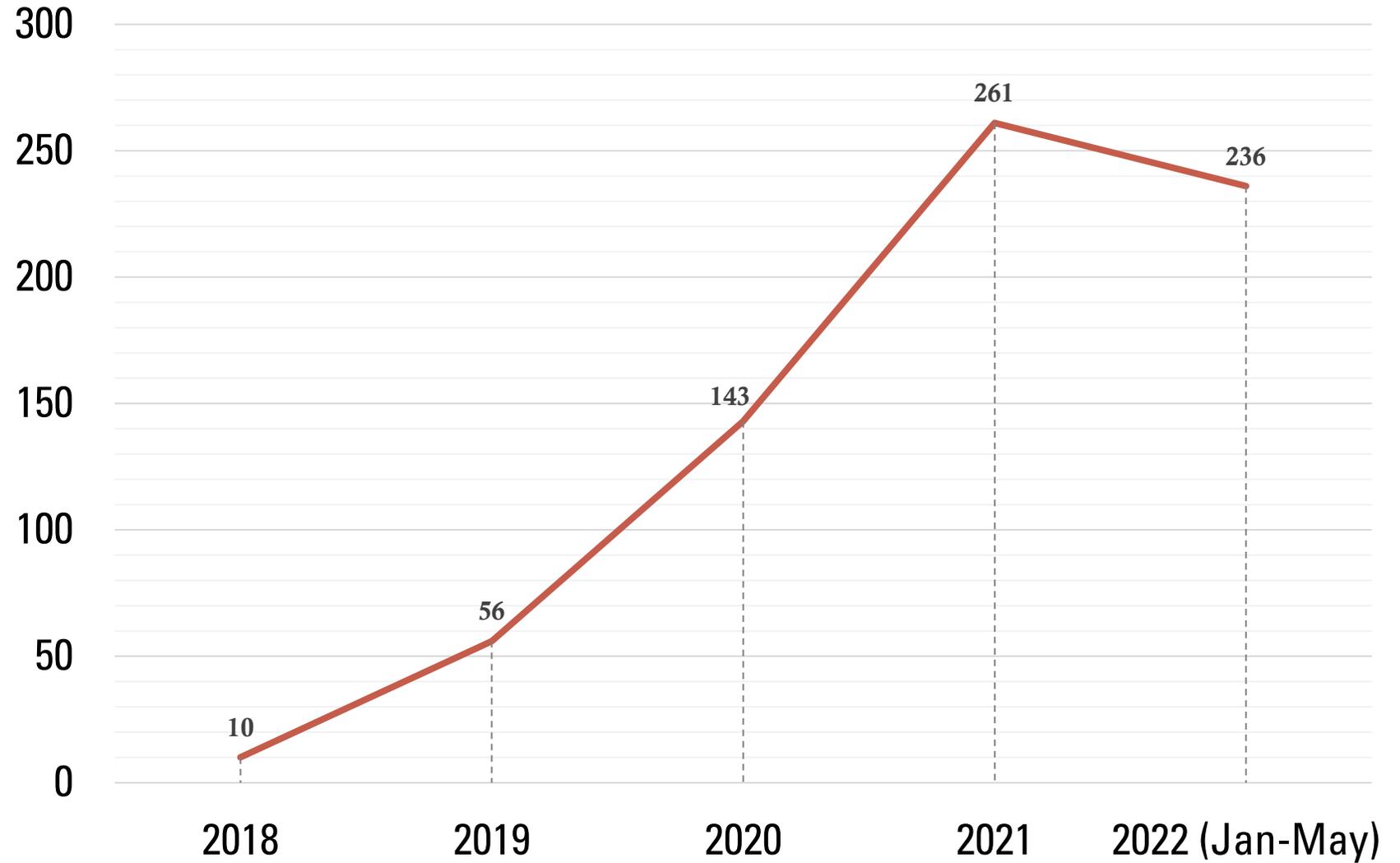
### 2. Operations

- Third-Party Commissioning
- Measure & Report Savings



---

# RESIDENTIAL ELECTRICAL PERMITS FOR SOLAR



# solarizeokc



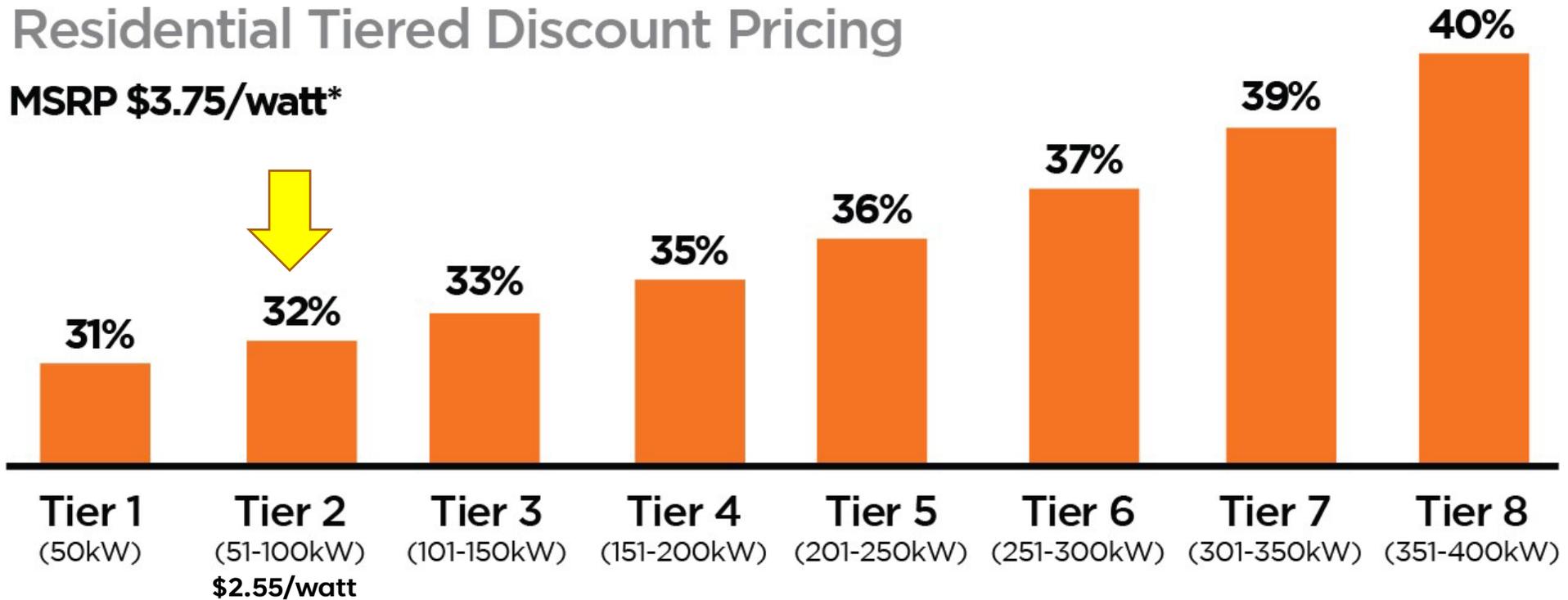
HOME | BUSINESS | NONPROFIT

# solarizeokc

RESIDENTIAL

## Residential Tiered Discount Pricing

MSRP \$3.75/watt\*

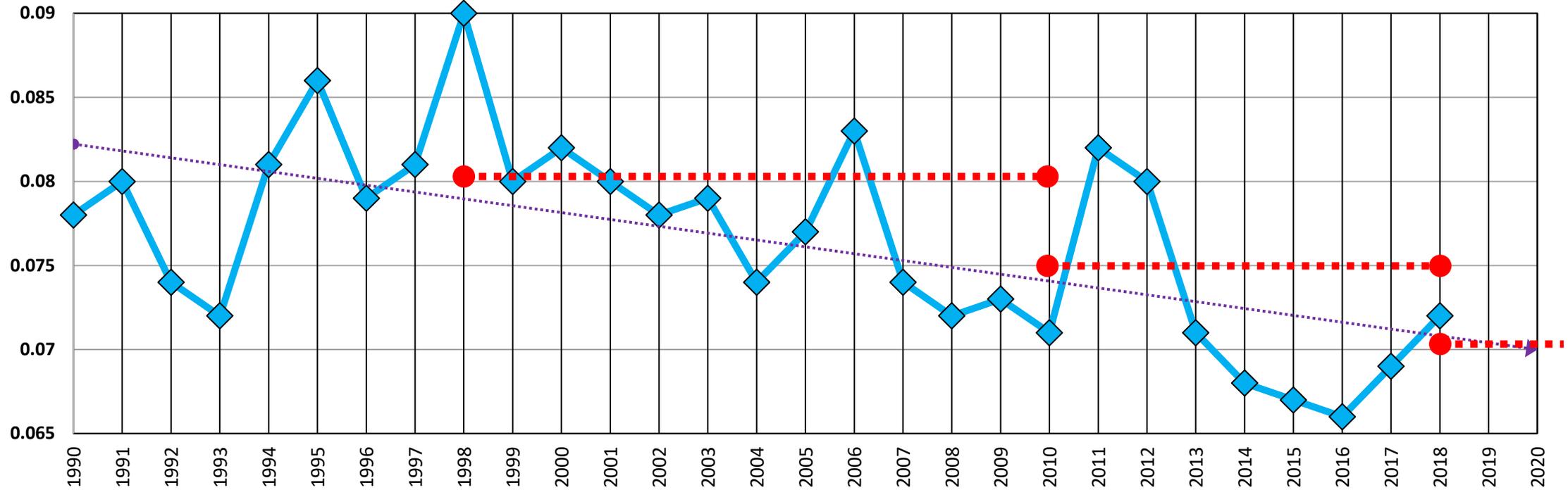


■ Savings

\*MSRP = cost per watt for same materials outside Solarize OKC

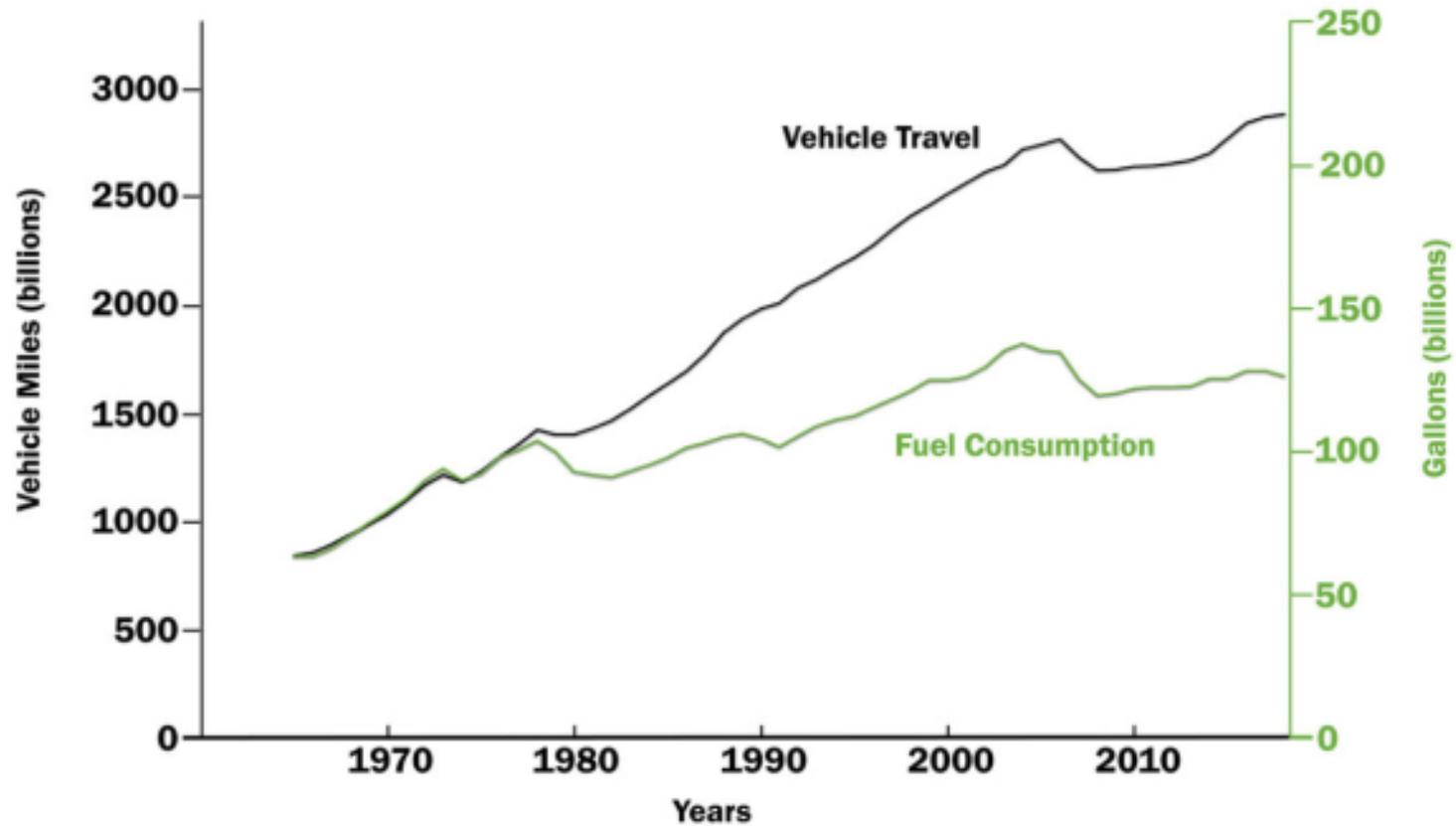


# AIR QUALITY



# NATIONAL AMBIENT AIR QUALITY STANDARD

FOURTH-HIGHEST OZONE READING

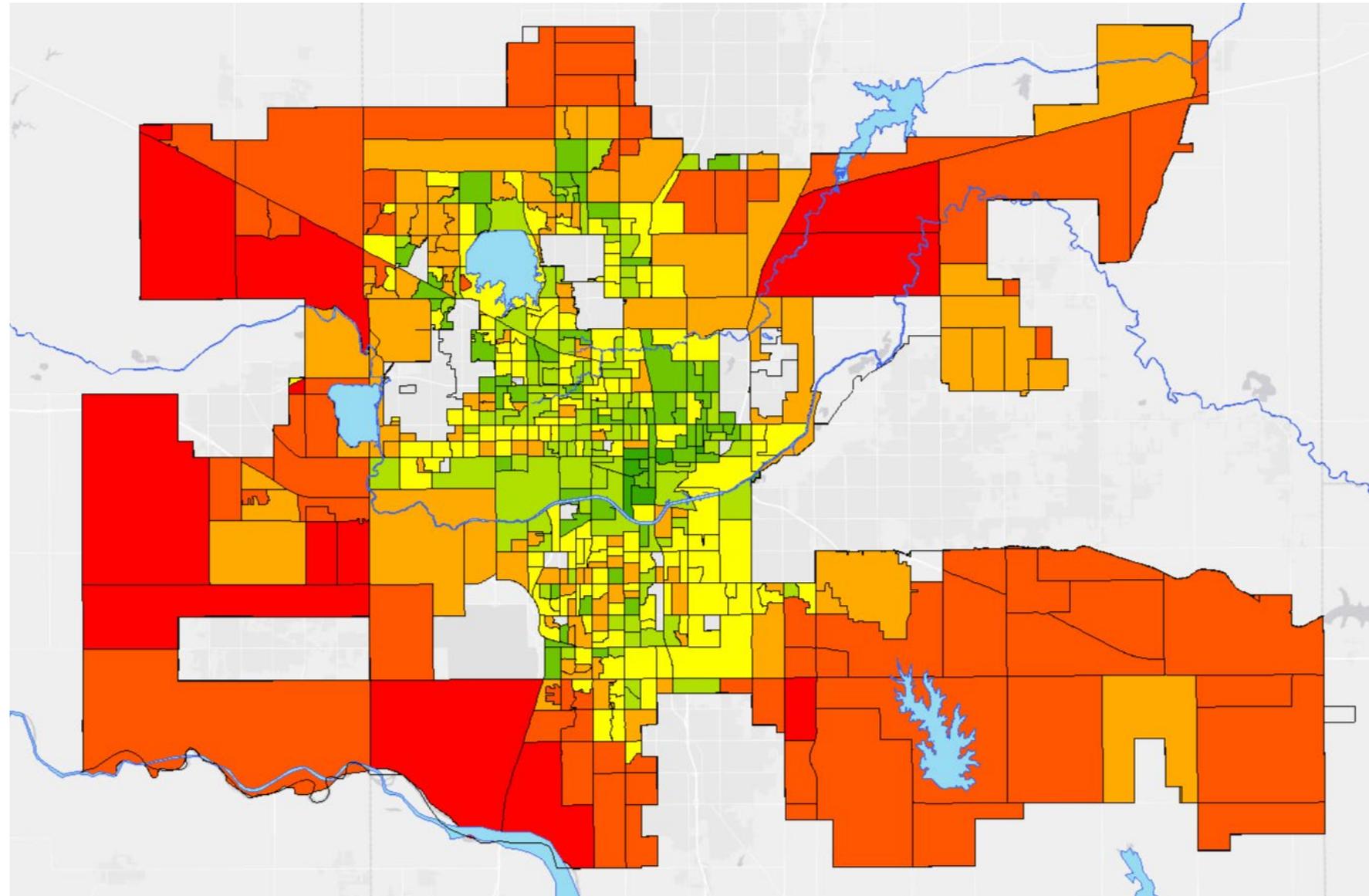
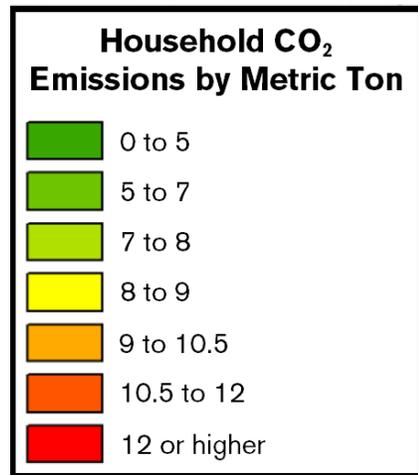


---

# CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS

---

# EMISSIONS (CO<sub>2</sub>) FROM AUTOMOBILE USE PER HOUSEHOLD



---

# NON-ATTAINMENT STUDY



- City of Oklahoma City
- Environmental Federation of Oklahoma
- Greater Oklahoma City Chamber of Commerce
- Oklahoma Department of Commerce
- Oklahoma Department of Transportation
- Oklahoma Gas & Electric Company
- ONE Gas
- Sierra Club – Oklahoma Chapter
- Tinker Air Force Base



A potential violation of federal air quality standards in the OKC area could bring about regulatory requirements that could cost the OKC Metro Area as much as \$9.6 - \$15.2 billion over a 30-year period.

[t.ly/2Vc9](https://t.ly/2Vc9)



10:00 AM · Jun 10, 2022 · Twitter Web App

---

# BICYCLE & PEDESTRIAN MASTER PLAN



**Mayor David Holt**  @davidfholt · Oct 16, 2020



Great find, Chris! The placement of the delineators actually just commenced a couple days ago. More protected bike lanes coming to OKC!



**Chris Lee** @KOCO\_FAST2 · Oct 16, 2020

This is awesome!

Dedicated, protected bike lanes on Walker Ave. across the river. I guess I need to get south more often. @davidfholt, I knew about General Pershing Blvd, but how long have these been open?



---

# ALTERNATIVE FUELS



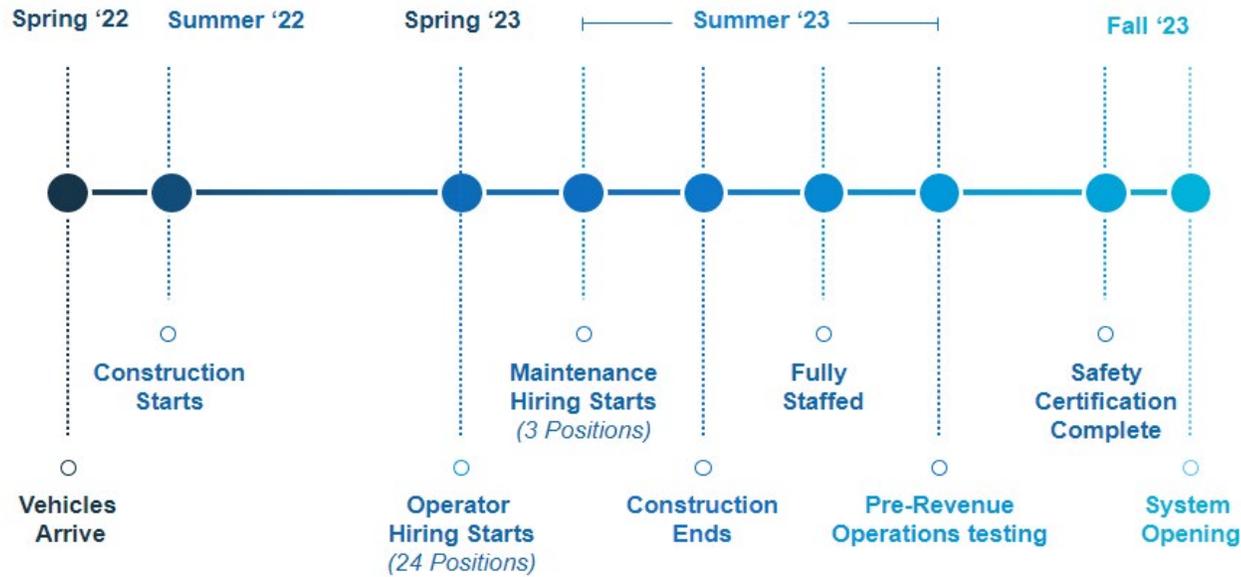


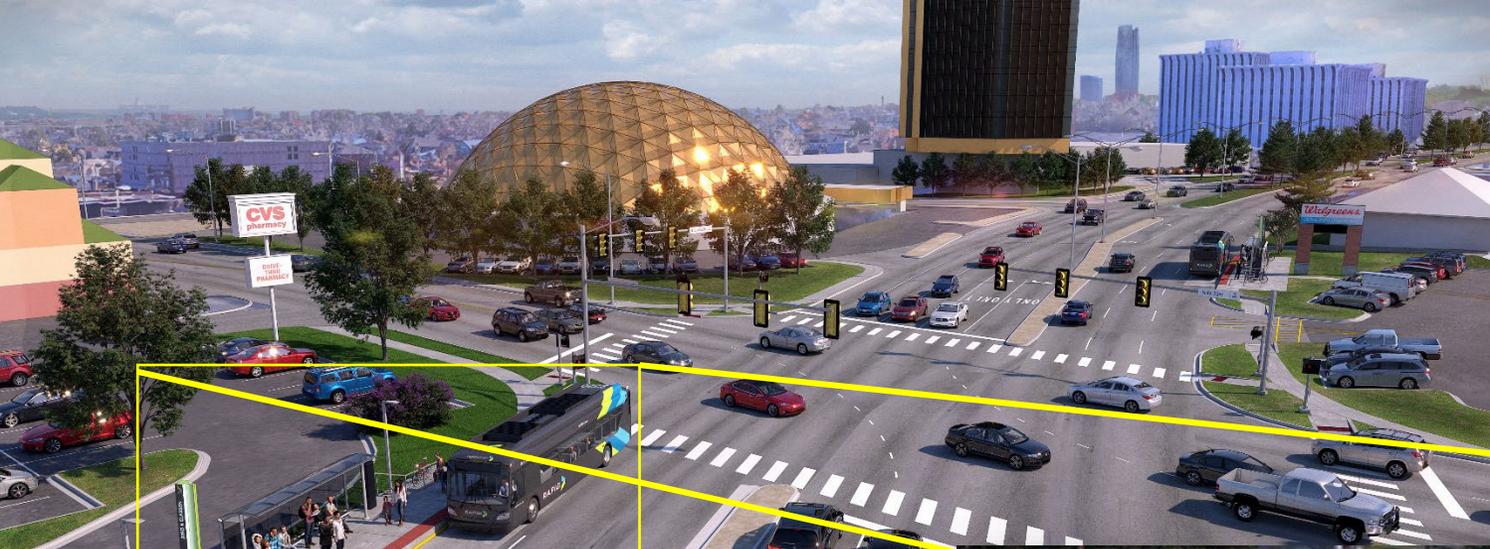
ARRIVING FALL 2023

# Bus Rapid Transit:

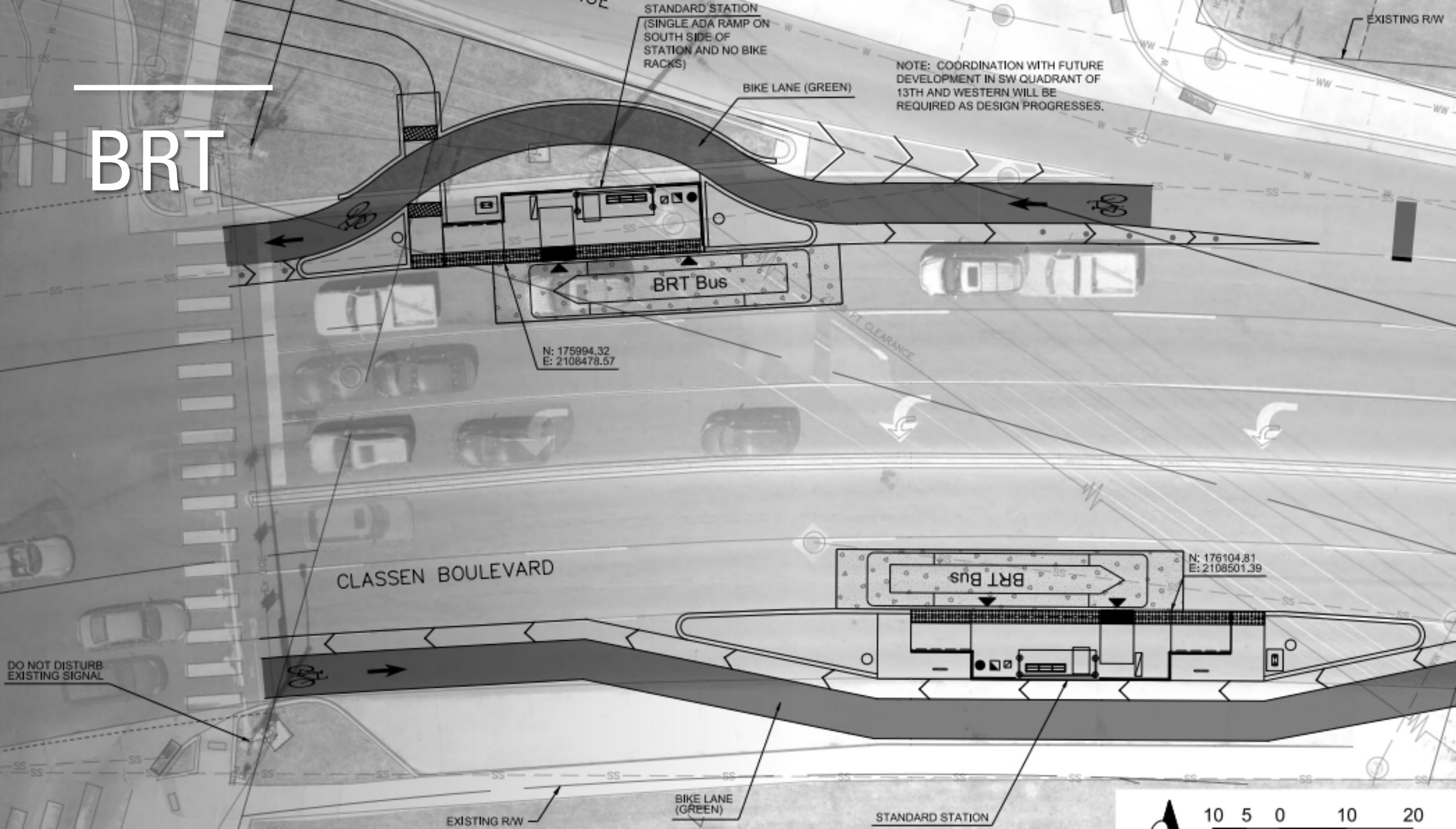
8-mile route within one-half mile of:

**40,000+ residents** and **~91,000 jobs**  
*(23% of OKC employment base)*





# BRT



STANDARD STATION  
(SINGLE ADA RAMP ON  
SOUTH SIDE OF  
STATION AND NO BIKE  
RACKS)

NOTE: COORDINATION WITH FUTURE  
DEVELOPMENT IN SW QUADRANT OF  
13TH AND WESTERN WILL BE  
REQUIRED AS DESIGN PROGRESSES.

BIKE LANE (GREEN)

BRT Bus

N: 175994.32  
E: 2108478.57

CLASSEN BOULEVARD

DO NOT DISTURB  
EXISTING SIGNAL

BRT Bus

N: 176104.81  
E: 2108501.39

EXISTING R/W

BIKE LANE  
(GREEN)

STANDARD STATION



# MAPS 4

## “ADVANCED TRANSIT”

**RAPID**



ARRIVING FALL 2023

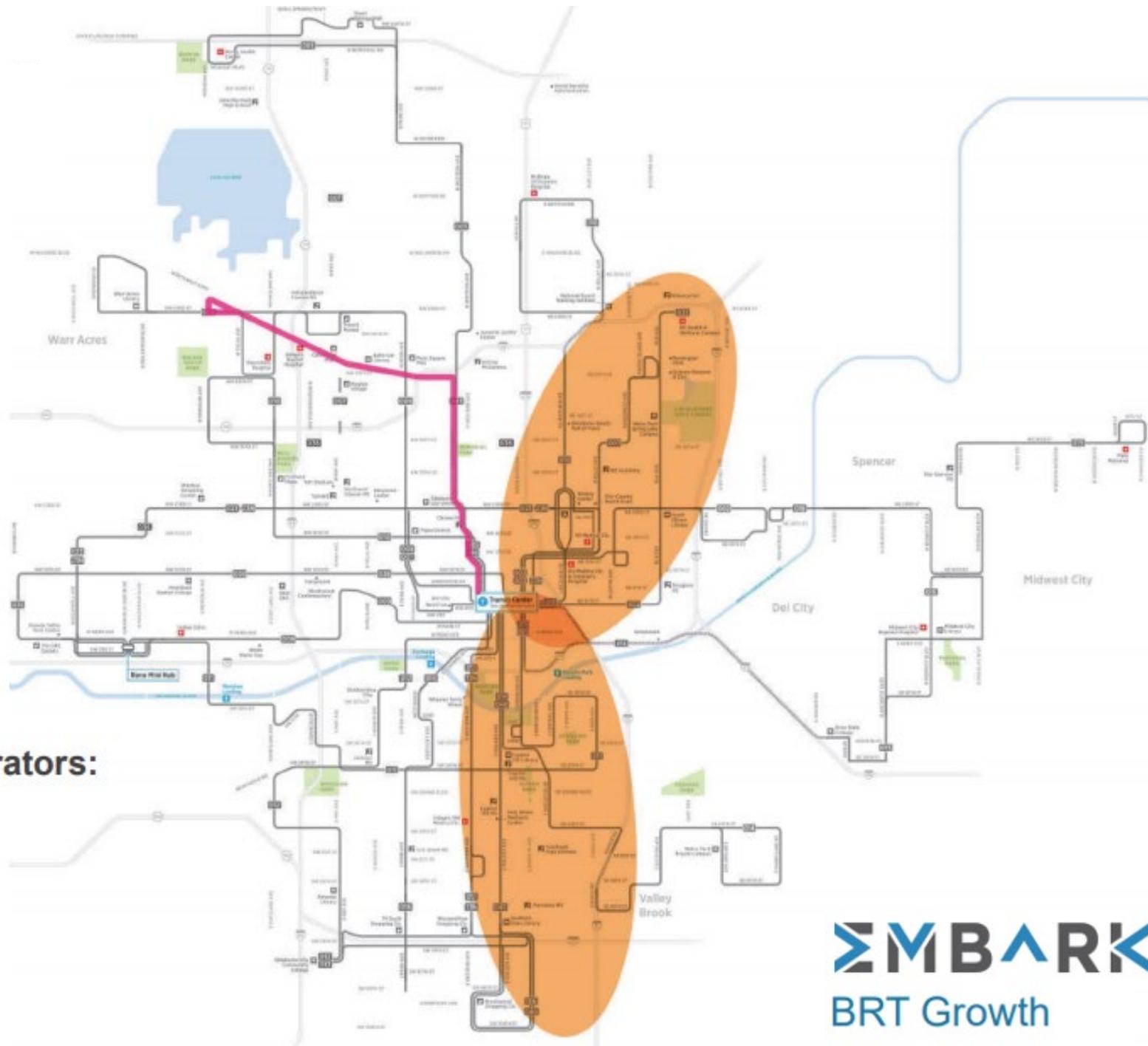
### Potential Trip Generators:

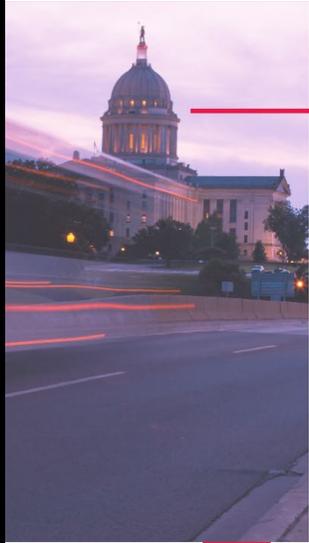
#### Northeast

- Innovation District
- Metro Tech
- Zoo

#### South

- Capitol Hill
- Southwest Medical





## What is regional transit?

Regional transit is not just commuter rail – it can include expanded and enhanced bus service, modern streetcars, and other modes of transportation. The Regional Transportation Authority of Central Oklahoma will serve its five-member cities Del City, Edmond, Moore, Norman, and Oklahoma City.



Commuter Rail



Streetcar



Expanded Bus



Other Modes

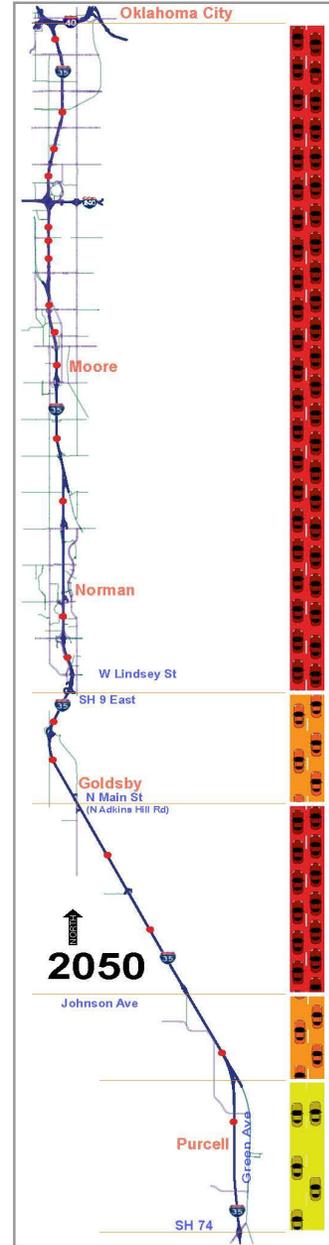
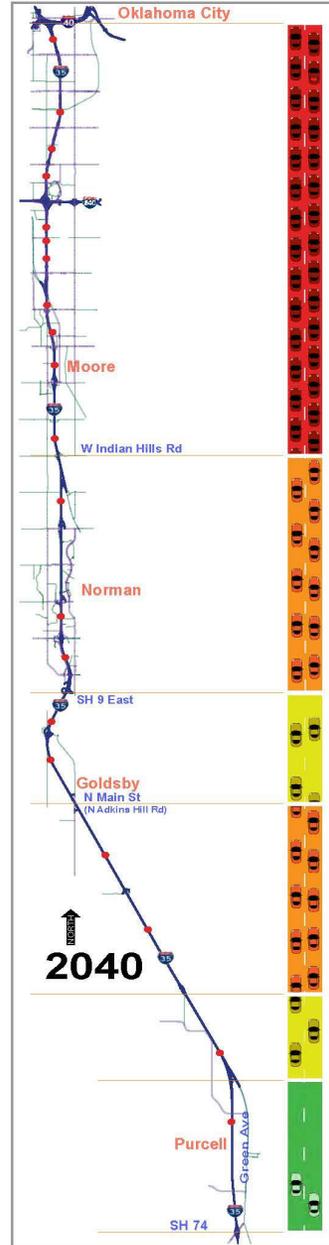
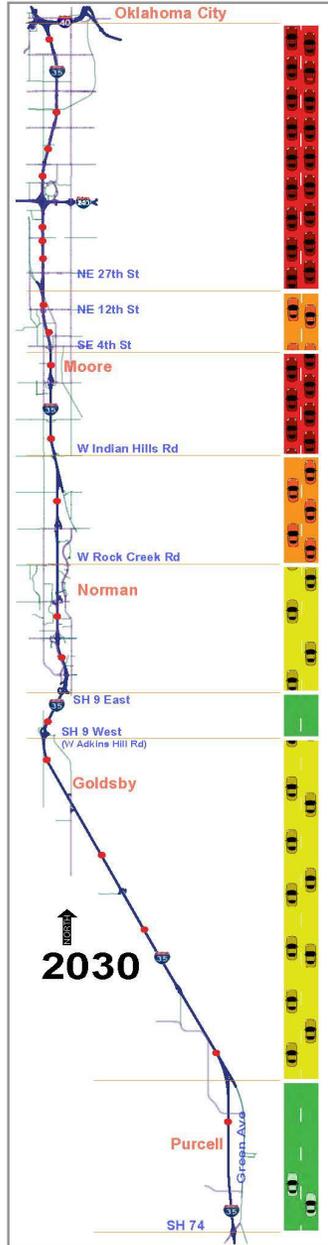
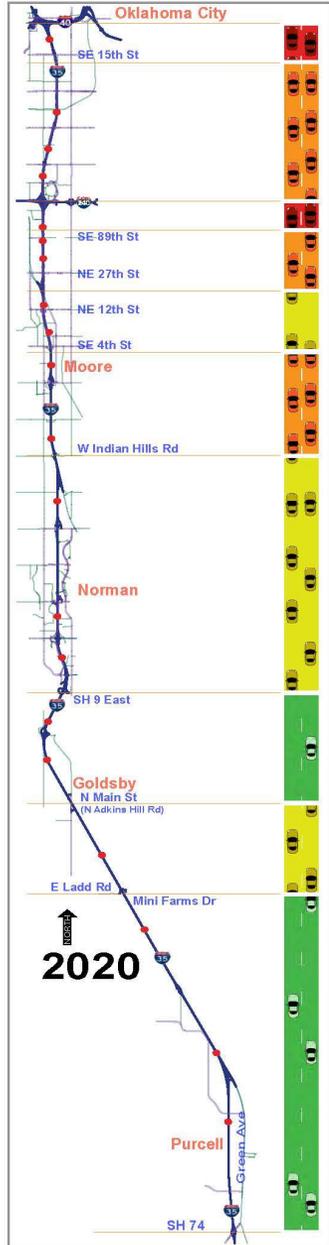
# RTA

Regional Transportation Authority  
of Central Oklahoma

2019 RESOLUTION BY:

DEL CITY, EDMOND, MIDWEST CITY, MOORE, NORMAN, OKC

[ENGAGEKH.COM/RTAMOVES](https://engagekh.com/RTAMOVES)



Free Flow - Drivers can change lanes freely and drive at the speed of their own choice.



Restricted Flow - Changing lanes requires drivers attention and is noticeably limited.



Congested Flow - Speed decreases and freedom for changing lanes is extremely limited.



Stop-and-Go Flow - Speed is inconsistent and changing lanes causes a shockwave in traffic delays. Time for traveling is not predictable.

● Traffic Count Locations



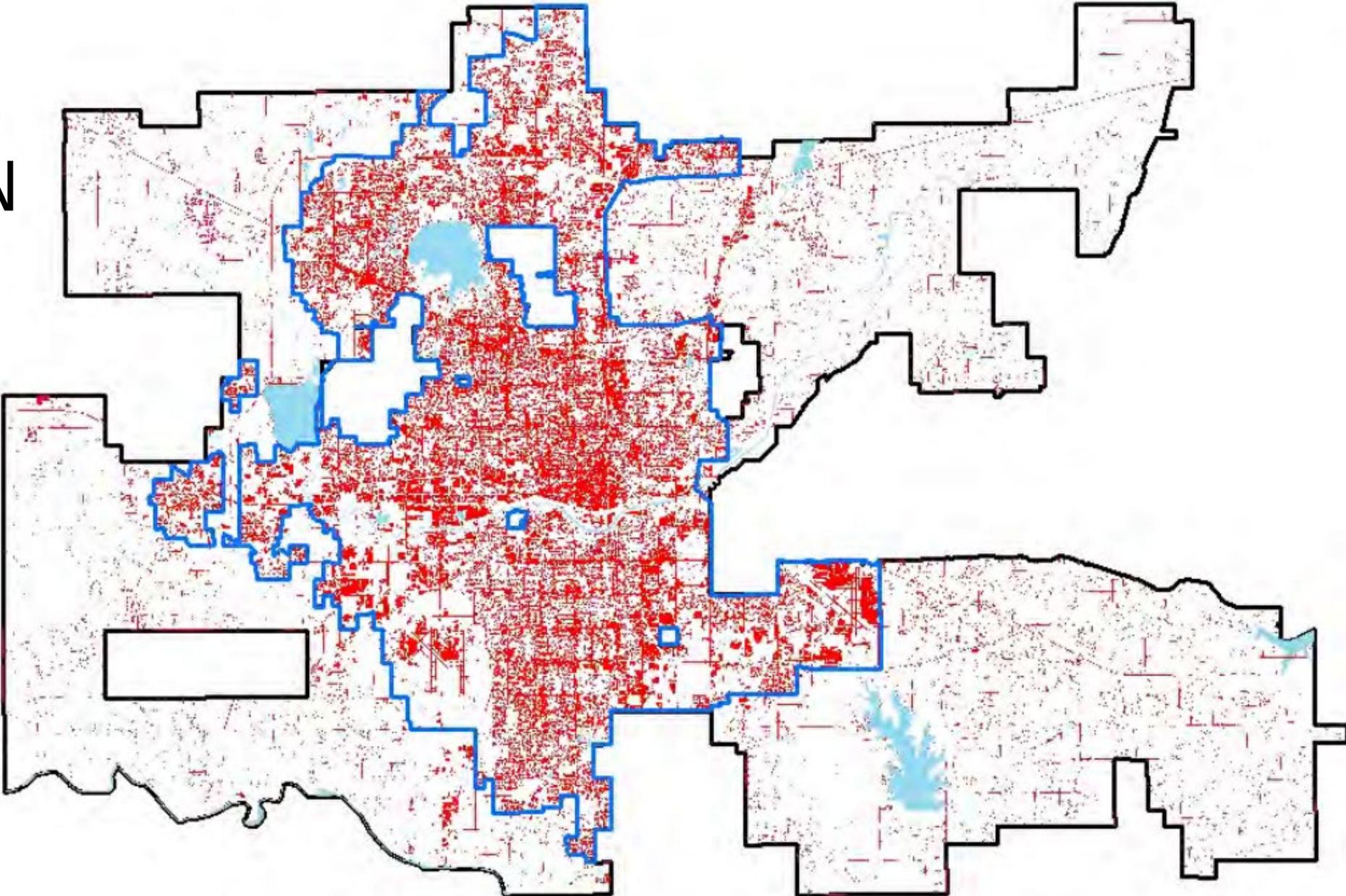


# NATURAL & BUILT ENVIRONMENT

---

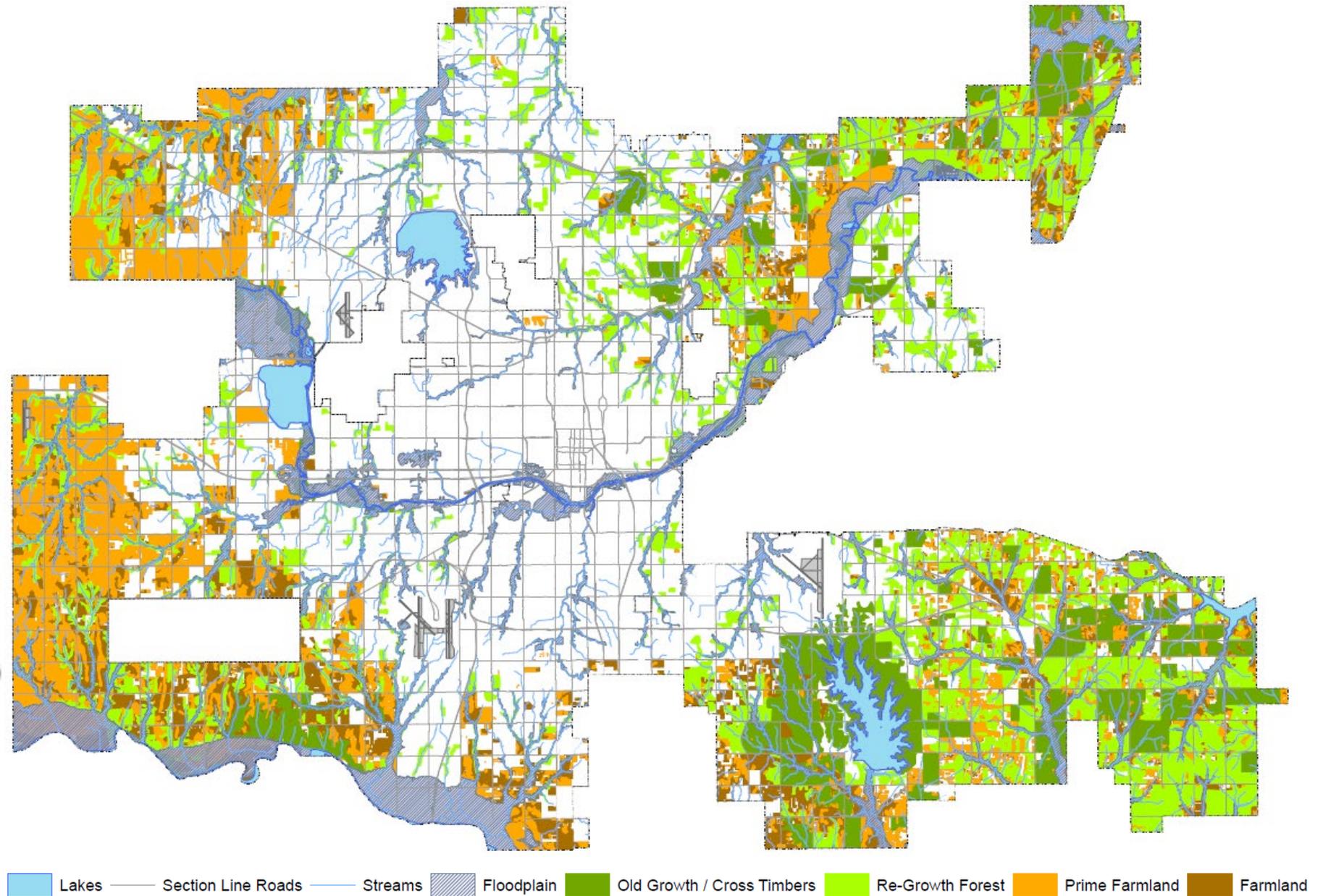
# IMPERVIOUS SURFACES IN OKC

-  Impervious Surface
-  Body of Water
-  Urban Area
-  City Limits



---

# OKC NATURAL RESOURCES





# DEVELOPMENT & FLOODING

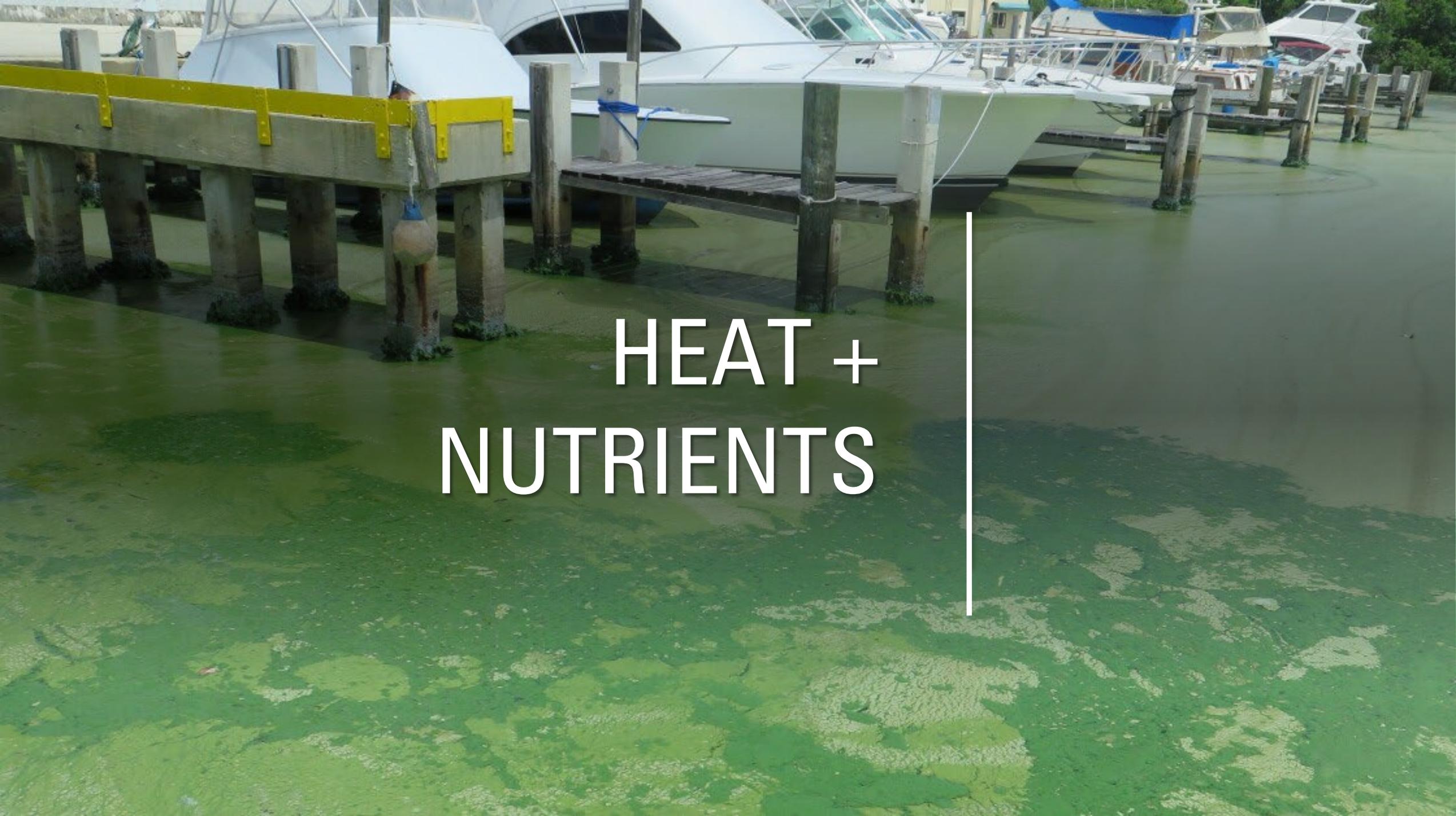
# PARKING



---

# NUTRIENT RUNOFF



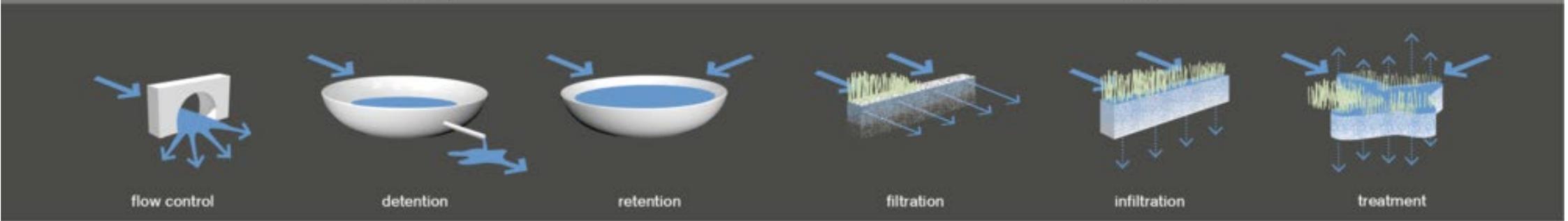


# HEAT + NUTRIENTS



mechanical

biological



slow —————> spread —————>

**flow control:** The regulation of stormwater runoff flow rates.

**detention:** The temporary storage of stormwater runoff in underground vaults, ponds, or depressed areas to allow for metered discharge that reduce peak flow rates.

**retention:** The storage of stormwater runoff on site to allow for sedimentation of suspended solids.

**filtration:** The sequestration of sediment from stormwater runoff through a porous media such as sand, a fibrous root system, or a man-made filter.

**infiltration:** The vertical movement of stormwater runoff through soil, recharging groundwater.

**treatment:** Processes that utilize phytoremediation or bacterial colonies to metabolize contaminants in stormwater runoff.

# LOW-IMPACT DEVELOPMENT



# KITCHEN LAKE

---

NW 36TH STREET

CLASSEN BLVD

WESTERN AVENUE

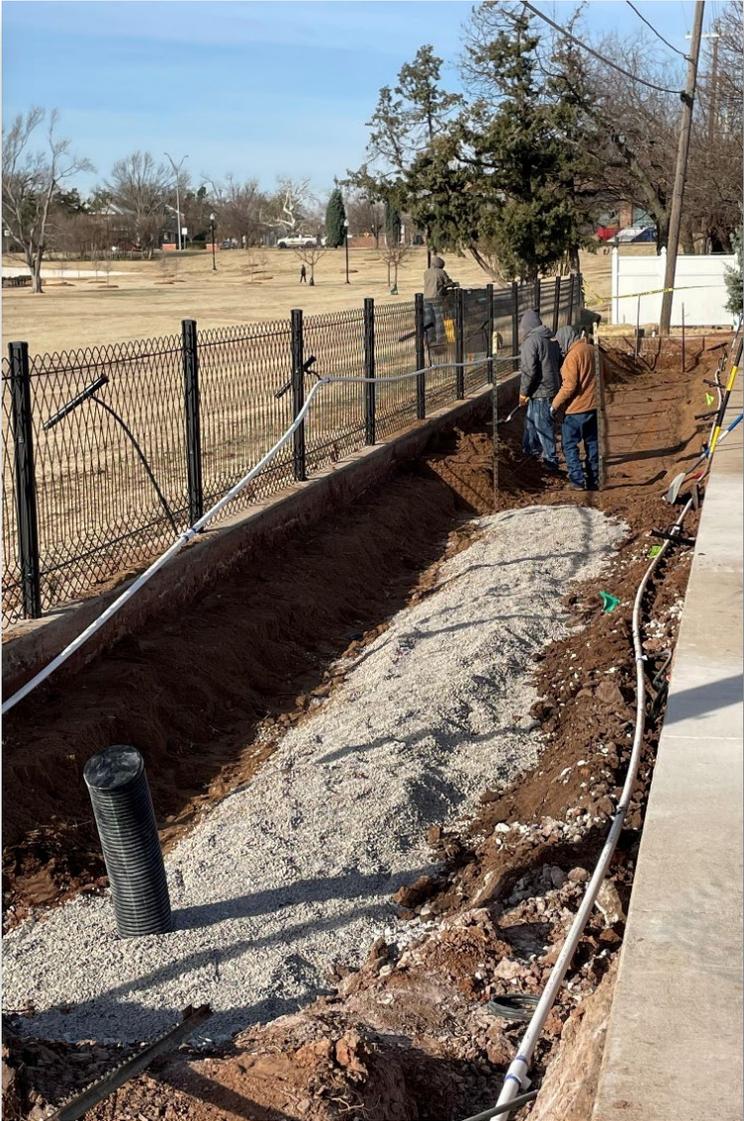


Design by LAUD Studio

# MEMORIAL PARK



**AARP  
COMMUNITY  
CHALLENGE**



# MEMORIAL PARK

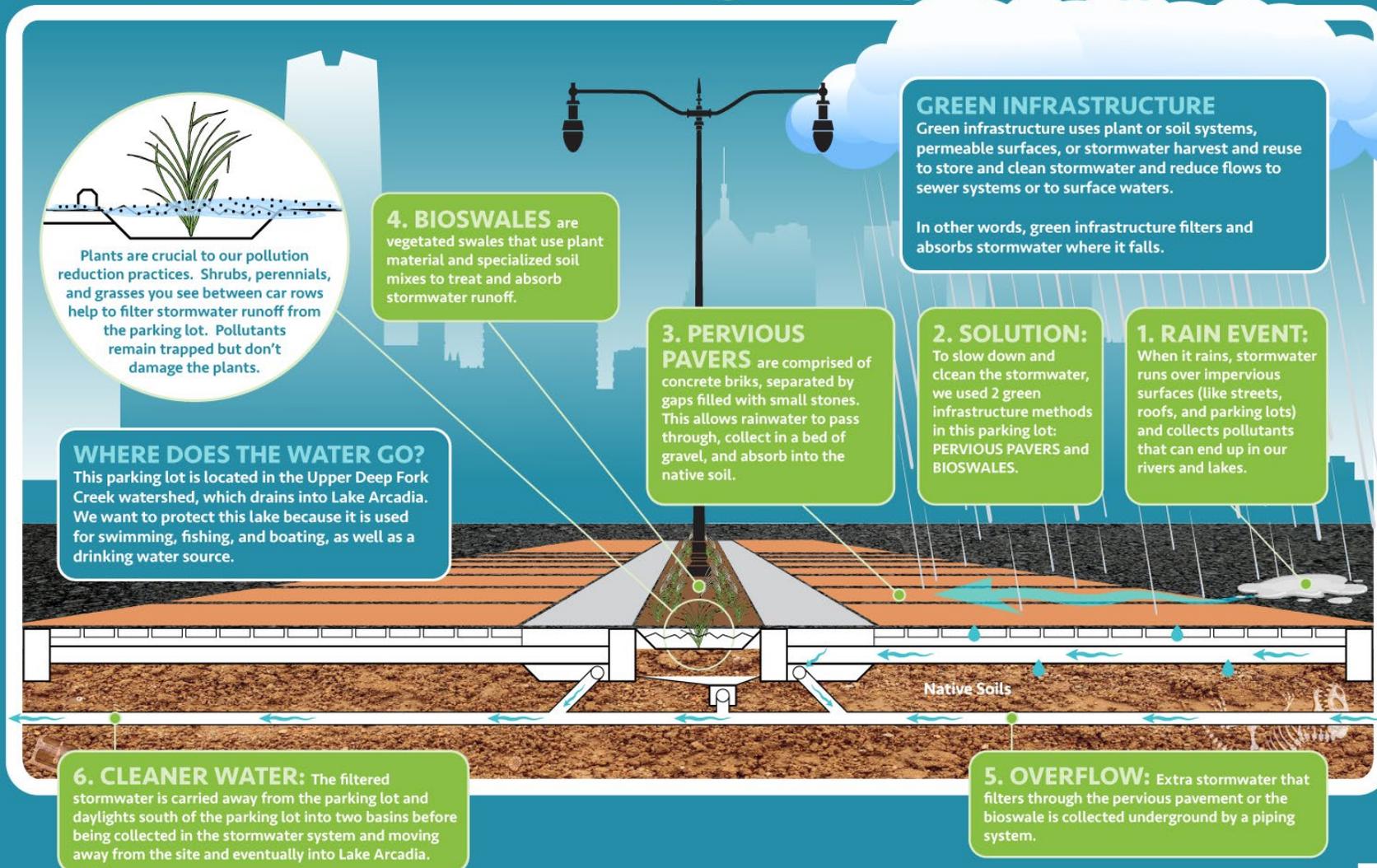


**AARP  
COMMUNITY  
CHALLENGE**



# GREEN INFRASTRUCTURE

*Reducing Harmful Runoff Pollutants*

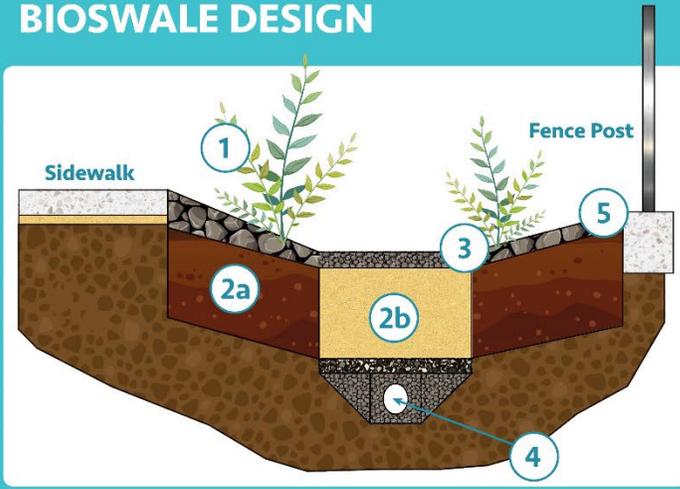


FOR MORE INFORMATION ABOUT THIS PROJECT, PLEASE  
VISIT: [okc.gov/departments/parks-recreation/memorial-park-parking-lot](http://okc.gov/departments/parks-recreation/memorial-park-parking-lot)



# BIOSWALES *Living Drains*

## BIOSWALE DESIGN



## WHAT IS A BIOSWALE?

Bioswales are vegetated swales that use plant material and specialized soil mixes to treat, absorb, and slow down stormwater runoff.

## HOW IS THIS BIOSWALE DESIGNED?

- 1 PLANTS**  
The landscaping is a mixture of native and non-native plants, but all plants are drought tolerant and hardy in Oklahoma's conditions.
- 2 SOIL**  
2a) The outer 2/3 of the cell is made up of growing media amended with compost to support plant growth and increase storage capacity.  
2b) The middle 1/3 of the cell is made up of sand for optimal drainage.
- 3 ROCK**  
The middle 1/3 of the cell contains small river rock (3/4"-1 1/2"), while the outer 2/3 of the cell contains large river rock (2"-4"). Using rock makes it convenient to clean out trash and debris from the bioswale and prevents erosion.
- 4 UNDERDRAIN**  
A 4" underdrain ensures a 24-48 hour drain time to prevent mosquito breeding.
- 5 IRRIGATION**  
Irrigation is installed and used for 2-4 years to establish plant material. Irrigation use will be discontinued use after establishment unless under extreme drought conditions.

## CAN YOU SPOT THESE PLANTS?



**FEATHER REED GRASS**  
Calamagrostis x  
acutiflora 'Karl  
Foerster'



**CATMINT**  
Nepeta x 'Walker's Low'



**MOONSHINE YARROW**  
Achillea x 'Moonshine'



**AUTUMN SAGE**  
Salvia greggii

## POLLINATORS ATTRACTED TO THESE PLANTS



**BUTTERFLIES**  
GREAT SPANGLED FRITILLARY  
**BEES**  
AMERICAN BUMBLE BEE  
**BIRDS**  
RUBY-THROATED HUMMINGBIRD



OKC PARKS



**AARP**®



OKLAHOMA CITY COMMUNITY FOUNDATION  
Your Connection for Good

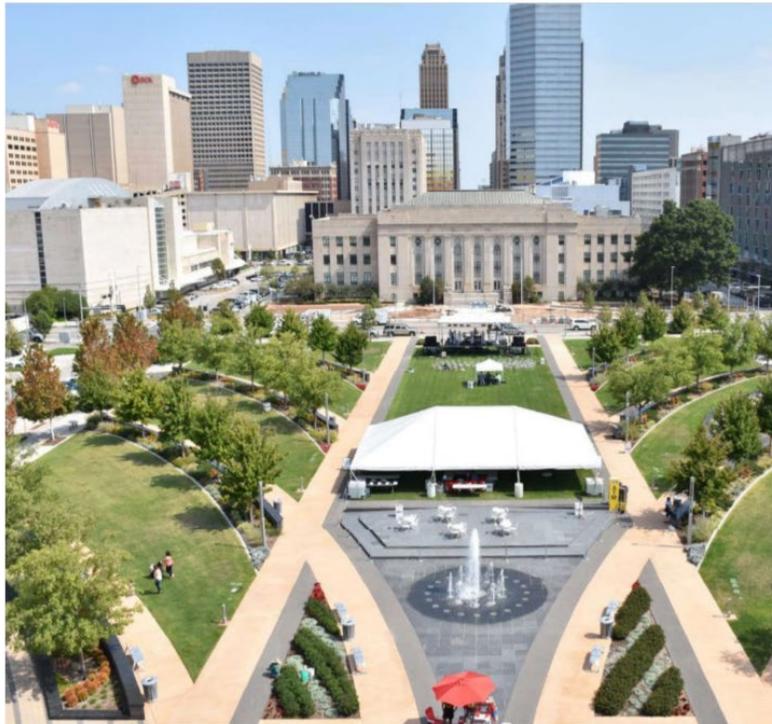
FOR MORE INFORMATION ABOUT THIS PROJECT, PLEASE  
VISIT: [okc.gov/departments/parks-recreation/memorial-park-parking-lot](http://okc.gov/departments/parks-recreation/memorial-park-parking-lot)



# NATURAL & BUILT ENVIRONMENT

## Oklahoma City Community Forest Assessment

2016



**Table 12. Stormwater Runoff Avoided by Most Common Species**

Species	Potential Evapotranspiration (gallons)	Evaporation (gallons)	Transpiration (gallons)	Water Intercepted (gallons)	Avoided Runoff (gallons)	Avoided Runoff Value (\$)
Eastern redcedar	12,376,143	1,200,281	6,159,486	1,201,775	<b>263,407</b>	2,354
American elm	11,573,653	1,122,452	5,760,095	1,123,850	<b>246,327</b>	2,201
American sycamore	10,988,742	1,065,726	5,468,990	1,067,053	<b>233,878</b>	2,090
Chinese elm	10,634,855	1,031,405	5,292,864	1,032,689	<b>226,346</b>	2,023
Baldcypress	10,409,779	1,009,576	5,180,846	1,010,833	<b>221,556</b>	1,980
Eastern cottonwood	10,125,390	981,995	5,039,308	983,218	<b>215,503</b>	1,926
Chinese pistache	8,988,379	871,724	4,473,429	872,809	<b>191,304</b>	1,709
Post oak	8,865,308	859,788	4,412,178	860,858	<b>188,684</b>	1,686
Platanus						
Callery pear	3,353,203	325,205	1,668,857	325,610	<b>71,368</b>	638
Eastern redbud	2,076,093	201,347	1,033,251	201,597	<b>44,186</b>	395
Green ash	1,755,195	170,225	873,544	170,437	<b>37,357</b>	334
Ponderosa pine	1,548,749	150,203	770,797	150,390	<b>32,963</b>	295
Loblolly pine	1,287,612	124,877	640,832	125,032	<b>27,405</b>	245
White ash	1,255,296	121,743	624,748	121,894	<b>26,717</b>	239
Common crapemyrtle	1,185,842	115,007	590,182	115,150	<b>25,239</b>	226
Honeylocust	1,007,149	97,677	501,248	97,798	<b>21,436</b>	192
Golden raintree	887,331	86,056	441,616	86,164	<b>18,885</b>	169
Other trees (See App. III)	27,577,338	2,674,536	13,724,977	2,677,875	<b>586,941</b>	5,245
<b>Total</b>	<b>167,075,411</b>	<b>16,203,543</b>	<b>83,151,810</b>	<b>16,223,718</b>	<b>3,555,938</b>	<b>\$31,776</b>

3.6 million gallons of avoided runoff

# NATURAL & BUILT ENVIRONMENT

## OKLAHOMA CITY METROPOLITAN AREA TREE CANOPY ASSESSMENT

The 2019 Oklahoma City Metropolitan Area Tree Canopy Assessment is the first of its kind. This comprehensive assessment identified and quantified the area's land cover, structure, and savings, air and water quality improvements, stormwater interception, quality of living, and aesthetics and beautification back to neighborhoods and the community at large.

### LAND COVER

Part of the assessment included using high resolution satellite imagery to provide a birds-eye view of the entire forest within

The 536 square mile urbanized study area includes nearly 700,000 acres of

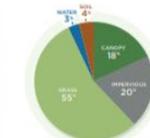
	URBANIZED AREA	NON-URBANIZED AREA
TREE CANOPY	20%	30%
POTENTIAL TREE CANOPY	53%	75%
GRASS/LOW-LYING VEGETATION	36%	50%
IMPERVIOUS SURFACES	38%	8%
BARE SOIL AND OPEN WATER	6%	12%



### PLANTING PRIORITY

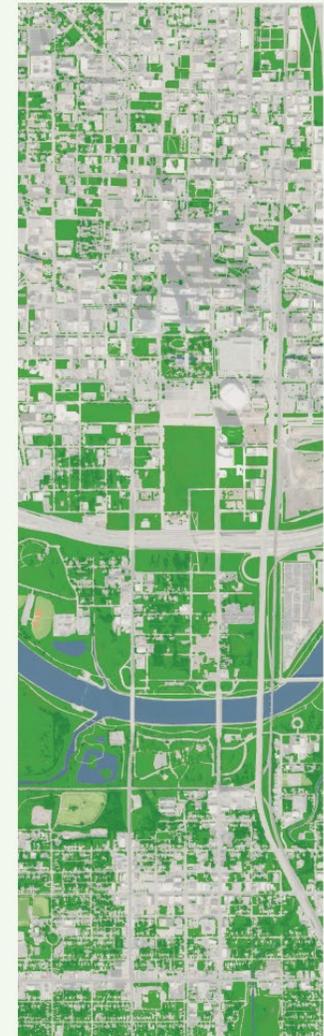
Along with the land cover assessment, a planting priority analysis was conducted to provide guidance and recommendations for future plantings to help mitigate the impacts of urban heat islands and stormwater runoff. Areas with an existing land cover type of grass or low-lying vegetation make up the majority of the recommended priority planting sites.

If every planting priority site were to be planted on, the study area could reach its maximum tree canopy potential of 59%.



The Moore Norman Tech Center - Penn Campus existing land cover makeup consists of 18% tree canopy coverage.

The Moore Norman Tech Center - Penn Campus existing land cover makeup consists of 18% tree canopy coverage.



---

# METROPOLITAN AREA PROJECTS (MAPS)



1993  
\$309 million

- Chicasaw Bricktown Ballpark
- Bricktown Canal
- Cox Convention Center
- Paycom Center Arena
- Civic Center Music Hall
- State Fairgrounds
- Ronald J. Norick Downtown Library
- Oklahoma River



2001  
\$700 million

- \$470 million: 70 new and renovated schools
- \$53 million: Technology projects
- \$9 million: Bus fleet replacement
  
- \$153 million: 400 projects in 23 suburban school districts

---

# METROPOLITAN AREA PROJECTS (MAPS)



2009

\$777 million

- Oklahoma City Convention Center
- Scissortail Park
- Streetcar
- RIVERSPORT Rapids
- Bennett Event Center
- Senior Health and Wellness Center
- Trails, Sidewalks, Other Infrastructure



2021

\$978 million

- Parks (\$140 million)
  - Youth Centers (\$110 million)
  - Senior Wellness Centers (\$30 million)
  - Mental Health and Addiction (\$40 million)
  - Family Justice Center (\$38 million)
  - Transit (\$87 million)
  - Sidewalks, bike lanes, trails, and streetlights (\$87 million)
  - Homelessness (\$50 million)
  - Multipurpose Stadium (\$37 million)
  - Clara Luper Civil Rights Center (\$25 million)
  - & more!
-

---

# SCISSORTAIL PARK (UPPER) \$132 MILLION



## CONSTRUCTING *THE PARK*



---

# SCISSORTAIL PARK (UPPER)



---

# BIOSWALES



# SCISSORTAIL PARK (LOWER)





SCISSORTAIL PARK (LOWER)

---

CODE UPDATE

# OKC Development Codes Update

**Phase 1:** Stakeholder Interviews, Code Diagnosis,  
Consultant Recommendation (complete)

**Phase 2:** Code Development (2019-2022)

**Phase 3:** Implementation (2023+)

Learn more & get involved at:

[okc.gov/codeupdate](https://okc.gov/codeupdate)

**T.O. Bowman**  
Program Planner  
(405) 297-3168



**[sustainability@okc.gov](mailto:sustainability@okc.gov)**

**[okc.gov/sustain](http://okc.gov/sustain)**