



# Bridge Maintenance

## *Rehab & Replacement*

**TULSA CITY COUNCIL**

**Capital Improvement Program Task Force**

**February 7, 2013**



# ***Benefits of Bridge Maintenance***

- **Extended life or serviceability**
- **Lower life-cycle costs**
- **Avoid failure condition**
- **Quantitative evaluation**



# ***City of Tulsa – Bridge Network***

- **268 Bridges Inspected (20' span min.)**
  - **Roadway Bridges: 238**
  - **Bridge closed: 1**
  - **Private Bridge over the Right of Way 1**
  - **Pedestrian Bridges 21**
  - **Railroad Bridges 7**



# ***Bridge: Average Age***

- **Roadway Bridges** **32 years**
- **Pedestrian Bridges** **21 years**
- **Railroad Bridges** **65 years**



# ***FHWA Regulations***

- **All bridges inspected at least once every 2 years; annually if there are concerns**
- **All bridges not meeting 23 Tons are Load Posted (raised from 20 Tons in January 2005)**
- **All bridges over water will be inspected every year; one year on the surface, the other year underneath**



# ***Bridge Evaluation: Definitions***

## **Functionally Obsolete (FO)**

**Older design features, narrow bridge, no shoulder and does not meet today's standards.**

## **Structurally Deficient (SD)**

**Older design, deficient under today's loads, member(s) poor condition, scour, foundation, section loss, etc.**

## **Load Posted (LP)**

**Operating limit less than 23 Tons.**



# ***Bridge Conditions...***

- **Functionally Obsolete: 26**
- **Structurally Deficient: 7**
- **Load Posted: 19**



# ***Historical: Funding Levels***

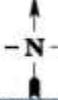
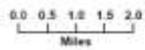
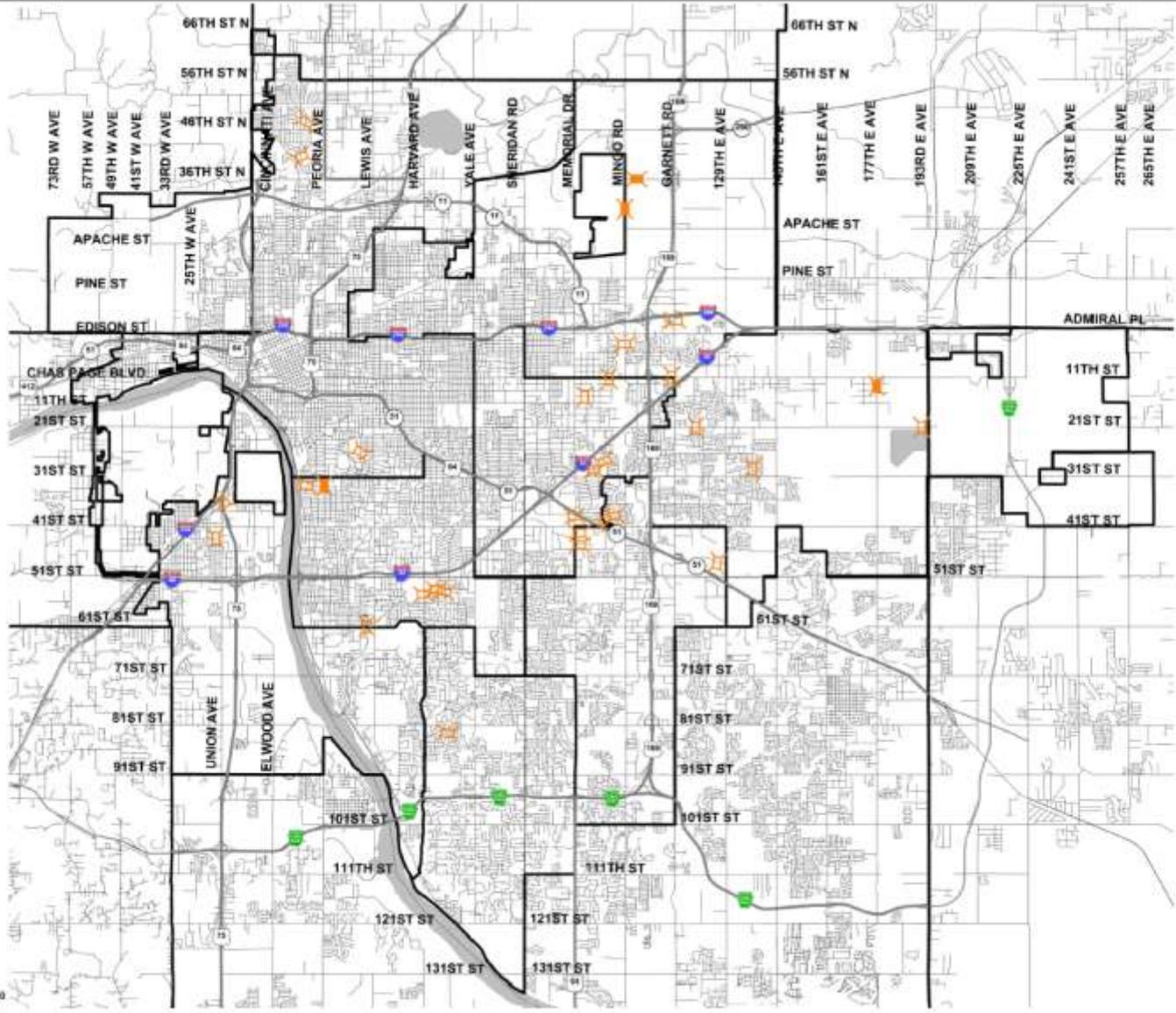
<b>FUNDING PACKAGE</b>	<b>AMOUNT</b>
<b>1991 Sales Tax</b>	<b>\$ 700,000</b>
<b>1994 GO Bond Issue</b>	<b>\$ 1,421,000</b>
<b>1996 Sales Tax</b>	<b>\$ 2,915,000</b>
<b>2001 Sales Tax</b>	<b>\$ 4,580,000</b>
<b>2005 GO Bond</b>	<b>\$ 10,000,000</b>
<b>2006 Sales Tax</b>	<b>\$ 10,000,000</b>
<b>2008 Fix the Streets</b>	<b>\$ 28,000,000</b>
<b>Total</b>	<b>\$ 57,616,000</b>



# ***Bridge Maintenance - Recommendations***

- **Replace 3 to 4 Structurally Deficient bridges on the arterial system** **\$ 10,300,000**
- **Rehabilitation (20+)** **\$ 5,525,000**

**Note: Cost estimates are preliminary – actual number of bridges may vary.**



**Transportation**  
**City of Tulsa**  
**Bridges**  
 Rehabilitation and Replacement  
**Citywide**

- LEGEND**
-  COT Replacement (4)
  -  COT Rehabilitation (27)

Date: 02/04/2013



# ***Bridge Maintenance - Recommendations***

- **Funds to coordinate with ODOT rehabilitation and replacement program (5 years of ODOT 8-Year Plan) **\$ 12,000,000****

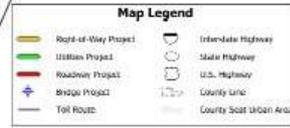
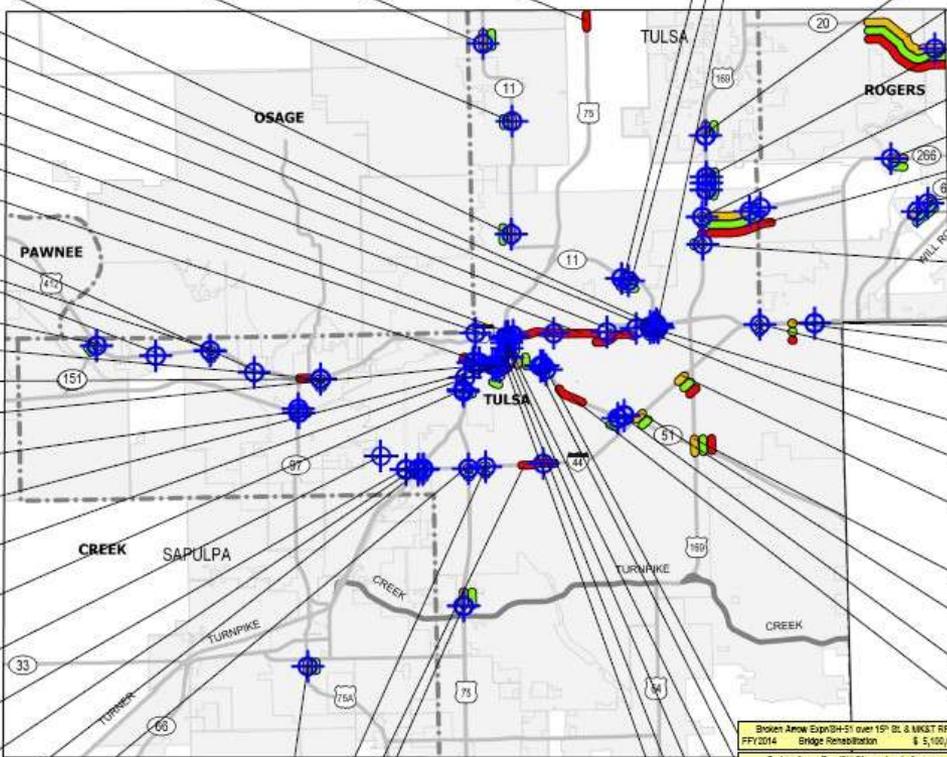
**Note: This addresses the adjacent City street or bridge improvements, ramp connections, and associated relocations.**

# OKLAHOMA DEPARTMENT OF TRANSPORTATION

## 2012 to 2019 Construction Work Plan

### Division 8 – Sheet 2 of 2

Note: The depicted information is based on project data currently available. Project estimates and schedules will remain subject to further refinement as more definitive data becomes available.



October 3, 2011

FFY2015	US-75/119+ St. Interchange	Interchange	\$ 7,950,000
FFY2014	SH-11 over Hominy Creek	Bridge & Approaches	\$ 2,634,396
FFY2012	Right-of-Way		\$ 348,230
FFY2012	Utilities		\$ 140,980
	<b>Total</b>		<b>\$ 3,123,606</b>
FFY2015	SH-11 over Delaware Creek	Bridge & Approaches	\$ 2,559,320
FFY2012	Right-of-Way		\$ 50,000
FFY2012	Utilities		\$ 83,000
	<b>Total</b>		<b>\$ 2,692,320</b>
FFY2014	SH-11 over Flat Rock Creek	Bridge & Approaches	\$ 1,200,000
FFY2012	Right-of-Way		\$ 348,230
FFY2012	Utilities		\$ 140,980
	<b>Total</b>		<b>\$ 1,689,210</b>
FFY2017	SH-11 Off Ramp at I-244	Bridge Rehabilitation	\$ 920,000
	<b>Total</b>		<b>\$ 920,000</b>
FFY2012	I-244 over I-244 Ramp	Bridge & Approaches	\$ 1,811,148
	<b>Total</b>		<b>\$ 1,811,148</b>
FFY2012	I-244 from Alaghty Avenue east 1.5 miles	Pavement Rehabilitation	\$17,468,733
	<b>Total</b>		<b>\$17,468,733</b>
FFY2016	I-244 from Osborne Avenue east 1.8 miles	Pavement Rehabilitation	\$12,577,117
	<b>Total</b>		<b>\$12,577,117</b>
FFY2015	I-244 from US-75 east 1.8 miles	Pavement Rehabilitation	\$21,320,734
	<b>Total</b>		<b>\$21,320,734</b>
FFY2015	I-244 E-8 Ramps (I-444 Under)	Bridge Rehabilitation	\$ 2,020,742
	<b>Total</b>		<b>\$ 2,020,742</b>
FFY2013	I-244 over Arkansas River (Eastbound)	Bridge & Approaches	\$45,000,000
	<b>Total</b>		<b>\$45,000,000</b>
FFY2012	US-94 over Eutaw Creek	Bridge Repair	\$ 636,000
	<b>Total</b>		<b>\$ 636,000</b>
FFY2019	US-94 over County Road	Bridge Rehabilitation	\$ 5,580,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 5,680,000</b>
FFY2017	US-94 over SH-151	Bridge & Approaches	\$ 3,400,000
FFY2015	Right-of-Way		\$ 218,000
FFY2015	Utilities		\$ 218,000
	<b>Total</b>		<b>\$ 3,836,000</b>
FFY2015	SH-97 from 2nd St. south to Merrow Drive	Grass, Drain & Surface	\$ 7,630,000
	<b>Total</b>		<b>\$ 7,630,000</b>
FFY2019	US-64 over 67th West Avenue	Bridge Rehabilitation	\$ 1,500,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 1,600,000</b>
FFY2018	I-444 from Arkansas River east 1.88 mi	Pavement Rehabilitation	\$17,523,540
	<b>Total</b>		<b>\$17,523,540</b>
FFY2019	SH-51 over Arkansas River	Bridge Rehabilitation	\$ 5,500,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 5,600,000</b>
FFY2019	Boston Ave., Main St. & Cheyenne Ave. over I-444	Bridge Rehabilitation	\$ 2,878,405
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,978,405</b>
FFY2019	I-444 over 11th & 9th St.	Bridge Rehabilitation	\$ 4,300,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 4,400,000</b>
FFY2019	West 23rd Street South over I-244	Bridge Rehabilitation	\$ 2,950,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 3,050,000</b>
FFY2019	SH-12 over 49th Ave. (Proposed Alignment)	Bridge Rehabilitation	\$ 1,200,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 1,300,000</b>
FFY2019	Okemune Expressway WB over I-244	Bridge Rehabilitation	\$ 1,900,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,000,000</b>
FFY2019	Okemune Expressway EB over I-244	Bridge Rehabilitation	\$ 2,011,245
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,111,245</b>
FFY2019	US-75 over I-44	Bridge Rehabilitation	\$ 1,800,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 1,900,000</b>
FFY2019	I-44 Ramp over MSV Railroad	Bridge Rehabilitation	\$ 328,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 428,000</b>
FFY2019	US-75A over Rock Creek	Bridge Rehabilitation	\$ 2,500,000
FFY2015	Right-of-Way		\$ 109,000
FFY2015	Utilities		\$ 109,000
	<b>Total</b>		<b>\$ 2,718,000</b>
FFY2019	I-44 over Railroad	Bridge Rehabilitation	\$ 2,440,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,540,000</b>
FFY2012	I-44 at Lewis Avenue	Grass, Drain, Bridge & Surf.	\$51,607,028
	<b>Total</b>		<b>\$51,607,028</b>
FFY2019	US-75 over Pollock Creek	Bridge & Approaches	\$ 5,800,000
FFY2017	Right-of-Way		\$ 100,000
FFY2017	Utilities		\$ 100,000
	<b>Total</b>		<b>\$ 6,000,000</b>

FFY2019	Shenandoah Rd. over SH-11	Bridge Rehabilitation	\$ 2,200,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,300,000</b>
FFY2019	N. 60th East Ave. over SH-11	Bridge Rehabilitation	\$ 520,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 620,000</b>
FFY2017	SH-11/I-244 Off Ramp	Bridge & Rehabilitation	\$ 50,000
	<b>Total</b>		<b>\$ 50,000</b>
FFY2019	Broken Arrow Exp(I-51 over 15th St. & MKGT RR)	Bridge Rehabilitation	\$ 5,100,000
	<b>Total</b>		<b>\$ 5,100,000</b>
FFY2014	Broken Arrow Exp(I-51 over Lewis Avenue)	Bridge Rehabilitation	\$ 3,700,000
	<b>Total</b>		<b>\$ 3,700,000</b>
FFY2019	US-75 Ramp north to east over I-444	Bridge Rehabilitation	\$ 1,200,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 1,300,000</b>
FFY2019	US-75 Ramp north to west over I-444	Bridge Rehabilitation	\$ 720,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 820,000</b>
FFY2019	2nd St. over I-444 (Includes 2nd St. W-N Ramp)	Bridge Rehabilitation	\$ 1,500,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 1,600,000</b>
FFY2019	4th St. over I-444	Bridge Rehabilitation	\$ 1,300,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 1,400,000</b>

FFY2017	US-169 over SH-135	Bridge & Approaches	\$ 5,200,000
FFY2015	Right-of-Way		\$ 218,000
FFY2015	Utilities		\$ 218,000
	<b>Total</b>		<b>\$ 5,636,000</b>
FFY2018	SH-20 from 4 mi. E. of Tulsa C.D. to E. Verdigris Riv.	Grass, Drain & Surface	\$ 3,000,000
FFY2016	Right-of-Way		\$ 6,000,000
FFY2016	Utilities		\$ 3,000,000
	<b>Total</b>		<b>\$12,000,000</b>
	<b>Not Fully Funded</b>		<b>\$12,000,000</b>
FFY2018	US-169 over Bird Creek & Overflow	Bridge & Approaches	\$140,000,000
FFY2015	Right-of-Way		\$ 545,000
FFY2015	Utilities		\$ 327,500
	<b>Total</b>		<b>\$140,872,500</b>
FFY2013	SH-266 over US-169	Bridge & Approaches	\$ 7,810,320
FFY2012	Right-of-Way		\$ 400,940
FFY2012	Utilities		\$ 356,740
	<b>Total</b>		<b>\$ 8,568,000</b>
FFY2016	SH-266 over Verdigris River Overflow	Bridge & Approaches	\$ 2,800,400
FFY2013	Right-of-Way		\$ 218,000
FFY2013	Utilities		\$ 106,000
	<b>Total</b>		<b>\$ 3,124,400</b>
FFY2016	SH-266 from 0.3 mi. east of US-169 east 2.25 mi.	Grass, Drain, Bridge & Surf.	\$11,400,000
FFY2013	Right-of-Way		\$ 218,175
FFY2013	Utilities		\$ 218,175
	<b>Total</b>		<b>\$11,836,350</b>
FFY2017	SH-90 over Unnamed Creek	Bridge & Approaches	\$ 2,100,000
FFY2015	Right-of-Way		\$ 100,000
FFY2015	Utilities		\$ 100,000
	<b>Total</b>		<b>\$ 2,300,000</b>
FFY2017	SH-65 over Moccasin Creek	Bridge & Approaches	\$ 4,100,000
FFY2015	Right-of-Way		\$ 218,000
FFY2015	Utilities		\$ 54,500
	<b>Total</b>		<b>\$ 4,372,500</b>
FFY2019	East 39th Street over US-169	Bridge Rehabilitation	\$ 2,800,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,900,000</b>
FFY2013	I-44 over 17th E. Avenue	Bridge & Approaches	\$ 9,810,000
	<b>Total</b>		<b>\$ 9,810,000</b>
FFY2014	I-44/153rd St. Interchange	Interchange	\$11,445,000
FFY2012	Right-of-Way		\$ 4,425,240
FFY2012	Utilities		\$ 2,232,237
	<b>Total</b>		<b>\$18,102,477</b>
FFY2016	I-44 over 165th E. Avenue	Bridge & Approaches	\$ 9,000,000
FFY2014	Right-of-Way		\$ 4,543,490
FFY2014	Utilities		\$ 2,000,475
	<b>Total</b>		<b>\$15,543,965</b>
FFY2019	I-244 Ramp IE over I-244 EB/IB & I-244 Ramp W/N	Bridge Rehabilitation	\$ 2,750,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 2,850,000</b>
FFY2019	Memorial Rd. Over I-244	Bridge Rehabilitation	\$ 3,200,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 3,300,000</b>
FFY2019	I-44/US-169 Interchange	Interchange	\$ 5,000,000
FFY2015	Right-of-Way		\$ 3,397,000
FFY2015	Utilities		\$ 2,199,800
	<b>Total</b>		<b>\$10,596,800</b>
	<b>Select Movements</b>		<b>\$10,596,800</b>
FFY2018	US-169/Broken Arrow Expressway Interchange	Interchange	\$25,000,000
FFY2015	Right-of-Way		\$ 4,005,750
FFY2015	Utilities		\$ 2,199,800
	<b>Total</b>		<b>\$31,205,550</b>
	<b>Select Movements</b>		<b>\$31,205,550</b>
FFY2019	I-44/Broken Arrow Expressway Interchange	Interchange	\$ 4,155,000
FFY2019	Right-of-Way		\$ 2,019,000
FFY2019	Utilities		\$ 5,164,000
	<b>Total</b>		<b>\$11,338,000</b>
	<b>Select Movements</b>		<b>\$11,338,000</b>
FFY2019	SH-51 over Broken Arrow & MKGT Rovers	Bridge Rehabilitation	\$ 3,100,000
FFY2017	Right-of-Way		\$ 50,000
FFY2017	Utilities		\$ 50,000
	<b>Total</b>		<b>\$ 3,200,000</b>
FFY2015	SH-51 from Peoria Ave. east to Lewis Ave.	Pavement Rehabilitation	\$ 7,315,240
	<b>Total</b>		<b>\$ 7,315,240</b>



# *Bridge Cost Summary*

- **Replace Structurally Deficient bridges on the arterial system** **\$ 10,300,000**
  - **Rehabilitation** **\$ 5,525,000**
  - **ODOT Coordination** **\$ 12,000,000**
- 
- \$ 27,825,000**



# ***Thank you...***

# ***Questions?***

**Bridge Network:**

**CONSULTANT: SAIC, Sue Tryon, PE**

**CITY OF TULSA:**

**Project Manager - Chris Cox, PE, Transportation Infrastructure Manager**

**Section Manager - Matt Liechti, PE, Manager, Project Planning and Coordination**

**Director - Paul Zachary, PE**