

APTA Rail Conference 2017

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Design Manager for Oklahoma City
MAPS 3 Modern Streetcar
Jacobs/AECOM Team

with permission from:



General Information:

Founded: April 22, 1889 (10,000 people arrived on first day)

Current Population: 620,602 (2014)

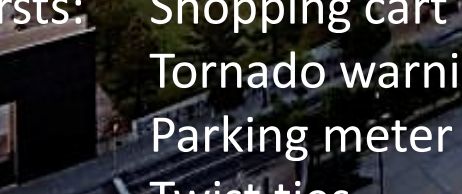
Land area: 620 sq mi (8th largest)

1980's: one of worst job and housing markets in US

2013: 8th best place for business (Forbes 2013)

Most recession-proof city (Forbes 2008)

3.5% Unemployment Rate

An aerial photograph of a parking lot. In the foreground, there is a dark-colored shopping cart. To its right, a yellow sign with a black border and the word 'Tornado' in red is visible. Further right, a parking meter stands. In the background, several white twist ties are scattered on the ground. The text 'Firsts:' is overlaid on the left side of the image.

Firsts: Shopping cart
Tornado warning
Parking meter
Twist ties



History of MAPS

Metropolitan Area Projects Plan - 1993

- Voter approved sales tax – 5 years
- \$350M capital program focused on downtown redevelopment



History of MAPS

MAPS for Kids - 2001

- Voter approved sales tax – 7 years
- \$700M capital program focused on improving schools
- 100+ schools
 - 70% downtown
 - 30% suburban



History of MAPS



MAPS 3 - 2009

- Voter approved sales tax – 7 years (54% approval)
- \$777M focused on improving the Quality of Life



TRAILS

QUICK FACTS

Project budget: \$39.5 million

Construction: West River Trail completed in 2015, Will Rogers Trail completion in 2017, Lake Draper trail completion in 2017



SIDEWALKS

QUICK FACTS

Project budget: \$18.1 million

Construction: Ongoing

MAPS 3



OKLAHOMA RIVER IMPROVEMENTS

QUICK FACTS

Project budget: \$57 million

RIVERSPORT Rapids completed in 2016



OKLAHOMA STATE FAIRGROUNDS IMPROVEMENTS

QUICK FACTS

Project budget: \$58.7 million

Size: 279,000-SF



SENIOR HEALTH AND WELLNESS CENTERS

QUICK FACTS

Project budget: \$52 MILLION

Construction: Under way

MAPS 3



DOWNTOWN CONVENTION CENTER

QUICK FACTS

Project budget: \$288 million

Size: 200,000-SF exhibit hall, 45,000-SF meeting space, 30,000-SF ballroom



DOWNTOWN PUBLIC PARK

QUICK FACTS

Project budget: \$132 million

Size: 40-acre north section, 30-acre south section



OKLAHOMA CITY STREETCAR

ARRIVING 2018



Project Status:
Design/Construction

Project Cost:
\$131 million (locally funded)

Anticipated Launch:
December, 2018

Vehicles:
6 Brookville Liberty Cars

Length of Route:
5.4 miles of track
\$22.4M / mile
(\$44.8 / Route Mile)

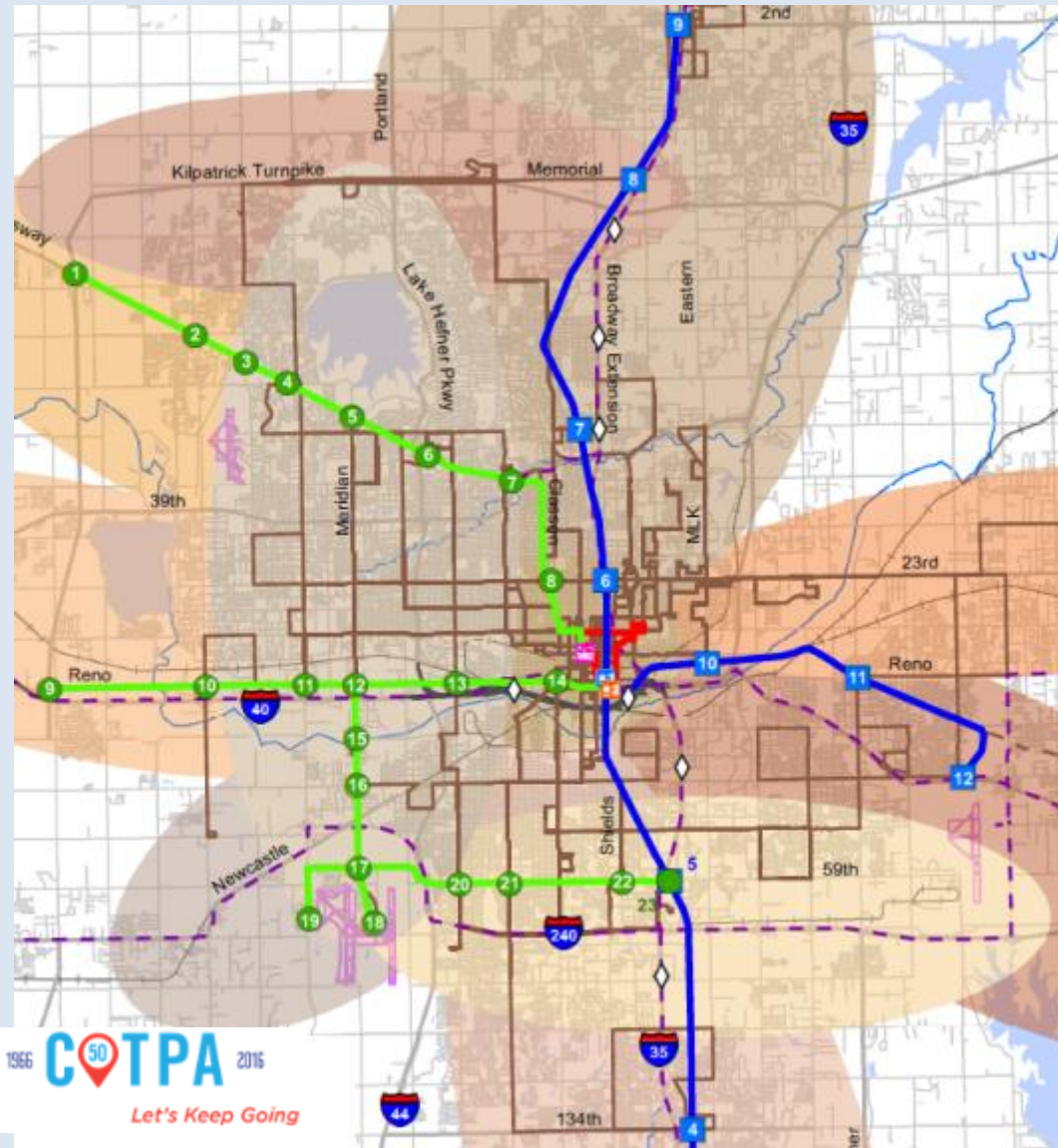
Stops: 22

Propulsion:
On and Off Wire

Right of Way:
Mixed Traffic and
Dedicated

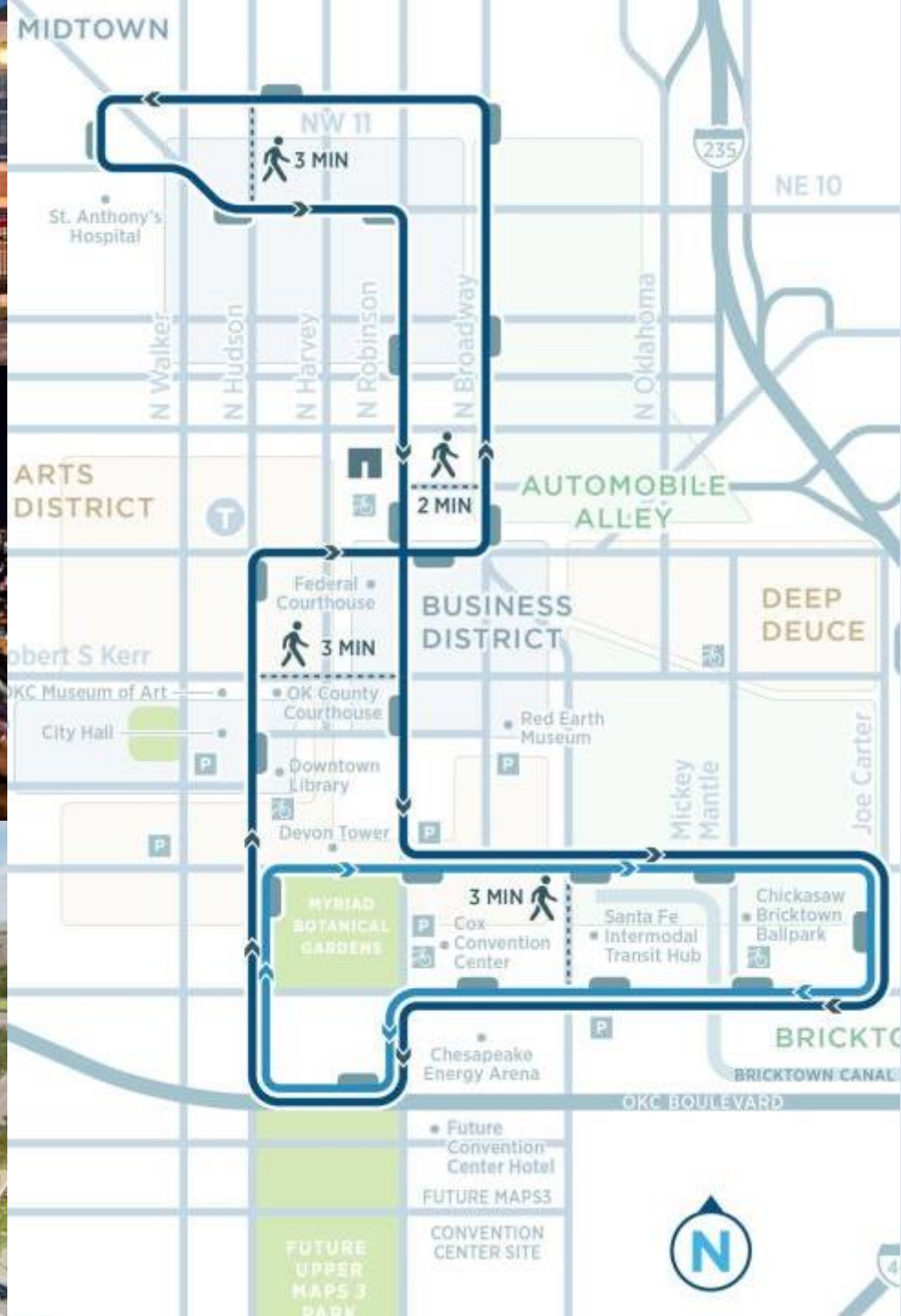


2005 COTPA Fixed Guideway Study



The System Plan includes:

- Commuter Rail from Edmond to Downtown OKC to Norman, and Downtown OKC to Midwest City/Tinker Air Force Base
- Bus Rapid Transit (BRT) along Reno Avenue, Northwest Expressway, 59th Street and Meridian Avenue
- Modern Streetcar serving as a circulator in downtown OKC; and Enhanced Bus



Vehicles

Brookville Liberty Modern Streetcars

- Lithium-ion battery ESS
- 5 vehicles in operation / 1 spare



Storage and Maintenance Facility



Wynn Construction Company

- \$5,721,000 low bid contract
- Substantial completion scheduled for October, 2017

Rail Procurement Contract

Girder Rail and Special Trackwork

- Ri-52 girder rail
- Girder rail special trackwork
- \$2.9M contract to Vossloh



Mainline Construction

Scope of Work

- Construction Elements
 - 5.4 miles of embedded track
 - Utility relocation
 - 22 streetcar stops
 - 6 traction power substations
 - Traffic signals
 - Train signaling



Mainline Construction

\$50.7M Low-bid awarded to Herzog/SWI in October, 2016

HERZOG Stacy and
Witbeck



Mainline Service/Bricktown Loop

Midtown Loop

4.86 Miles of Service Line
10-12 Minute headways

BRICKTOWN LOOP

2.04 Miles of Service Line
15 Minute headways



Downtown Park/Convention Center Terminus



Intermodal Hub

Purchase and restore historic Santa Fe Station

- \$10M Budget
- Includes streetcar infrastructure



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APTA Rail



Designing to a \$121M Budget

- Contractually obligated
- Multiple bid packages
- Management tools (tracking betterments / bid-alternates)
- Approx. \$3M in betterments / bid alternates



Recent Modern Streetcar Project Costs

History of Modern Streetcar Project Costs			
Project	Cost/Mile	Year	Cost/Mile (adjusted)
Portland - Phases 1-2	\$21.7 M	2001	\$33.7 M
Tacoma Link	\$44.4 M	2003	\$64.9 M
Portland - Phase 3	\$31.3 M	2007	\$40.7 M
Seattle SLU	\$43.3 M	2007	\$56.3 M
Portland Central Loop	\$38.7 M	2012	\$44.9 M
Tucson	\$51.7 M	2013	\$56.5 M
Atlanta	\$53.9 M	2014	\$59.0 M
Seattle First Hill	\$48.3 M	2016	\$52.8 M
Cincinnati	\$69.3 M	2016	\$73.5 M
Kansas City	\$49.2 M	2016	\$50.7 M
Detroit	\$45.4 M	2017	\$46.4 M



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Oklahoma Streetcar	\$44.8M	2018	\$44.8M



General Differences in Costs

- Federal vs. Local Only
- Schedule
- Procurement Method
- Project Sponsor
- Regional Cost Index
- Local Project Conditions
 - Utility Agreements
 - Transit Priority Systems
 - Specific Elements



Design to Budget

- Projects driven by limited budgets
- Keep it simple
 - Retrofit where possible
 - Look for efficiencies
- Configuration management
 - Continual cost trend assessment
- Analyze each design element
 - Essential
 - Ancillary
 - Discretionary / betterments



Design to Budget

Keys to Success

- Locally funded
- Project champion
 - MAPS Transportation Subcommittee
- City/MAPS initiative



Design to Budget

Collaborative Effort

- MAPS
- EMBARK
- Public Works
- ADG
- Brookville Equipment
- Utility Companies
 - OGE
 - ATT
 - Others



Design Team

Jacobs Engineering (local prime)

- Utility Design
- Maintenance Facility
- Vehicle Procurement
- Construction Management

AECOM

- Planning
- Mainline Design
- Rail and Track Procurement

Shiels Obletz Johnsen

- System Planning
- Operations Planning



Hybrid Vehicles



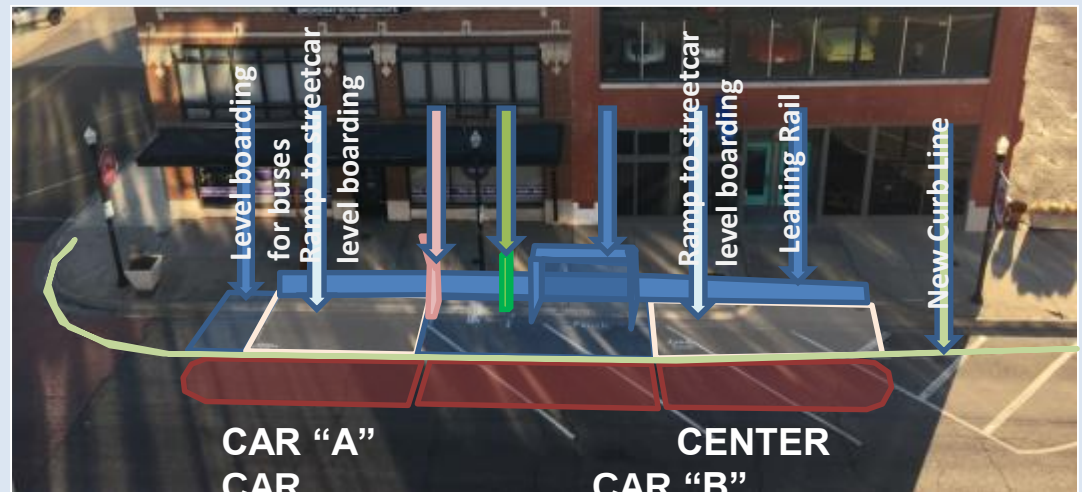
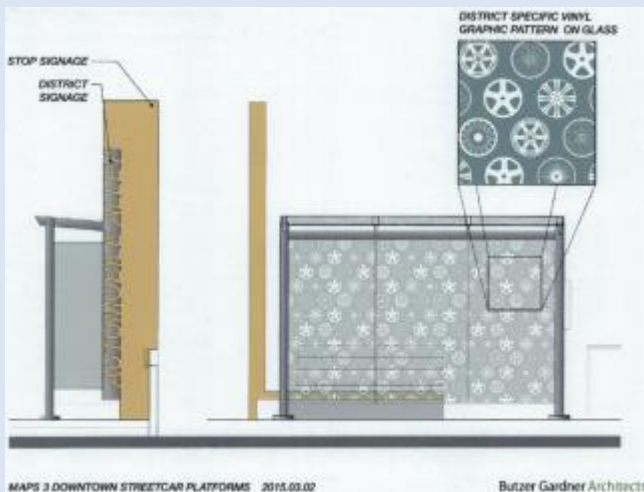
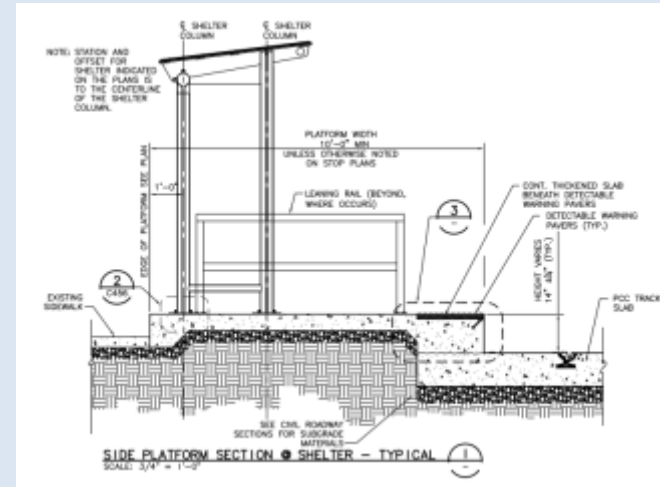
Minimizing Utility Impacts

- Alignment design
 - Review
- Collaborative review with utility owners
 - Determine maintenance needs
- Methods to maintain in place
 - Access accommodations



Stop Designs

- Curb Extensions
- Joint-Use with Bus
 - Supplemental service
 - Utility maintenance agreement



Challenges

- Major utilities
- Project coordination/phasing
- Travel time



Challenges

Project Coordination (Design & Construction)

- E.K. Gaylord Project 180
- OKC Boulevard
- Hudson Road
- OKC Boulevard Landscaping
- OKC Boulevard/Harvey Intersection Design
- ADG maintaining master schedule for all known schedule interfaces



Transit Priority Systems

Midtown Loop

35 minute travel time

Bricktown Loop

13 minutes + recharge

- Key intersections are designed to use Train to Wayside (TWC) Communications
- Reduced operating fleet requirements



Success!!!

(so far)

Entire scope of project under contract nearly \$9M under total project budget.

- Total Cost = \$112M
- \$20.7M/track mile (\$41.4M/route mile)

System Enhancements

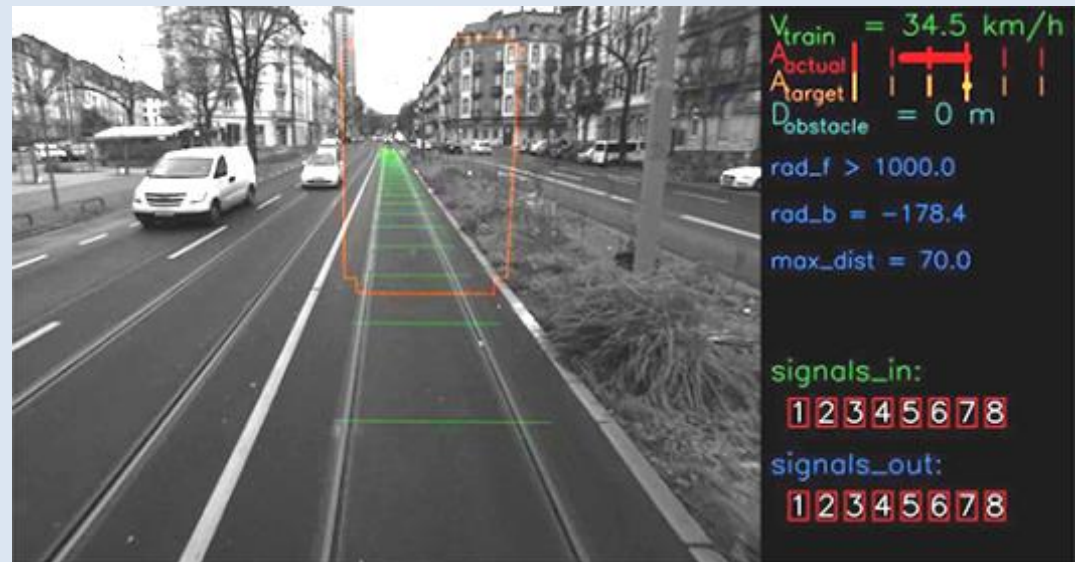
- \$3M in Bid Alternatives
- Vehicle #7
- Additional infrastructure planned for “turn-back” operations
- OMF site improvements and equipment



Innovation

Autonomous Streetcar Feasibility Study

- Autonomous operation
- Connected vehicle technology
- Smart infrastructure



Groundbreaking



Mainline Construction groundbreaking February 7, 2017

Revenue Service



Grand Opening December, 2018



Thank You



Questions?

