RTA ALTERNATIVES ANALYSIS UPDATE

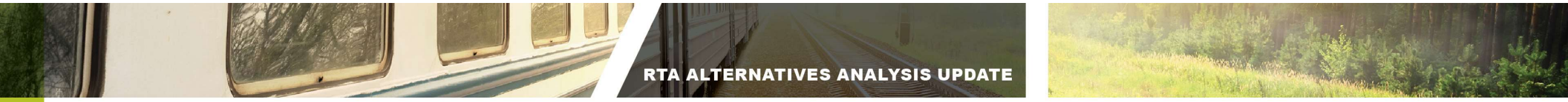
Prepared by

Kimley»Horn

Prepared for

Regional Transportation Authority of Central Oklahoma

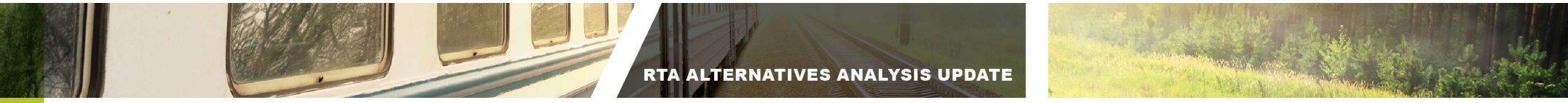
Board of Directors
October 21, 2020



Agenda

1. Transportation Planning Overview
2. Transit Modes and Service Types
3. What is a Transit System Plan?
4. Transit System Plan Process
5. Look Ahead

Transportation Planning Overview

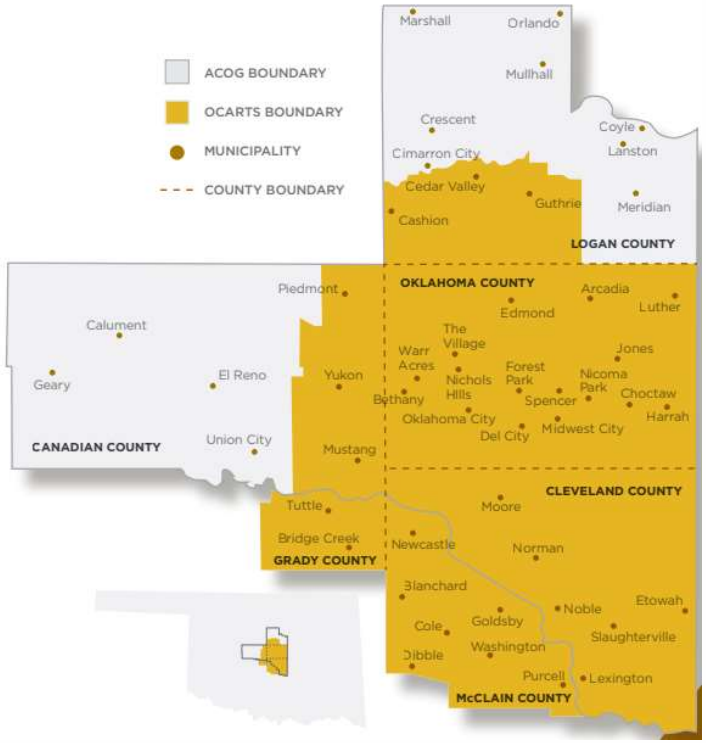


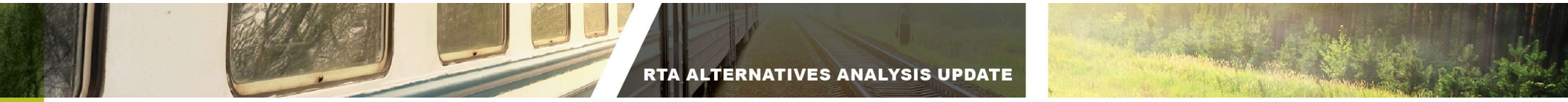
Regional Transportation Planning

- **State**
  - *Department of Transportation (ODOT)*
    - Administers and coordinates transportation planning process for state's MPOs
- **Regional**
  - *Metropolitan Planning Organization (MPO)*
    - Organization created and designed to carry out the metro area's transportation planning process (FTA, 2019); federal requirement for all urbanized areas with more than 50,000 residents
    - MPOs submit plans to the State for inclusion in statewide programs; plans must meet Federal requirements
- **Local**
  - *Counties and cities*
    - Comprehensive/General plans
- **Implementing agencies**
  - *Transit service providers*

Who's Who

- **Federal**
  - US Department of Transportation: Federal Highway, Federal Transit, and Federal Railroad Administrations
- **State -** Oklahoma Department of Transportation (ODOT)
- **Regional**
  - Association of Central Oklahoma Governments (ACOG)
  - Regional Transportation Authority (RTA)
- **Local**
  - 36 cities and six counties in RTA boundaries
- **Implementing agencies**
  - Central Oklahoma Transit and Parking Authority (COTPA) / EMBARK



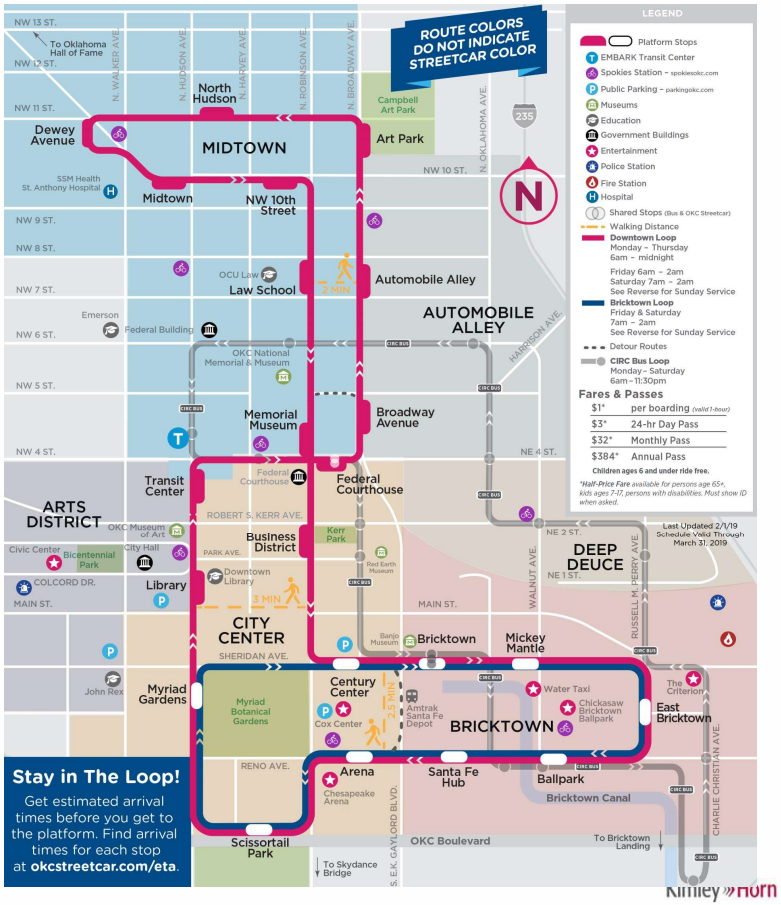


Recap of Central Oklahoma Transit Planning

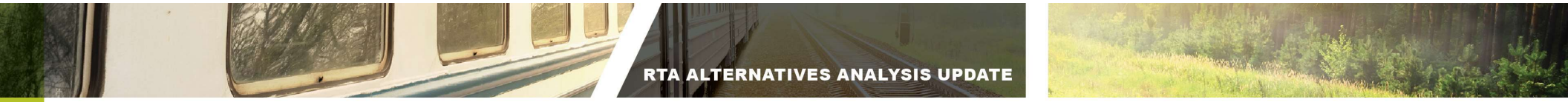
Year	Study Name	Sponsor	Key Findings/Purpose
2005	Fixed Guideway Study	COTPA	Identifies 2030 System Plan Vision including blend of enhanced bus, BRT, streetcar, and commuter rail corridors
2011	Intermodal Transportation Hub Master Plan	ACOG	Identifies a feasible, centralized intermodal hub site to accommodate fixed guideway system identified in 2005 Study
2015	Commuter Corridors Study	ACOG	Analyzes 3 commuter corridors from 2005 Study, and recommends North (to Edmond) and South (to Norman) commuter rail corridors, and streetcar east to Tinker AFB.
2016	Encompass 2040	ACOG	Metropolitan Transportation Plan identifies how to invest $10b in transportation system over 25-year horizon within the OCARTS area.

Implementation Example: OKC Streetcar

- **2005 Initial Planning**
  - 2005 Fixed Guideway Study
- **2009 Metropolitan Area Projects (MAPS) 3**
  - MAPS 3 passed in 2009
  - $135 million construction cost
- **2018 Construction Completed**
  - Approximately 5 Miles of Service
    - Downtown Loop
    - Bricktown Loop
  - **Grand opening December 14**



Transit Modes & Service Types

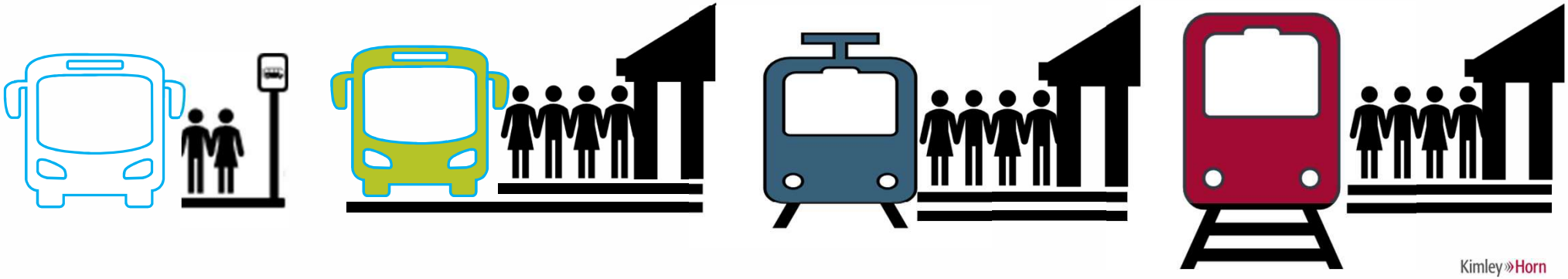


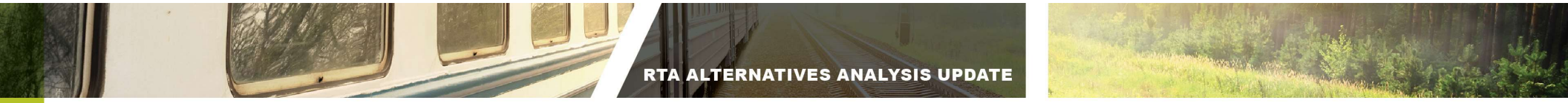
Family of Transit Modes

- Fixed route bus
- Bus Rapid Transit (BRT)
- Streetcar
- Light Rail Transit (LRT)
- Commuter rail

Considerations for Alternatives Analysis

- Service Parameters and Outcomes
- Service Objectives
- Timing/ Delivery Schedule
- Capital Cost
- Operating Costs
- Economic Development





What are Service Parameters?

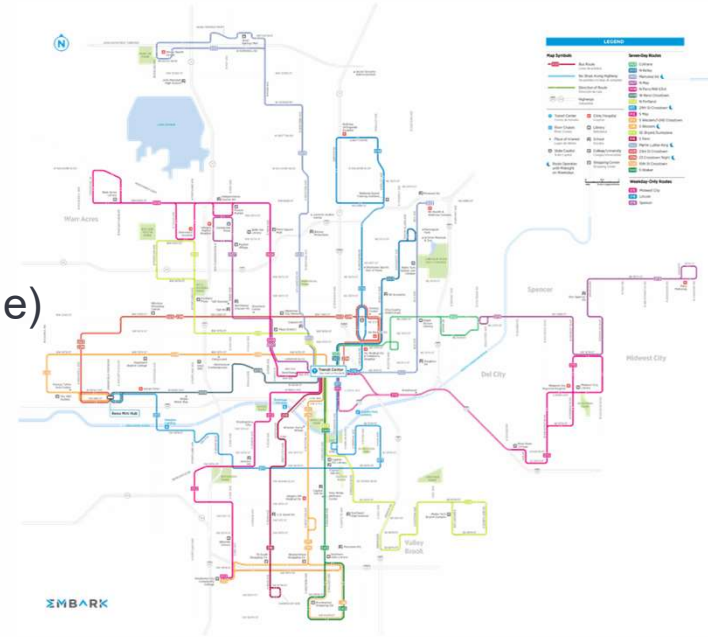
Frequency:	Number of vehicles (buses or trains) arriving in a given hour
Headway:	Intervals of time between bus or train; the longest someone should be expected to wait
Service Span:	Hours of operation
Travel Time:	Overall time it takes for a passenger to go from point A to point B on the bus or train
Capacity:	Number of passengers that can fit in a vehicle; cars per train; passengers per hour on a train or bus
Route Length:	Length of route impacts total operating cost and number of vehicles (drivers/conductors) needed to maintain certain frequencies.
Station Spacing:	Spacing of stations is a factor of route length and trip type; Closer stations lead to greater transit coverage, but slower overall travel time

Fixed Route Bus

- Far-reaching network of routes
- Serves wider and more complete geographic area
- Offers connections to other transit modes

- Typical Frequency: Variable; generally every 15 to 30 minutes
- Seating Capacity: 36 to 40 seats
- Operating cost: Medium/high* ($1.31 per pass mile)

- Capital Cost: Low
- Economic Development Limited

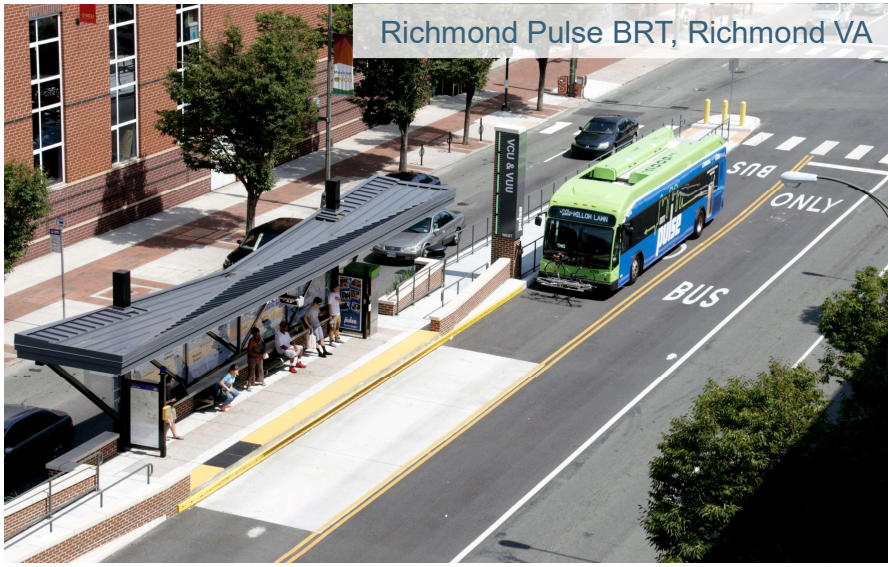


Bus Rapid Transit

- Typically longer routes with higher ridership
- Greater spacing between stations (vs. fixed route bus)
- Operates in designated lane or right-of-way (50% or more)
- Stations space about ½ mile to 1 mile apart

- Typical Frequency: Typically 5 to 15 minutes
- Seating capacity: 35 to 60 seats
- Operating cost: Medium/high ($1.31 ppm)

- Capital Cost: Varies (low to medium)
- Economic Development: Moderate, along corridor



Richmond Pulse BRT, Richmond VA

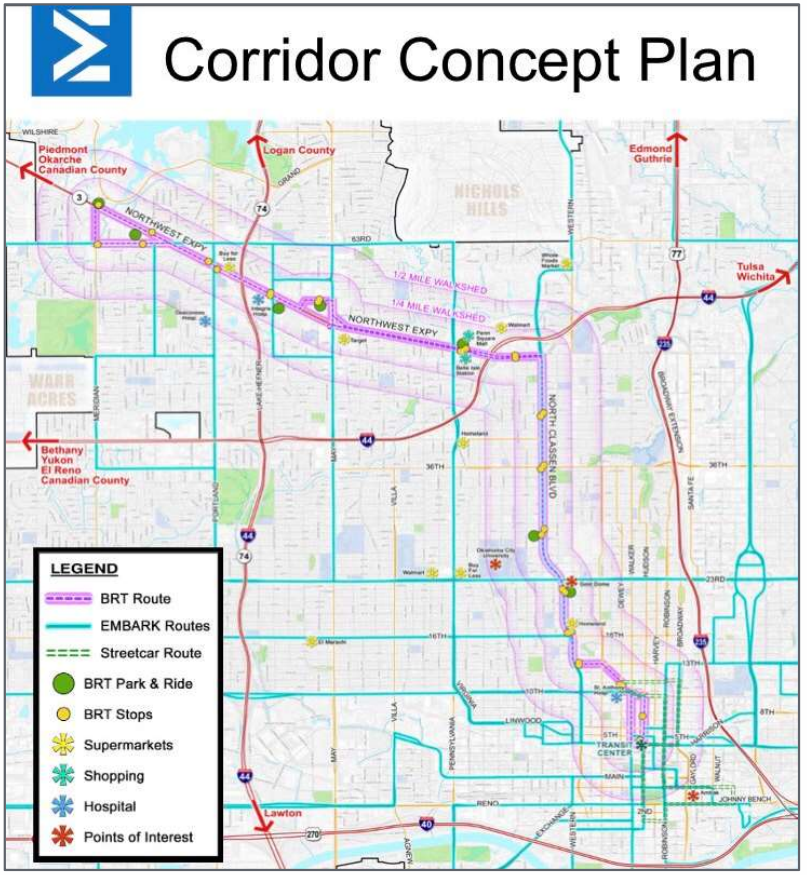
UTA UVX BRT, Utah County, UT

Northwest BRT Corridor

- **Initial Planning**
  - 2005 Fixed Guideway Study
  - 2016 Northwest Multimodal Transportation Corridor Concept Plan
- **Funding**
  - Bond/Sales Tax/COTPA - $13.7 Million
  - BUILD Grant - $14.3 Million (2018)
- **Currently Under Design**
  - Mix flow and dedicated facilities
  - BRT styled/branded vehicle (possibly articulated)

Year	2018		2019				2020				2021				2022				2023			
Quarter	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Detailed Planning																						
Environmental																						
Preliminary Engineering																						
Approvals & Permitting																						
Final Design																						
Construction																						
Safety Certification																						
Vehicle Procurement																						

Source: 2018 BUILD Application



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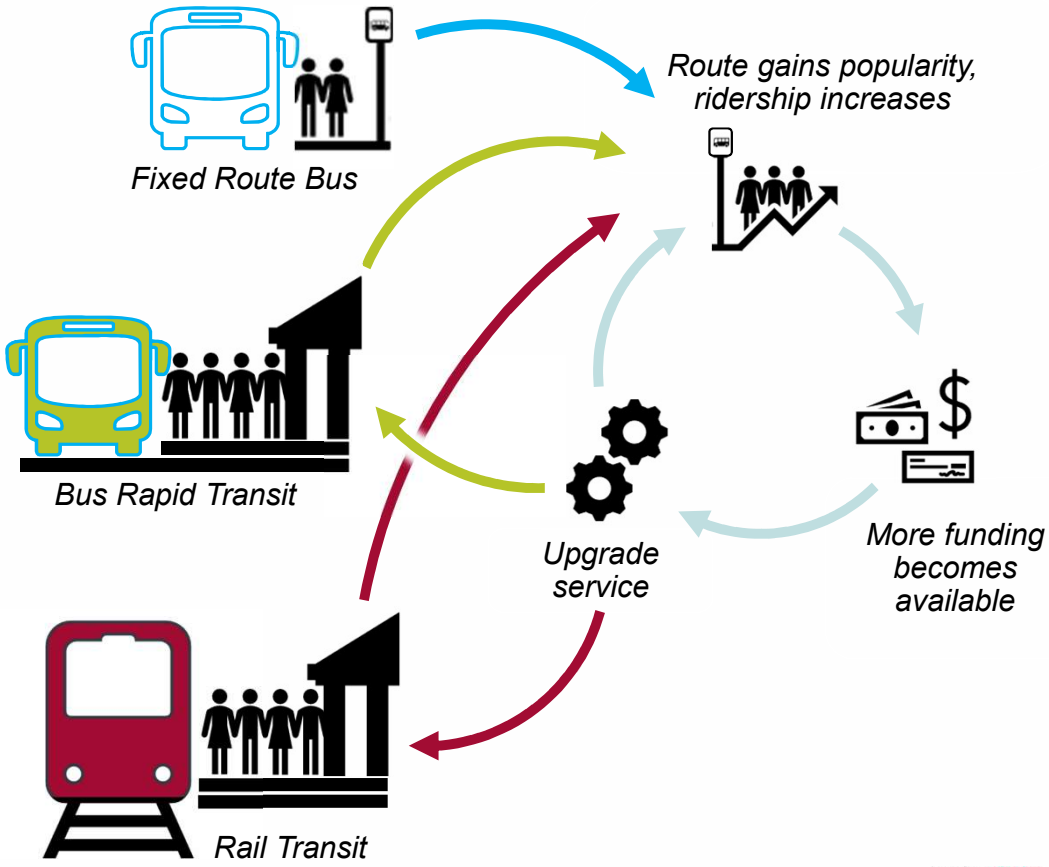
Transition from BRT to Rail Transit

- BRT Investment:
  - Growth in ridership opportunity
  - Establish a transit culture
  - Spur economic growth along corridor
- Do Not Preclude Rail
  - As ridership grows and funding is available
  - Ability to leverage an existing RR corridor
- Land Use and Economic Development Opportunity
  - Investment in permanent transit features (e.g., stations) inspires station area growth



Streetcar

- Operates in shared lane, and/or in designated right-of-way
- Last-mile connectors for shorter trip lengths
- Powered by overhead catenary system*
- Typical Operating Speeds: 20-25mph
- Stations are closely spaced – ¼ to ½ mile

- Typical Frequency: every 5 to 15 minutes
- Seating capacity: 40 to 74 seats per car
- Operating cost: High ($2.02 ppm)

- Capital Cost: Medium to high
- Economic Development: Significant, along corridor

D-Line & B-Line, EMBARK, Oklahoma City, OK

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Light Rail Transit (LRT)

- Typically longer routes along high-ridership corridors
- Operates in designated right-of-way on standard rail tracks
- Powered by overhead catenary system
- Typical operating speeds: 55mph
- Stations spaced ¾ - 1 mile apart

- Typical Frequency: every 5 to 15 minutes
- Seating capacity: 50 to 100 seats per car
- Operating cost: Low/medium ($0.92 ppm)

- Capital Cost: Medium to high
- Economic Development: Significant, around stations

Yellow Line, Dallas Area Rapid Transit, Dallas, TX

TRAX, Utah Transit Authority, UT

Commuter Rail

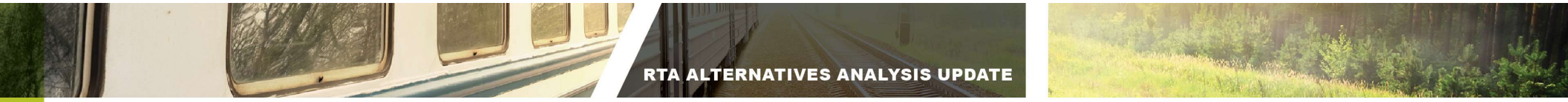
- Connecting urban core to surrounding suburbs
- Operates on standard rail tracks, may share tracks with other rail services (e.g., Amtrak, freight rail, etc.)
- Typically diesel powered
- Typical operating speeds: 79mph
- Station spacing 5- 8 miles

FrontRunner, Utah Transit Authority, UT

Trinity Rail Express, Dallas-Fort Worth, TX

- Typical Frequency: Every 15 to 60 minutes
- Seating capacity: 75 to 130+ seats per car
- Operating cost: Very low ($0.51 ppm)

- Capital Cost: Varies (medium to high)
- Economic Development: Moderate to significant, around stations

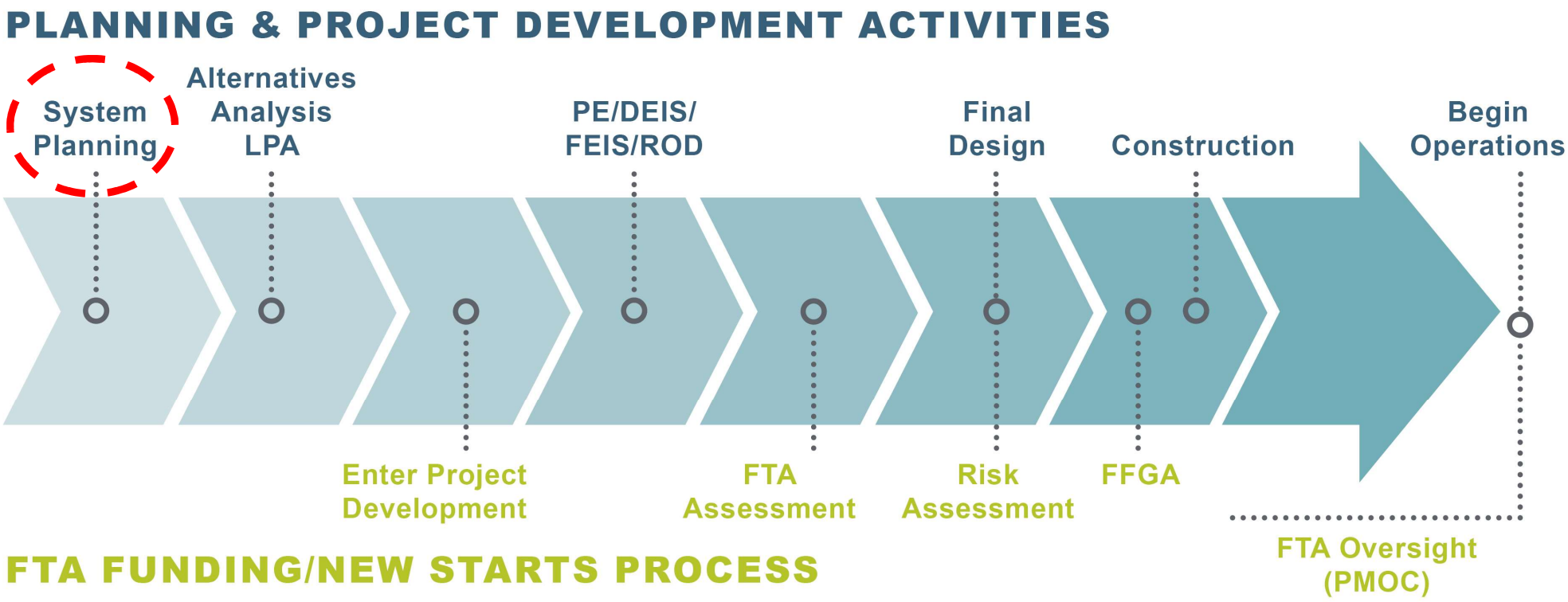


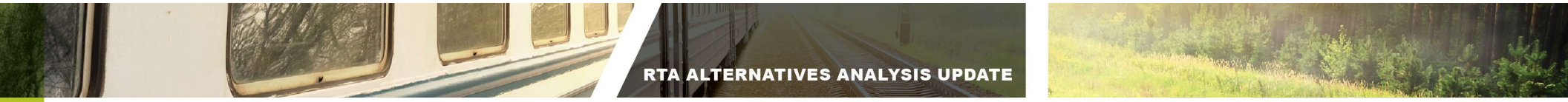
Summary

Mode	Capital Cost	Operating Cost (per Passenger-Mile)	Economic Development Potential
Fix Route Bus	low	$1.31	limited
Bus Rapid Transit (BRT)	low to medium	$1.31	moderate (along corridor)
Streetcar	medium to high	$2.02	significant (along corridor)
Light Rail Transit (LRT)	medium to high	$0.92	significant (around stations)
Commuter Rail	medium to high	$0.51	moderate to significant (around stations)

What is a Transit System Plan?

Project Lifecycle



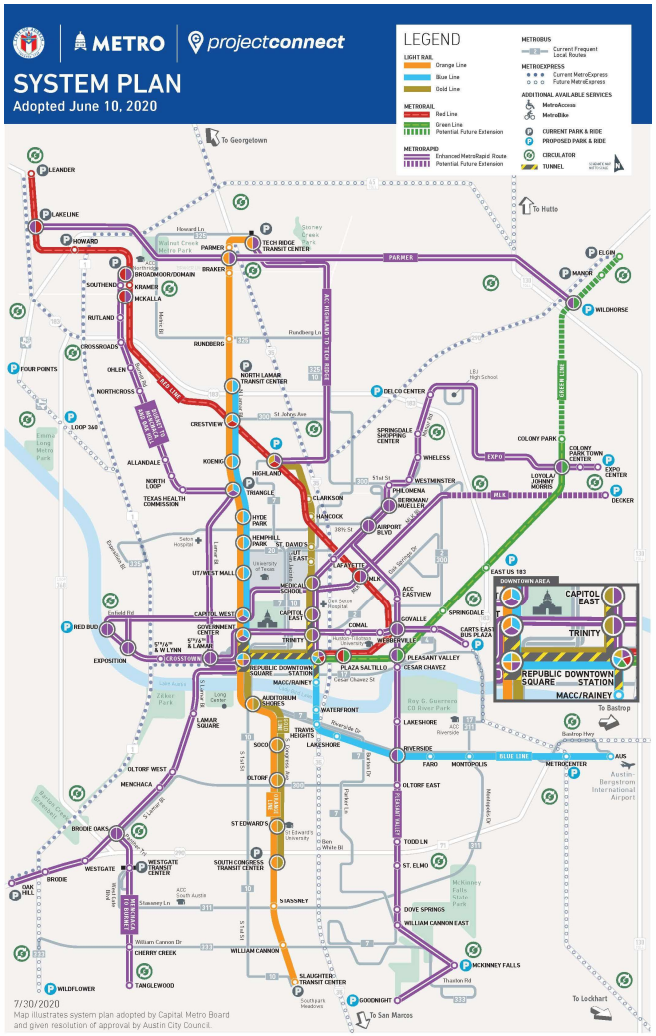


Transit System Plans

- Definition: Long-range, comprehensive plan for transit in a defined geographic area
- Span: 10 - 25 years
- Elements:
  - Vision and goals
  - Discussion of previous plans and studies
  - Defined corridors & identified transit modes
  - Financial plan
  - Implementation Schedule
- Transit system plans help identify key projects
- Need to be adopted into regional long-term plans to be competitive for FTA funding
- Typically prepared prior to Alternatives Analysis and environmental (NEPA) efforts for a particular corridor

Austin – Project Connect

- Program Description
  - 3 new LRT Lines (45 miles)
  - 1 new commuter rail line (27 miles)
  - Downtown transit tunnel
  - Expanded bus service – Local/Express/BRT (74 miles of new BRT)
  - 24 new Park and Ride lots
- Financial Plan
  - $9.8B for full plan
  - $7.1B for initial investment (on Nov. 3 ballot)
  - Funding: local property tax within Austin; FTA funds
- Implementation Schedule
  - 13 years (2021-2034) for initial investment projects



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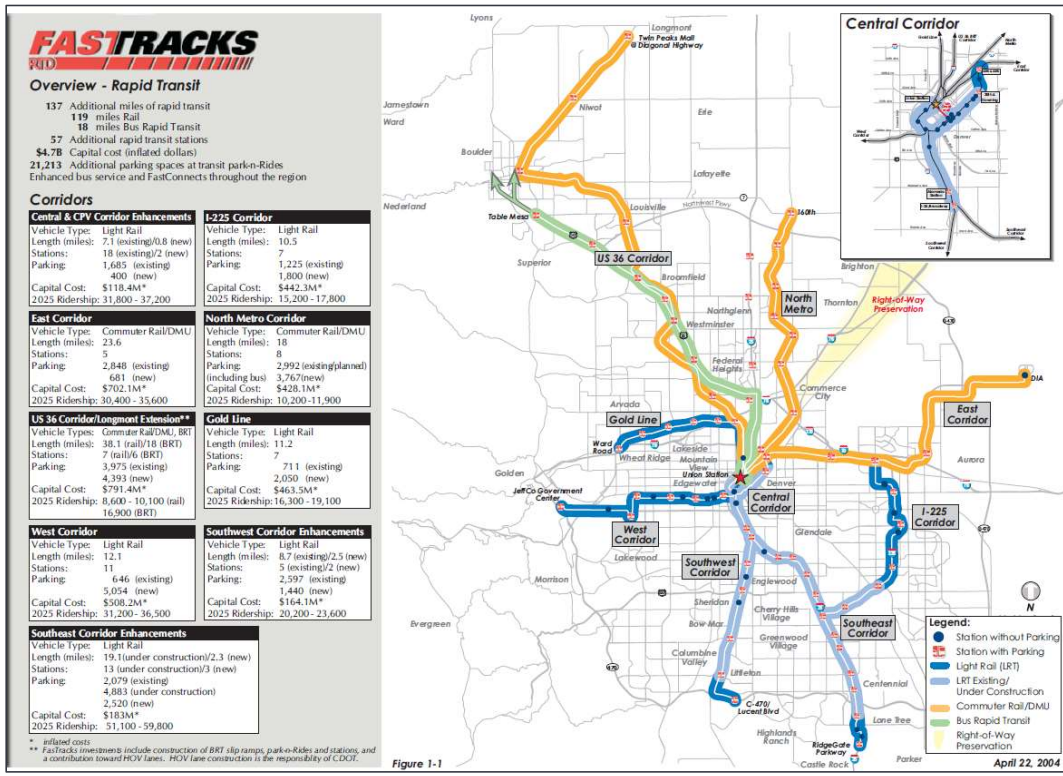
Denver – FasTracks

- Program Description:
  - 6 new rapid corridors (40 miles of light rail, 79 miles of commuter rail, and 18 miles of BRT)
  - Enhanced bus service
  - Timed transfer points
  - 31 new park-n-rides
  - Denver Union Station
- Financial plan
  - Cost: $4.7 billion
  - Funding: sales tax; local, regional, and state grants; FTA New Starts; TIFIA loans, P3 delivery
- Implementation Schedule
  - 12 year plan (2005-2017)



FASTRACKS

Overview - Rapid Transit

137 Additional miles of rapid transit
119 miles Rail
18 miles Bus Rapid Transit
57 Additional rapid transit stations
$4.7B Capital cost (inflated dollars)
21,213 Additional parking spaces at transit park-n-Rides
Enhanced bus service and FastConnects throughout the region

Corridors

Central & CPV Corridor Enhancements	
Vehicle Type:	Light Rail
Length (miles):	7.1 (existing)/0.8 (new)
Stations:	18 (existing)/2 (new)
Parking:	1,685 (existing) 400 (new)
Capital Cost:	$118.4M*
2025 Ridership:	31,800 - 37,200

I-225 Corridor	
Vehicle Type:	Light Rail
Length (miles):	10.5
Stations:	7
Parking:	1,225 (existing) 1,800 (new)
Capital Cost:	$442.3M*
2025 Ridership:	15,200 - 17,800

East Corridor	
Vehicle Type:	Commuter Rail/DMU
Length (miles):	23.6
Stations:	5
Parking:	2,848 (existing) 681 (new)
Capital Cost:	$702.1M*
2025 Ridership:	30,400 - 35,600

North Metro Corridor	
Vehicle Type:	Commuter Rail/DMU
Length (miles):	18
Stations:	8
Parking:	2,992 (existing/planned)
(including bus)	3,767(new)
Capital Cost:	$428.1M*
2025 Ridership:	10,200-11,900

US 36 Corridor/Longmont Extension**	
Vehicle Types:	Commuter Rail/DMU, BRT
Length (miles):	38.1 (rail)/18 (BRT)
Stations:	7 (rail)/6 (BRT)
Parking:	3,975 (existing) 4,393 (new)
Capital Cost:	$791.4M*
2025 Ridership:	8,600 - 10,100 (rail) 16,900 (BRT)

Gold Line	
Vehicle Type:	Light Rail
Length (miles):	11.2
Stations:	7
Parking:	711 (existing) 2,050 (new)
Capital Cost:	$463.5M*
2025 Ridership:	16,300 - 19,100

West Corridor	
Vehicle Type:	Light Rail
Length (miles):	12.1
Stations:	11
Parking:	646 (existing) 5,054 (new)
Capital Cost:	$508.2M*
2025 Ridership:	31,200 - 36,500

Southwest Corridor Enhancements	
Vehicle Type:	Light Rail
Length (miles):	8.7 (existing)/2.5 (new)
Stations:	5 (existing)/2 (new)
Parking:	2,597 (existing) 1,440 (new)
Capital Cost:	$164.1M*
2025 Ridership:	20,200 - 23,600

Southeast Corridor Enhancements	
Vehicle Type:	Light Rail
Length (miles):	19.1(under construction)/2.3 (new)
Stations:	13 (under construction)/3 (new)
Parking:	2,079 (existing) 4,883 (under construction) 2,520 (new)
Capital Cost:	$183M*
2025 Ridership:	51,100 - 59,800

* inflated costs
** FasTracks investments include construction of BRT slip ramps, park-n-Rides and stations, and a contribution toward HOV lanes. HOV lane construction is the responsibility of CDOT.

Figure 1-1

April 22, 2004

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Central Puget Sound – Sound Move

- Program Description:
  - 81 miles of commuter rail
  - 25 miles of light rail
  - High-Occupancy Vehicle (HOV) Expressway with regional bus service
  - 41 park-n-rides
- Financial plan
  - Cost: $3.9 billion
  - Funding: sales tax, municipal bonds, FTA New Starts, farebox
- Implementation schedule
  - 10 year plan (1996-2005)

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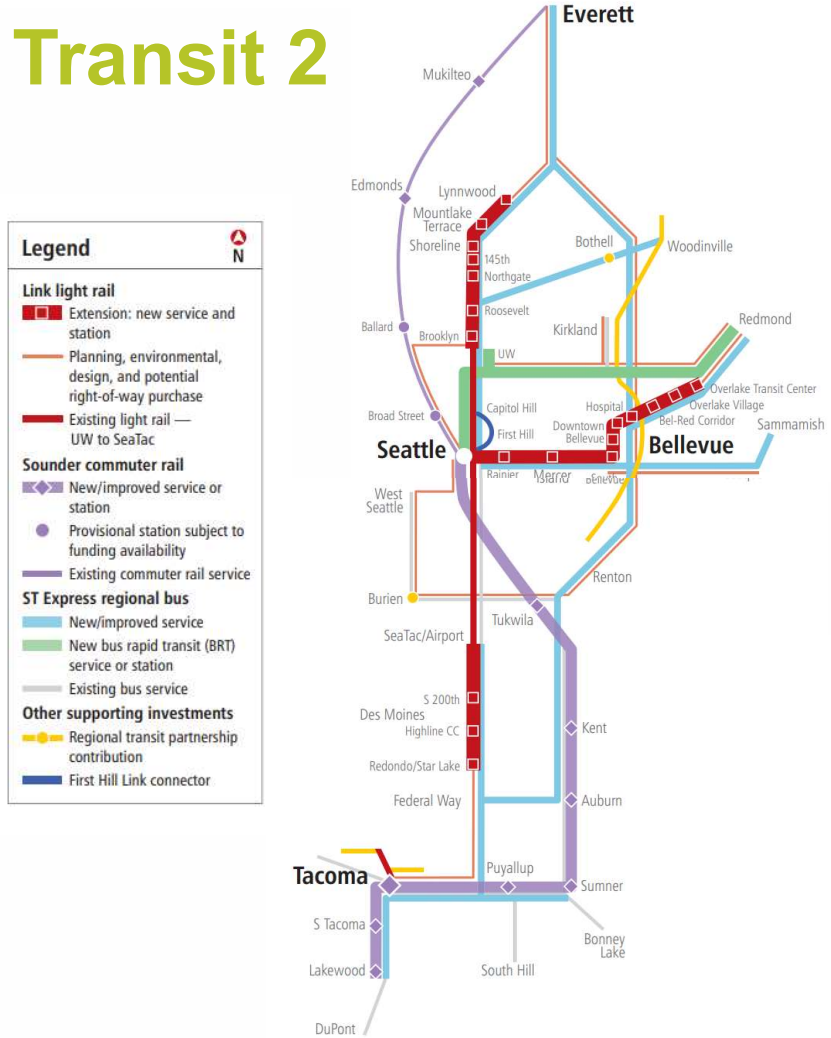
Central Puget Sound – Sound Transit 2

- Program Description:
  - 36 miles of light rail
  - Expanded span and additional commuter rail service
  - Increased express bus service
  - Multimodal access improvements
- Financial plan
  - Cost: $17.8 billion
  - Funding: sales tax, bonds, federal grants, Sound Moves surplus, farebox
- Implementation schedule
  - 15 year plan (2008-2023)



Central Puget Sound – Sound Transit 3

- Program Description:
  - 60 miles of light rail
  - 2 BRT corridors
  - Expanded commuter rail stations & track and signal upgrades
  - Multimodal access improvements
  - Transit-oriented development (TOD) & shared parking
- Financial plan
  - Cost: $53.9 billion
  - Funding: sales tax, Sound Move + Sound Transit 2 surplus, bonds, Federal grants, fares
- Implementation schedule
  - 25 year plan (2016-2041)

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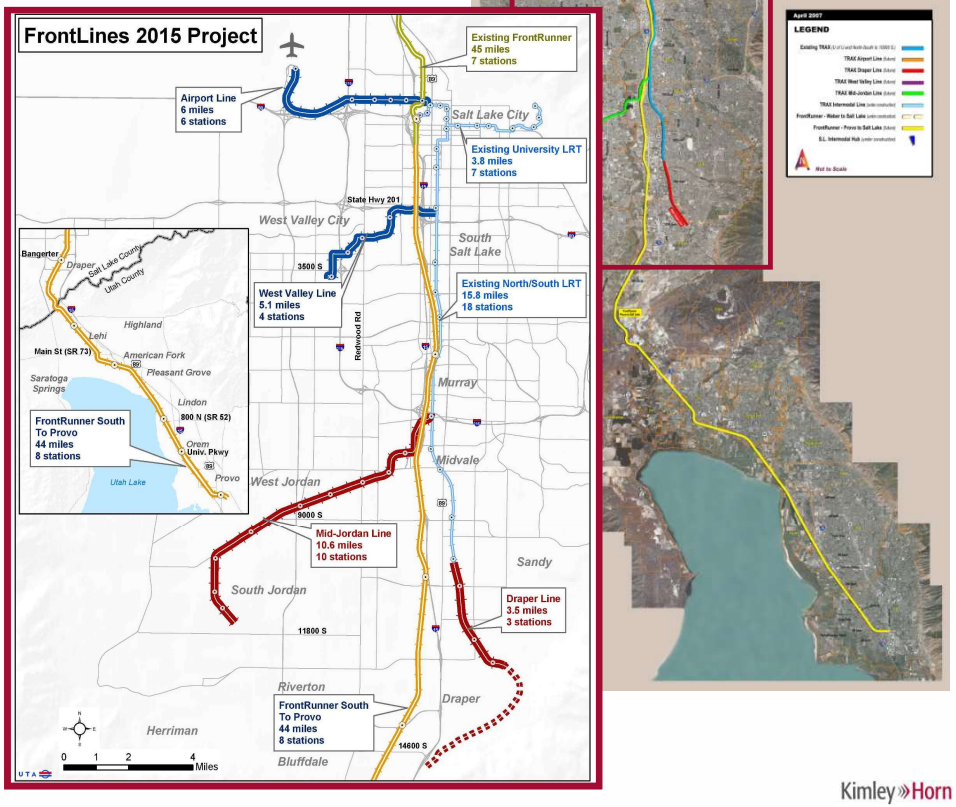
Salt Lake City – Front Lines 2015

- Program Description:
  - 6 new rapid corridors (70 miles new passenger rail service)
  - Commuter Rail, Light Rail, and Streetcar
  - New park-n-rides
  - Salt Lake City Intermodal Hub
- Financial plan
  - Cost: $2.4 billion
  - Funding: Sales Tax and FTA New Starts as part of a Program of Projects
- Implementation Schedule
  - 10 year plan (2006-2015)
  - Program was completed in 2013



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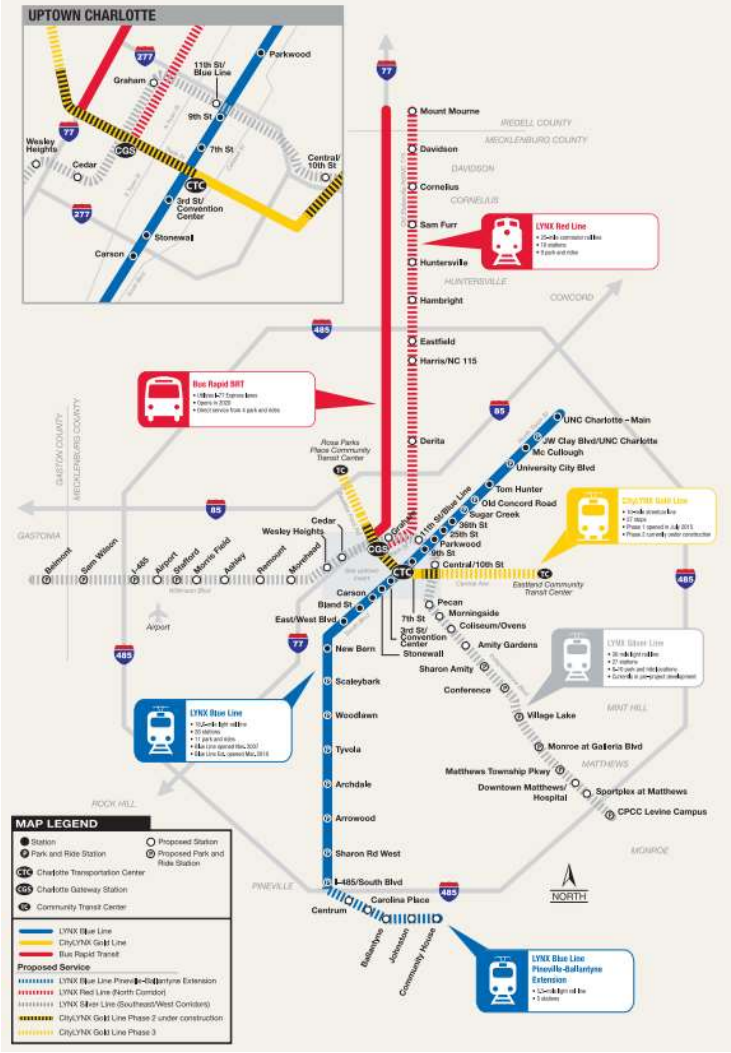
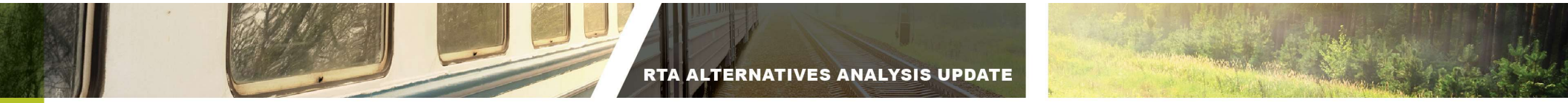
Charlotte – Transit Vision

- Program Description:
  - 25 miles of commuter rail
  - 45 miles of light rail
  - 10 miles of streetcar
  - 25 miles of BRT
  - Charlotte Gateway District & Multimodal Station
  - TOD
- Funding Plan – TBD
- Implementation Schedule
  - 25 year plan (2006-2030)

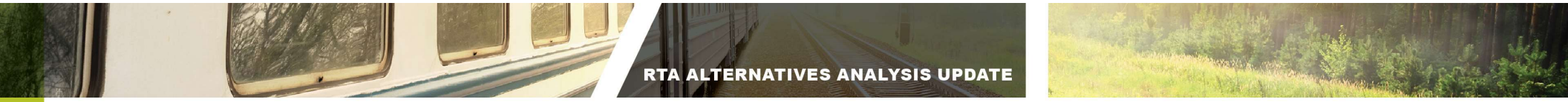


Transit System Planning Process



Traditional Transit System Planning Ingredients

- Goals, Objectives, and Policies
- Visioning and community engagement
- Regional travel demand analysis
- Mode considerations
- Time Horizons
- Financial strategies/considerations (funding, costs, phasing/schedule, grants)



Central Oklahoma: Building Blocks

- Fixed Guideway Study (2005)
- Intermodal Transportation Hub Master Plan (2011)
- Commuter Corridors Study (2015)
- Encompass 2040 (2016)

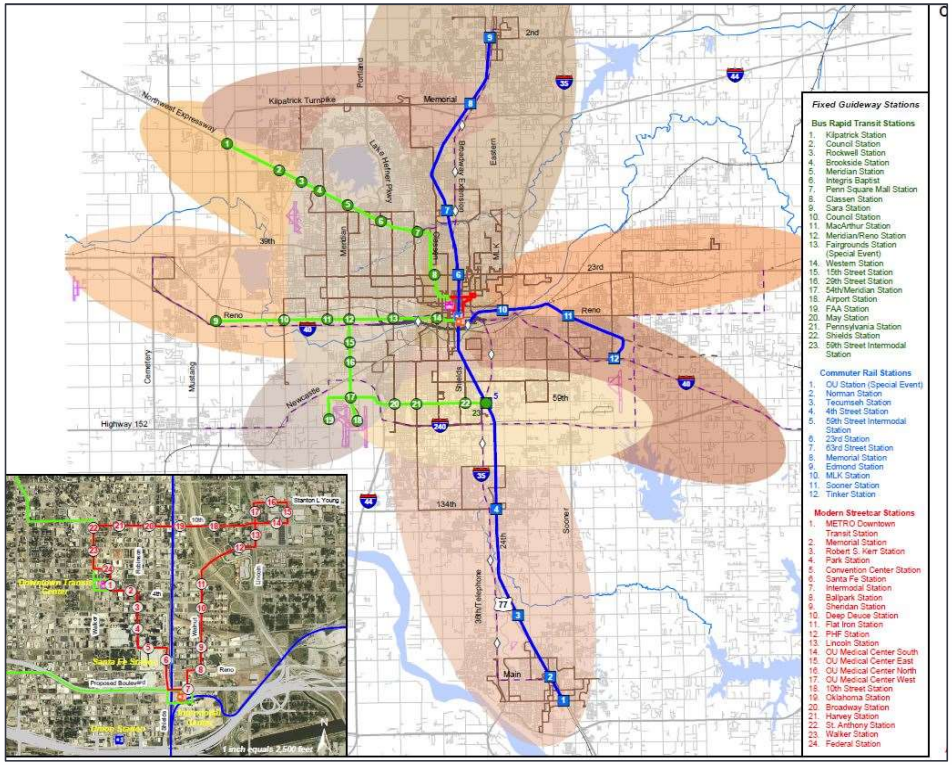
Fixed Guideway Study (2005)

Purpose:

- Defined preferred long-range transit network, including fixed guideway modes
- Considered needs of entire ACOG Region
- Evaluated appropriateness of wide-range of modal technologies
- Identified the region's primary commuter corridors
- Extensive public and stakeholder involvement

Recommendations:

- Enhanced bus, BRT, streetcar, and commuter rail
- Imagines central agency for planning high capacity transit



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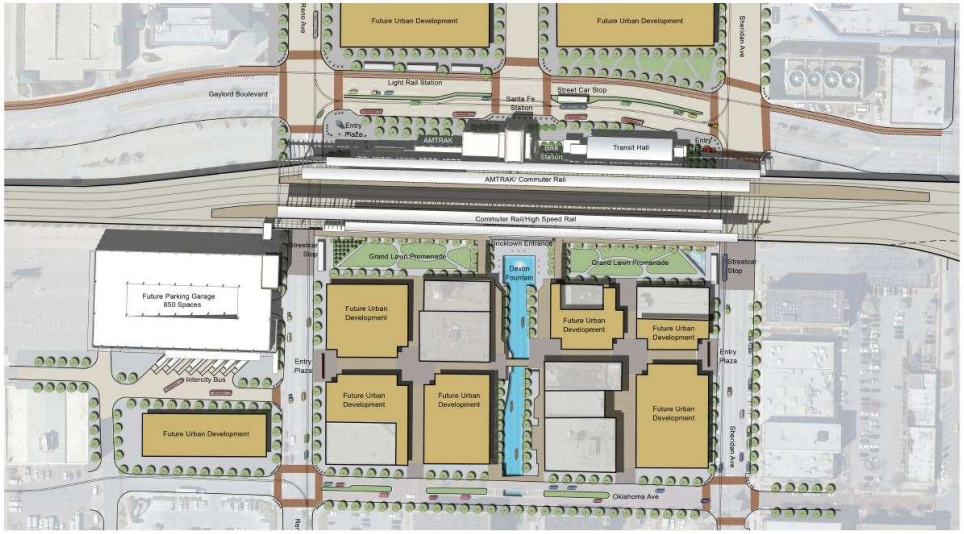
Intermodal Transportation Hub Master Plan (2011)

- Identified feasible, centralized intermodal hub site accommodating fixed guideway system identified in 2005
- Hub supports fixed guideway plan improvements
- Considered supporting modes including Amtrak, intercity bus, shuttles, taxis, high-speed rail, bicycles, and pedestrians as well as TOD
- Validated the feasibility of hub at Santa Fe Station (image to the right)
- Identified phasing plan to secure right-of-way and expansion of site as transit system matures



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Commuter Corridor Study (2015)

- **Purpose:**
  - Re-analyze three corridors from the 2005 plan for greater detail on mode, alignment, and cost
  - Each corridor evaluated independently with consideration given to network compatibility
  - Mix of qualitative and quantitative criteria evaluated universe of alternatives with several iterations
- **Recommends:**
  - **North Corridor** – Commuter rail to Edmond along existing rail ROW supported by the Classen Streetcar Extension
  - **East Corridor** – Streetcar to Tinker AFB
  - **South Corridor** – Commuter rail to Norman along existing rail ROW

Figure 5-5: ACOG Commuter Corridors LPAs

North Corridor

- 31 miles of commuter rail (blue) and 5 mile extension of Downtown OKC streetcar (purple)
- 6 commuter rail stations (excluding Santa Fe Station)
- One-seat ride between Edmond and Oklahoma City
- $530m – $730m Capital Cost
- $7.5m Annual Operating Cost
- Estimated 2035 weekday daily ridership:
  - 5,700 (North/South commuter rail)
  - 2,100 (streetcar extension)

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South Corridor

- 31 miles of commuter rail
- 8 commuter rail stations (excluding Santa Fe Station)
- One-seat ride between Norman and Oklahoma City
- Connects with North Corridor
- $310m – $410m Capital Cost
- $5.5m Annual Operating Cost
- Estimated 2035 weekday daily ridership:
  - 5,700 (North/South commuter rail)

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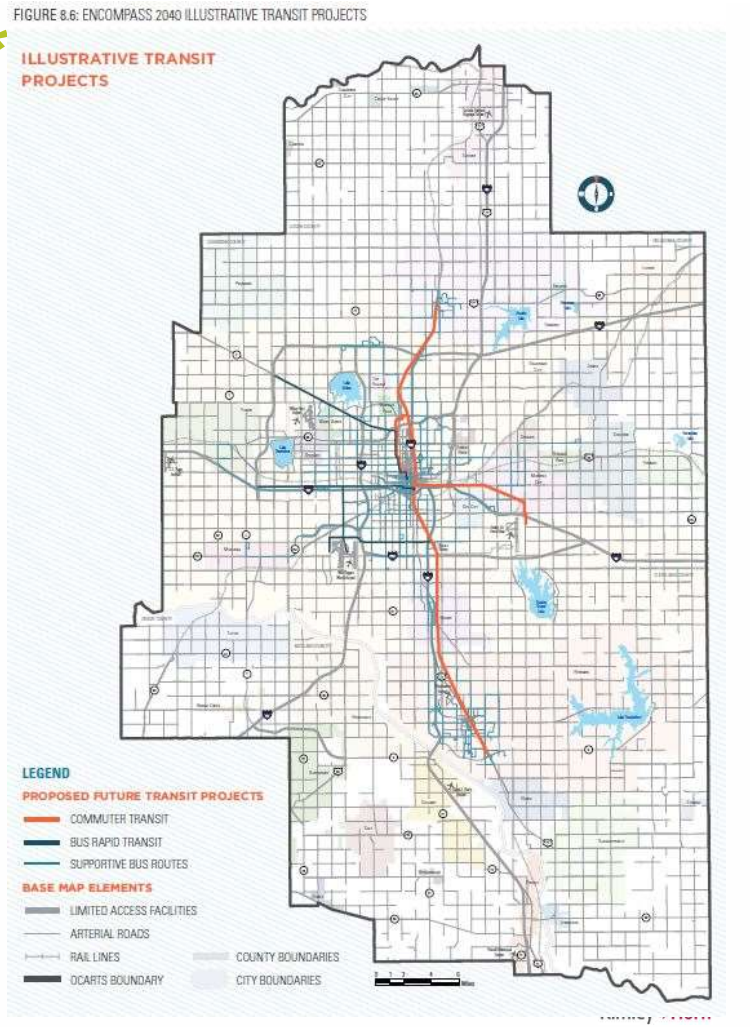
East Corridor

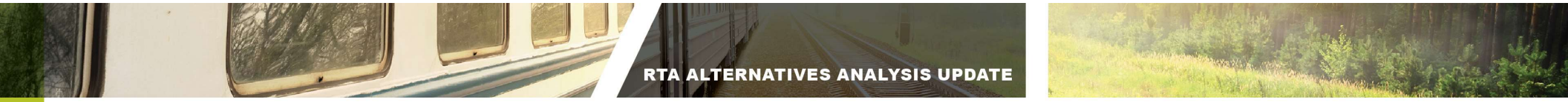
- 9 miles of streetcar
- 7 stations
- One seat ride between Tinker Air Force Base, Midwest City, Del City, and Oklahoma City
- $320m – $440m Capital Cost
- $2.5m Annual Operating Cost
- Estimated 2035 weekday daily ridership: 2,300

ACOG Encompass 2040 (2016)*

- 25-year horizon to identify program of investment ($10b) in transportation system
- Evaluated performance of business-as-usual (Scenario 1) and focused growth (Scenario 2)
- Modelled “Illustrative” transit network including 2005 and 2015 study recommendations
- Acknowledges lack of funding as largest barrier of implementing “Illustrative” network
- With “enhanced roadways and regional transit”, regional transit ridership sees a 580% increase in Scenario 1 and a 694% increase in Scenario 2
- Regional transit improvements not included in final network
- **Recommendations:**
  - Continue Regional Transit Dialogue and implementation of previous plans
  - Coordinate transit and land use planning
  - Explore Will Rogers World Airport access

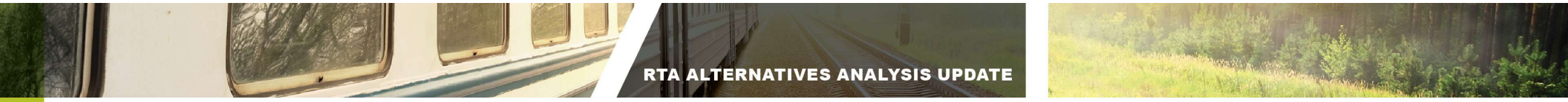
**Currently being updated*





RTA Process Moving Forward

- Synthesize previous efforts prior to the RTA's formation
- Develop RTA System and/or Vision Plan
  - Long-term plan for the RTA system
  - Focus on higher capacity modes
  - Examine key corridors
- ACOG Process
  - Incorporate the RTA's vision plan into the next Metropolitan Transportation Plan update and Unified Planning Work Program



Look-Ahead: Upcoming Discussion Topics

- ✓ TEAM INTRODUCTION, APPROACH, AND SCOPE
- ✓ OVERVIEW OF THE REGIONAL RAIL SYSTEM PLAN
  Why it's Important • How FTA Views System Planning • How it relates to ACOG Process
- REVISIT AND CONFIRM GOALS & OBJECTIVES
- VIRTUAL CORRIDORS TOUR
- INTRODUCTION TO SERVICE GOALS

Open Discussion

Thank you!