

CENTRAL CORRIDOR HIGH-CAPACITY TRANSIT STUDY

Step 5 Briefing: Final Alternatives

March 27, 2014

Austin City Council Meeting

Austin City Hall, Council Chambers



Agenda

- 1) Project Connect
- 2) Central Corridor Work Plan
- 3) Phase 1 Recap
- 4) Phase 2 Overview
- 5) Evaluation of Final Alternatives
- 6) Next Steps



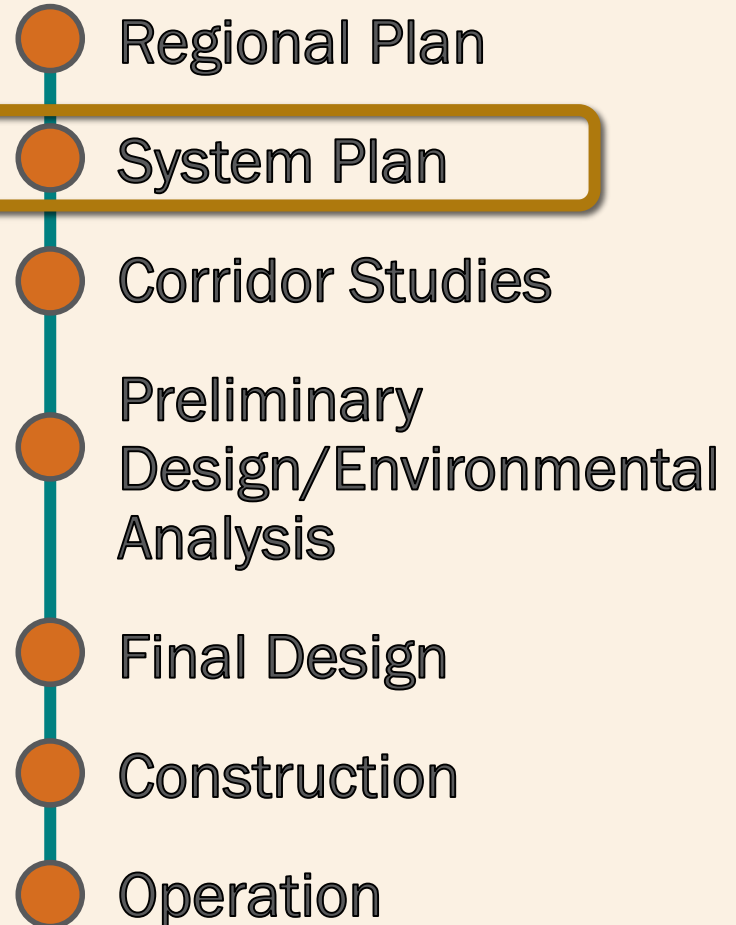
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Project Connect

1

Project Connect

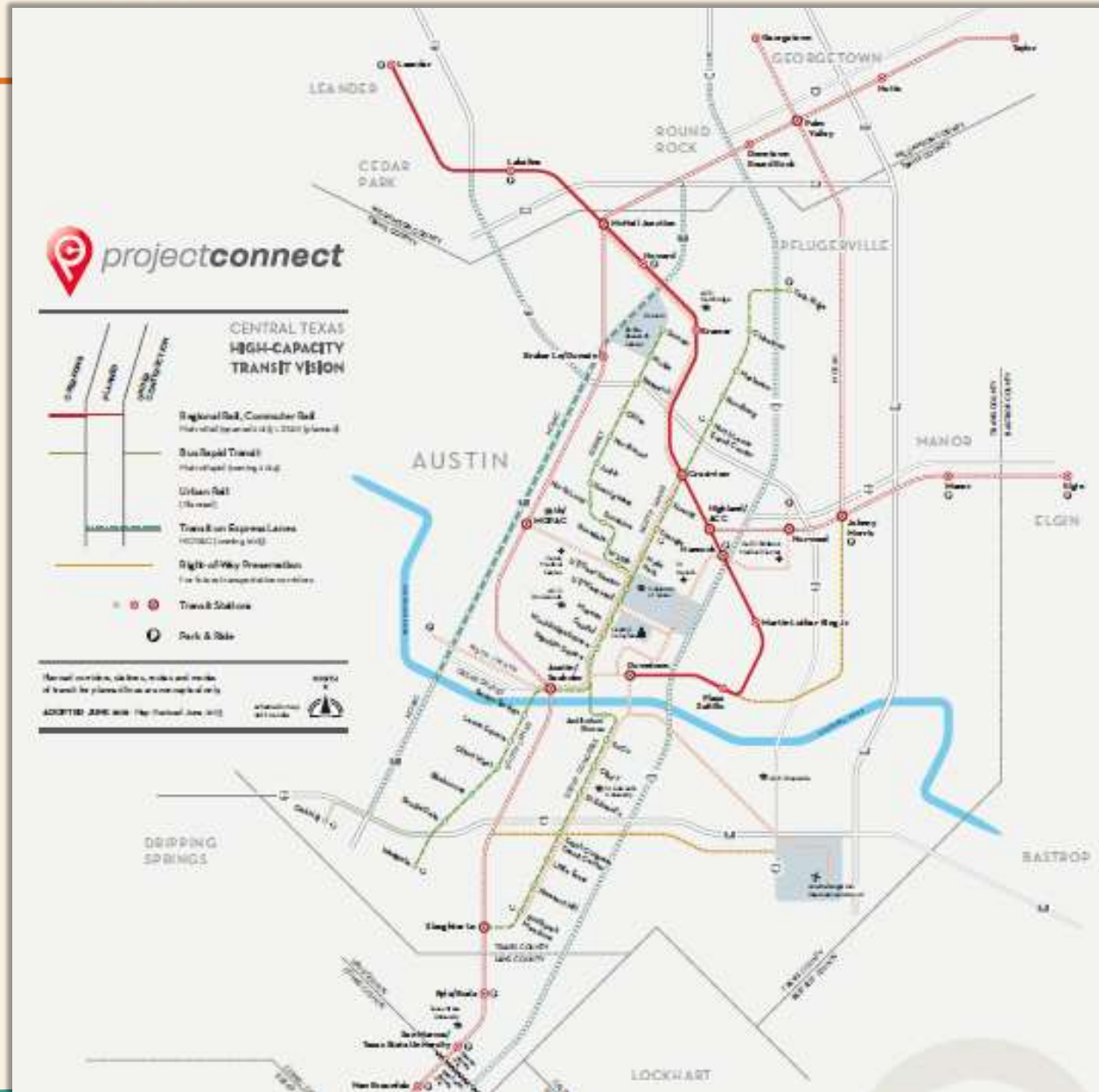
- A **partnership** between Central Texas transportation agencies
- A regional, long-range high-capacity transit **system plan** for Central Texas



1

Project Connect Vision

- System
 - 25 Centers & ABIA
 - 4 Counties/13 Cities
- Funding
 - \$4B Total Capital
 - Can Fund:
 - \$1.9B (49%) Capital
 - \$82M O&M
- Organization
 - ILA for Early Project Development
 - Framework for Regional Organization and 'Single System' Integration



Project Connect Corridors

- North



2

Central Corridor Work Plan

2

Central Corridor Work Plan Phases

Decision-Making Process

- Phase 1: Select Priority Sub-Corridor
 - ‘Where are we going...next?’
- Phase 2: Select Locally Preferred Alternative (LPA)
 - ‘How will we get there?’



3

Phase 1 Recap

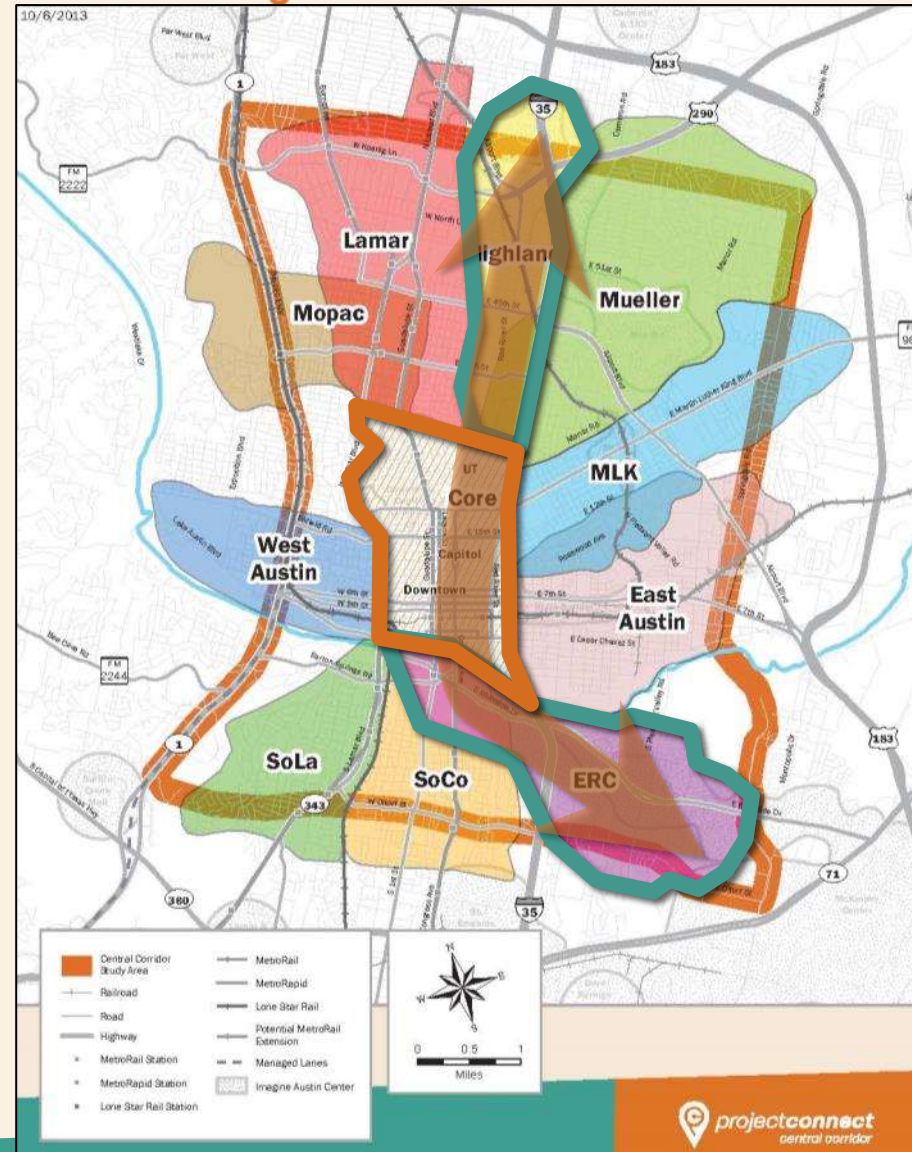
- Action on December 12, 2013
 - Endorsed (7-0) project team recommendation for East Riverside and Highland Sub-Corridors
 - Identify funding needs and sources to continue Central Corridor project definition and development activities in the next tier of sub-corridors
 - Continue cultivating a relationship with FTA to prepare for any future high-capacity transit investments in the Lamar sub-corridor

3

Council Adopted Central Corridor Priority Area

East Riverside & Highland

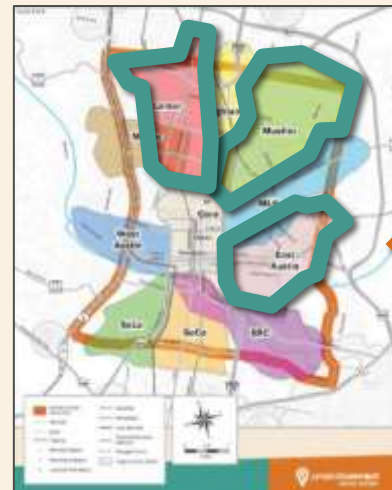
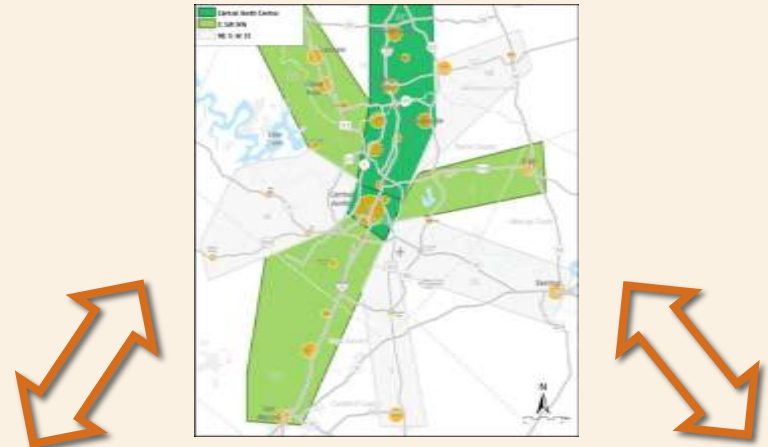
- East Riverside (ERC) and Highland were consistently in the top two
- Advanced both into Phase 2
 - Develop best project
- Balanced corridor
 - System Development
 - Shaping Characteristics
 - Serving Characteristics



3

Central Corridor System Planning

- Continuing system level planning during project development is critical
 - All sub-corridors could support high-capacity transit
 - Central Corridor phasing must be integrated with all system planning efforts
- Project definition is needed for Lamar, Mueller, East Austin
 - Leverage future funding opportunities
 - Create project pipeline - “shovel-ready”



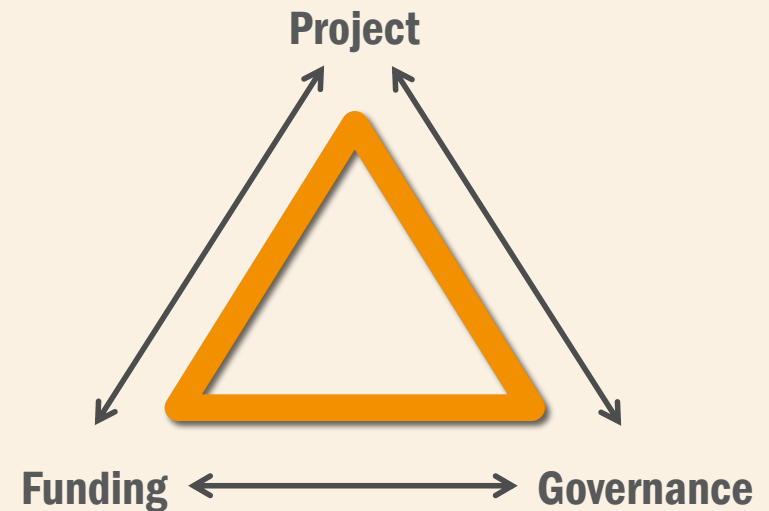
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Phase 2 Overview

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Phase 2 Objectives

- Project Definition
 - Service, mode, alignment, stops
- Funding Plan
 - Capital and O&M costs, funding sources
 - *Within* overall Project Connect Plan
- Governance Structure
- *Programs and Policies*



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Phase 2 Work Plan & Schedule

Decision-Making Process

- Phase 2: Select Locally Preferred Alternative (LPA)

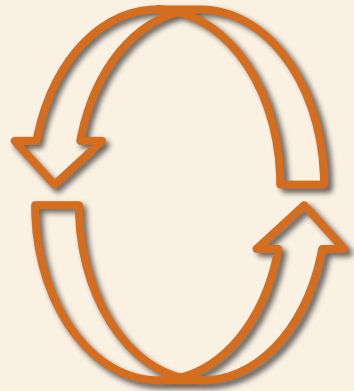
Current
Progress

Central Corridor High-Capacity Transit Study Work Plan

				2013	2014						
				6	7	8	9	10	11	12	
				Dec	Jan	Feb	Mar	Apr	May	Jun	
Phase 2 Select Draft Locally Preferred Alternative (LPA)	Step 4: Identify Preliminary Alternatives	Task 9	Project Purpose								
		Task 10	Process – Methodology & Criteria								
		Task 11	Identify & Screen Preliminary Alternatives – Service, Mode & Alignment								
	Step 5: Define Final Alternatives	Task 12	Define Final Alternatives – Mode & Alignment								
	Step 6: Evaluate Alternatives	Task 13	Evaluate Final Alternatives								
	Step 7: Select LPA	Task 14	Select Draft Locally Preferred Alternative (LPA)								
			Decision								
											*

4

Evaluation Process



Identify Preliminary Alternatives

Screen Preliminary Alternatives

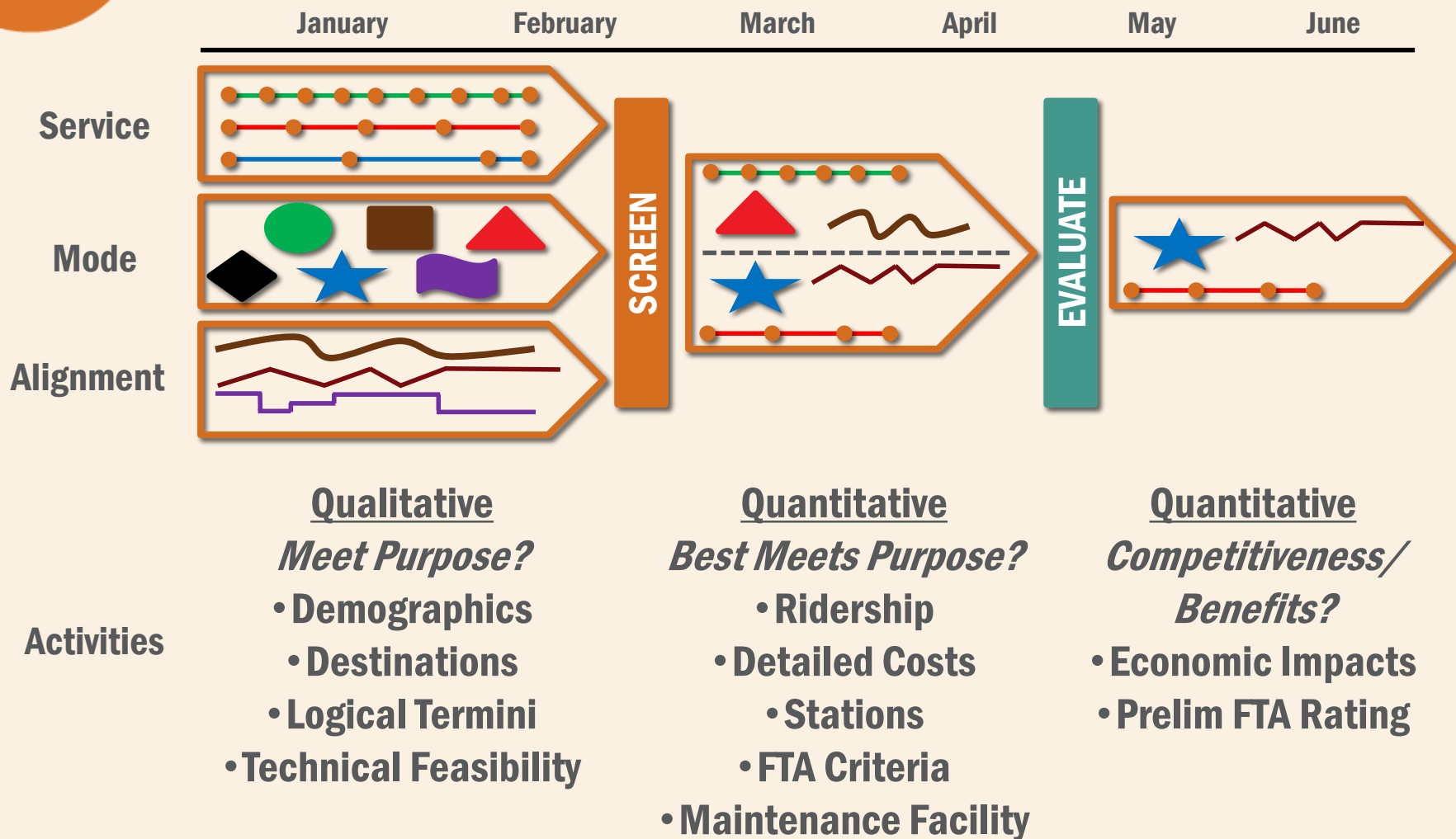
Define Final Alternatives

Evaluate Final Alternatives

Select Draft LPA

4

Evaluation Process





Phase 2 Public Involvement



4

Public Involvement: Recent Highlights

- February 8th Public Workshop at ACC Highland
 - 166 participants
 - Topics: Purpose, service, modes and alignments
- Online Engagement Tool
 - MetroQuest
 - Topics: Purpose, service, modes and alignments
 - 1100+ participants
- Input Report Published Online
 - Includes all survey responses and comments
- 16 Briefings past month
 - 4 Neighborhood Associations
 - 9 Stakeholder Groups
 - 3 Boards & Commissions



4

Public Involvement: Upcoming Activities

- Step 5 Workshops
 - 4/3 Austin Chamber Transportation Committee
 - 4/12 East Riverside Corridor
 - 4/17 Downtown Austin
- Multiple SpeakUpAustin discussions planned
 - Reliability and Guideway
 - Mode discussion
- 4/4 HousingWorks New Starts Forum
- Webinar on Evaluation Process
- Briefings, Boards & Commissions, community events and festivals





Project Purpose & Service Profile



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Project Purpose

Congestion

1

Core

3

Centers

Constraints

Growth

System

2

Funding

Congestion is the number one citizen priority by a wide margin.

4

Service Profile

January

February

March

April

May

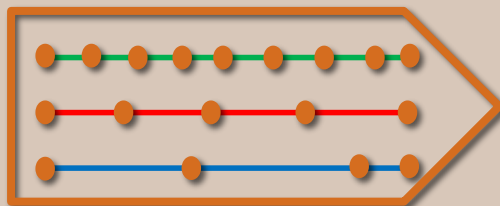
June

Preliminary
Alternatives

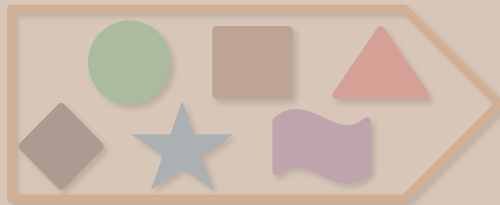
Final
Alternatives

Locally
Preferred
Alternative
(LPA)

Service
Alternatives



Mode
Alternatives

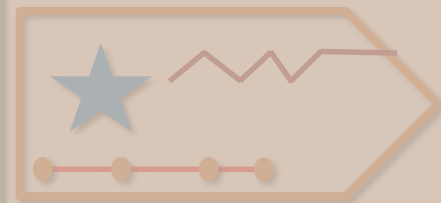
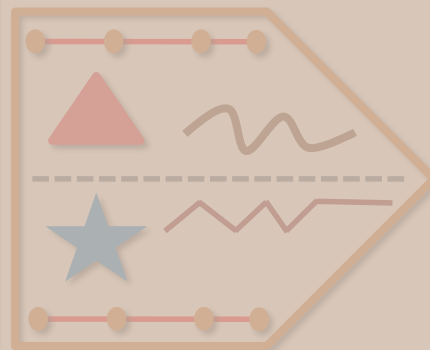


Alignment
Alternatives



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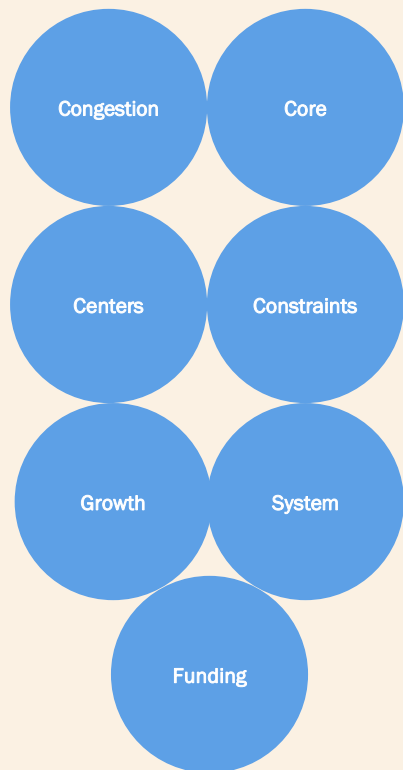
EVALUATE



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Target Service Profile

Project Purpose used to define Service Profile



- Service Characteristics
 - Reliability
 - Frequency
 - Stop Spacing
 - Speed
- A large orange arrow points from the 'Service Characteristics' section towards the 'Recommended Service Profile' box.

Recommended Service Profile

Medium
Reliability

Medium-High
Frequency

Medium-High
Stop Spacing

Medium
Speed

4

Target Service Profile

Reliability

Mostly Dedicated

Mixed Traffic

Transit Priority/
Pre-emption

Dedicated
Guideway

Separated
Guideway

Fully Separated
Guideway

Frequency

10 - 15

5 minutes

60 minutes

Stop Spacing

½ - 1 mile

< ¼ mile

> 5 miles

Speed

20-30 avg.

10 mph

55 mph maximum (including stops)

60 mph

4

Mode Screening

January

February

March

April

May

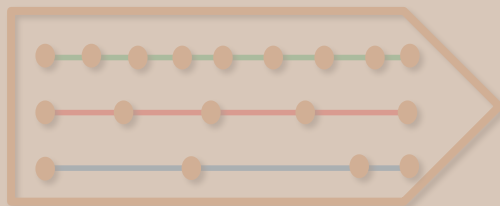
June

Preliminary
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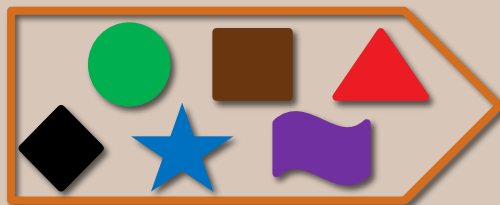
Final
Alternatives

Locally
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Alternative
(LPA)

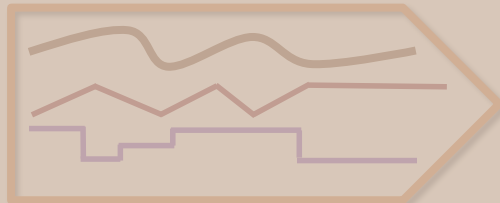
Service
Alternatives



Mode
Alternatives

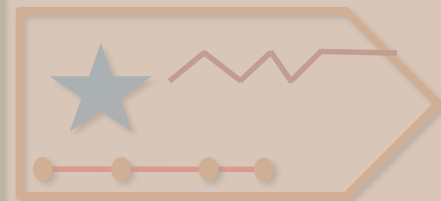
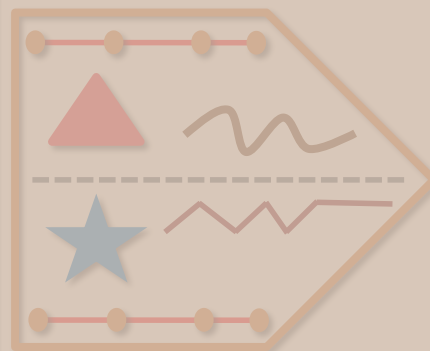


Alignment
Alternatives







































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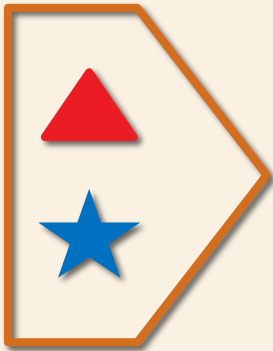
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Mode Screening

What are our high-capacity options for transit?	What is it, where does it go, and when do I use it?	How many people can it carry per hour during rush hour? ²	How fast does it go on average?	How often does it stop?	When can I get on?	Real World Example
 High-Speed Rail	 <p>High-Speed Rail uses specialized vehicles to travel at high speeds on fully dedicated and grade-separated tracks or guideway.</p> <p>Typically used to travel quickly between major urban centers.</p>	 <p>Carries 600 - 1,200 passengers</p>	 <p>Average speed 100 - 220 mph</p>	 <p>Stops are 50 miles to 100 miles apart</p>	 <p>Rail runs every 30 min. rush hour, and every 60 min. all other times</p>	Amtrak Acela
 Regional Rail	 <p>Regional Rail service connects different cities and regions, typically using existing railroad lines.</p> <p>Typically used to travel longer distances between large cities.</p>	 <p>Carries 600 - 2,400 passengers</p>	 <p>Average speed 60 - 75 mph</p>	 <p>Stops are 3 miles to 15 miles apart</p>	 <p>Rail runs every 30 min. during rush hour and every 1 - 3 hours all other times</p>	The Capitol Corridor between San Jose and Sacramento in Northern California is an example of regional rail. Locally, the Lone Star Rail District is planning the LSTAR regional rail line between Georgetown and San Antonio, with nine stops in our Region.
 Commuter Rail	 <p>Commuter Rail trains operate on railroad tracks that carry riders to and from work in a region.</p> <p>Typically used to travel from suburbs to central cities.</p>	 <p>Carries 400 - 1,400 passengers</p>	 <p>Average speed 30 - 50 mph</p>	 <p>Stops are 1 mile to 5 miles apart</p>	 <p>Rail runs every 30 min. during rush hour and every hour all other times</p>	Capital Metro's MetroRail Red Line between Leander and downtown Austin is a local example of commuter rail.
 Transit on Express Lanes	 <p>Express, or managed, lanes are highway lanes that are free to registered van pools and transit vehicles, and tolled for all other vehicles. The toll rate changes throughout the day based on how much traffic is on the managed lanes in order to keep the lanes fully used without being too busy.</p> <p>Typically used to travel within a city and between close-in suburbs and the city.</p>	 <p>Carries 400 - 900 passengers</p>	 <p>Varies. Typically toll rate adjusted to maintain a minimum average speed of 50 mph</p>	 <p>Multiple stops within close proximity near termini with 5 miles to 25 miles of non-stop service in between</p>	 <p>Buses run every 10 min. during rush hour and every 30 min. all other times</p>	Katy Managed Lanes are operated by the Harris County Toll Road Authority in Houston, TX. Locally, the Central Texas Regional Mobility Authority is currently planning express lanes along Mopac Expressway in Austin.
 Heavy Rail Transit	 <p>Heavy Rail Transit uses specialized high-capacity electric vehicles on fully-dedicated and grade separated tracks or guideway.</p> <p>Typically used to travel within very dense urban areas and corridors.</p>	 <p>Carries 10,000 - 30,000</p>	 <p>Average speed 40 - 60 mph</p>	 <p>Stops are 1 mile to 2 miles apart</p>	 <p>Rail runs every 3-5 min. rush hour and every 10 - 15 min. all other times</p>	DC Metrorail
 Gondola (Aerial Tram)	 <p>Gondolas uses small specialized vehicles propelled by a cable suspended from tall masts.</p> <p>Typically used in the US in mountainous, tourism applications over short distances.</p>					Portland Aerial Tram

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Final Mode Alternatives



Urban Rail



Bus Rapid Transit

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Alignment Screening

January

February

March

April

May

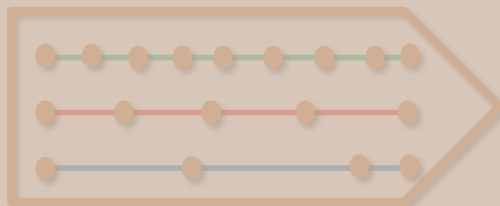
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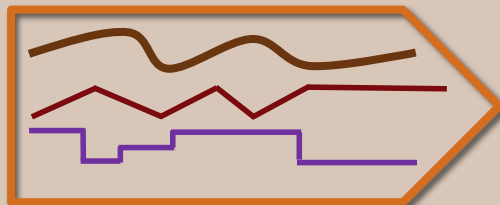
Service
Alternatives



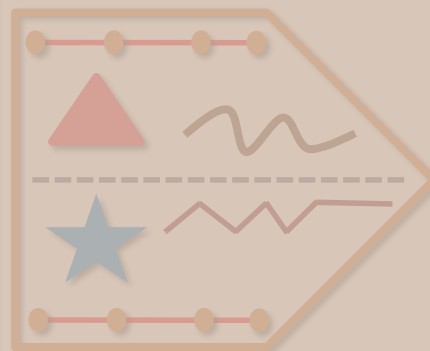
Mode
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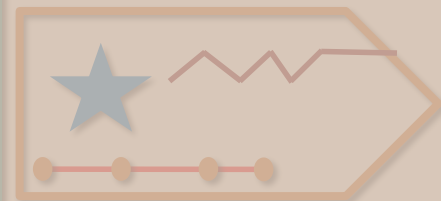
Alignment
Alternatives



SCREEN



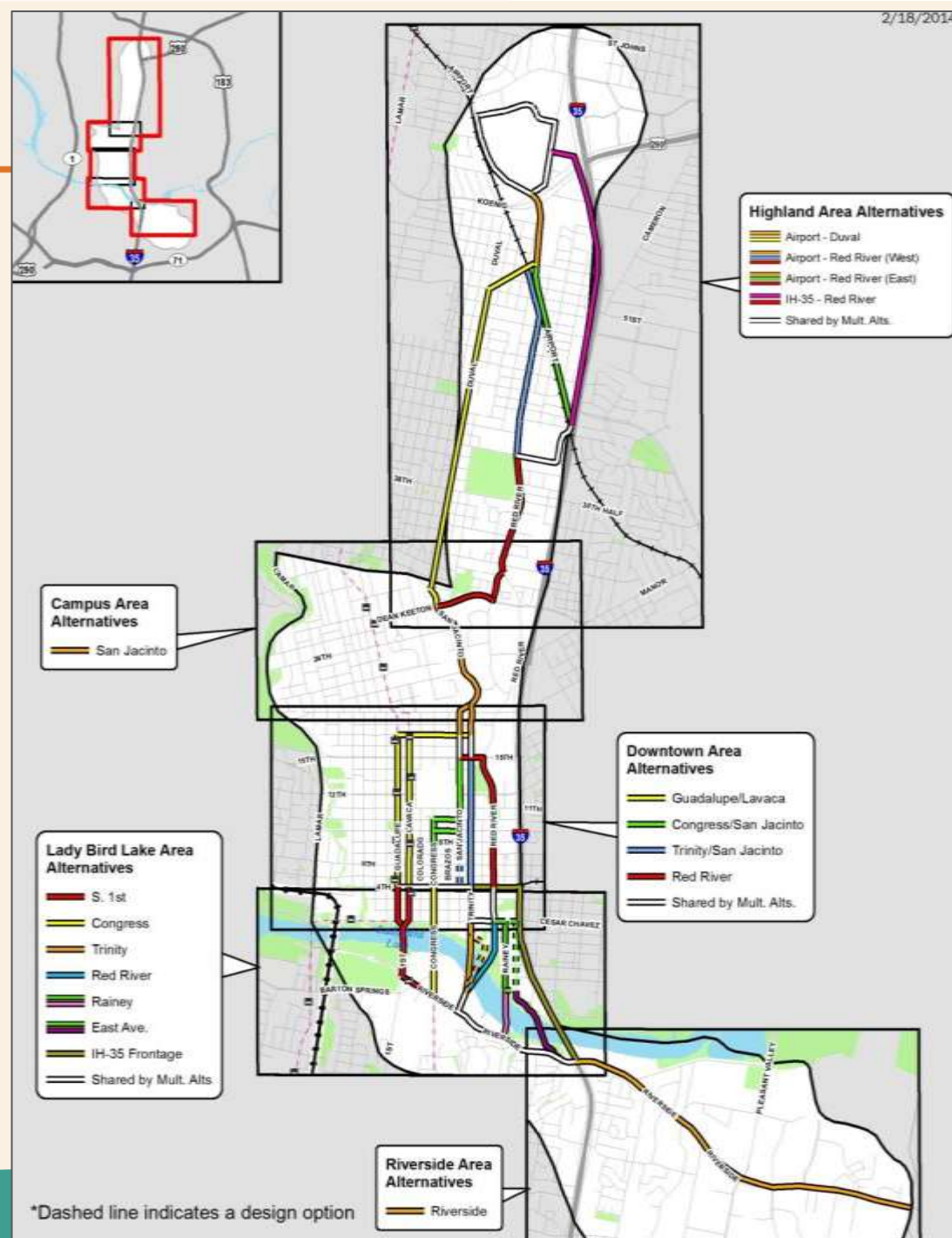
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Alignment Screening

- Corridor organized into five areas:
 - East Riverside
 - Lady Bird Lake
 - Downtown
 - Campus
 - Highland

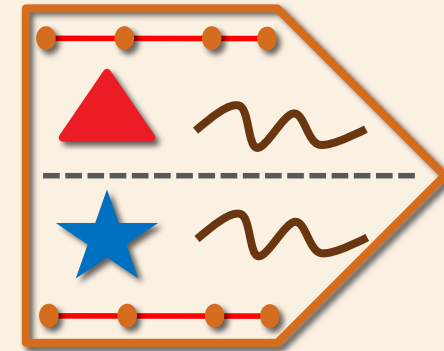
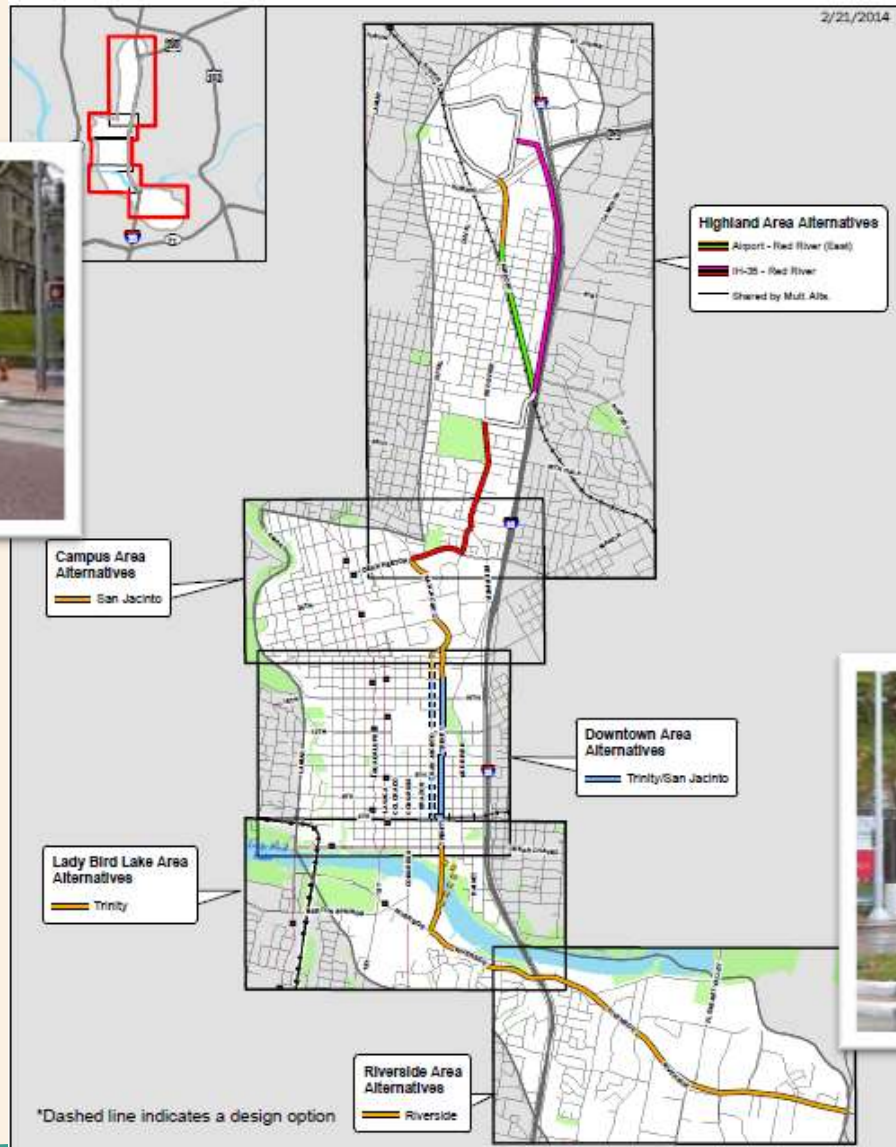


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Final Alternatives



Urban Rail



Bus Rapid Transit



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Final Alternatives – Elements

- Number and locations of stops
- Alignment alternatives refinements
 - Additional screening
 - Typical sections
- Operations plan – *in progress*

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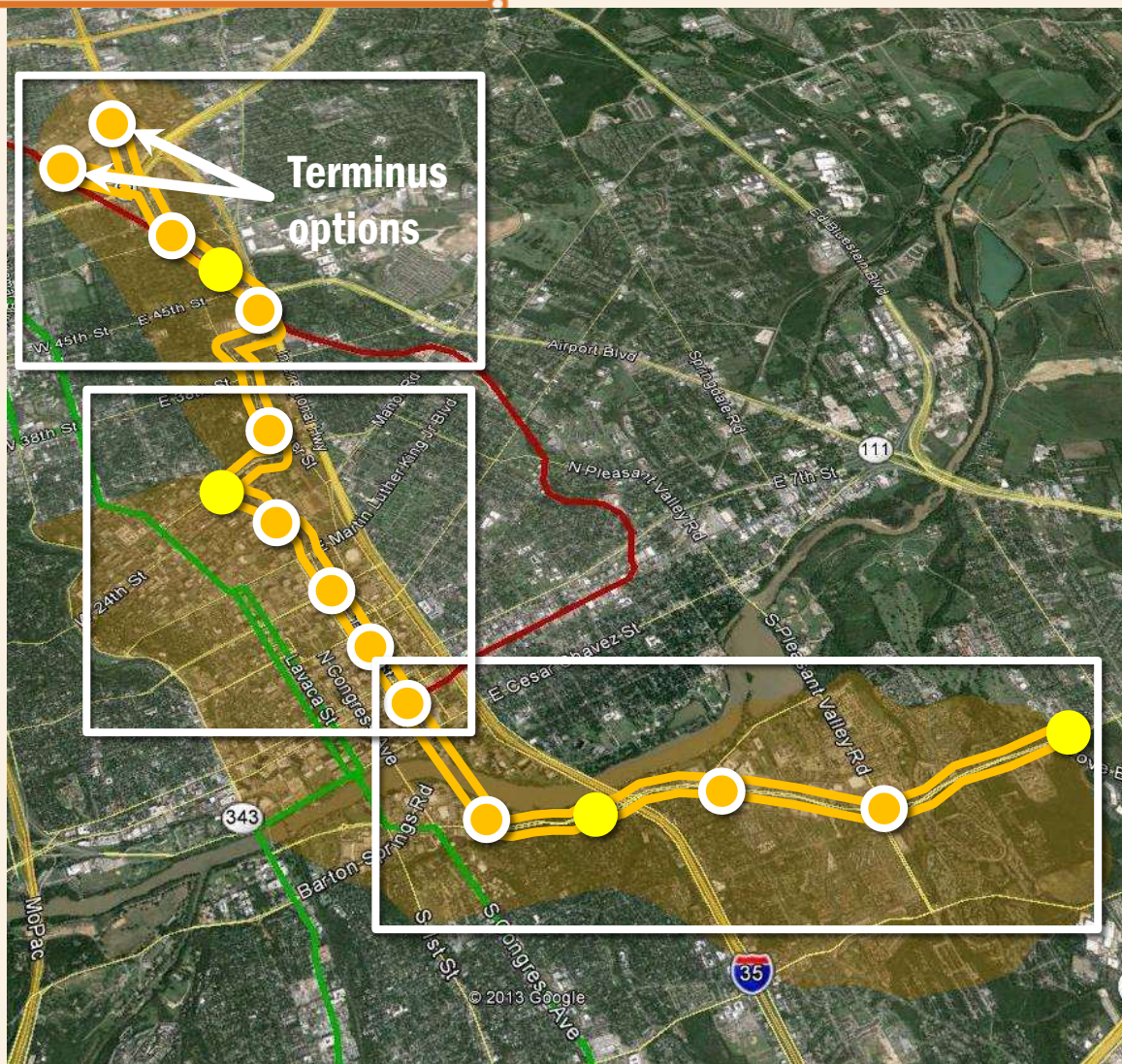
Conceptual Station Locations

16 Potential Station Locations

Base locations (12)



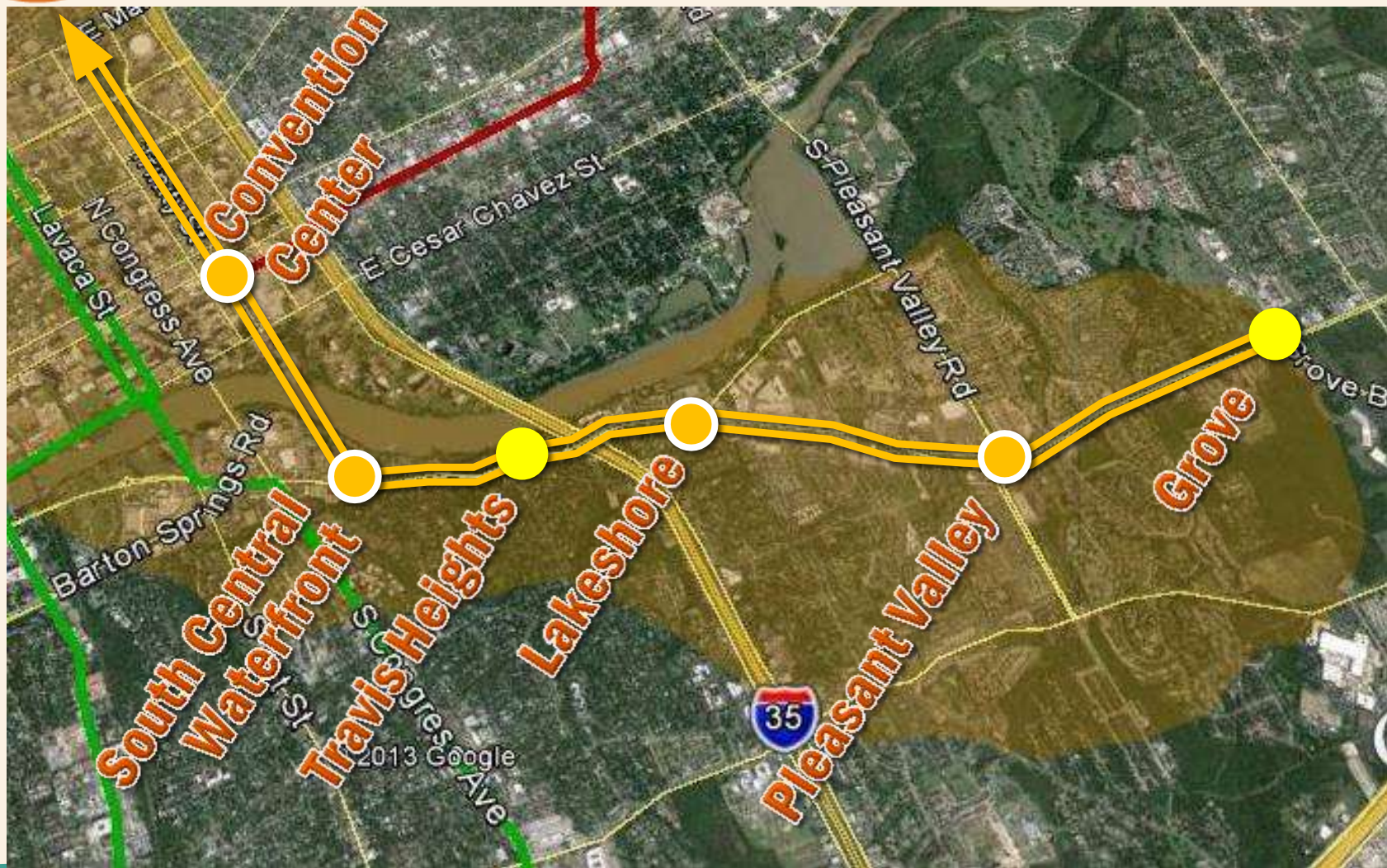
Optional locations (4)



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Conceptual Station Locations

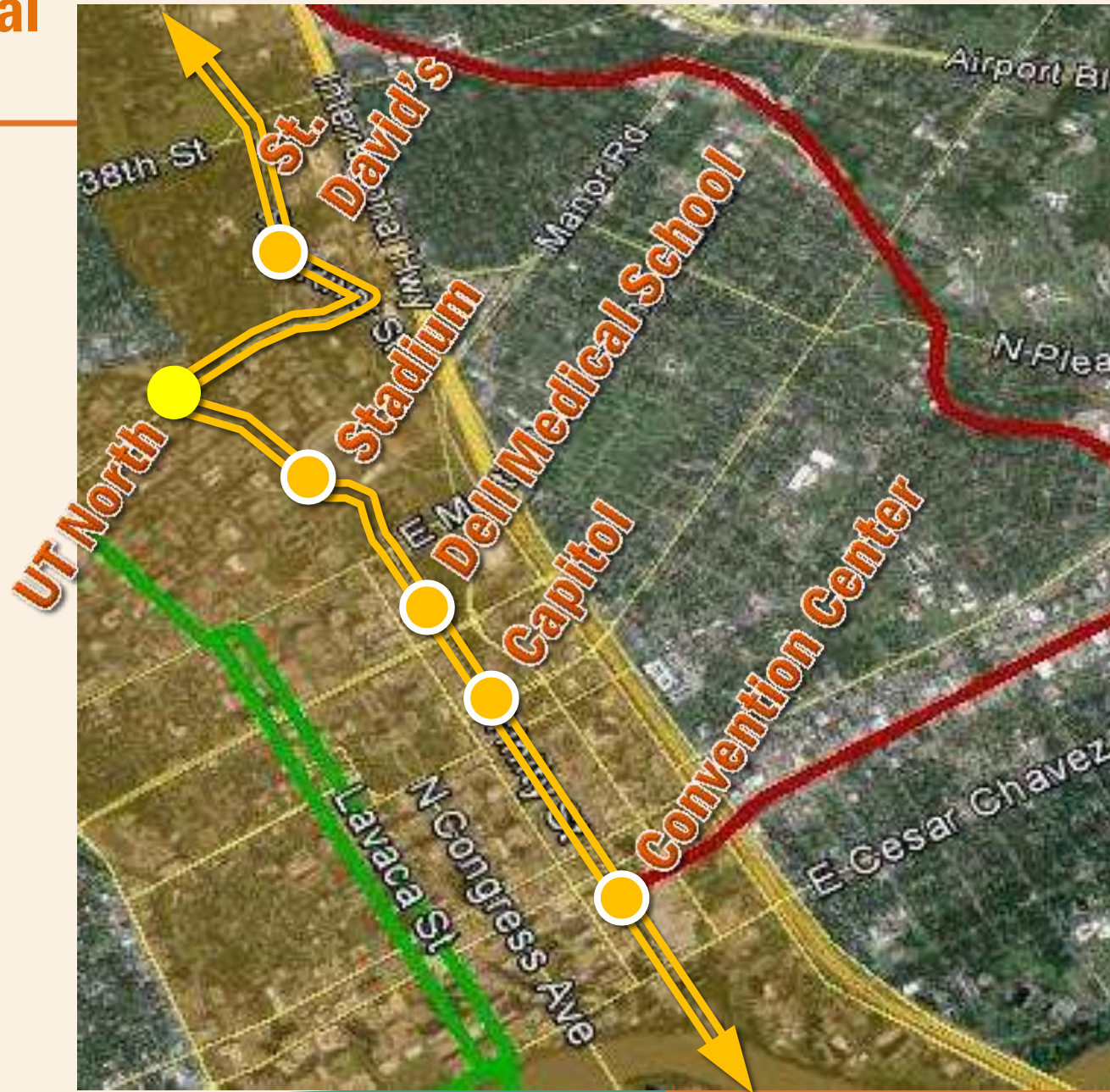
- East Riverside



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Conceptual Station Locations

- Downtown through UT



4

Conceptual Station Locations

- Hancock to Highland

Terminus
options





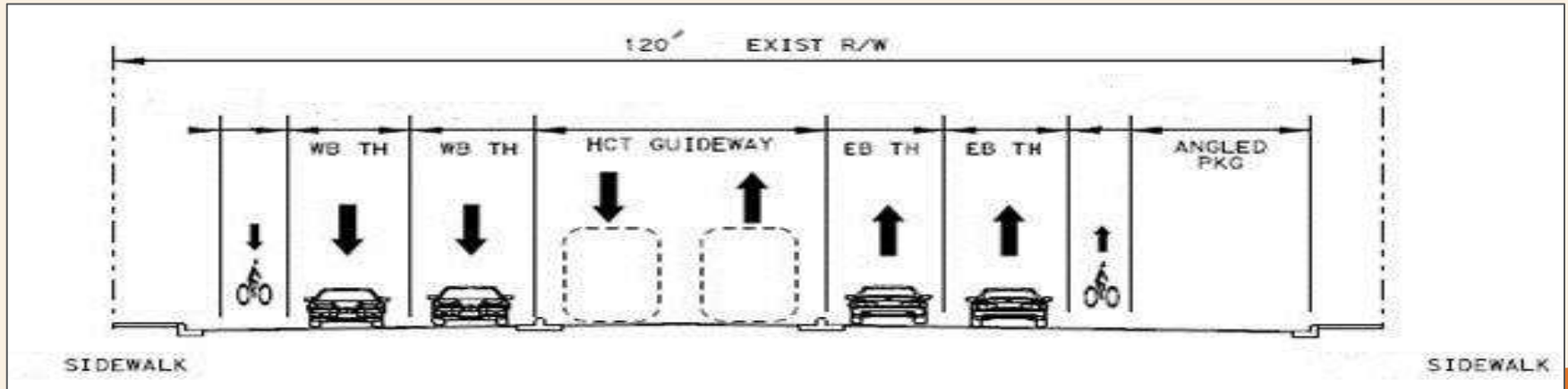
Alignment Alternatives Refinements

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Typical Section

- Considerations
 - ROW width
 - Guideway requirements
 - Operations
 - At grade, elevated, tunnel
 - Other modes
 - Parking
 - Driveways
 - Etc.

*Guideway considerations and station platforms are virtually the same for both modes

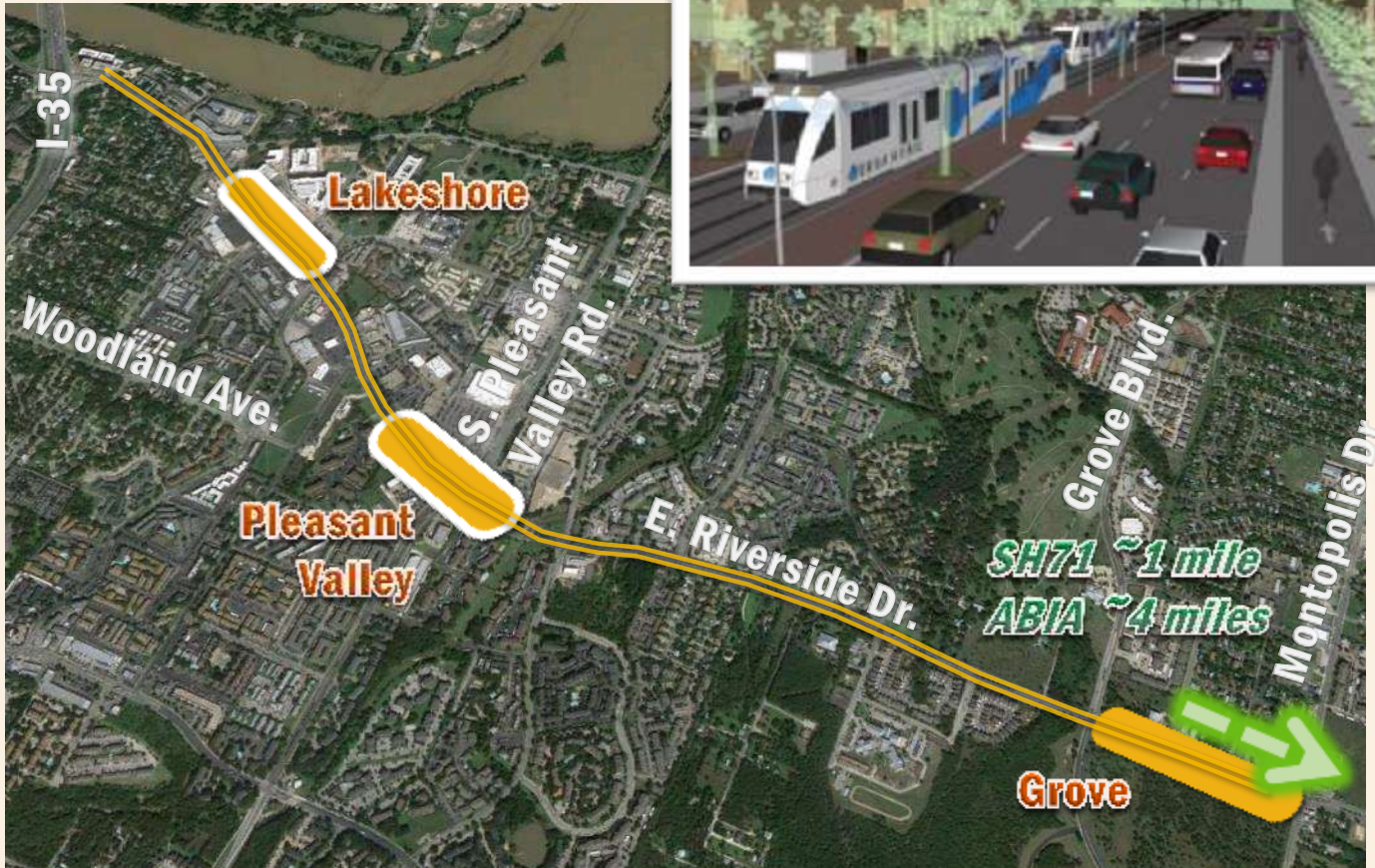


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E. Riverside Dr. (East of I-35)



- Center running, at-grade
- Adequate ROW
- Stations at Grove, Pleasant Valley and Lakeshore
- Potential park & ride at Pleasant Valley and/or Grove

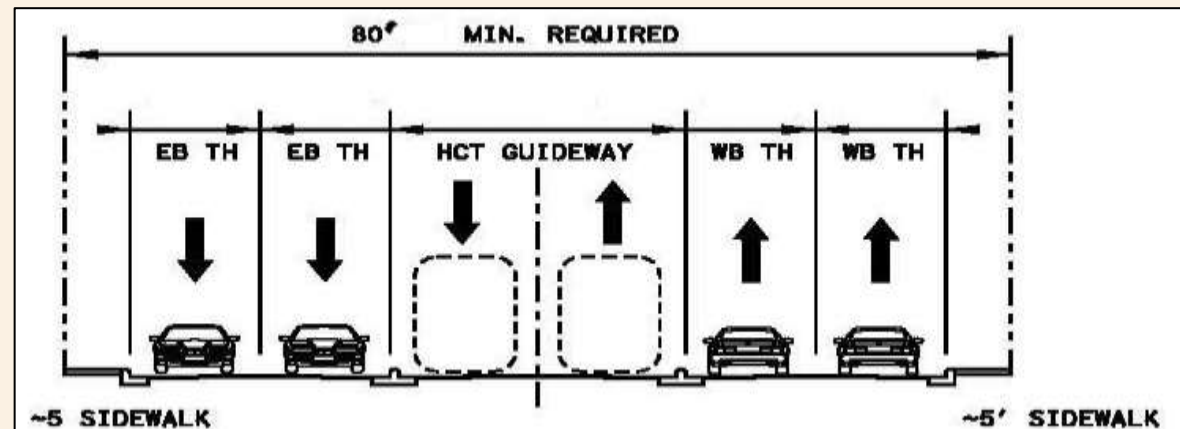


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E. Riverside Dr. (West of I-35)



- Center running, at-grade
- Variable ROW
- South Central Waterfront station
- Optional Travis Heights station
- Requires roadway widening and bridge reconstruction at creek crossings



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Lady Bird Lake Crossing: Preliminary Alternatives



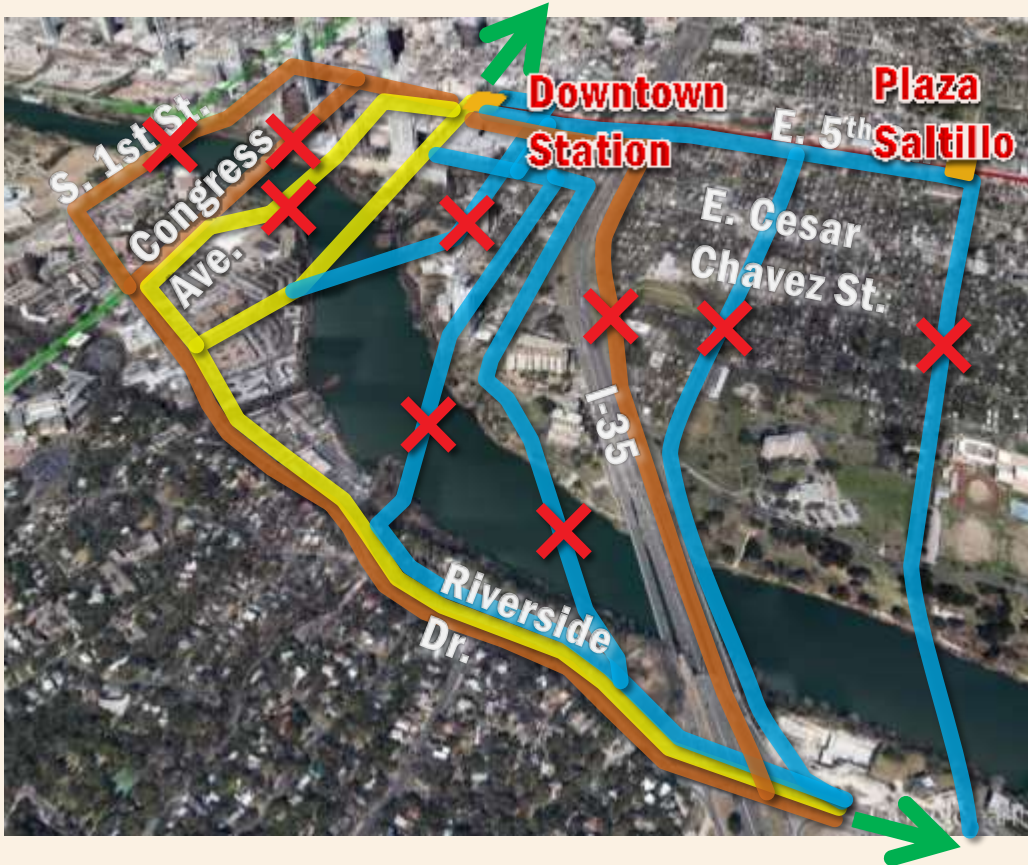
Existing
Bridges

New Crossing
(west)

New Crossing
(east)

4

Lady Bird Lake Crossing: Preliminary Alternatives



- **Existing Bridges** —
 - Reduced auto capacity; traffic and construction impacts
 - Poor reliability and speed; constrained intersections
 - Mexican free-tailed bat population
- **New Crossing (west)** —
 - Circuitous alignment
 - Impacts to Statesman and constrained intersections
- **New Crossing (east)** —
 - Narrow ROW/street width
 - Inability to do dedicated
 - Circuitous alignment; traffic impacts to 4th St, Cesar Chavez
 - Red Line impacts
 - Lack of system connectivity
 - Access to East Riverside

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Lady Bird Lake Crossing Alternatives

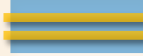
- 3 Alternatives: Bridge, Short Tunnel, Long Tunnel
- Common limits compared
 - East Riverside to 15th St
- Rough order-of-magnitude costs range from approx:
 - Urban Rail: \$175M – \$475M
 - BRT: \$150M – \$430M



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Lady Bird Lake Crossing #1

Bridge Alternative



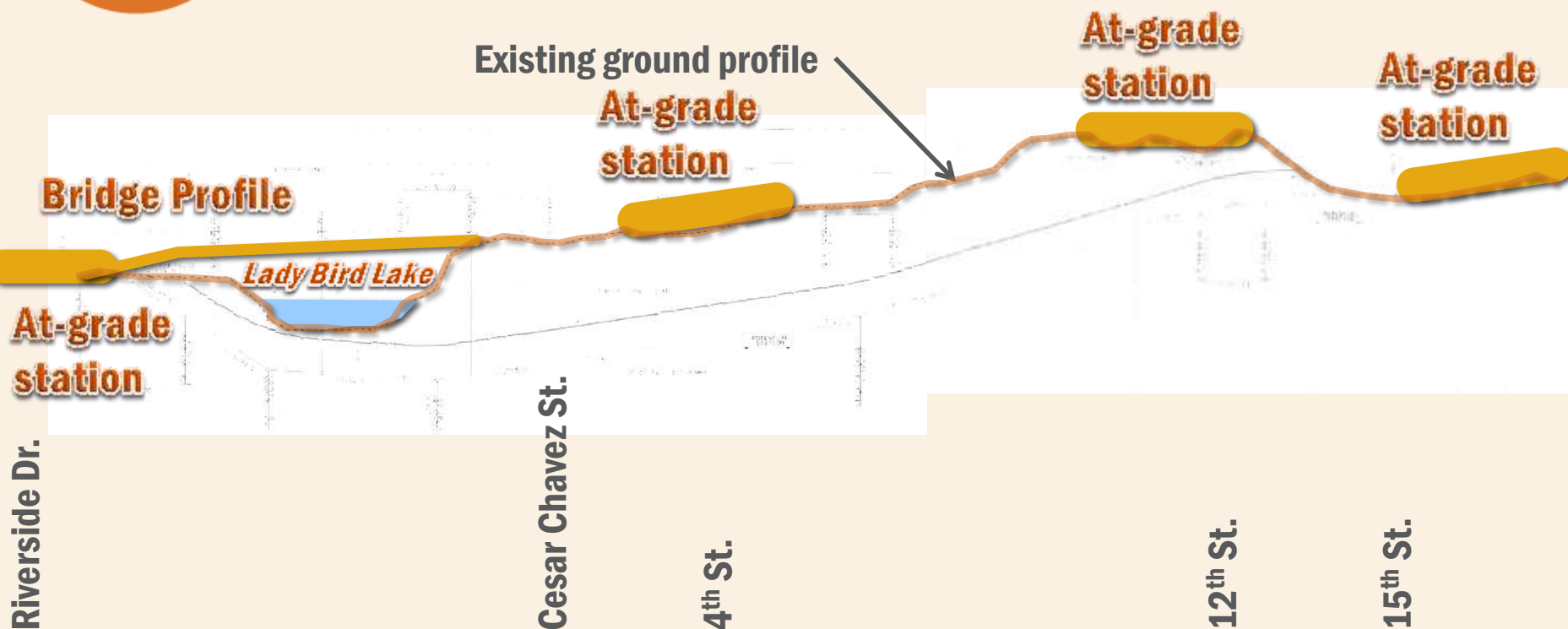
- Lower cost than tunnel
- Interface with Waller Creek Lattice, Waller Creek Boathouse, Four Seasons, TxDOT, Statesman, Housing Authority
- Opportunity for signature structure



Portland-Milwaukie Light Rail Bridge across Willamette River

4

Lady Bird Lake Crossing #1 *Bridge Alternative*




- Rough order-of-magnitude cost for Urban Rail \$175M (East Riverside to 15th St.)
 - \$75M for signature bridge
 - \$100M for at-grade section (Cesar Chavez to 15th St.)
- BRT ~25% - 30% less

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Lady Bird Lake Crossing #2

Short Tunnel Alternative



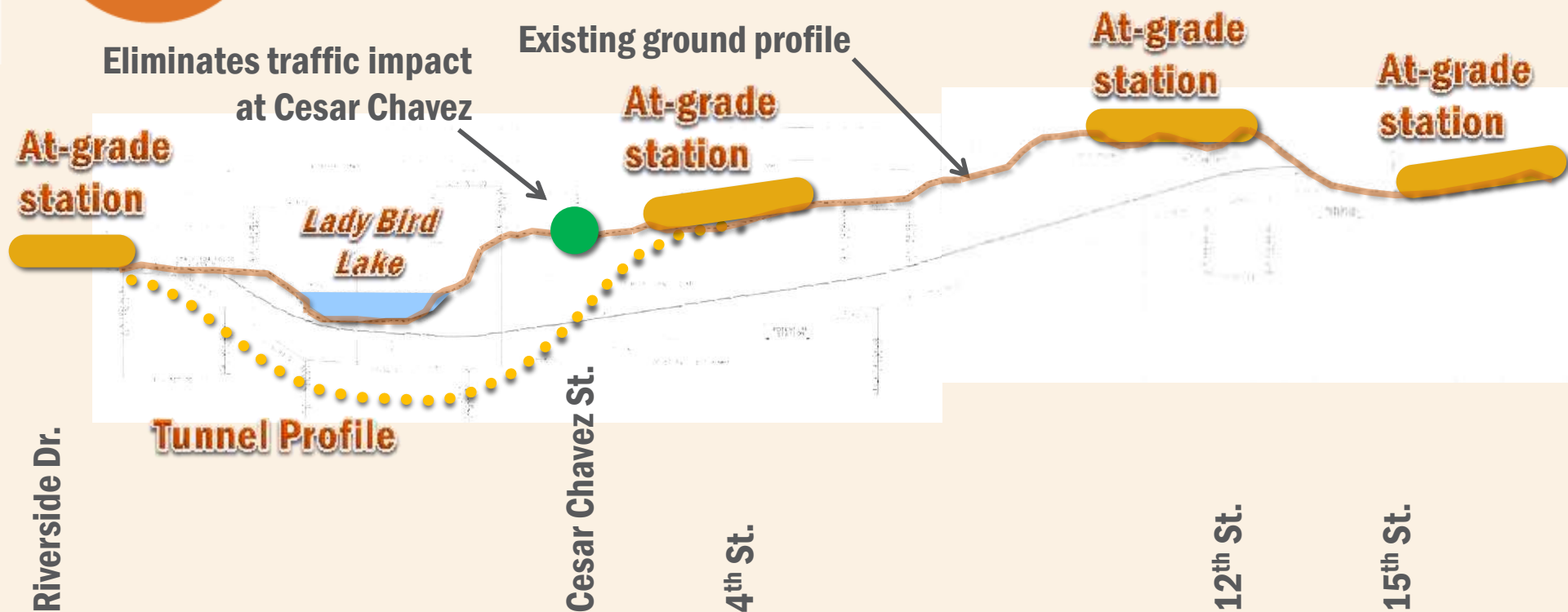
- Costs more than bridge
- Avoids Waller Creek Boathouse
- Construction methods:
 - Cast-in-place box
 - Bored/mined tunnel
- Portals on South Shore and Trinity 
- Tunnel can be stubbed for future extension



Portal example from LA Metro Gold Line

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Lady Bird Lake Crossing #2 *Short Tunnel Alternative*

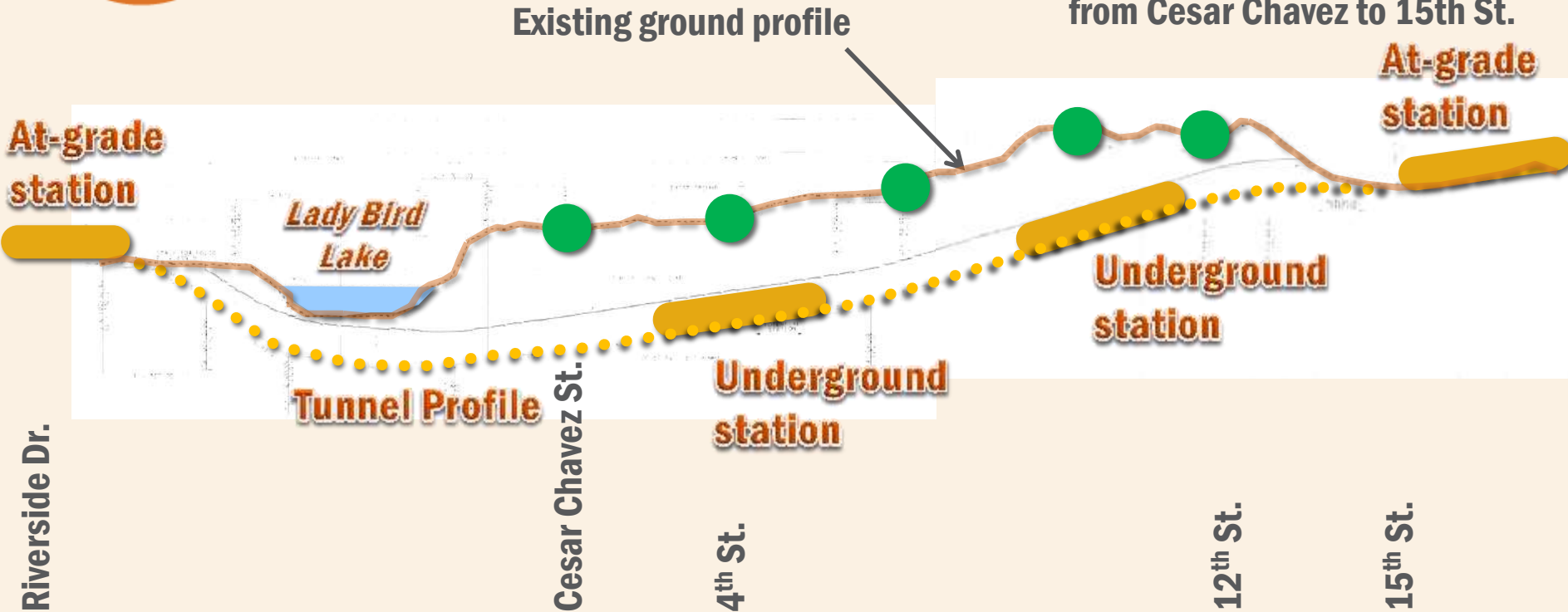


- Rough order-of-magnitude cost for Urban Rail \$240M (East Riverside to 15th St.)
 - \$175M for tunnel
 - \$65M for at-grade section (4th St. to 15th St.)
- BRT ~15% - 25% less

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Lady Bird Lake Crossing #3 Long Tunnel Alternative

Eliminates at-grade impacts to traffic, pedestrians, utilities, etc., from Cesar Chavez to 15th St.



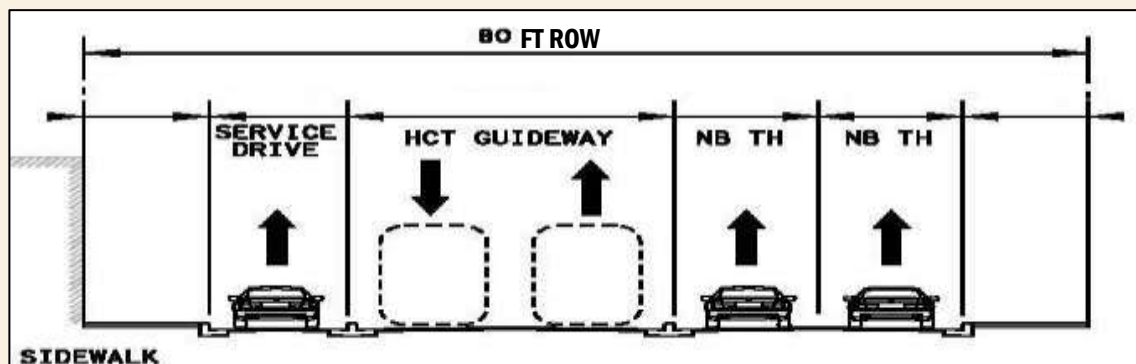
- Rough order-of-magnitude cost for Urban Rail \$475M (East Riverside to 15th St.) – tunnel and stations
- BRT ~5% - 15% less

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Trinity Street (At-Grade Alternative)



- Eliminated San Jacinto couplet preliminary alternative
- Numerous driveways and alleys
- Grades near recommended maximum for high-capacity transit vehicles
- Center-running on west side of street with two northbound through lanes and service lane



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San Jacinto Boulevard



- Consistent with UT master plan (below)
- San Jacinto will become transit mall
- Crowd control and pedestrian activity
- Floodplain mitigation

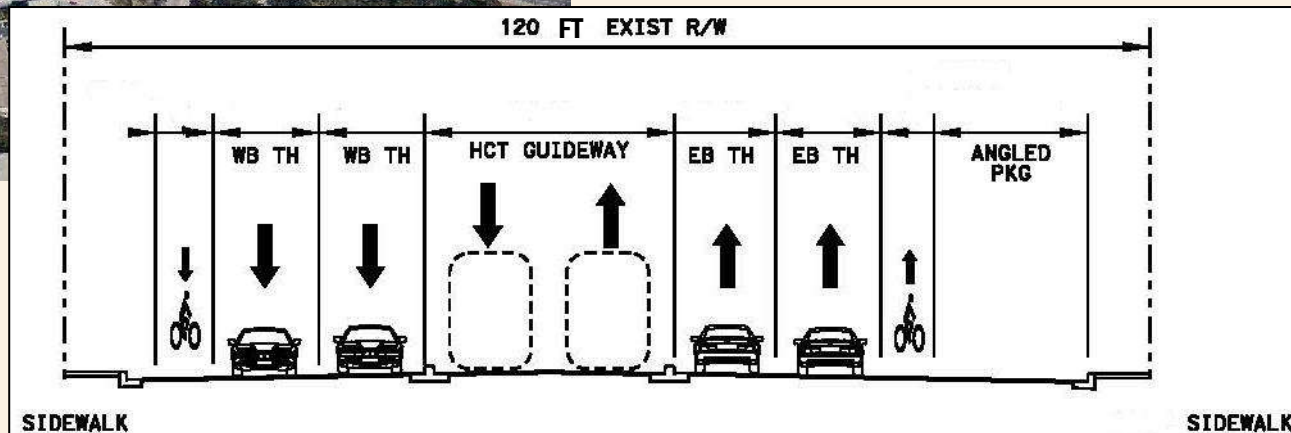


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Dean Keeton Street – Medical Arts

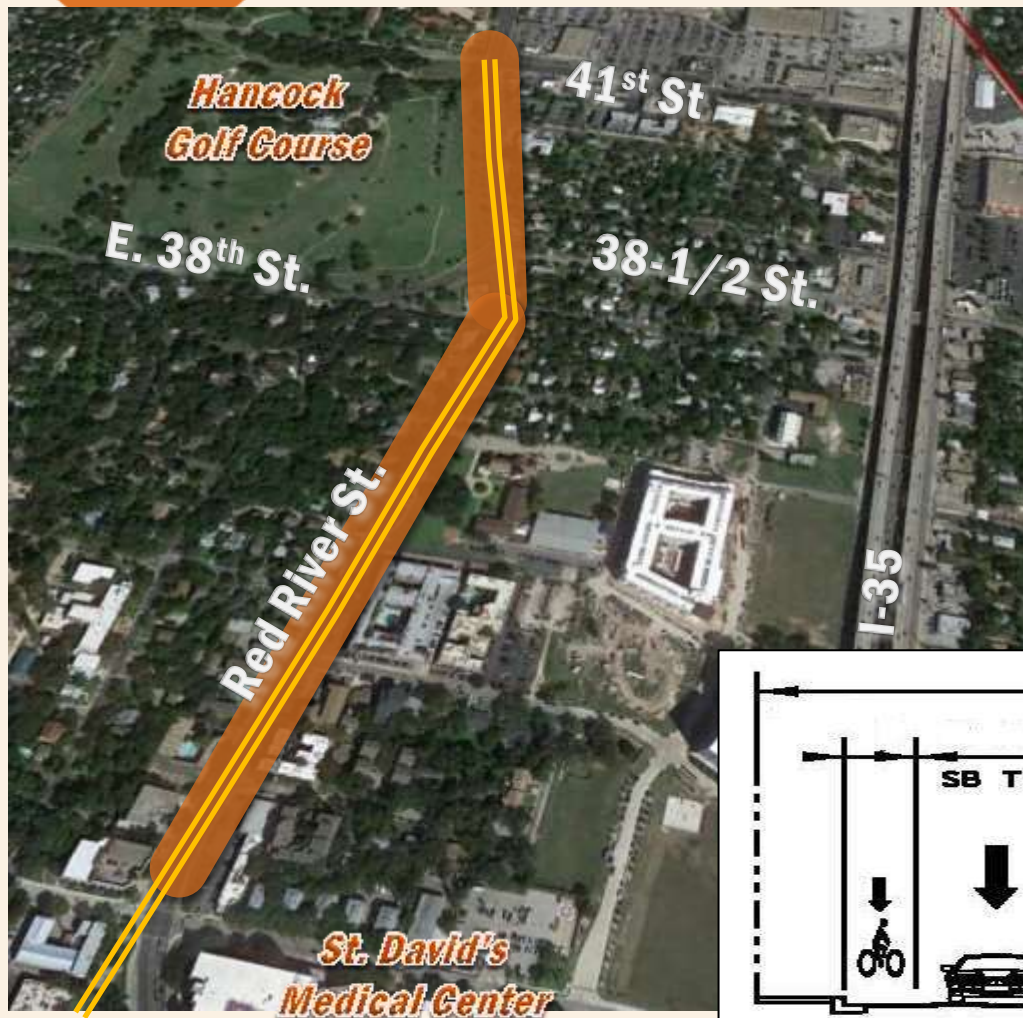


- Center-running in Dean Keeton and Medical Arts
- Opportunity for stop location next to St. David's Medical Center
- Opportunity to increase speed with wider curve at Dean Keeton/San Jacinto

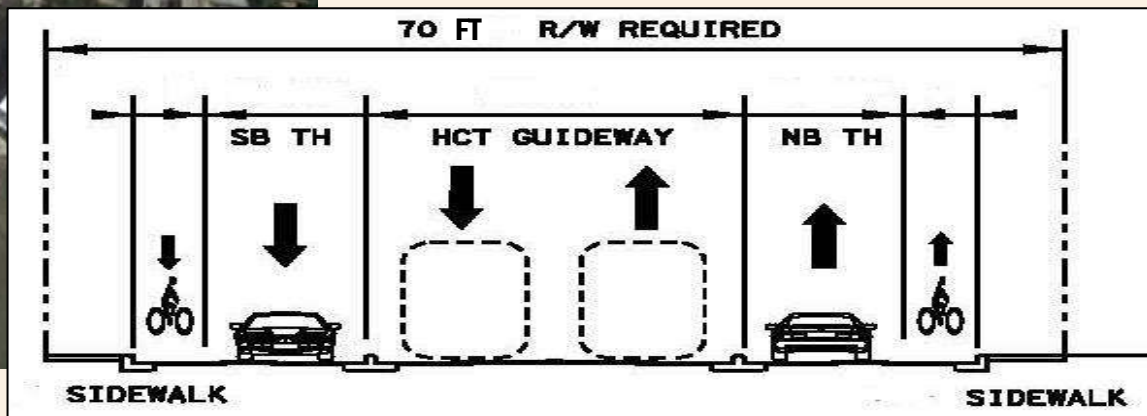


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Red River Street



- Center-running
- Frequent residential driveways
- Narrow ROW would require removal of one lane of traffic in each direction
- Additional design considerations required




4

Hancock Alternatives



- Grade separation with Red Line
- Property and neighborhood impacts
- I-35 improvements

East Tunnel Option =====

- Portal on 41st 
- Below-grade station at Red Line
- Potential tunnel extension under I-35 towards Mueller

West Tunnel Option =====

- At-grade station and portal on Red River
- Red Line transfer at Highland or new station on Airport

4

Airport Boulevard



- Center-running
- Tunnel portal from Hancock in median
- Widen roadway to west
- Parallel drainage improvements



I-35 – Elevated over SB Frontage

- Eliminated due to significant ROW limitations and community opposition to additional elevated structures

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ACC Highland Terminus Options

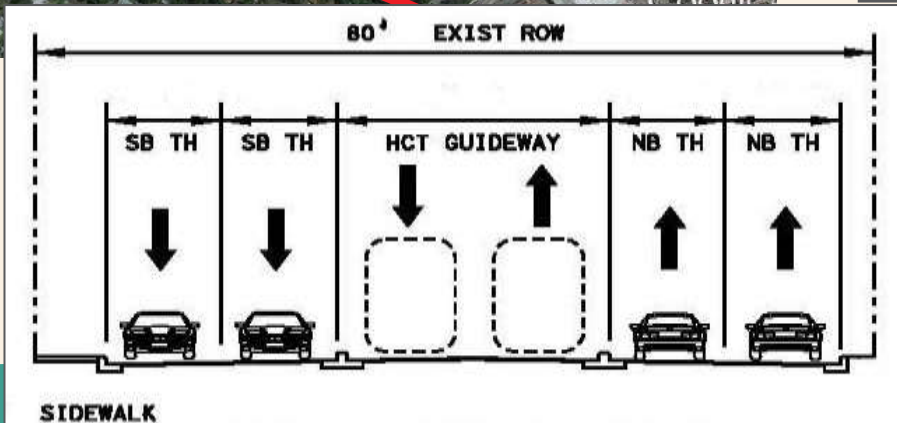


Middle Fiskville Terminus

- Opportunity for park & ride
- Opportunity to extend to north or northeast
- Red Line transfer at Hancock or Airport Blvd. (new station)
- Potential tunnel from Airport Blvd to Middle Fiskville to increase service speed and reliability

Airport Blvd Terminus

Transfer at existing Highland Station



4

Ongoing Considerations: System Connectivity

- MetroRail Red Line
 - Downtown Station improvements
 - Impacts of additional station at Hancock or Airport Blvd.
- E-W through downtown
 - 4th St. transit mall
 - Seaholm/LSTAR/Amtrak
- Future connections
 - Next tier sub-corridors (Lamar, Mueller, East Austin)
 - Other sub-corridors and Project Connect corridors

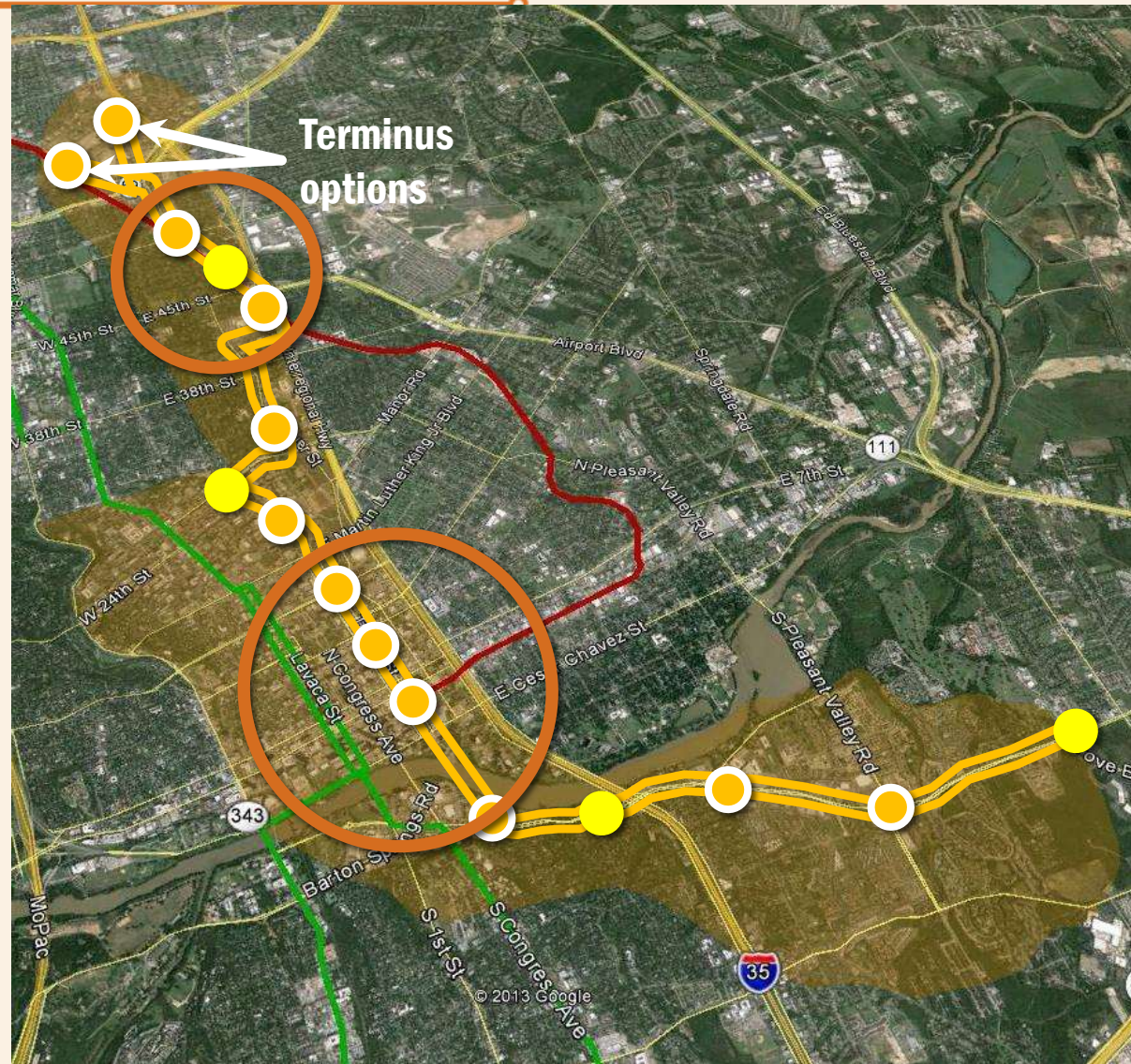
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Evaluation of Final Alternatives

5

Evaluation Focus

- Hancock to Highland
- Lady Bird Lake to 15th



5

Evaluation Factors

- Basic characteristics
 - Alternative length
 - Number of stations
- Socioeconomic characteristics
 - Population within ½ mile of stations*
 - Transit-dependent populations within ½ mile of stations*
 - Affordable housing within ½ mile of stations*
 - Employment within ½ mile of stations*

***FTA criteria**

5

Evaluation Factors

- Ridership
 - Projected average weekday ridership
 - Projected annual ridership*
 - Projected annual transit-dependent ridership*
 - Effect on system ridership
- Travel time
 - ACC Highland to 4th Street
 - Grove to 4th Street
 - Total transit travel time (end to end)
 - Potential travel time savings

***FTA criteria**

5

Evaluation Factors

- Cost effectiveness
 - Rough order-of-magnitude total capital cost*
 - Rough order-of-magnitude annual O&M cost*
 - Estimated O&M cost per rider
 - FTA cost effectiveness calculation*
- Economic development potential
- System connectivity

***FTA criteria**

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Evaluation Factors

- Potential environmental effects
 - Lady Bird Lake
 - Visual
 - Known cultural resources
 - Traffic
 - Emissions*
 - ROW
 - Utilities
- FTA competitiveness (FTA criteria index)

*FTA criteria

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Next Steps

6

Road to the LPA

Central Corridor Study Topics

- April
 - Operations plan
 - Evaluation approach
 - FTA process
 - Project development timeline
- Early May
 - Project team recommendation for LPA (*end-to-end*)
 - System connectivity
 - Rough order-of-magnitude (ROM) cost estimates
 - Ridership estimates
 - Funding and governance
- Mid May
 - Phasing options (*the project*)
 - System connectivity
 - Scope and fee for additional system planning and project definition
- June
 - Action on recommended LPA and 1st Phase (*the project*)

Council Schedule

- March 27th
 - Briefing
- May 22nd
 - Briefing
- June (tbd)
 - Special Session
- June 26th
 - Action

THANK YOU

More Information:

Project Connect &
Central Corridor HCT Study

projectconnect.com

