Community Task Force
October 5, 2017
Welcome and Introductions
Project Partners

- Regional Transportation District (RTD)
- Colorado Department of Transportation (CDOT)
- Denver Regional Council of Governments (DRCOG)
- City of Aurora
Meeting Purpose and Agenda
Meeting Purpose

- Review findings of initial center-running BRT evaluation
- Review key differentiators/opportunities/challenges of center-running concept
- Identify common themes and outstanding questions on center-running BRT evaluation
Agenda

- Peer City Review
- Review findings of center-running BRT evaluation
- Evaluation criteria: key differentiators/benefits/challenges
- Key themes and group discussion
- Next steps and path forward
Center-Running BRT on Colfax
Study Area
Corridor Development Timeline

Opportunity for Stakeholders and Public To Influence Project Design

Alternatives Analysis
- Locally Preferred Alternative
  - Definition of mode & alignment
  - Conceptual station locations
  - Operating plan
  - Local decision

12-18 months
- Federal Transit Administration Project Development

Conceptual Design & Environmental Analysis
- Concept Design & Environmental Clearances
  - Design detail determined
  - Environmental impacts identified

18 months
- Engineering & Design

18-24 months
- Construction

Ongoing
- Revenue Service

We Are Here

Fully Designed and Funded Project
- Design complete
- Finance package
Center-Running BRT in Sister Cities
Denver’s Peers are Building Quality BRT

- Cleveland: HealthLine BRT
- Chicago: Ashland BRT
- Seattle: Madison RapidRide BRT
- NYC: Fordham Road Select Bus Service
- Eugene: EmX BRT
- Boston: Silver Line BRT
Healthline BRT, Cleveland

https://youtu.be/kF6EF3kOGQE
Ashland BRT, Chicago

- Similar corridor and ridership to Colfax
- Population living within 0.5 miles of Ashland corridor expected to grow by 55,000 (about 24%) by 2040.
Ashland BRT, Chicago

https://youtu.be/csc2ZDuQLo
Seattle Madison BRT

- Serves several neighborhood retail districts
- Purpose is to deliver high-quality mobility to accommodate current and expected growth
Madison BRT, Seattle

https://youtu.be/nmpCkw9dPkw
Center-Running BRT Evaluation and New Criteria
Where We’ve Been: Screen 3 Plus Results Summary

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Enriched Bus in Shared Lanes All Day</th>
<th>Bus Rapid Transit in Exclusive Lanes in Peak Period</th>
<th>Bus Rapid Transit Side-Running in Exclusive Lanes - All Day</th>
<th>Bus Rapid Transit Center-Running in Exclusive Lanes - All Day</th>
<th>Modern Streetcar in Exclusive Lanes in Peak Period</th>
<th>Modern Streetcar in Shared Lanes All Day</th>
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Environmental Measures

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Urban Character Measures

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Overall Results

- Low capital and operating costs
- Moderate ridership
- Excellent cost effectiveness
- Limited economic benefit and return on civic investment
- Low capital and operating costs
- High ridership
- Excellent cost effectiveness
- Good economic benefit and high return on civic investment
- Low capital and operating costs
- High ridership
- Excellent cost effectiveness
- High economic benefit and high return on civic investment
- Low capital and operating costs
- High ridership
- Moderate cost effectiveness
- High economic benefit but low return on civic investment
- High capital and operating costs
- High ridership
- Moderate cost effectiveness
- High economic benefit but low return on civic investment
- High capital and operating costs
- High ridership
- Moderate cost effectiveness
- High economic benefit but low return on civic investment
# SCREEN 4

## RESULTS SUMMARY

<table>
<thead>
<tr>
<th>Category</th>
<th>Side-Running in Exclusive Lanes - All Day</th>
<th>Center-Running in Exclusive Lanes - All Day</th>
<th>Key</th>
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<tbody>
<tr>
<td>Ridership</td>
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<td>Transit Travel Time</td>
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<td>GOOD/FAIR</td>
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<td>Auto Travel Time</td>
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<td>Transit Reliability</td>
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<td>Cost-Effectiveness</td>
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<td>Vehicle Miles Traveled</td>
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<td>Multimodal Access</td>
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<td>Pedestrian Safety + Experience</td>
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<td>Vehicle Access</td>
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<td>Economic Development</td>
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<td>Urban Design/Placemaking</td>
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<td>Construction Impact</td>
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<td>Agency + Community Support</td>
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<tr>
<td>Overall Results</td>
<td>▪ TBD</td>
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</table>

*Note: TBD indicates the results are to be determined.*
Potential Evaluation Criteria for Additional Screening

**OPERATIONS**
- Transit Operating Cost
- Expansion Capacity
- Traffic Operations
- Cost-Effectiveness
- Ridership
- Person Capacity

**EXPERIENCE**
- Travel Time Reliability
- Placemaking
- Passenger Experience
- Multimodal Access (Station Spacing)

**COMMUNITY**
- Multimodal Safety – Vision Zero
- Vehicle Miles Traveled
- Economic Development
- Construction Impacts
- Business Access
- Community & Agency Support
- Construction Impacts
Screen 4 Criteria:  
Key Differentiators, Benefits and Tradeoffs
Criteria Topics for Today’s Discussion

Transit Travel
  Time
  Reliability

Operating Cost
Future Proofing

Placemaking
  Passenger Experience

Multimodal Safety
  Pedestrian Comfort & Experience

Business Access
  Parking & Loading

Traffic Operations

Pedestrian, Bicycle, ADA Access
Station Spacing

Comfort & Experience
Transit Reliability

The Bottom Line:

- Center Running BRT (CRBRT) has less friction with other road users including curbside conflicts, providing more reliable travel.
- Changes to traffic and corridor development don’t affect future transit operations.
- CRBRT operators can accurately predict future operating costs/avoid year-over-year increases.

Tradeoffs/Other Considerations:

- More left turn restrictions.
- Less auto travel lanes.

Future proofing from delay as land-use, traffic, and curb uses change.
Reduced Conflicts

No conflicts with turning vehicles, parallel parking, or truck loading.
100% Near-Level Boarding

Off Board Fare Payment & Level Boarding are major contributors to improved travel speed and reliability.
Transit Reliability

The Bottom Line:

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Tradeoffs/Other Considerations:

- More left turn restrictions
- Less auto travel lanes

Future proofing from delay as land-use, traffic, and curb uses change
Local Business Access

The Bottom Line:

- CRBRT will restrict auto left turns at most non-signalized left turns
- CRBRT has similar curb use (parking and loading) impacts to SRBRT (no conflicts with buses)
- CRBRT will improve pedestrian safety and crossing opportunities, making it more attractive to park and cross the street to access businesses
- CRBRT will also improve bicycle and motor vehicle safety

Tradeoffs/Other Considerations:

- On-street parking movements don’t negatively impact transit operations

Given current vehicle oriented uses on corridor, side running has lesser impacts. This may change over time.
Vehicle Access

Before Center-Running

After Center-Running

Street A  Street B  Street C

Colfax

colfax corridor connections
Local Business Access

The Bottom Line:

- CRBRT will restrict auto left turns at most non-signalized left turns
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Tradeoffs/Other Considerations:

- On-street parking movements don’t negatively impact transit operations

Given current vehicle oriented uses on corridor, side running has lesser impacts. This may change over time.
Stop Consolidation/Local Service

The Bottom Line:

- CRBRT will maintain or improve overall transit travel times when considering walk, wait, and ride.
- All CRBRT stations will offer more rail-like boarding experience, making it easier for seniors and people with disabilities to ride.
- CRBRT and SRBRT provide opportunities for improved sidewalks and bike and pedestrian access to corridor.

Tradeoffs/Other Considerations:

- Some passengers will need to walk further to access service.
- Some local stops are consolidated.
Conceptual Stops

Project Map

Conceptual BRT Stations

Conceptual Standard Bus Stop
Stop Spacing In Denver

- Local and Limited use one set of high-quality stations in Denver
- 3-5-minute headways

Colfax has a well connected urban sidewalk network providing good access to the corridor.
How stop spacing affects walking distances

<table>
<thead>
<tr>
<th>Blocks Traveled by Service Provided</th>
<th>BRT 1/4 mi.</th>
<th>BRT 1/2 mi.</th>
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<tbody>
<tr>
<td>Household A</td>
<td>3 blocks</td>
<td>3 blocks</td>
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<tr>
<td>Household B</td>
<td>3 blocks</td>
<td>5 blocks</td>
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<tr>
<td>Household C</td>
<td>3 blocks</td>
<td>4 blocks</td>
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</tbody>
</table>

Walking Travel Path to Transit Stop:
- • • • • BRT Stop (1/2 mile stop spacing) and Path
- • • BRT Stop (1/4 mile stop spacing) and Path
- ▼ ▼ ▼ 1/8 mi. Service Stop and Path

Colfax Corridor Connections
Anatomy of a Trip

**Side Running BRT**
- Walk to Transit
- Wait @ Station
- Ride
- Walk to End

**Center Running BRT**
- Walk to Transit
- Wait @ Station
- Ride
- Walk to End

Wait time perceived as most punitive
Traffic Operations

The Bottom Line:

- CRBRT will shift some vehicle trips to parallel corridors, but impacts are limited to a few intersections (will be focus for mitigations)
- CRBRT will reduce total vehicle volume on corridor but increase person throughput and access
- CRBRT or SRBRT will provide opportunity for operational improvements (signal optimization, extended/new turn lanes, re-striping, minor curb/gutter relocation) that will aid vehicle and transit operations

Tradeoffs/Other Considerations:

- Some vehicles will shift to parallel corridors
- Auto trips are more susceptible to minor delays due to parallel parking and truck loading
- Auto trips will experience a few additional minutes of travel time from end-to-end

Grid street network can absorb diversion with minimal vehicle travel time increases
Safety

Multimodal Safety
Pedestrian Comfort & Experience

The Bottom Line:

- CRBRT will eliminate many of the most significant conflict points that lead to serious injury and fatal collisions
- CRBRT will reduce crossing exposure
- CRBRT design could provide center pedestrian refuges at non-signalized crossings (under discussion)
- CRBRT provides vertical features in the roadway that serve as traffic calming

Tradeoffs/Other Considerations:

- Left turns only allowed at signalized intersections. May require U-turns or multiple lefts to get to destinations.
- Will require careful design decisions about pedestrian crossings at non-signalized intersections
Improves Crossing Safety and Comfort

- Island stations calm traffic
- Pedestrian refuges reduce crossing distance
- Shorter crossing distances = less exposure to vehicle traffic
- Eliminating unprotected lefts improves pedestrian safety
- Station lighting enhances security
Safety

Multimodal Safety
Pedestrian Comfort & Experience

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Placemaking/Streetscaping

The Bottom Line:

- CRBRT will open sidewalk space for pedestrian, retail activation by removing bulky shelters and waiting passengers
- CRBRT alternative eliminates all curbside transit stops and boarding
- CRBRT improves transit customer security by separating transit customers from other sidewalk users (and providing transparent design and lighting)
- CRBRT can increase space for landscaping and public art
- CRBRT station design is less constrained, allowing for signature design

Tradeoffs/Other Considerations:

- Passenger may feel more isolated in the center of the street during off-peak times (lighting and station design can mitigate)
Placemaking/Streetscaping

- Frees sidewalk space for retail and community activation
- Increases opportunity for public art and streetscape improvements
- Landscaping increases property values
Street Design

HealthLine BRT, Cleveland
Landscaping

HealthLine BRT, Cleveland
Public Art

Steve Manka, “Chorus Line”

HealthLine BRT, Cleveland
Placemaking/Streetscaping

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Tradeoffs/Other Considerations:

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Key Themes and Group Discussion
Next Steps and Path Forward
Where Do We Go From Here?

- Identify Local/Regional Funding Sources
- Compete for Federal Funding*
- BID/RNO presentations and updates
- Gather community feedback and complete more detailed design and implementation schedule

*Next Task Force Meeting: Wednesday, November 15

*requires environmental clearance by Federal Transit Administration and funding availability
www.ColfaxCorridorConnections.com

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