Regional BRT Feasibility Study

DRCOG Board Meeting

July 18, 2018
Project Vision

A Bus Rapid Transit network that enhances regional connectivity, supports future travel demand, and improves attractiveness of transit
Goal & Desired Outcomes

Study Goal

- Identify and prioritize corridor-based and/or fixed-guideway BRT projects in RTD’s service area

Desired Outcomes

- A planned BRT network
- A prioritized list of short-term BRT investments
- Identification of one or more projects ready for project development
Project Team

Felsburg Holt & Ullevig (FHU)
  o Apex Design (Apex)
  o Connetics Transportation Group (CTG)
  o Economic and Planning Systems (EPS)
  o Headwaters Economics (HE)
  o Peter Koonce (PK)
  o Parsons Transportation Group (PTG)
Project Team Task Leads

RTD Project Manager
Brian Welch, AICP

Project Manager
Holly Buck, PE, PTP | FHU

Principal-in-Charge
Elliot Sulsky, PE, AICP | FHU

Identification of Potential Physical/Operation Enhancements
Jim Baker | CTG
Molly Veldkamp, AICP | Apex

Evaluation & Prioritization
Holly Buck, PE, PTP | FHU
Phil Hoffmann | PTG
Patty Gude | HE
Brian Duffany | EPS

Data Collection & Analysis
Emma Belmont, AICP | FHU

Public Information/Engagement
Cady Dawson | FHU

Agency Coordination
Holly Buck, PE, PTP | FHU

Final Deliverables
Documentation Oversight
Cady Dawson | FHU
# Project Schedule

## Data Collection, Existing Conditions, & Summary of Prior Studies
- Review & summarize prior studies
- Data collection
- Develop vision/goals

## Horizon Year Travel Demand Modeling
- Travel demand modeling

## Select Tiered Evaluation Methodology
- Review & evaluate potential metrics

## Application of Evaluation Methodology
- Candidate corridor identification
- Tier 1 Evaluation
- Tier 2 Evaluation
- Tier 3 Evaluation
- Tier 4 Evaluation

## Public Information/Public Involvement
- Public involvement plan
- Ongoing public information
- Public outreach
- Agency coordination

## Deliverables
- GIS mapping
- Equity analysis mapping
- Draft plan
- Final plan

## Meetings
- Technical Advisory Committee
- RTD Board of Directors
- DRCOG Transportation Advisory Committee
- DRCOG Board of Directors

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**KEY:**
- Technical Memorandum
- Local Government Planning Meeting
- Web Update
Stakeholder Engagement

Project Technical Advisory Committee
- RTD, CDOT, DRCOG

Partner Coordination Meetings
- RTD Board of Directors
- DRCOG Board of Directors/TAC
- Local Government Planning Meetings

Engagement Tools
- Project website
- Online map-based evaluation review and commenting
- Project email updates
- Public meetings
- Pop-up events
Project Evaluation Principles

- Provides connectivity and access
- Increases ridership
- Enhances expandability, equity, and sustainability
- Ensures cost-effectiveness
- Aligns with state and local agency recommendations
- Considers technological innovation/Smart Cities
- Adheres to FAST Act BRT definition
- Integrates engineering/operation feasibility/safety
- Acknowledges potential environmental impacts
- Capitalizes on financial resources
Tiered Evaluation Methodology

**CANDIDATE CORRIDORS**
Identify all potential corridors

**TIER 1**
Identify High Demand Travel Corridors

**TIER 2**
Identify Congestion and/or Delay

**TIER 3**
Identify Viability of Capital Investment

**TIER 4**
Final Evaluation & Prioritization

**TASKS**
- Identify all corridors for evaluation of BRT feasibility
- Identify high demand travel corridors
- Evaluate top 10-20 corridors retained in TIER 1
- Evaluate top 5-10 corridors retained in TIER 3

**RESULTS**
- Identify potential corridors for evaluation
- Identify top 20-30 corridors for advancement to TIER 2 evaluation
- Identify top 10-20 corridors/corridor segments for advancement to TIER 3 evaluation
- Identify top 5-10 corridors/corridor segments for advancement to TIER 4 evaluation

**Dates**
- FEB-MAR 2018
- APR-JUN 2018
- JUL-SEP 2018
- OCT '18-JAN '19
- FEB-APR 2019
Candidate Corridors Evaluation

Metrics

- Community/TAC identified BRT corridors
- Existing RTD bus routes with >1 million annual boardings in 2016
- Roads with >40,000 vehicles/day in 2040

Results

- Identify corridors for advancement to Tier 1 evaluation
Candidate Corridors

Legend
- Candidate Corridors
- Rapid Transit Projects in Fiscally Constrained Plan
- Existing and Funded RTD Rapid Transit Line
- Future RTD Rapid Transit Line
- Rapid Transit Station

Candidate Corridors include the following:
- Community identified BRT corridors.
- Existing RTD bus routes with 1 million or greater annual boardings.
- Roads with 2000 daily vehicle volumes 40,000 or greater.
- Where service travels outside of RTD's service boundary, transit stops will not be provided.
Candidate Corridors

Web Map Review & Commenting Tool

https://rtd-denver.maps.arcgis.com/apps/webappviewer/index.html?id=d0b7e52e598240c68536bf9016280896
Tier 1 Evaluation

Goal
- Identify high demand travel corridors

Metrics
- Highest 25% population per corridor mile in 2040 (1/2 mile buffer)
- Highest 25% employment per corridor mile in 2040 (1/2 mile buffer)
- Population + job densities greater than 17 per acre in 2040 (1/2 mile buffer)
- Potential to serve key activity centers or transit connections
Tier 1
Preliminary Analysis

2040 Population
Tier 1
Preliminary Analysis

Population Growth
2020-2040
Tier 1
Preliminary Analysis

2040 Employment
Tier 1
Preliminary Analysis

Employment Growth
2020-2040
Tier 1
Preliminary Analysis

2040 Population + Employment Density
Tier 1 Initial Test

Segments in Top Tier 1 Categories
Tier 1 Initial Test

Number of Tier 1 Categories Met
Preliminary Tier 1 Analysis

Web Map Review & Commenting Tool

https://rtd-denver.maps.arcgis.com/apps/webappviewer/index.html?id=93813d60b5ff48d6b0a16410a32d408c
Tier 1 Analysis Next Steps

Analysis
- Assemble key activity center and transit connection data
- Aggregate data and develop routes for modeling

Result
- 20-30 corridors/routes for Tier 2 evaluation
Tier 2 Evaluation

Goal
- Identify congestion and/or delay

Evaluation Criteria
- 2040 peak travel time comparisons (auto to bus)
- Highest 25% of 2040 daily ridership projections
- 2040 volume to capacity ratios greater than 0.8
- 2040 lineloads on roads approaching or exceeding capacity
- Existing routes with highest delay

Result
- Identify top 10-20 corridors/corridor segments for Tier 3 evaluation
## Tier 3 Evaluation

### Goal
- Identify viability of capital investment

### Evaluation Criteria
- Right-of-way availability
- Viability of lane repurposing
- Viability of exclusive or semi exclusive lanes
- Meets FTA definition of BRT
- Potential to impact sensitive resources
- Alignment with agency plans/policies
- Capital cost

### Result
- Identify top **5-10** corridors/corridor segments for **Tier 4** evaluation
Tier 4 Evaluation

Goal
- Final evaluation and prioritization

Evaluation Criteria
- Travel time savings by route (no action vs. proposed)
- Operating cost
- Boardings
- Boardings per service hour and mile
- Annualized cost per rider (capital and operating)
- Transit dependent populations served
- Potential to address community-identified safety concerns

- Suitability for Small Starts funding
- Connectivity to other multimodal facilities
- Availability of local agency financial support
- Neighborhood buy-in
- Support for community economic development goals

Result
Identify top 3-5 corridors/corridor segments for BRT investment
Upcoming Activities

Stakeholder Meetings
- DRCOG Board of Directors – July 2018
- RTD Board of Directors – December 2018
- DRCOG TAC/Board of Directors – December 2018
- RTD Local Government Planning Group – January 2019

Public Outreach
- Coordinated public information campaign with local agencies
- Focused corridor and stakeholder outreach

Questions?

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