



Denver Moves Transit 2: From Bus Stops to BRT

April 13th, 2022

Agenda

- Introductions
- Denver Transit Program Overview – David
- Leading with Equity – My
- Translating the Vision to Action – Jonathan
- Implementing the Plan - Justin

Introductions



My La
City of Denver



Jonathan Mosteiro
Nelson\Nygaard

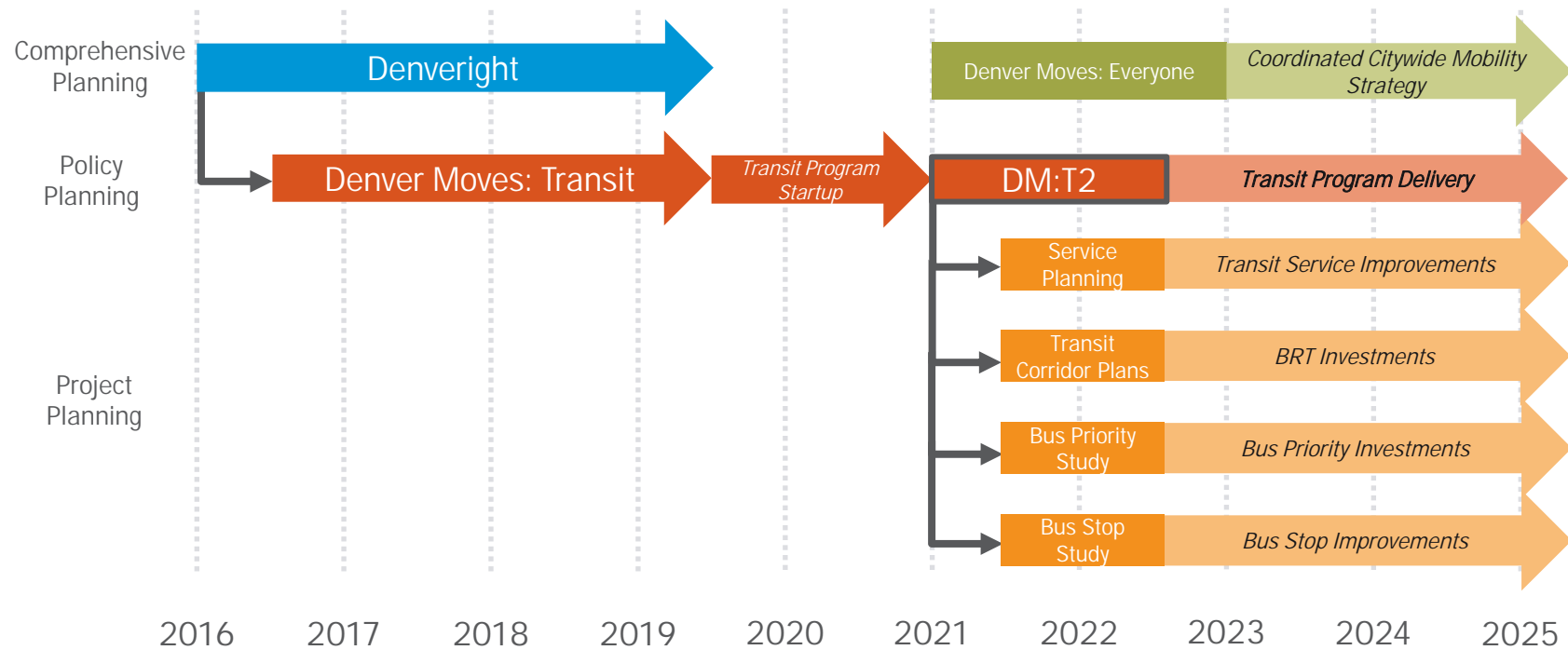


Justin Begley
City of Denver

Denver's Mobility Action Plan (2017)



Denver Transit Program



Leading with Equity



Leading with Equity

Infusing equity into every step of the process

- Equitable Investment Workshop
- Data Analysis
- Transit Prioritization Tool
- Scenario Development

DEFINITIONS

Equity

"Just and fair inclusion into a society in which all, focusing on those who have been harmed and are experiencing the greatest barriers, can participate, prosper, and reach their fullest potential." - [PolicyLink](#)



GARE'S RACIAL EQUITY FRAMEWORK & ANALYSIS

Racial Equity Framework +



Analysis Questions

1. Do the desired results include the **needs & goals** of BIPOC communities? Why or why not?
2. What does the **data** say or not say about needs? (Disaggregated by race, income, ability, etc.) **What information is missing?**
3. How will BIPOC communities be **engaged meaningfully**? What is the approach?
4. Who benefits / is burdened? What are the **strategies & alternatives** proposed by BIPOC?
5. How is the **implementation** plan informed by BIPOC and are they aware of critical milestones and timelines?
6. What is the feedback loop for **transparency and accountability**?

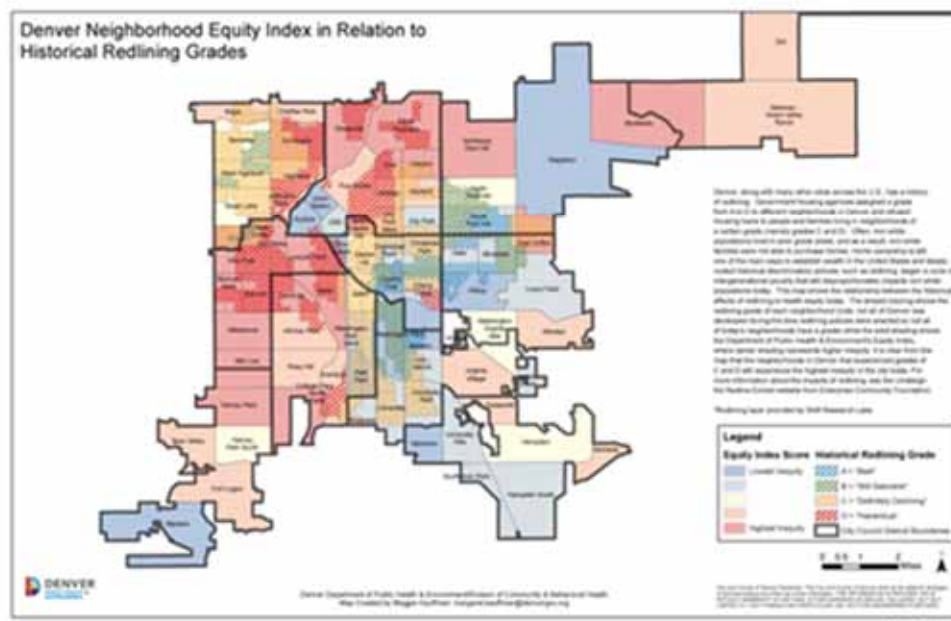
HISTORICAL CONTEXT

National

- › Jim Crow, Federal Highway Act, Urban Renewal, Slum Clearance, Eminent Domain, GI Bill

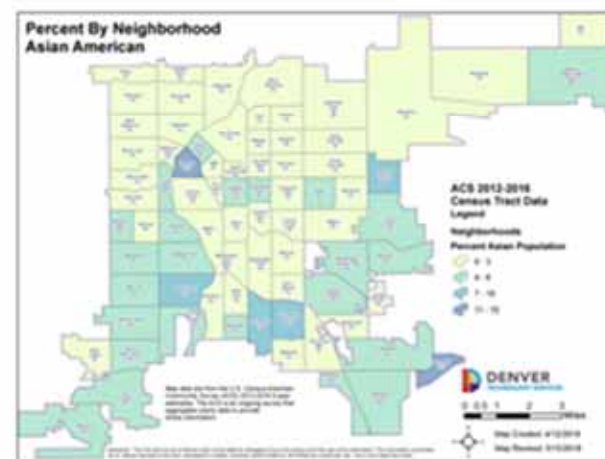
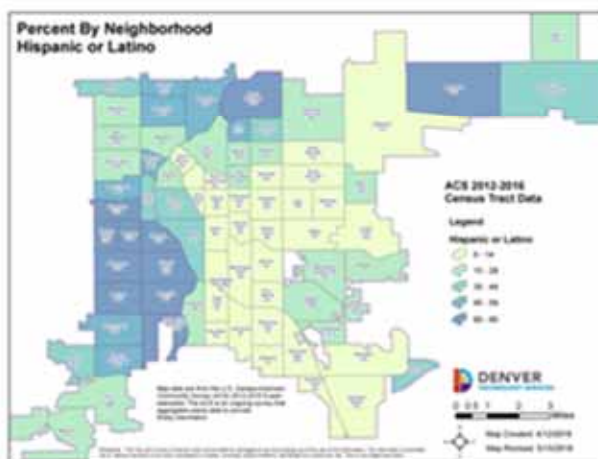
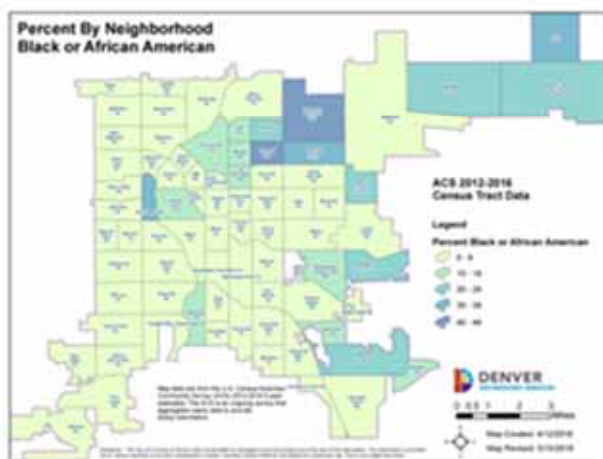
Local

- › Residential segregation laws, covenants, redlining, blockbusting, concentrated communities, less mobility



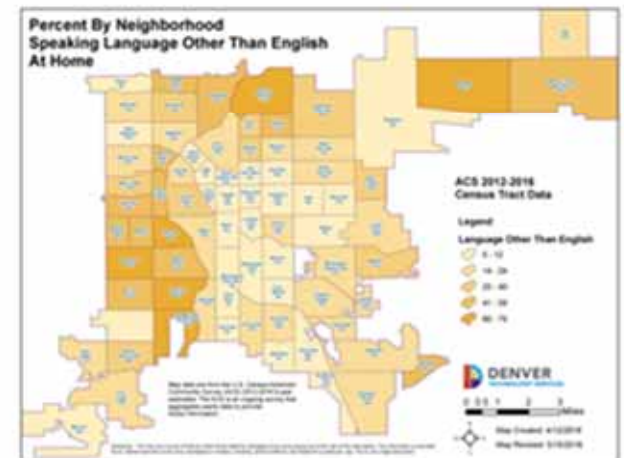
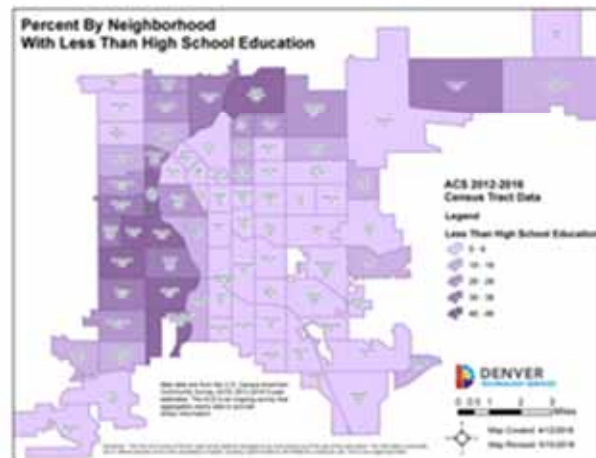
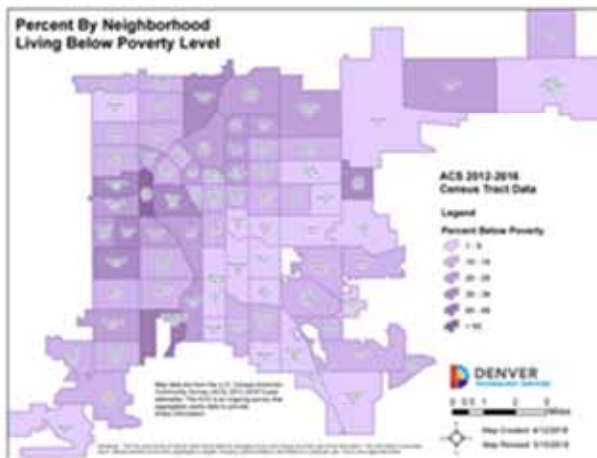
DEMOGRAPHIC SPATIAL ANALYSIS

The presence of multiple factors helps identify communities that have less access to resources.



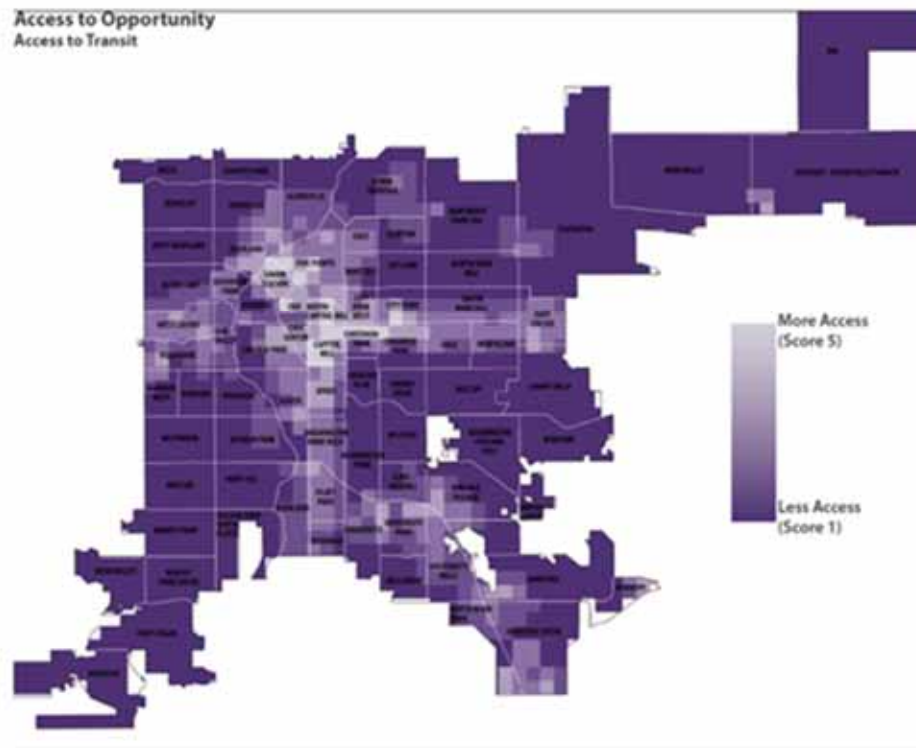
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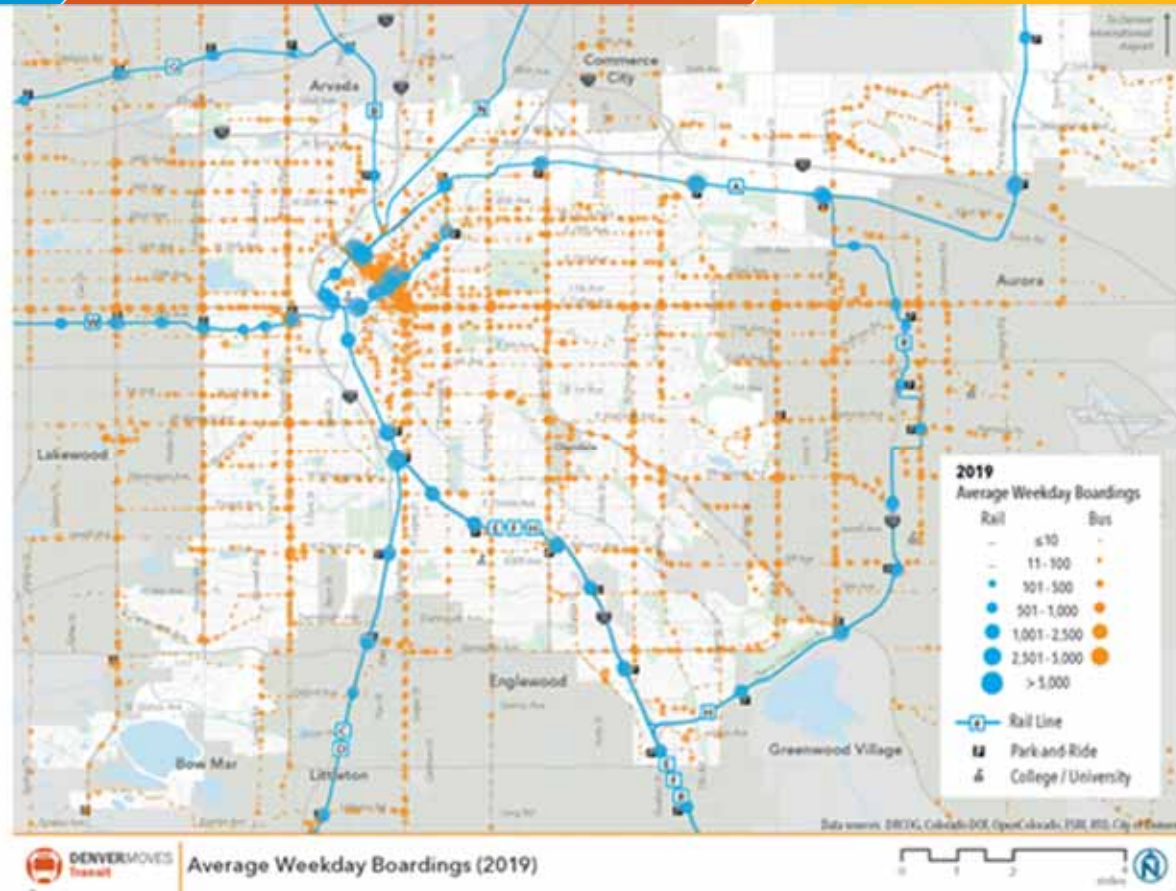
TRANSIT ACCESS & SERVICE

- Transit access, defined by people being within $\frac{1}{2}$ mile from high-capacity transit corridors and rail stations within Denver and any area within $\frac{1}{4}$ mile of the frequent transit network (headways 15-min or less, 6a-10p, 7 days per week).



SYSTEM TODAY

Ridership (Pre-COVID)



SYSTEM TODAY

Ridership (During COVID)

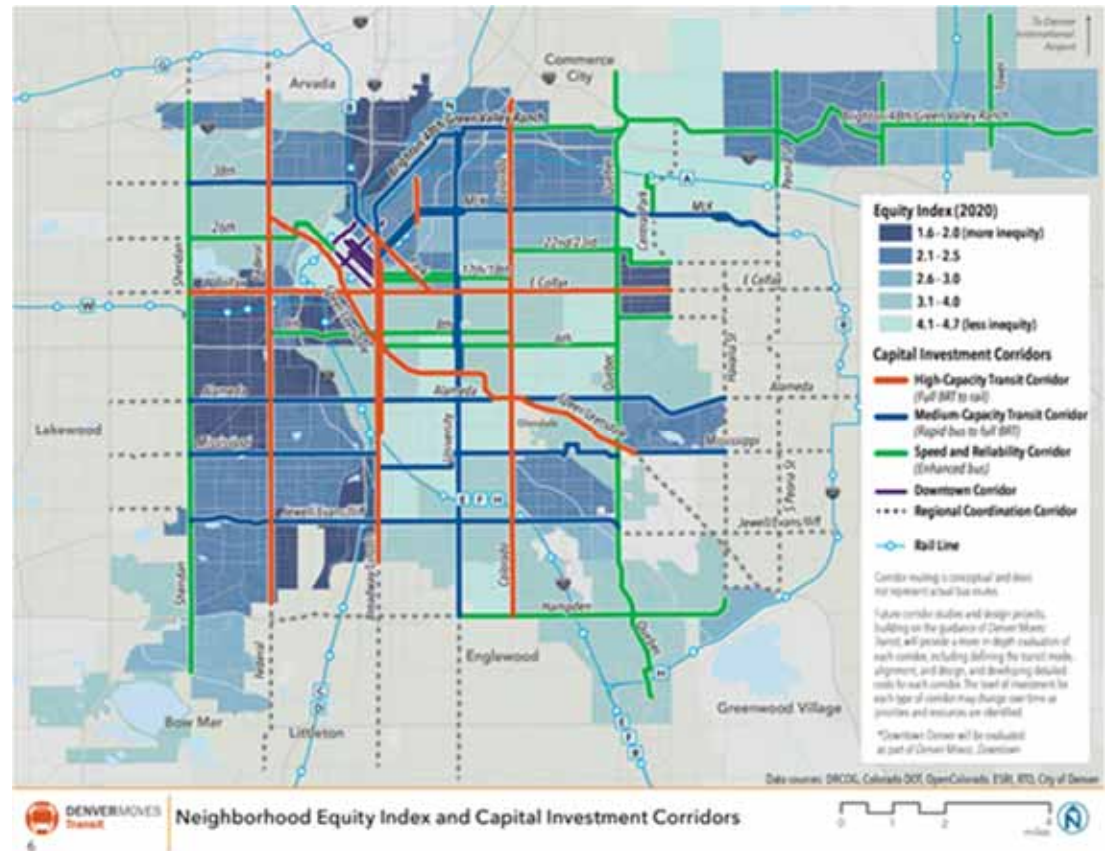


SYSTEM TODAY

Ridership Change



Neighborhood Equity Index



How important is each prioritization theme to determining investment priorities?





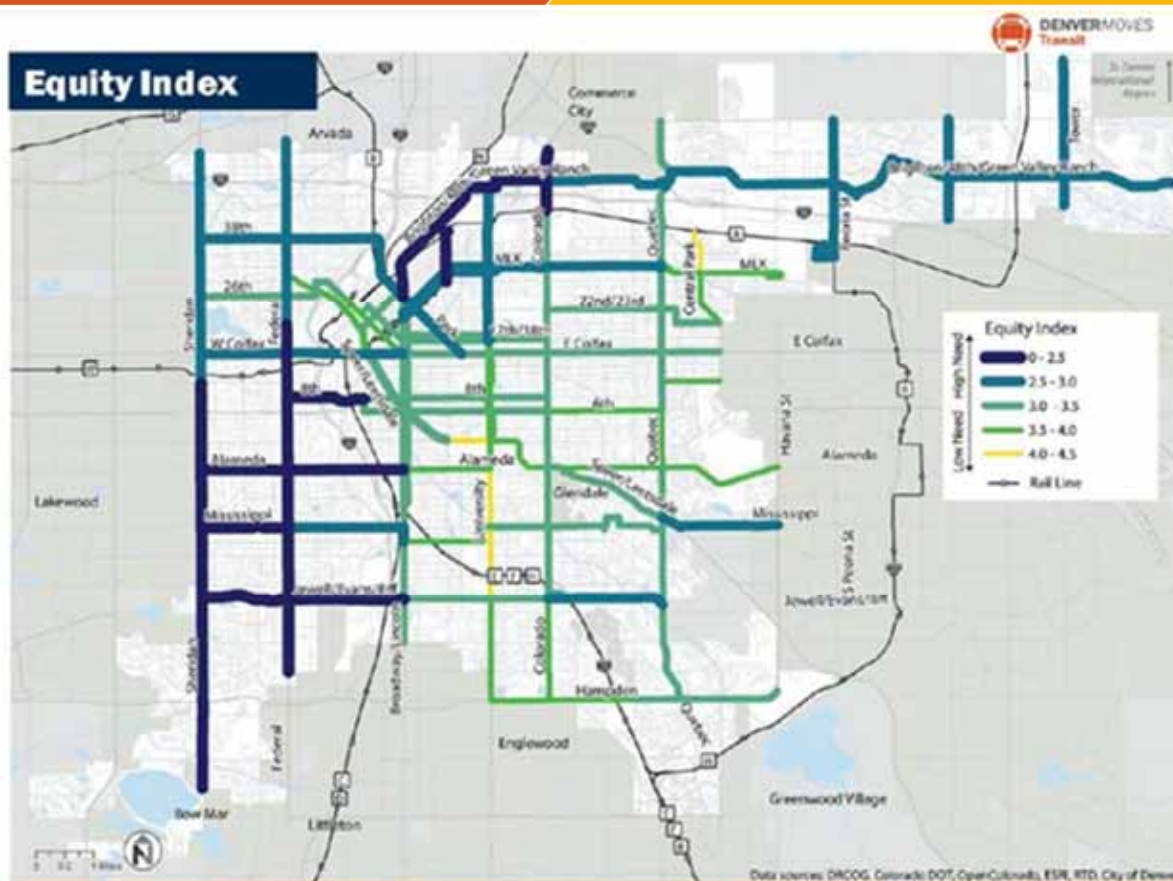
Equity

Components of Equity Score:

- Equity Index
- Low-income population
- Low/mod-wage jobs
- Ridership retained during COVID

Top 5 corridors by equity score:

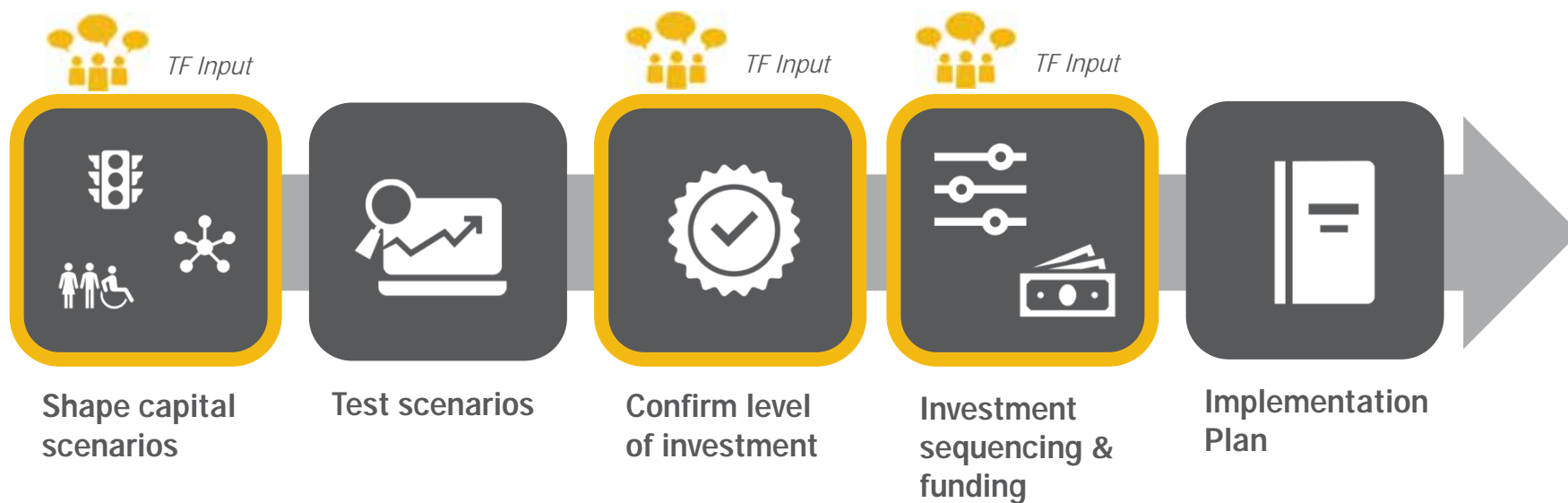
1. Brighton/48th/Green Valley Ranch
2. Federal
3. West Colfax
4. Sheridan
5. Jewell/Evans/Iliiff



Vision to Action



From Priorities to Implementation



Denver Moves: Transit – Adopted Vision



Transit Capital Investment Corridors














Denver's Frequent Transit Network Vision



DENVER
TRANSPORTATION &
INFRASTRUCTURE

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2 Step Process

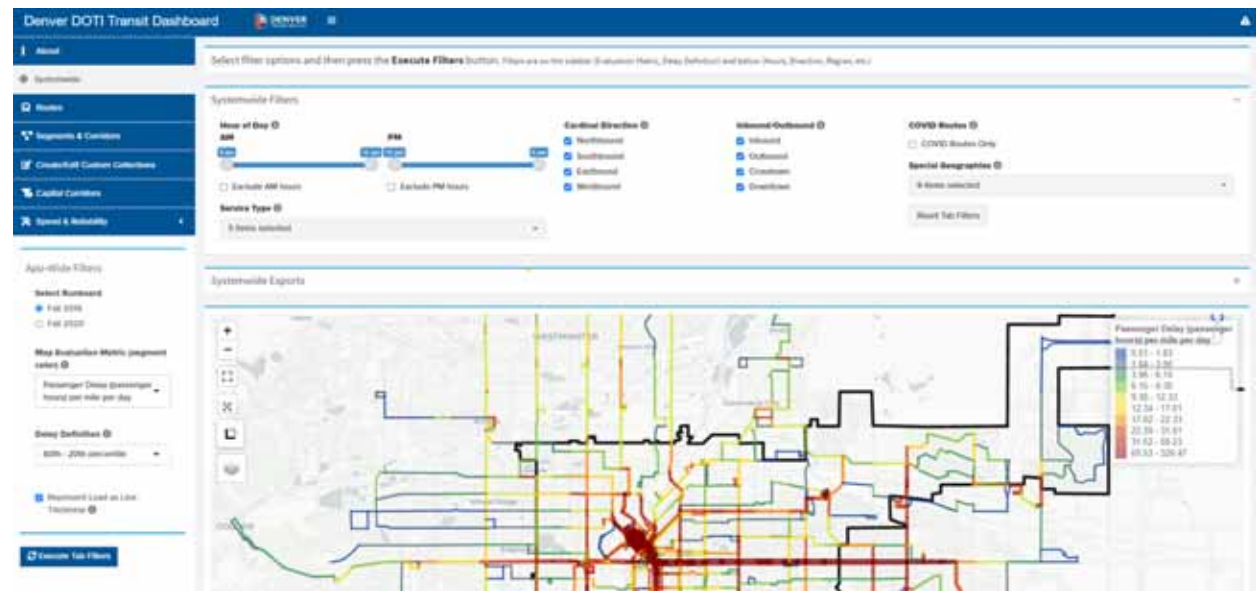
	Purpose	Metrics					
Scenarios	Determine Level of Investment	 Equity	 Passenger Delay	 Ridership	 Connectivity	 Capital Cost	 Operating Cost
Corridors	Determine Order of Investment	<div> Equity</div>		 Land Use	 Cost Effective	 Regional Priority	 Funding Viability

Service Prioritization













Denver Transit Dashboard Tool

Version of Nelson\Nygaard's Bus Delay Analysis Tool (BDAT)

- Based on Fall 2019 & 2020 APC and AVL data processed to the stop pair level
- Aggregated to custom segment network representation from stop pairs
- Developed several metrics for quantifying delay
- Scenario testing module (DM:T) and Bus Priority Investment module



Scenario Testing

	Purpose	Metrics					
Scenarios	Determine Level of Investment	 Equity	 Passenger Delay	 Ridership	 Connectivity	 Capital Cost	 Operating Cost
Corridors	Determine Order of Investment	<div>  Equity </div> <div>  Land Use </div> <div>  Cost Effective </div> <div>  Regional Priority </div> <div>  Funding Viability </div>					<div>  Funding Viability </div>

Service Prioritization

Capital Investment Levels

Rail*

Example: L Line



**Rail reserved for Central Rail Extension corridor*

High-Investment BRT

Example: Colfax BRT



Med-Investment BRT

Example: Federal Blvd.



BAT Lanes

Example: Broadway


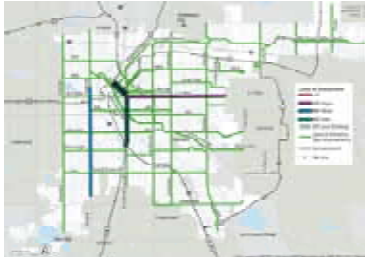





TSP and Queue Jumps































Example: Washington, D.C.



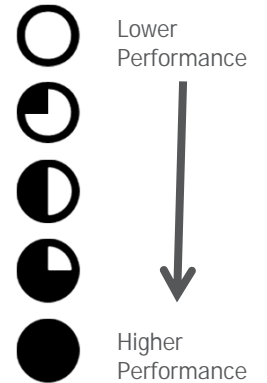
Five Scenarios

Baseline	Denver Better Bus	Regional Partnerships	BRT+	DM:T Full Vision
Existing transit investments + E Colfax & Federal BRT	Baseline + Bus Priority improvements systemwide	Better Bus + DRCOG BRT corridors (Med Investment)	Testing higher level of BRT investment on key corridors	Close alignment of investment levels with DM:T vision
				

Capital Scenario KPIs

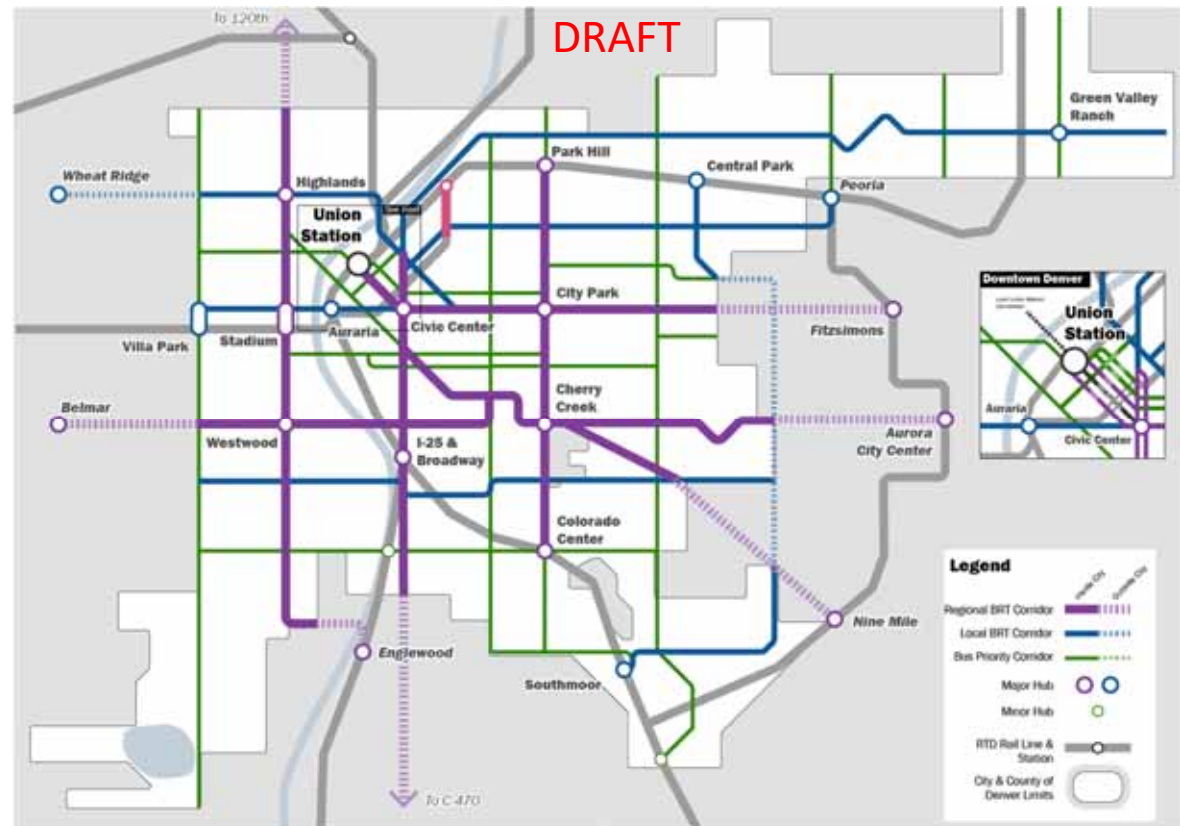
	<u>Baseline</u>	<u>Denver Better Bus</u>	<u>Regional Partnerships</u>	<u>BRT+</u>	<u>Full Vision</u>
 Equity					
 Passenger Experience					
 Ridership					
 Connectivity/ Accessibility					
 Cost Effectiveness					

Key






BRT+ Scenario



- Expanded BRT investment in Denver-focused corridors:
 - Mississippi
 - MLK
 - Brighton/GVR
- Upgraded BRT investment in priority regional corridors:
 - Broadway
 - Colorado
 - Speer/Leetsdale
- Invest in BRT corridors with highest federal funding match potential first



Why BRT+












**Subject to change based on corridor/project refinement*

		BRT+	DMT Vision
Benefits*	 Potential reduction in passenger delay	-22%	-23%
	 Potential increase in corridor ridership	+50%	+67%
	 Percent of low-income Denverites served by BRT	35%	42%

		BRT+	DMT Vision
Costs*	 Total capital cost	~\$1.9 B	~\$4.1B
	 Capital cost per new rider	\$15	\$18



Investment Sequencing

	Purpose	Metrics					
Scenarios	Determine Level of Investment	 Equity	 Passenger Delay	 Ridership	 Connectivity	 Capital Cost	 Operating Cost
Corridors	Determine Order of Investment	 Equity  Land Use		 Cost Effective	 Regional Priority	 Funding Viability	
		Service Prioritization					



Funding Viability

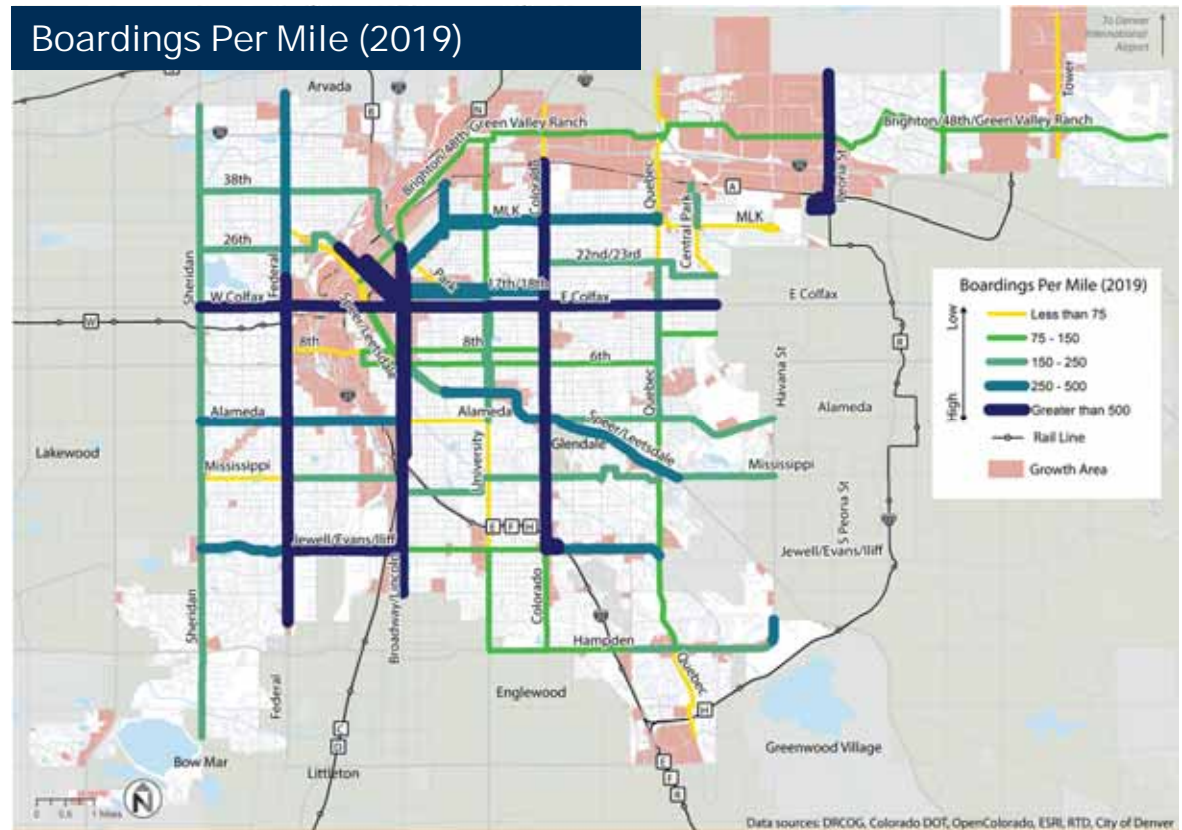
Components of Funding Viability Score:

- Ridership (2019)
- Federal grant competitiveness
- Public/Political Support

Initial Top 5 corridors:

1. East Colfax
2. Broadway/Lincoln
3. Federal
4. Colorado
5. West Colfax

Boardings Per Mile (2019)



Project Sequencing

1. All corridors ranked by combined score
2. Isolate likely FTA corridors
3. Consider Equity Score
4. Consider logical phasing
5. Funding capacity by tiers

Tier 1
Near Term

Corridors for FTA Grants

- East Colfax
- Federal

Tier 2
Mid Term

1. 38th/Park*
2. Speer/Leetsdale
3. Colorado

Tier 3
Long Term

4. Alameda
5. Broadway/Lincoln

Locally-led Corridors

1. **Brighton/48th/GVR**
2. **Mississippi**
3. **MLK**
4. **West Colfax**

RTD Fastracks

1. **CRE/L Line (2022-2050)**

BRT System Implementation

Implementation Period	Corridor	Advances Equity Score	Supports Land Use Score	Funding Viability Score	Regional Priority Score	Cost Effectiveness Score	Overall Rank
Tier 1 (2022-2030)	East Colfax	4	4	5	4	5	3
	Federal	5	3	5	4	5	1
	Brighton/GVR	5	4	4	3	2	8
Tier 2 (2031-2040)	38 th /Park	4	5	3	4	3	11
	Speer/Leetsdale	4	4	3	4	5	5
	Colorado	4	3	5	5	4	6
	Mississippi	5	3	2	3	4	9
Tier 3 (2041-2050)	Alameda	4	3	3	4	3	13
	Broadway/Lincoln	4	5	5	3	5	2
	MLK	4	4	3	5	2	10
	West Colfax	5	5	4	3	5	4

Corridor Sheets

- All Capital Corridors
- Key information & results from Scenario/Prioritization processes
 - Overview (Cost, Length, Existing boardings/delay)
 - Conceptual project development timeline
 - Implementation details (Investment phase, rank, key partners, service frequency & gap)
 - Prioritization metrics (1-5 scale)
- Quickly update policymakers and stakeholders on implementation details for each corridor in system



Implementation

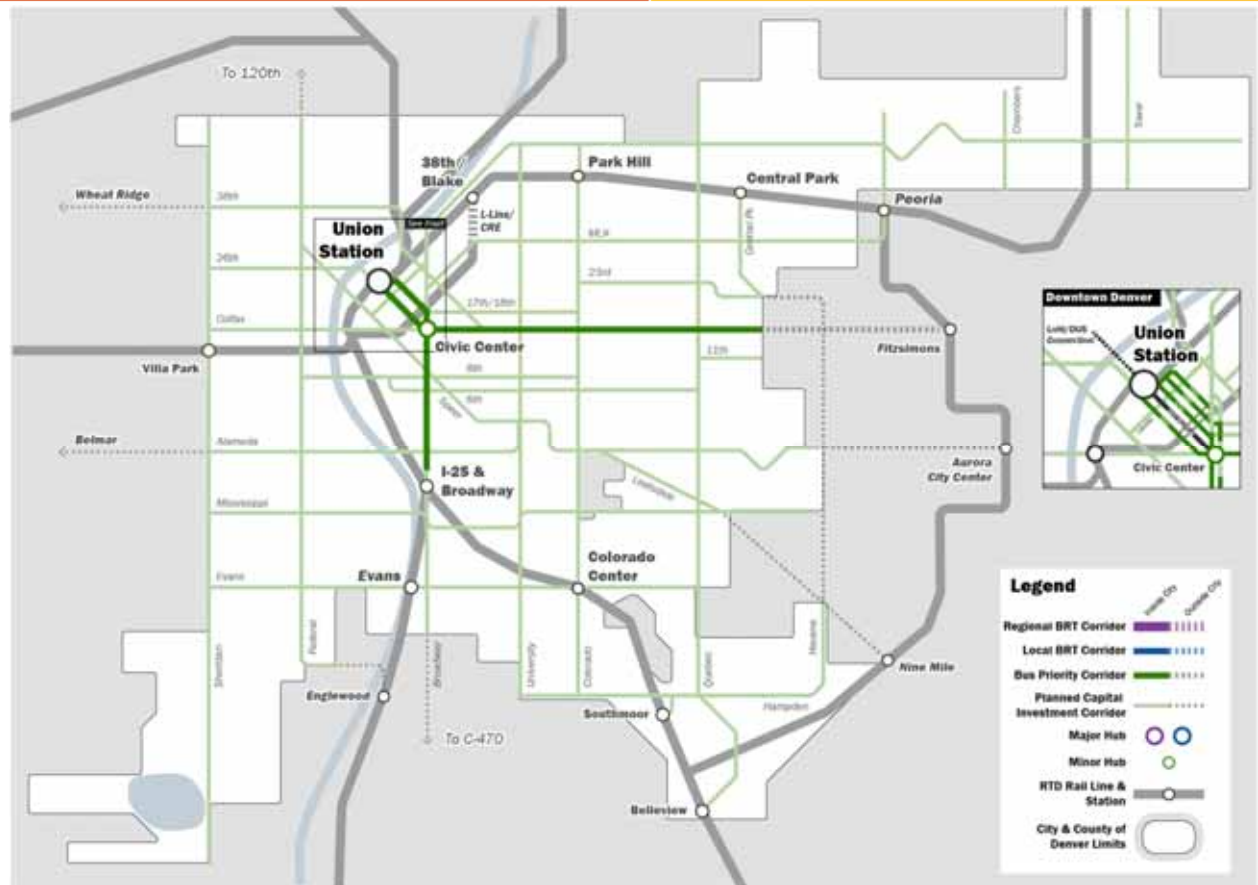
'The How'



Existing Corridors

Through 2021

- 16th Street MallRide
- Bus Priority
 - East Colfax (15L Project)
 - 15th/17th Streets
 - 18th/19th
 - Broadway/Lincoln



Near-term Priorities

2022-2027

- East Colfax Regional BRT
- Bus Priority Corridors

Previously Planned

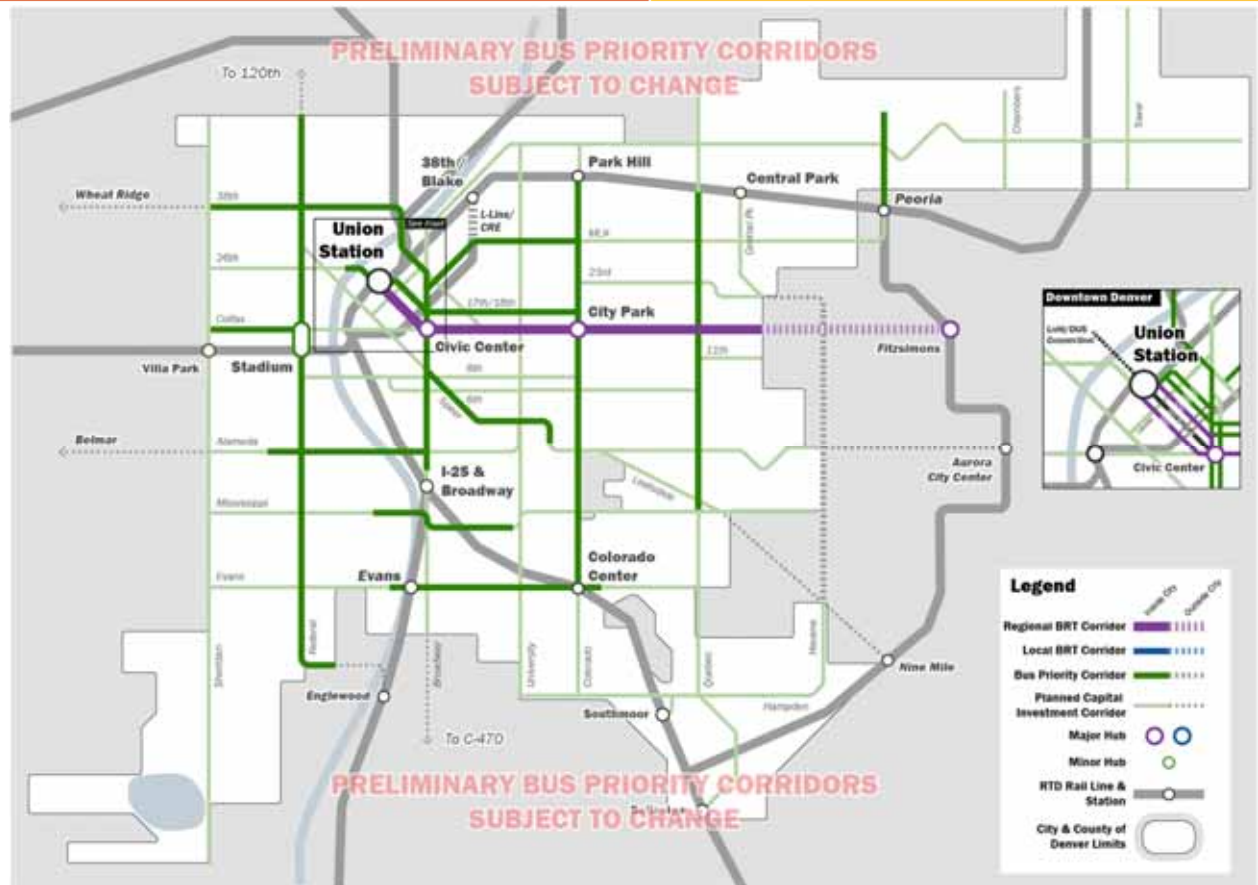
- Federal
- West Colfax
- Additional Downtown Corridors
- East 17th and 18th Streets
- Downing
- 12th St
- Havana (Aurora)

Network Study*

- Speer/Leetsdale
- Colorado
- Peoria
- MLK
- Alameda
- Evans
- Mississippi
- 38th/Park
- Quebec

**PRELIMINARY/
SUBJECT TO CHANGE*

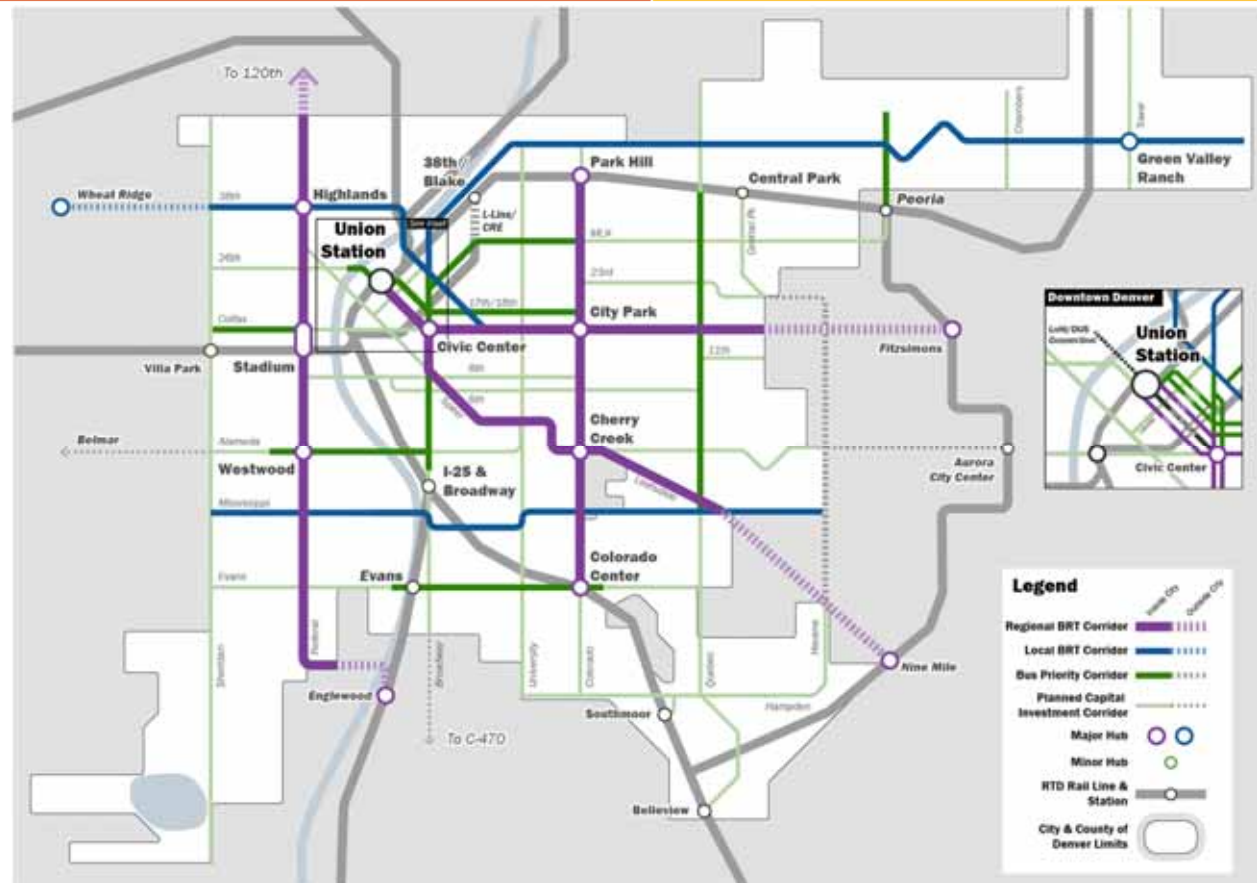
- Brighton/Green Valley Ranch (Study)



Mid-term Priorities

2028-2040

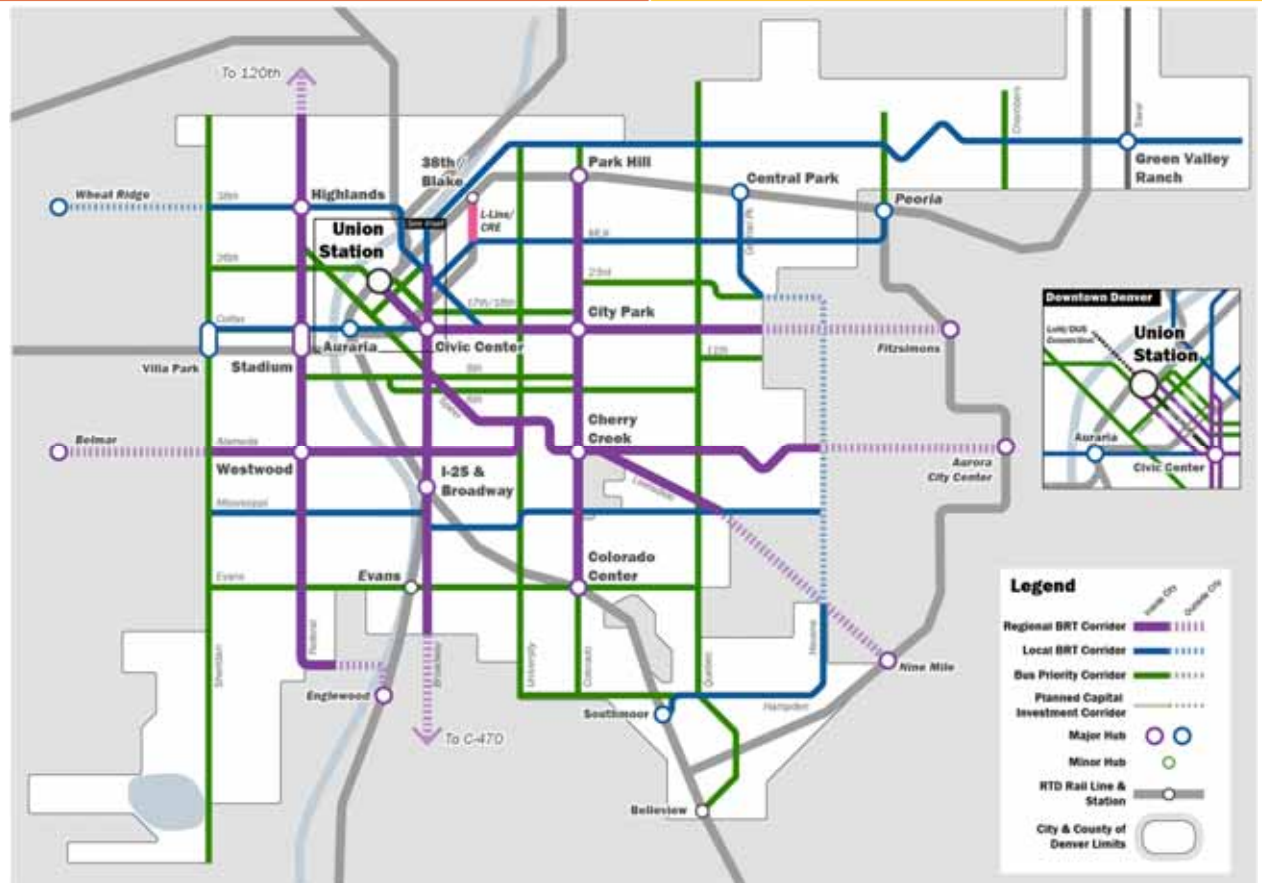
- Regional BRT
 - East Colfax
 - Federal
 - Colorado
 - Speer/Leetsdale
- Local BRT
 - Brighton/Green Valley Ranch
 - 38th/Park
 - Mississippi
- Bus Priority Tier 1 & 2 Corridors (TBD)

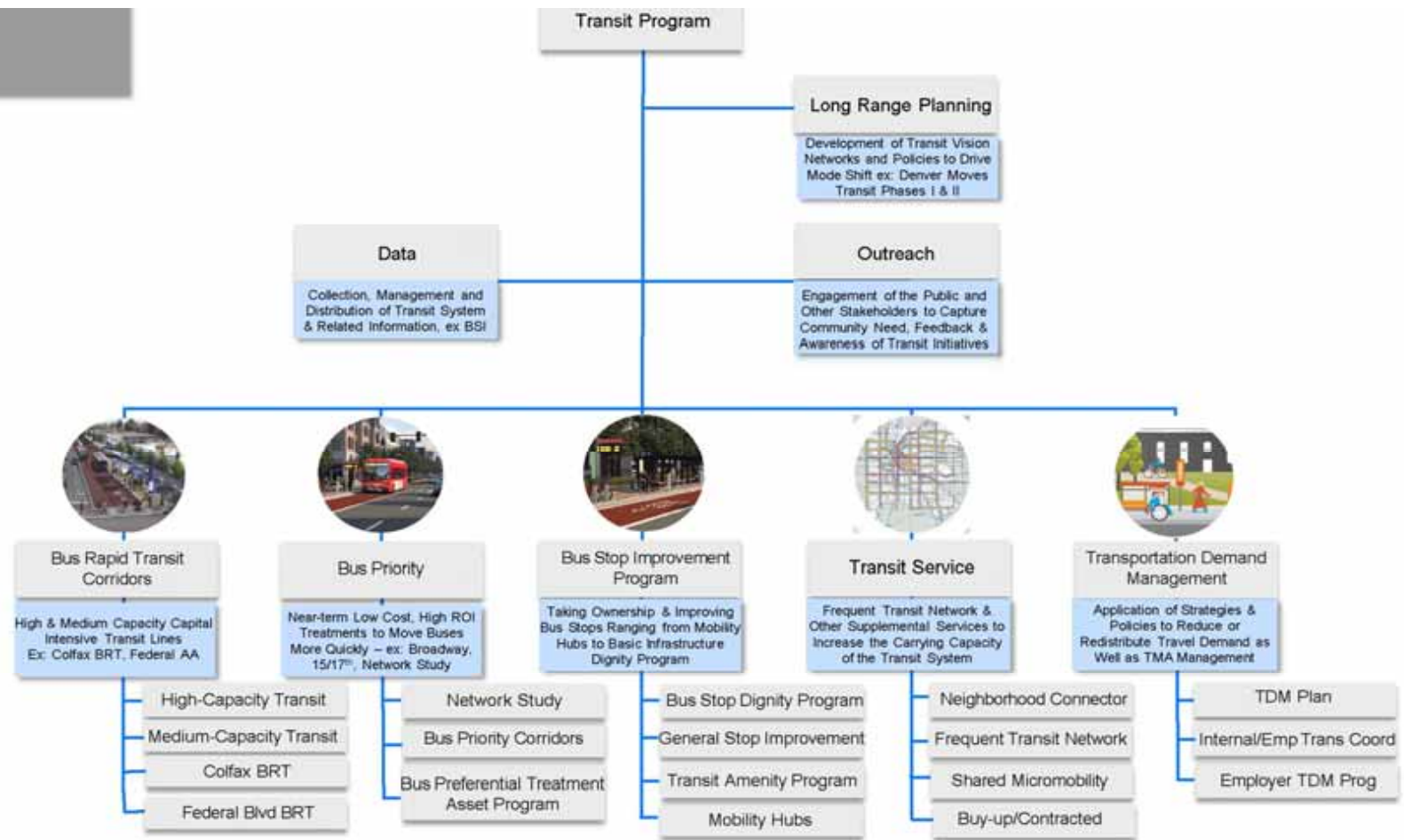


Long-term Priorities

2041-2050/Full Build-out

- Regional BRT
 - East Colfax
 - Federal
 - Colorado
 - Speer/Leetsdale
 - **Broadway/Lincoln**
 - **Alameda**
- Local BRT
 - Brighton/Green Valley Ranch
 - 38th/Park
 - Mississippi
 - **West Colfax**
 - **MLK**
 - **Havana/Hampden/Central Park**
- All Bus Priority Improvements
- L-Line/CRE (2022-2050)





Potential Sources of Revenue to Fund

- Federal Funds : Formula and Competitive
- Denver Discretionary Capital Investment Program (CIP)
- Denver Special Revenue Fund (SRF)
- Denver Bond Programs
- Climate Protection Funds
- Value Capture
- Advertising



Mapping Program to Financing Potential

		Existing Funding Sources				New Funding Sources			
		Federal CIG Funds	Federal/ Regional Funds	GO Bond	Other Existing Local Funds	Sales Tax	Property Tax	Value Capture	Other Local Funds/ Fees
	BRT Corridor Program	✓	✓	✓	✓	?	?	?	?
	Bus Priority Program	X	✓	✓	✓	?	?	?	?
	Bus Stop Improvement Program	X	✓	✓	✓	?	?	?	?
	Other Transit Capital	✓	✓	✓	✓	?	?	?	?
	BRT Operations	X	?	X	✓	?	?	X	?
	Frequency Improvements	X	?	X	✓	?	?	X	?
	Connector Services	X	?	X	✓	?	?	X	?
	Program Management	X	X	X	✓	?	?	X	?

Denver City Strategies to Implement

- Spot, Segment and Corridor
- By Treatment or Area
- One Build
- With Partners: RTD & Neighboring Jurisdictions
- Design – Bid - Build (Traditional) or Packaged into a Private Sector 3P Opportunity
- Evolution of a Street: Bus Priority to Bus Rapid Transit

Case Study: Federal Blvd

Afternoon Symposium session covering how the City and its partners are delivering a Bus Priority project on Federal Blvd

Q&A



My La
City of Denver



Jonathan Mosteiro
Nelson\Nygaard



Justin Begley
City of Denver



Thank you!