



# BID Workshop

September 12, 2017



# Welcome and Introductions



# Project Partners

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

# Meeting Purpose and Agenda



# What We've Heard

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- How and when did the City decide to evaluate center-running BRT on Colfax?”
- What is center-running BRT and how does it work?
- What impact does BRT have on retail sales?
- How will vehicular traffic and access to businesses along the corridor be impacted (e.g. how will left turns work, will there be traffic diversion to side streets)?

# Meeting Purpose

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- Provide project background and progress to-date
- Overview of what center-running BRT is and how it works
- Review key opportunities/differentiators/tradeoffs of new concept
- Answer key questions and identify areas where more information is needed

# Agenda

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- Project History and Evolution
- Center Running BRT Concept
- BRT Case Studies
- Benefits/Differentiators of Center-Running BRT
- Tradeoffs of Any BRT System
- Q&A
- Next Steps



# Project History and Evolution:

*How we got here and where we're going...*





# Purpose of the Project

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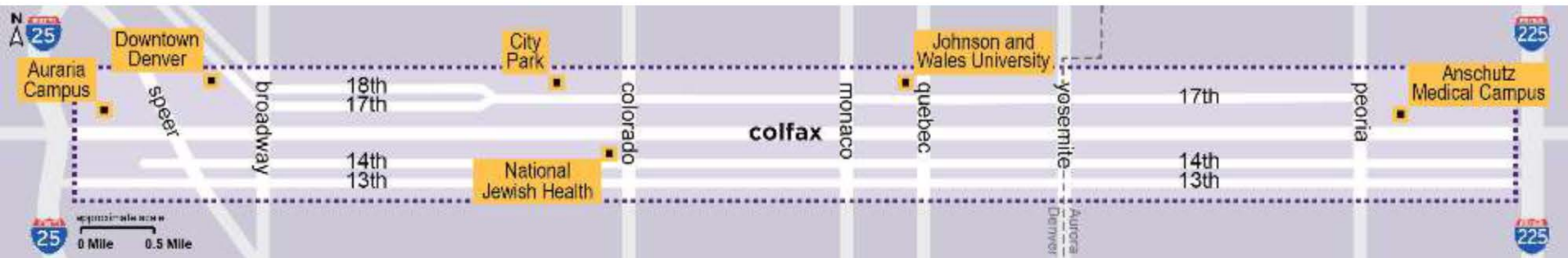
To identify and provide a package of multi-modal transportation improvements in the East Colfax corridor that:

- Improve mobility, connectivity, safety, and accessibility
- Meet current and future person-trip demand
- Encourage a shift of auto trips to alternative modes
- Interact seamlessly, efficiently, and safely with other transportation corridors, systems, and modes
- Are consistent with area economic development, placemaking/streetscaping and liveability plans and principles



# Study Area

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# Key Challenges and Opportunities

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- Moving more people along and to destinations along East Colfax without adding lanes or taking property
- Growth of Denver region even greater than expected
- Very high Colfax corridor ridership today (22,000 / weekday)



Maximum number of cars on a street



Distribution of people served by these cars



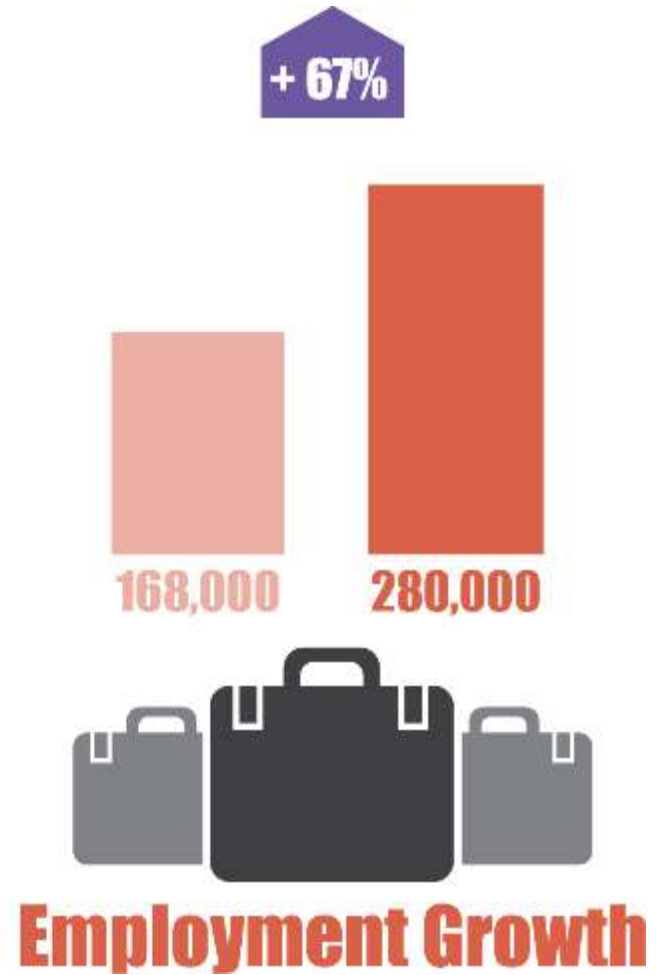
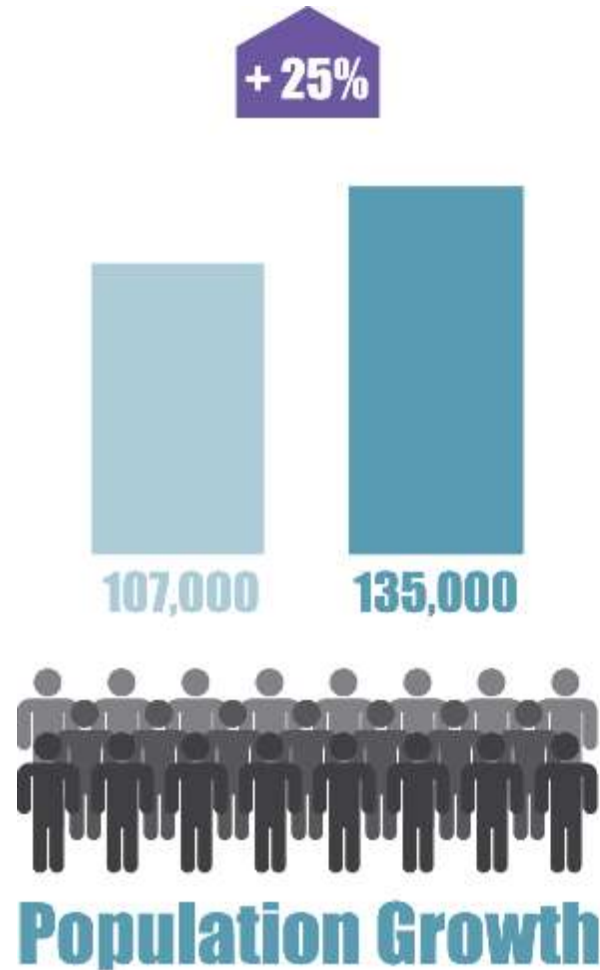
The same number of people on a bus



The same number of people on a ped-bike friendly street

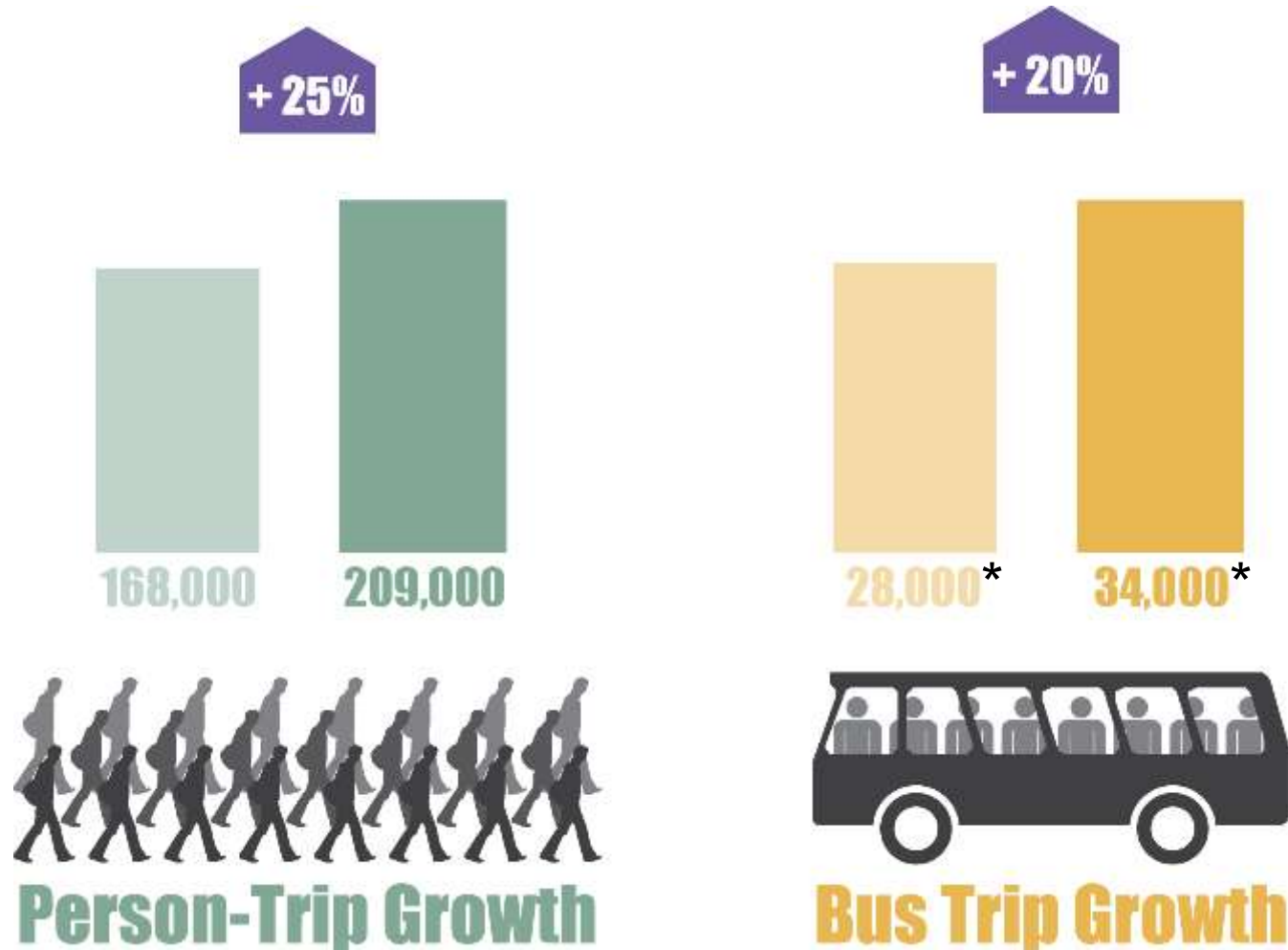
# Why is This Project Needed?

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(2010 to 2035)

# Why is This Project Needed?



(2010 to 2035)

\*ridership includes 10, 20, and 15 & 15L

# Project Background

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- **Study began in 2012**
  - Public Scoping (2012)
  - Alternatives Analysis (2013)
  - Bus Rapid Transit (BRT) identified (2014)
  - Side-Running BRT using peak-period lanes (2016)



# Community and Agency Feedback

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## Supported Outcomes

- Doubles existing ridership
- Increases person-trip capacity
- Reduces transit travel time
- Reliability
- Enhanced Passenger Experience

## Opportunities for Improvement

- Be bold – think long term
- 24-hour transit lane
- Placemaking – opportunity to reimagine Colfax as Main Street
- Prioritize pedestrians and bicycle safety and access (Vision Zero)

# Project Evolution

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- Side-Running BRT concept refined based on community input, project goals and mobility needs
- Analyzed potential alternative options
- Center-Running BRT design better addresses key community, safety and mobility priorities



# MOBILITY ACTION PLAN

It's getting too hard to move around Denver and too many people are getting hurt on our streets. Our infrastructure is deteriorating, transportation options are limited and the ones we have are major sources of pollution.

The time to act is now. We must be smart and we must be bold. Denver's Mobility Action Plan will support the transportation choices people want to make and move more people, more efficiently and more safely. It will increase mobility options, improve safety, address climate change, improve public health, and create more accessibility.



**\$2+ billion** over the next 12 years to make it safer and easier to get where we need to go.

**Denver's Mobility Action Plan**  
Denver is ready to transform its transportation system.

<b>30%</b>	<b>80%</b>	<b>Zero</b>
Commuters biking, walking or taking transit by 2030	Reduction of emissions by 2050	Traffic Deaths by 2030

## Strategic Goals



### CHOICE

Providing more choices: Walk, Bike, Drive, Transit or Share



### SAFETY

Improving safety through Vision Zero



### CLIMATE & HEALTH

Expanding use of electric vehicles and charging stations



### ACCESSIBILITY

Increasing technology to make your trip easier and faster

# Center Running Bus Rapid Transit



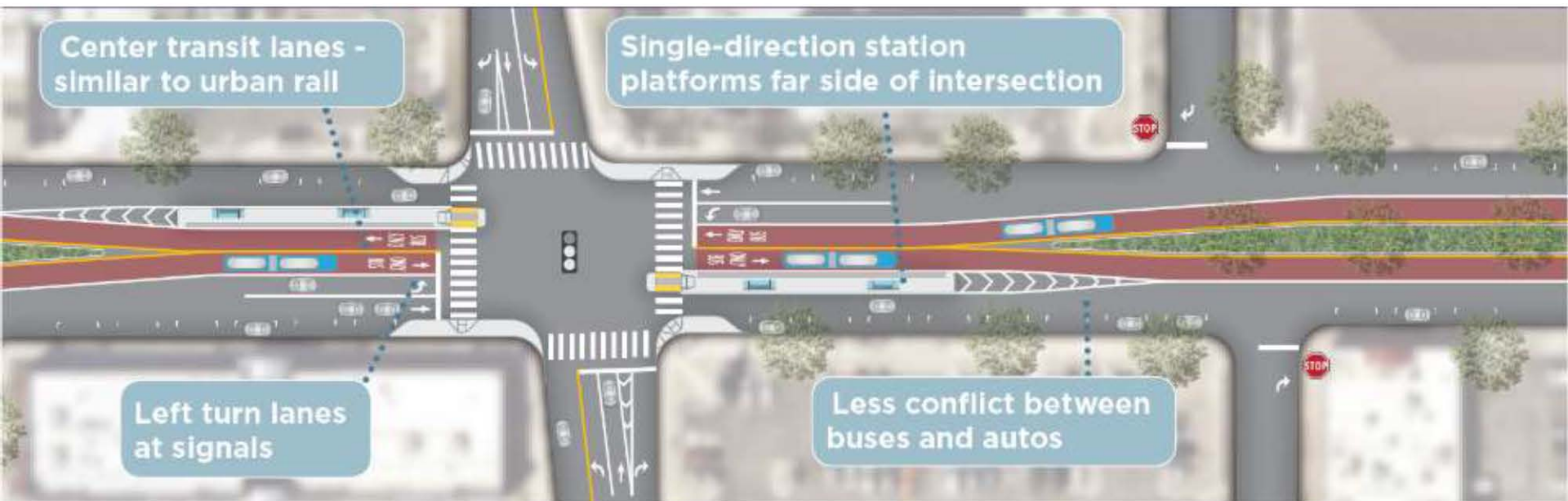
# The Colfax BRT Opportunity

## Center-Running Exclusive Lanes



# The Colfax BRT Opportunity

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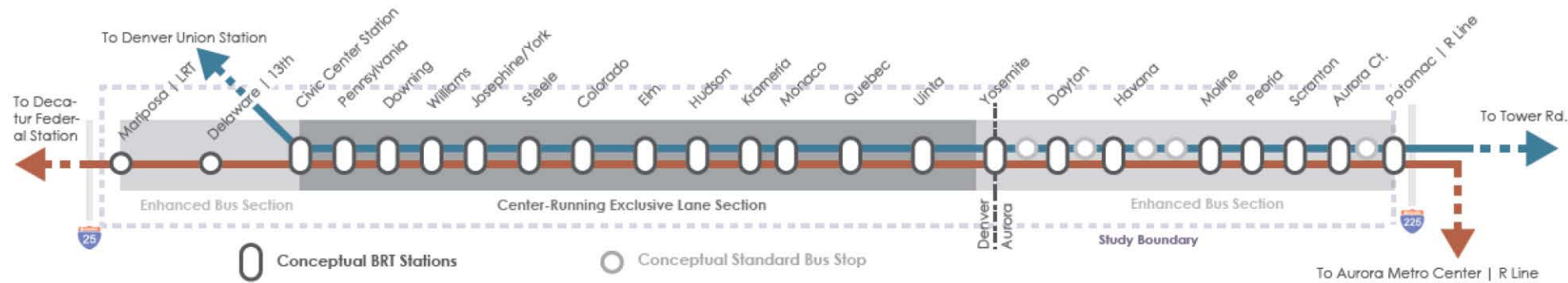
Center BRT w/ Split Platform

# The Colfax BRT Opportunity



# Conceptual Operations

## Project Map



# Delivering a Complete Corridor with BRT at the Center





# BRT as Centerpiece of A Complete Street

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Delivering on transit and walkability



# Center Running BRT Evolution

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- Many early arterial BRT projects used side lanes
- 10 years of experience shows downsides



- Center running BRT becoming the preferred solution for urban corridors
- Helps deliver on safety, placemaking, and long-term operations



# Denver's Peers are Building Quality BRT

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



**HealthLine BRT in the Euclid Avenue Corridor, Cleveland**

# Center-Running BRT



HealthLine BRT, Cleveland

# Signature Stations





Street Design



Street Design





Street Design



# Public Art



Steve Manka, "Chorus Line"

**\$5.8 BILLION**  
IN NEW INVESTMENT

resulting from the  
**EUCLID AVENUE STREETScape**  
and BRT Project

RENOVATIONS AND EXPANSIONS

**\$2.5 BILLION**

NEW DEVELOPMENT  
**\$3.3 BILLION**

PRIVATE

**\$2.7 BILLION**

PUBLIC AND NONPROFIT

**\$3.1 BILLION**



# Paving the way to economic development

MICHELLE JARBOE | THE PLAIN DEALER

The remarking of Euclid Avenue was primarily a transportation project — a \$197 million federally funded effort to improve a major artery and to connect downtown Cleveland to University Circle using a bus rapid transit line. But the project also promised economic development, with the revived road acting as a canvas for construction.

That growth is happening. More than \$3.3 billion in projects have been in the planning stages, under construction or completed near Euclid during the past two years. That number might be higher, if not for timing: The corridor re-opened in October 2008, when the nation was at the height of a financial crisis. The recession, a lending crunch and a real estate crisis have stalled some projects and wiped out others. And a number of projects that have emerged or survived are driven by institutions or propped up by tax credits and other subsidies.

This map gives an overview of much of the development around the Euclid corridor.



## Public Square to Inner Belt (\$605.9 million)

1	Public Square improvements	\$75,000 as study so far
2	Euclid Avenue planters	\$305,000
3	Terminal Tower renovations	\$40 million
4	Highway Building renovations	\$47 million
5	Park Building condos	\$17 million
6	May Co. building renovations	\$5-\$6 million
7	East Fourth Street	\$25 million
8	Cleveland Bike Station	\$75,000
9	The Residences at 688	\$45 million
10	Schofield Building renovations	\$44 million
11	Truman and Security Federal renovations	\$8 million
12	Wynham Cleveland at Playhouse Square renovations	\$4 million
13	Cowell & Hubbard Building renovations	\$3 million so far
14	East 14th Street improvements	\$2.5 million
15	Hanna Theatre and Hanna Building	\$30.7 million
16	Allen Theatre/Cleveland Play House/CSU project	\$20-\$30 million
17	CSU law school renovation	\$3 million
18	Adage Realty Advisors	\$1 million
19	University Lefts	\$12 million
20	CSU student center	\$10 million
21	CSU garage	\$14 million
22	Stephanie Lubis James transit center	\$14 million
23	CSU main classroom building	\$27 million
24	CSU new student housing	\$60 million
25	CSU College of Education building	\$26 million

## Midtown (\$186.8 million)

26	University Studios apartments	\$2.7 million
27	Power Direct call center and offices	\$1.5 million
28	4600 Euclid Avenue	\$5 million
29	RTA paratransit facility renovations	\$2.7 million
30	Salvation Army Adult Rehabilitation Center renovations	No cost or date set
31	Ohio regional psychiatric hospital	\$84 million
32	Planer's Ice Cream expansion	\$2 million
33	American Sugar expansion	No cost available
34	Gallucci's expansion	\$7,000-\$30,000
35	Euclid Tech Center	\$20 million
36	Victory Lefts building	\$2 million
37	Baker Electric Building	\$7 million
38	PRHS senior housing development	\$8.8 million
39	Cleveland Housing Network housing for the homeless	\$1 million
40	Rainbow Plaza Apartments update	\$7 million
41	Woodhaven town houses	\$20 million

## University Circle (\$2.5 billion)

42	Cleveland Clinic, various projects	\$700 million
43	Cleveland Clinic, various projects	\$85 million
44	Stable Cardiovascular Innovation Center	\$25.3 million
45	Park Lane Villa	\$20 million
46	Tudor Arms/Douglas Hotel	\$2 million
47	Stokes VA Medical Center	\$50 million
48	Cleveland Museum of Natural History	No cost or date set
49	Cleveland Museum of Art	\$250 million
50	Hawken School at University Circle	\$3 million
51	West gateway landscaping and lighting project	No cost or date set
52	University Hospitals Case Medical Center projects	\$382 million
53	University Hospitals Case Medical Center projects	\$27 million
54	The Commons, apartment and retail renovations	\$2.5 million
55	Uptown plaza	\$900,000
56	University Circle Inc. University Hospitals hotel	\$25-\$30 million
57	Museum of Contemporary Art Cleveland	No cost or date set
58	Cleveland Institute of Art expansion	\$22 million
59	Cleveland Hearing & Speech Center	\$16 million
60	Uptown street improvements	\$4 million
61	Uptown neighborhood	\$250-\$200 million
62	Lot 45 mixed-use transportation center	\$40-\$50 million
63	Abington Arms green renovations	\$2.5-\$2.3 million
64	East 220th Street rapid station	\$5-\$10 million
65	Circle 328	\$5 million
66	27 Colman	\$10 million
67	Mayfield Road street improvements	\$10 million

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REPORT BY MICHELLE JARBOE, GRAPHIC BY BOB BRONSTEIN | THE PLAIN DEALER



# Healthline BRT, Cleveland

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<https://youtu.be/kF6EF3kOGQE>

# Eugene: EmX

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- At least \$100 million in investment along the corridor since implementation
- 10% job growth within 0.25 miles compared to -5% job growth citywide (includes 4% increase in retail jobs)



# Serving Established Corridors

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Geary BRT & Van Ness BRT, San Francisco

# Serving Established Corridors

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- 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 Corridor, Chicago



# NYC: Fordham Road Select Bus Service

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- 24% increase in retail sales in first year post-implementation
- 71% increase in retail sales after three years, compared to only 38% in the surrounding neighborhoods



# Seattle Madison BRT

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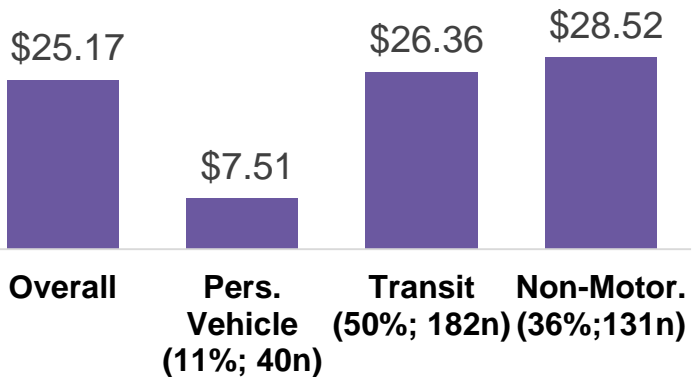
- Serves several neighborhood retail districts
- Purpose is to deliver high-quality mobility to accommodate current and expected growth



# Seattle: Retail Spending - Live/Work

*Those living and working in the survey area reported the lowest average spending of all major respondent groups. Among this group, people who used a personal vehicle reported spending far less than those taking transit or walked/biked, on average.*

**Average Spent (\$)  
Among Live/Work in Area**



**Relative Spending Power  
Among Live/Work in Area**

	% of Visitors	Avg. Spent (\$)	Relative Spent (\$)	Relative Spending Power
Personal Vehicle	11%	7.51	.83	1.00
Transit	50%	26.36	13.17	15.87
Non-Motorized	36%	28.52	10.27	12.37

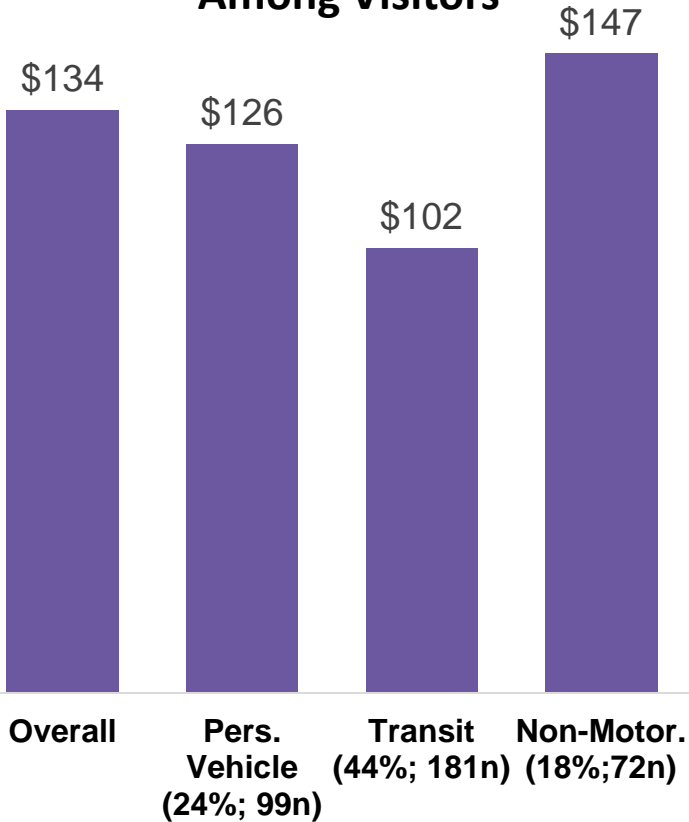
Q16. How much money do you plan to spend during your visit?



# Seattle: Retail Spending - Visitors

*While visitors arriving using a personal vehicle are more likely to spend more per capita than transit users, these costs are more likely to reflect travel and parking-related costs. Visitors who use transit report spending less – on average – but retain higher relative spending power by virtue of their subgroup size.*

**Average Spent (\$)  
Among Visitors**



**Relative Spending Power  
Among Visitors to the Area**

	% of Visitors	Avg. Spent (\$)	Relative Spent (\$)	Relative Spending Power
Personal Vehicle	24%	125.89	30.72	1.00
Transit	44%	101.95	45.21	1.47
Non-Motorized	18%	146.80	26.03	0.85

Q16. How much money do you plan to spend during your visit?



# Madison BRT, Seattle

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<https://youtu.be/nmpCkw9dPkw>

# Benefits/Differentiators of Center-Running BRT

# Transit Capacity & Ridership

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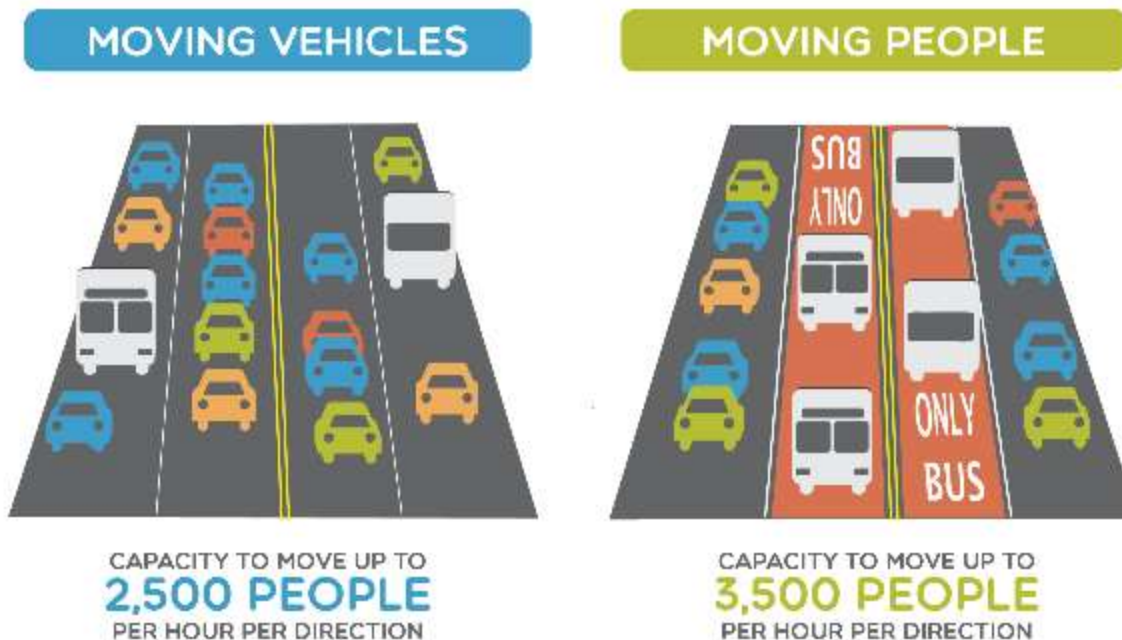
- **Current bus ridership more than doubles** – Colfax BRT projected ridership of up to 50,000 by 2035
- **Shift from vehicles to transit due to improved travel times, reliability and convenience of BRT**
- **Improved transit travel times** – up to 15 minutes faster during peak periods in 2035 than if we do nothing



# Transit Capacity & Ridership

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- HealthLine (Cleveland): 48% ridership increase
- EmX (Eugene): 100% ridership increase in 1<sup>st</sup> year of operations
- Orange Line (Los Angeles): Achieved 15-year forecast of 20,000+ riders in first seven months





# Transit Speed and Reliability

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- Eliminates many curbside conflicts
- **Future proofing** as land-use, traffic, and curb uses change
- Frequent service (every 3-5 minutes)
- High quality stations



EmX, Eugene Springfield, OR

# Safety

## Vision Zero

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- 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



Madison BRT, Seattle

# Safety

## Pedestrian/Bicycle first design

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- Improved multi-modal access and connectivity
- Designs that protect the most vulnerable users
- Safer, more accessible, walkable and bikeable neighborhoods



HealthLine BRT passengers crossing from a center station platform near the Cleveland Clinic

# Tradeoffs of Any BRT System

# Tradeoffs

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- Local access and turning movements
- Traffic and parking
- Stop consolidation/local bus service

# Turning Movements

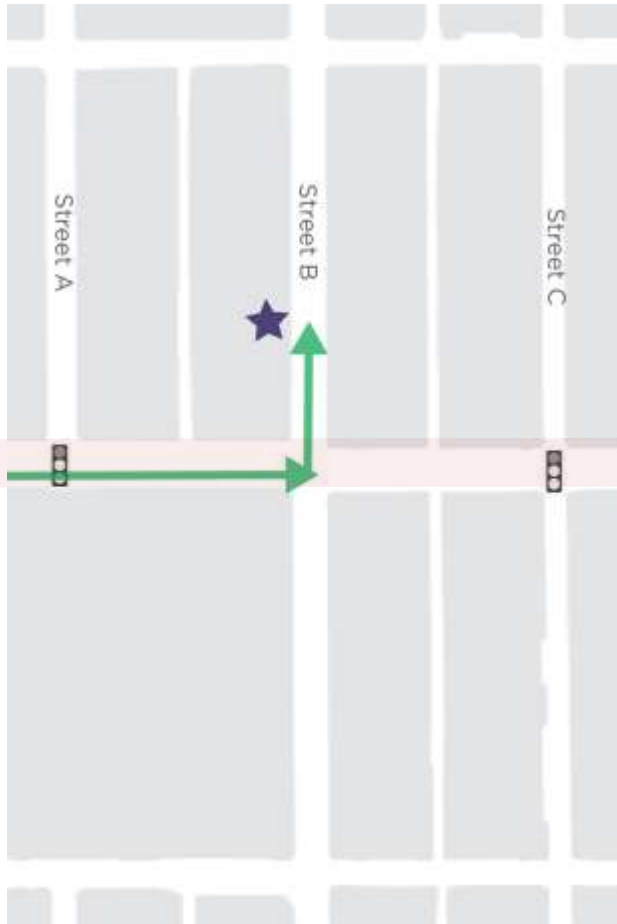
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Opportunities	Challenges
<ul style="list-style-type: none"><li>▪ Significantly reduces number of vehicle conflicts with other vehicles and peds/bikes</li></ul>	<ul style="list-style-type: none"><li>▪ Left turns only allowed at signalized intersections. May require U-turns or multiple lefts to get to destinations.</li></ul>
<ul style="list-style-type: none"><li>▪ Improved safety</li></ul>	<ul style="list-style-type: none"><li>▪ No crossing over center BRT lanes except at signals</li></ul>

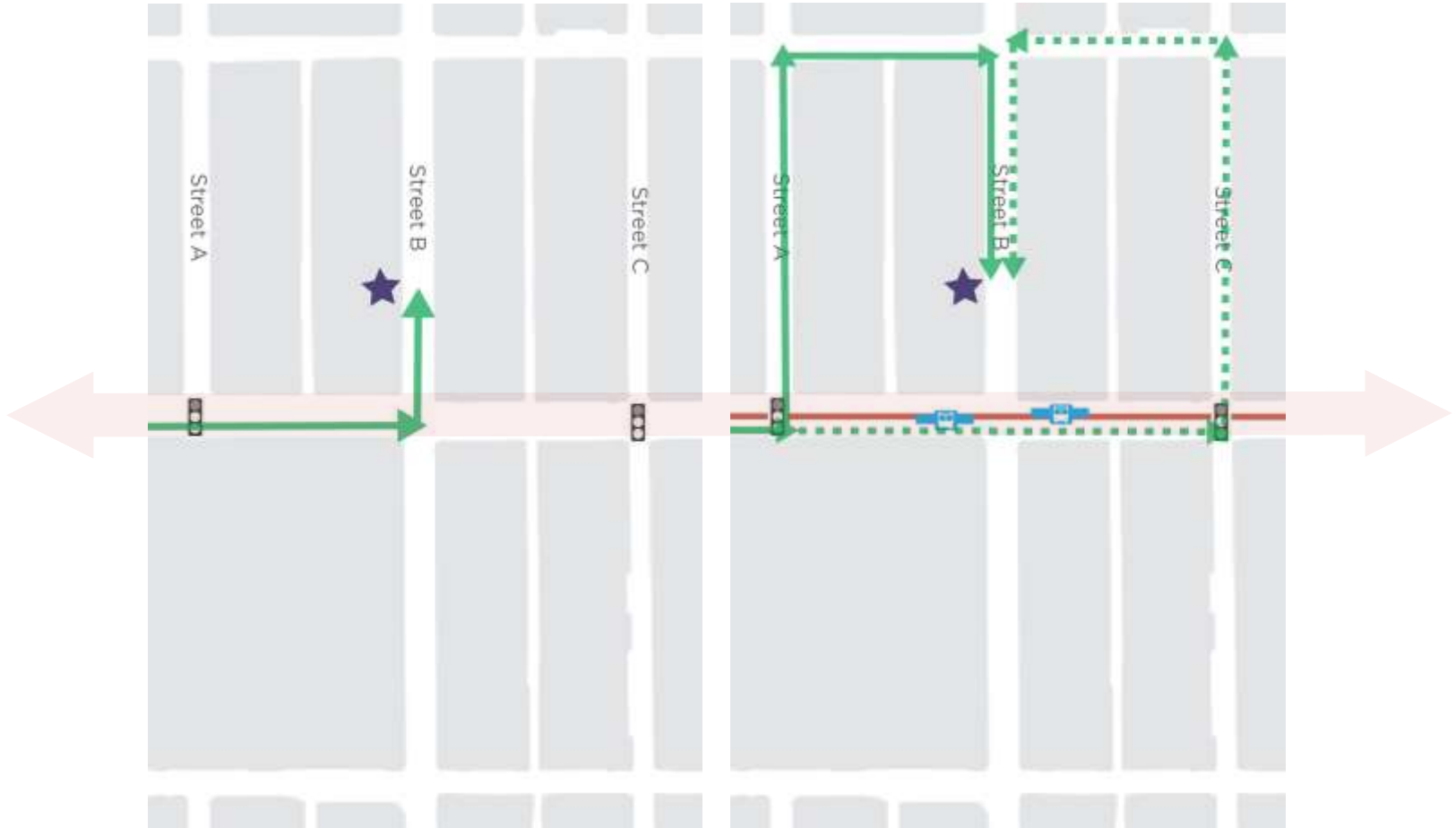
# Turning Movements

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Before Center-Running



After Center-Running



# Vehicle Traffic and Parking

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Opportunities	Challenges
<ul style="list-style-type: none"><li>More people using transit</li></ul>	<ul style="list-style-type: none"><li>Some vehicle trips will shift to parallel corridors</li></ul>
<ul style="list-style-type: none"><li>Overall reduction of volume of vehicles along BRT corridor</li></ul>	<ul style="list-style-type: none"><li>Grid street network can absorb diversion with minimal vehicle travel time increases</li></ul>
<ul style="list-style-type: none"><li>Some on-street parking spaces added by moving stations to center</li></ul>	<ul style="list-style-type: none"><li>Some on-street parking spaces eliminated near station locations</li></ul>
<ul style="list-style-type: none"><li>Operational improvements: signal optimization, extended/new turn lanes, re-striping, minor curb/gutter relocation (within existing ROW)</li></ul>	



# Station Spacing

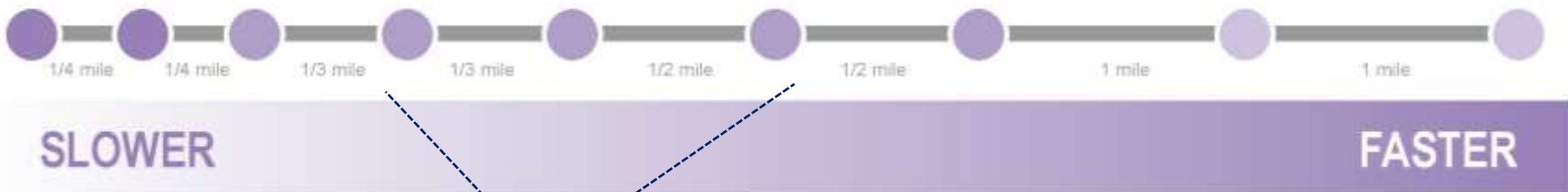
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Opportunities	Challenges
<ul style="list-style-type: none"><li>▪ BRT provides efficiencies local services can't provide</li></ul>	<ul style="list-style-type: none"><li>▪ Maintain local service that will complement the BRT system</li></ul>
<ul style="list-style-type: none"><li>▪ Provide enhanced efficiencies without a fare increase for local service or higher fare for BRT</li></ul>	<ul style="list-style-type: none"><li>▪ Some local stops consolidated</li></ul>
<ul style="list-style-type: none"><li>▪ Opens up sidewalk space for pedestrians, retail activation</li></ul>	

# Local Service/Stop Consolidation

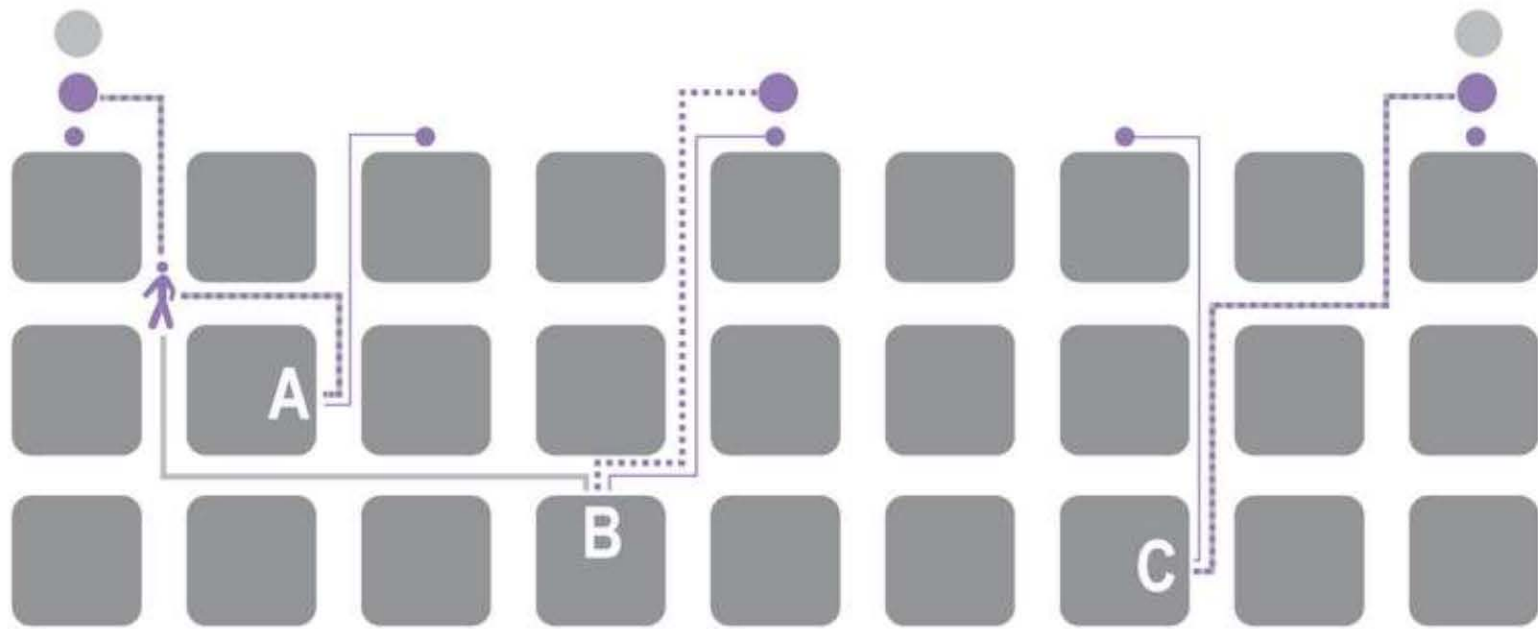
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- Local and Limited use one set of high-quality stations in Denver
  - Local would have slightly longer stop spacing
  - Limited would have slightly closer stop spacing
- 3-5-minute headways between 15 and 15L



Colfax has a well connected urban sidewalk network providing good access to the corridor

# How stop spacing affects walking distances



Blocks Traveled by Service Provided

	1/8 mi. Service	BRT 1/4 mi.	BRT 1/2 mi.
Household A	2 blocks	3 blocks	3 blocks
Household B	3 blocks	3 blocks	5 blocks
Household C	3 blocks	3 blocks	4 blocks

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

Questions?



# Next Steps



# Where Do We Go From Here?

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- Identify Local/Regional Funding Sources
- Compete for Federal Funding\*
- Gather community feedback and complete more detailed design and implementation schedule
- Business/property owner or developer representation on Task Force
  - ***Next Task Force Meeting: October 5, 2017***

\*requires environmental clearance by Federal Transit Administration and funding availability



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