Integrated Connectivity Study: Front Range & Mountain Corridor

Western High Speed Rail Association
October 23, 2012

TYPSA USA
AZTEC

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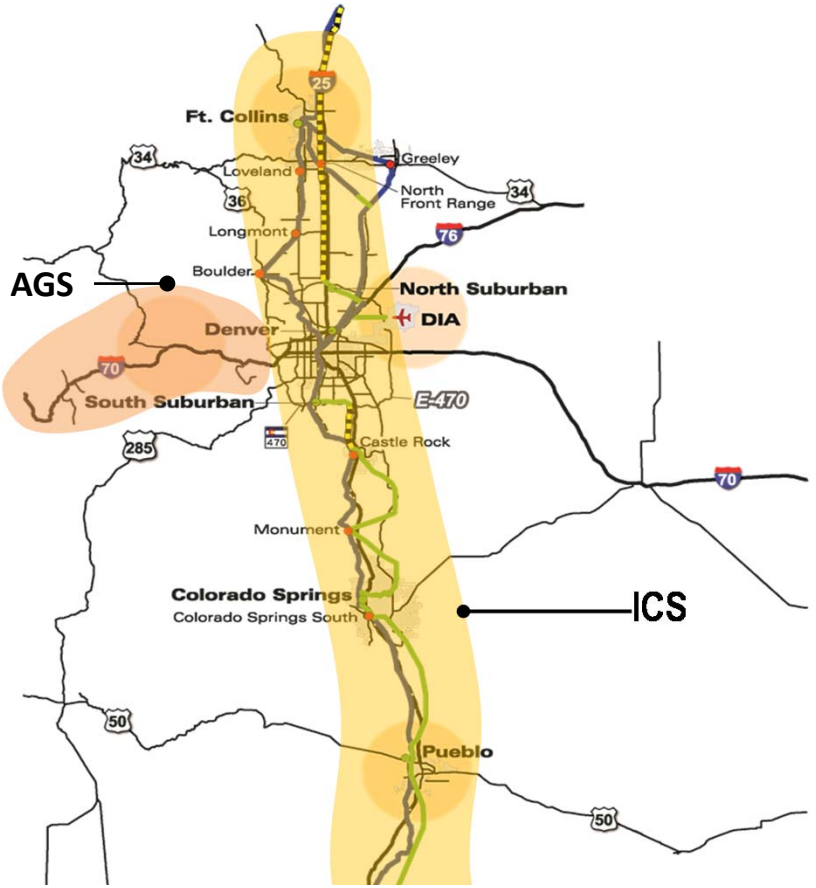
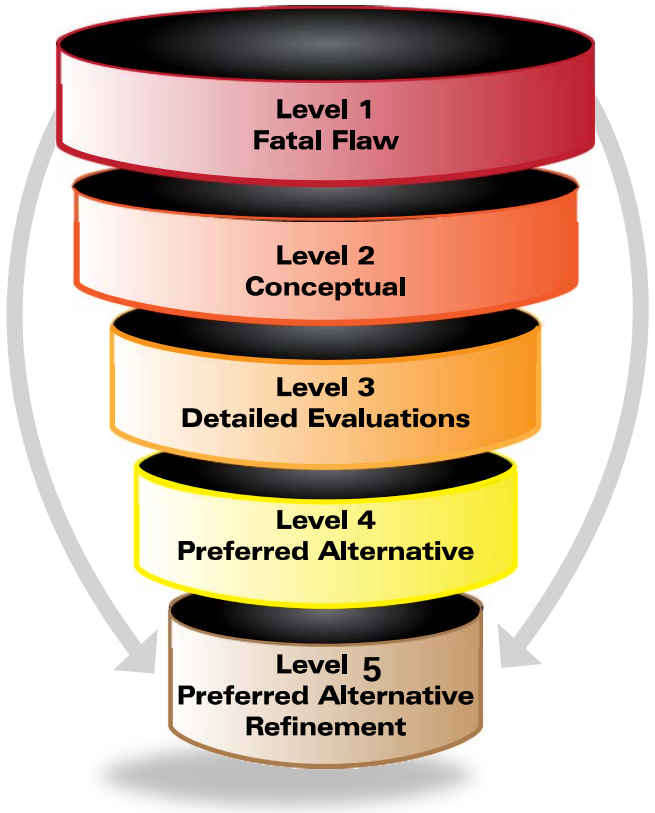
Project Profile

- Advanced Guideway System (AGS) Feasibility Study
  - Along I-70 west of Denver
- Interregional Connectivity Study (ICS)
  - Along I-25 north & south of Denver



Project Profile - Continued

- Purpose
  - Determine feasibility of technology, alignment, and funding / financing
  - For it to be feasible, the system must provide benefits greater than the capital and operating costs of its implementation



Physical Description

- I-70 Corridor
  - Eagle County Airport to Denver International Airport
  - 4 Counties

I-70 Corridor Information

Length: 150 Miles

Minimum Operable Segment: 50 Miles

Approach: Industry-focused analysis

Population: 95,000 (2010) → 187,300 (2040)

Current Cost Estimate: $14 Billion

- I-25 Corridor
  - Fort Collins to Pueblo
  - 4 Metropolitan Areas

I-25 Corridor Information

Length: 180 Miles

Minimum Operable Segment: 10 Miles

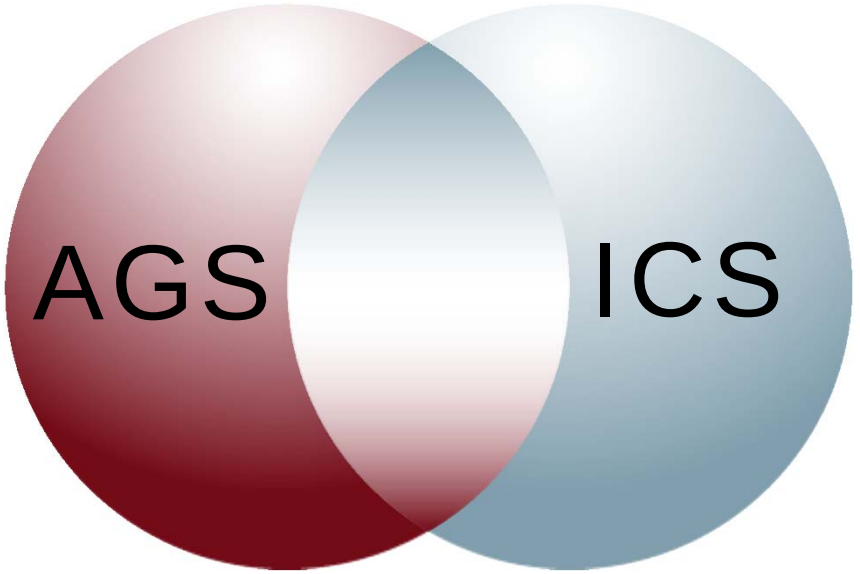
Approach: Community-focused analysis

Population: 4,164,000 (2010) → 6,368,000 (2040)

Current Cost Estimate: $7 Billion

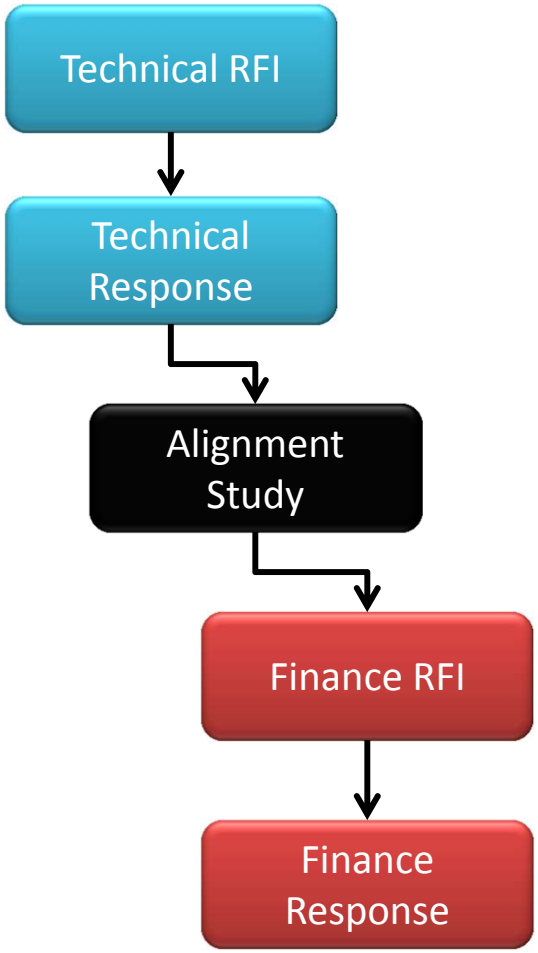
Study Approach

- Consistent Vision and Goals
- Consistent Criteria
- Common Methodologies:
  - Governance
  - Cost estimating
  - Ridership
  - Impact analyses
  - Financial strategies



AGS Industry Outreach Process

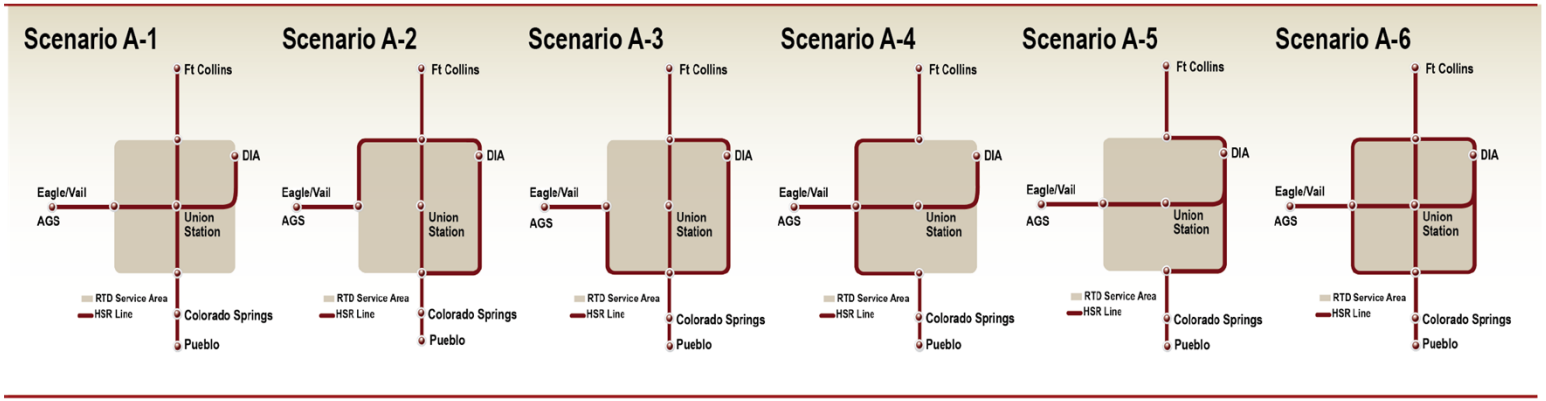
- Maximize Participation
  - Reduce cost to propose at this phase
  - Leave team formation open
- Separate Technology & Finance
  - Better responses
  - More responses
- Alignment/Technology Groupings
  - Within I-70, Outside I-70, Hybrid



AGS Performance & Operational Criteria

- Approximately 30 Criteria
- Key Criteria
  - 65 mph average between stations or better
  - Handle mountainous terrain & all weather conditions
  - Scalable for both peak periods and long-term
  - Reliable 98%, within ±5 minutes
  - Accommodate luggage and common outdoor gear
  - Design capacity of 4,900 persons/hour, per direction
  - Ultimate: DIA to EGE, Minimum: JeffCo to Summit
  - Minimum of 6 stations

System Connectivity



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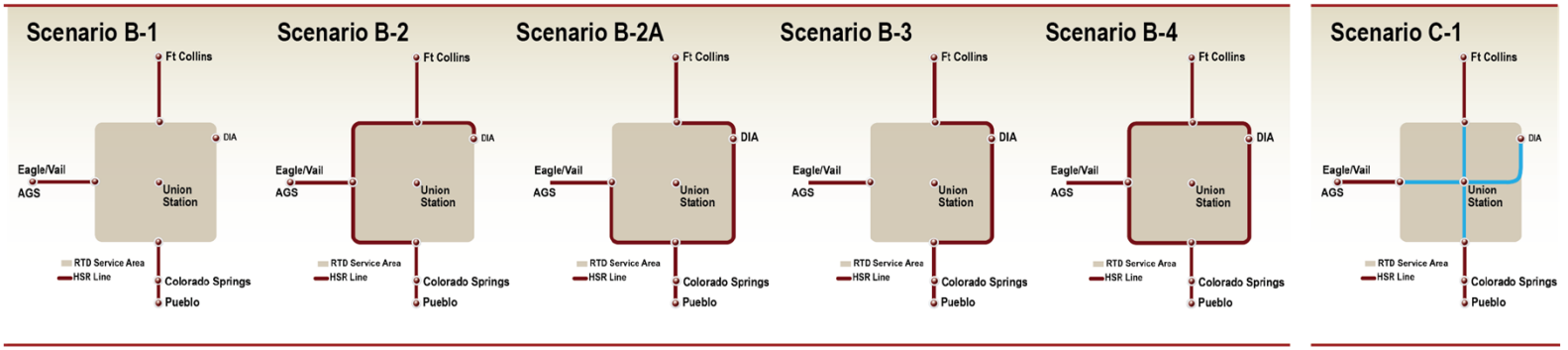

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Measuring Feasibility: B/C Ratio

- Benefits are expected to include the following:
  - Passenger revenue
  - Reductions in VMT
  - Reductions in highway delay
  - Reductions in accidents
  - Reductions in atmospheric pollution
  - Reductions in aviation delay (if any)
  - Reductions in highway investment requirements
  - Reductions in aviation investment requirements
  - Increases in property tax revenue around HSIPR stations (tax increment basis)
  - Increases in personal income from the construction and operation of the HSIPR system

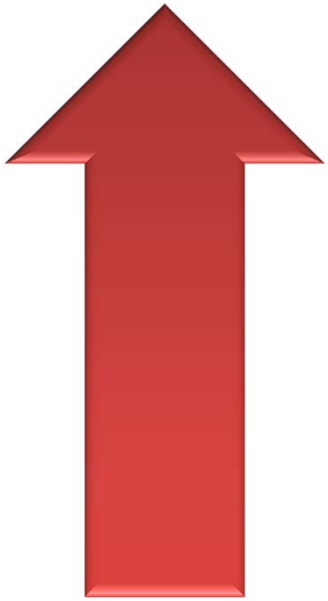
Measuring Feasibility: B/C Ratio

- Costs are expected to include the following:
  - All operating and maintenance costs (OPEX)
  - All capital costs, including right of way and soft costs (CAPEX)

- It is anticipated that the operating life assumed for the B/C studies will be 50 years; that long term interest for bonding will be assumed at 5 percent; and that inflation will average 3.5 percent per year, resulting in an "effective interest rate" of 1.5 percent. A sensitivity analysis will be provided to identify the risks associated with changes in the baseline conditions.

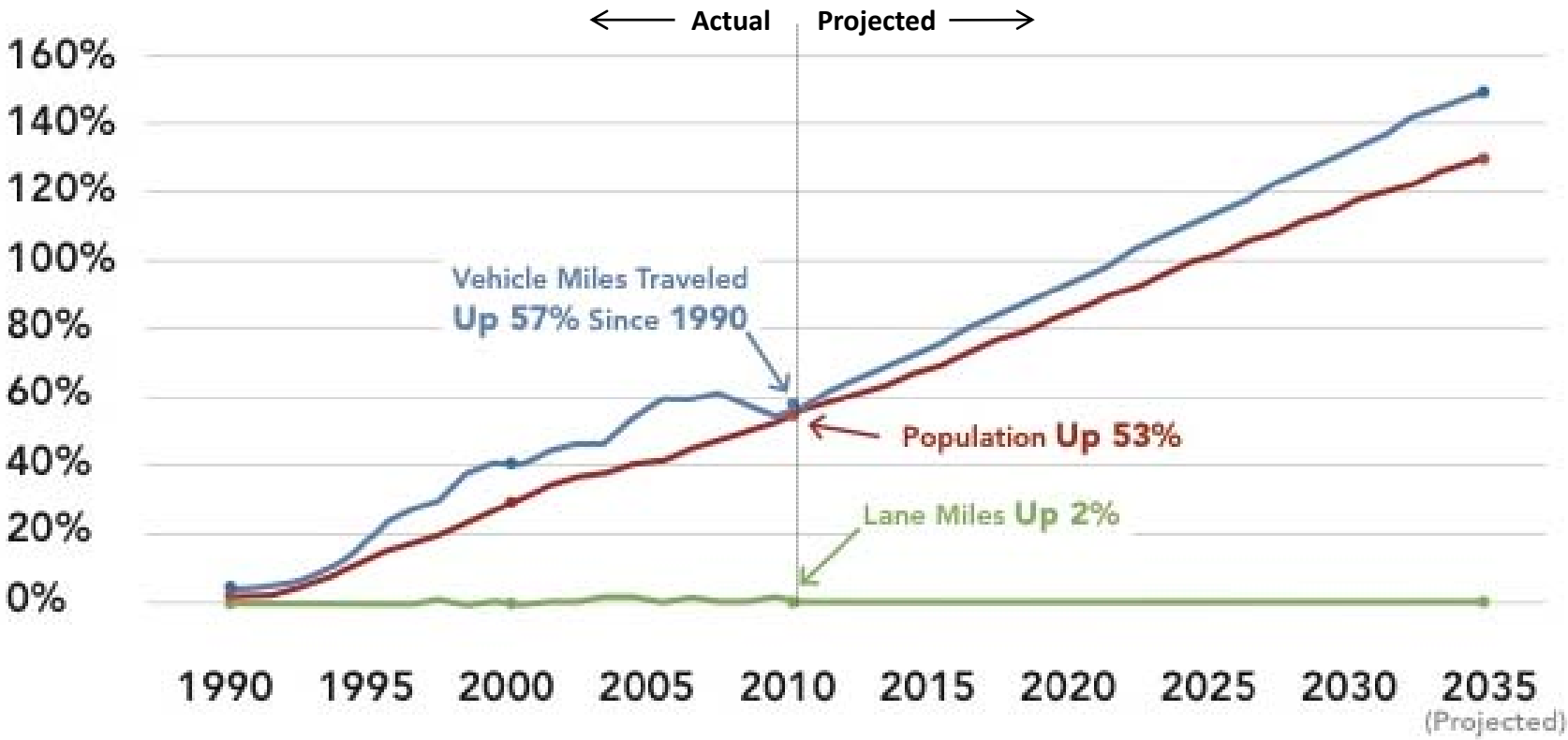
Drivers & Demand

- Statewide increase in population from 5 to 8 million (2010-2040)
  - Study area increase in population from 4.3 to 6.6 million (2010-2040)
  - 80% of the State's growth in the 16-county study area (25% of counties)
- I-70 Congestion will increase for winter & summer recreation
  - 1.5 to 3.5 hour delays now on most weekends
  - 3.5 to 5.5 hour delays by 2035
  - Tourism is Colorado's 2nd largest industry
- I-25 Congestion will increase for commuters
  - 0.5 to 1.0 hour delays now each direction AM/PM Peak
  - 1.5 to 2.0 hour delays by 2035 each direction
  - Loss of economic competitiveness, Increase in air pollution

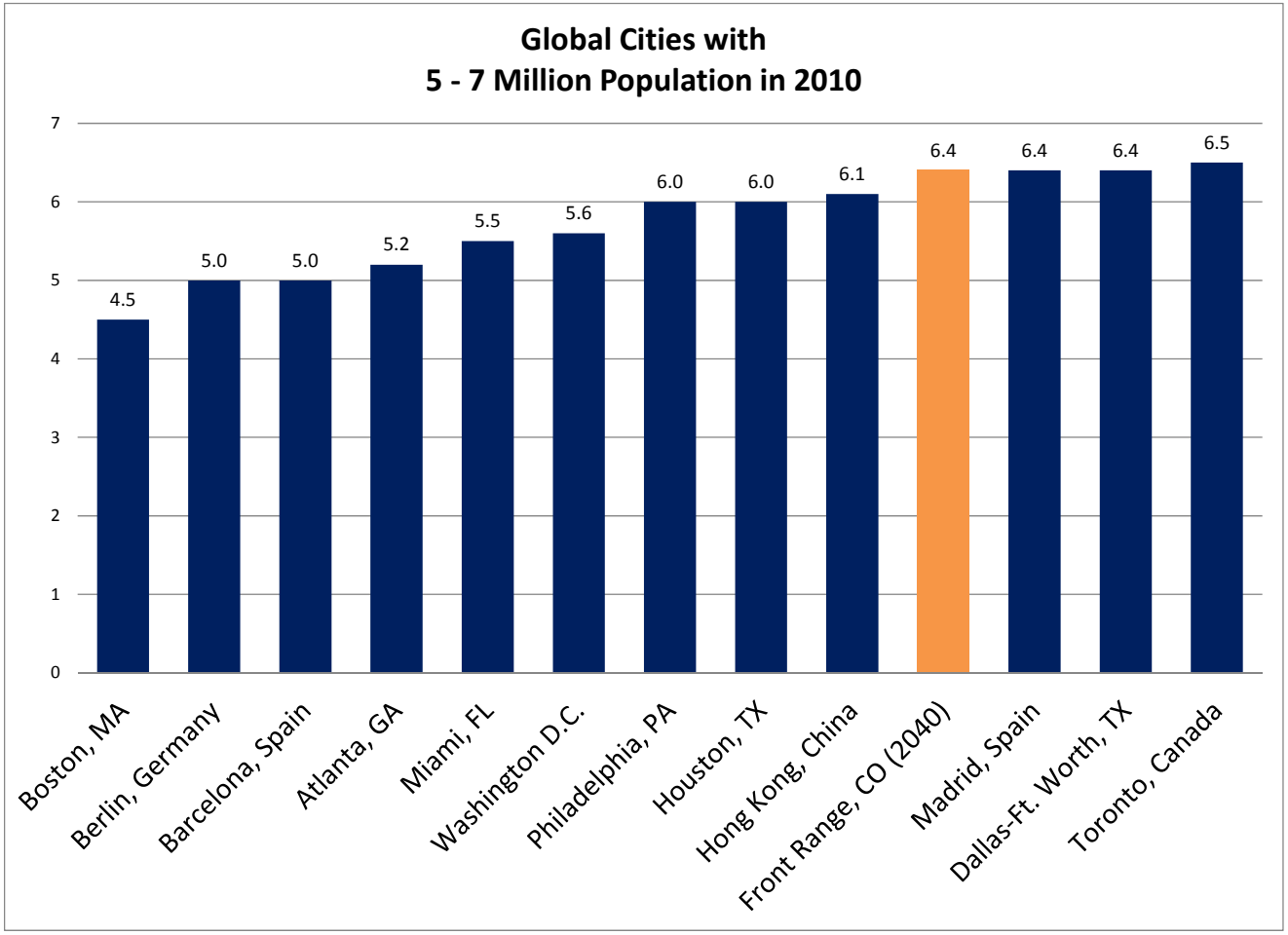


Drivers & Demand

Colorado Actual and Projected Growth: 1990–2035



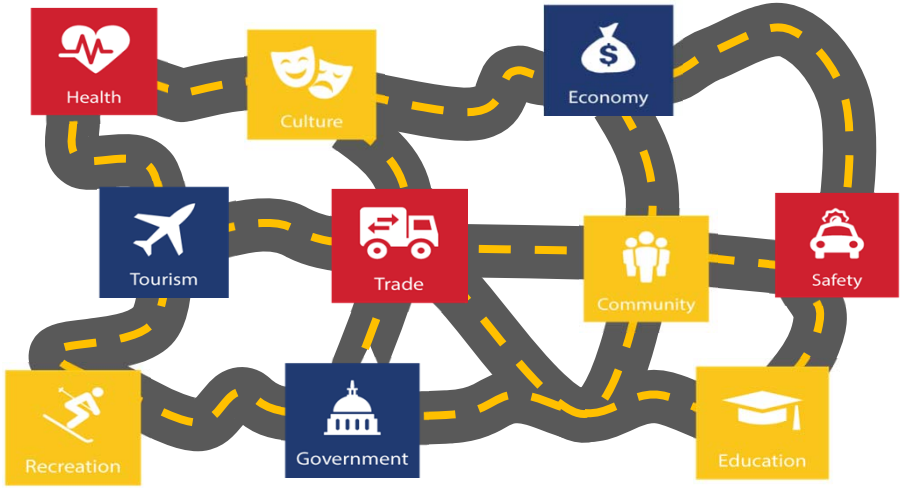
Drivers & Demand



Drivers & Demand

Drivers & Demand

- **I-70 Corridor**
  - 15 Years of Environmental Studies to reach current conclusion
  - Same conclusion in each phase of study: rapid inter-city transit must be part of this corridor's future
- **I-25 Corridor**
  - 9 Years of Environmental Studies to reach current conclusion
  - Consistent conclusion: rapid inter-city transit must be part of Colorado's future



Project Development Process

Project Phase	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Feasibility													
Environmental + Design													
Funding & Financing													
Bidding													
Constructing													

Station & Land Use Discussion

- I-70 AGS Corridor includes four counties: Jefferson, Clear Creek, Summit & Eagle

- Previous studies identified from 8 to 17 stations
- Must accommodate peak period demands of 4,900 passengers per hour in the peak direction by 2035

What does this look like?

Stations & Land Use Discussion

Not likely this idyllic…

But not quite this big either.

Station Area Considerations

Table 1
Station Area Implications of Design Capacity

Persons per Hour	Persons per Car	Cars per Hour	Trains per Hour	Cars per Train	Length per Car (feet)	Total Train Length (feet)
			85 Persons per Car			
4,900	85	58	10-minute frequencies / 6 per hour	10	x 100 ft/car	1,000
4,900	85	58	15-minute frequencies / 4 per hour	15	x 100 ft/car	1,500
			100 Persons per Car			
4,900	100	49	10-minute frequencies / 6 per hour	9	x 100 ft/car	900
4,900	100	49	15-minute frequencies / 4 per hour	13	x 100 ft/car	1,300

Source: CDOT Division of Transit & Rail, 2012.

Station Area Considerations

Stations & Land Use Discussion

- Think through all the elements:
  - Platform, track & waiting areas
  - Traffic circulation
  - Feeder bus circulation/interface
  - Drop-off (Kiss-and-ride)
  - Bike/ped connections
  - Parking: car & bike
  - Baggage accommodation
  - Landscaping
  - Storm water
  - Electrical Power
  - Adjacent uses

Station Area Considerations

Land Use Considerations

- Existing/Potential Use
- Property Availability
- Ownership
- Growth Potential
- Community Character
- Development Rights

Contact Information

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