

Presentation To  
**Rocky Mountain  
Rail Authority (RMRA)**

Transportation Economics & Management Systems, Inc.  
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**PROPOSAL  
SUBMITTED TO  
ROCKY MOUNTAIN  
RAIL AUTHORITY**

**MARCH 21, 2008**

**Data Collection Update**

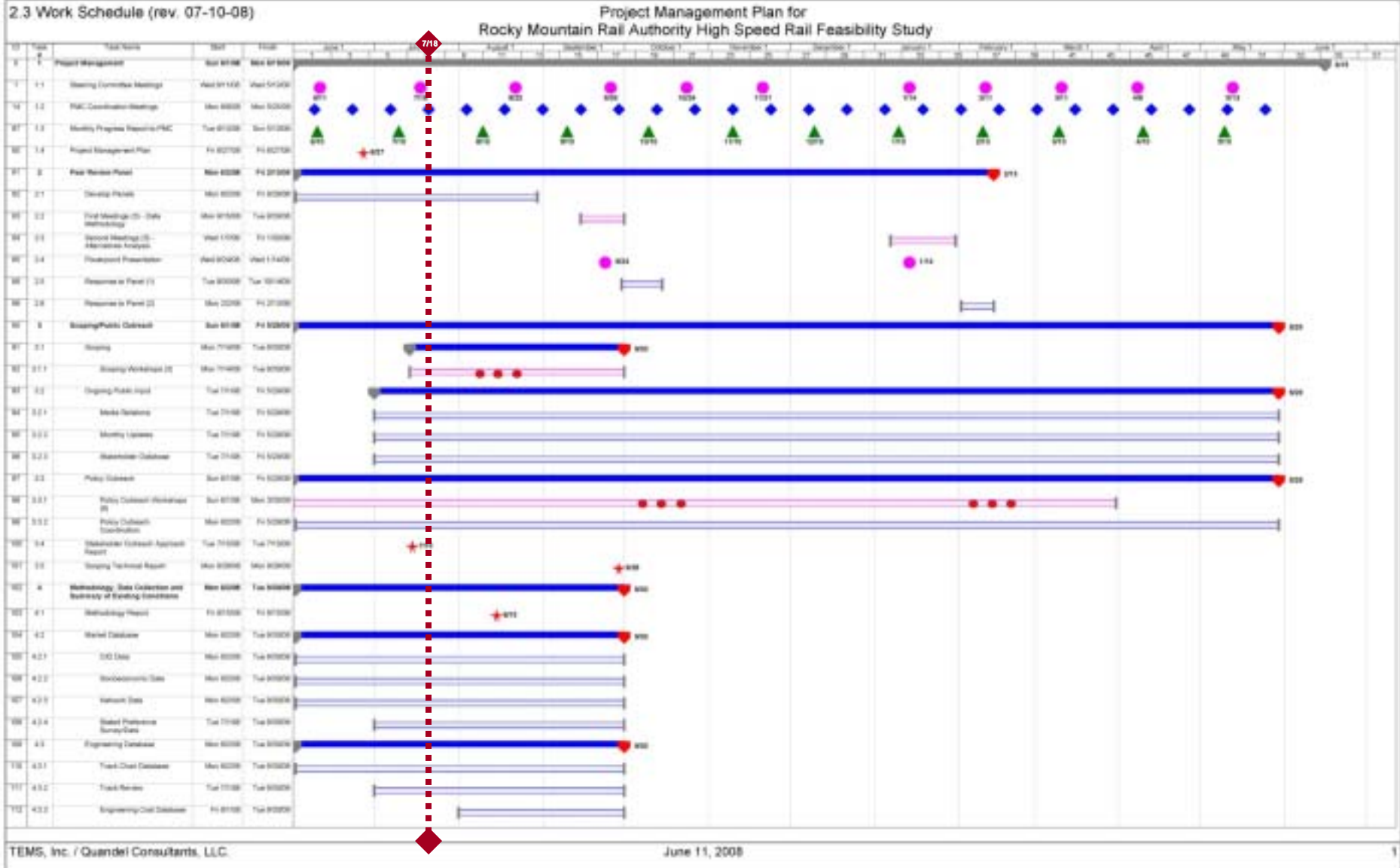
**July 18, 2008**

**CONSULTANT SERVICES FOR  
HIGH SPEED RAIL FEASIBILITY STUDY**



SUBMITTED BY  
**TEMS**  
Transportation Economics & Management Systems, Inc.  
in association with  
Quandel Consultants, LLC

# Study Work Schedule: Tasks 1 thru 4.3.3



# Study Work Schedule: Tasks 4.4 thru 8.4

2.3 Work Schedule (rev. 07-10-08)

Project Management Plan for  
Rocky Mountain Rail Authority High Speed Rail Feasibility Study



TEMS, Inc. / Quandel Consultants, LLC

June 11, 2008

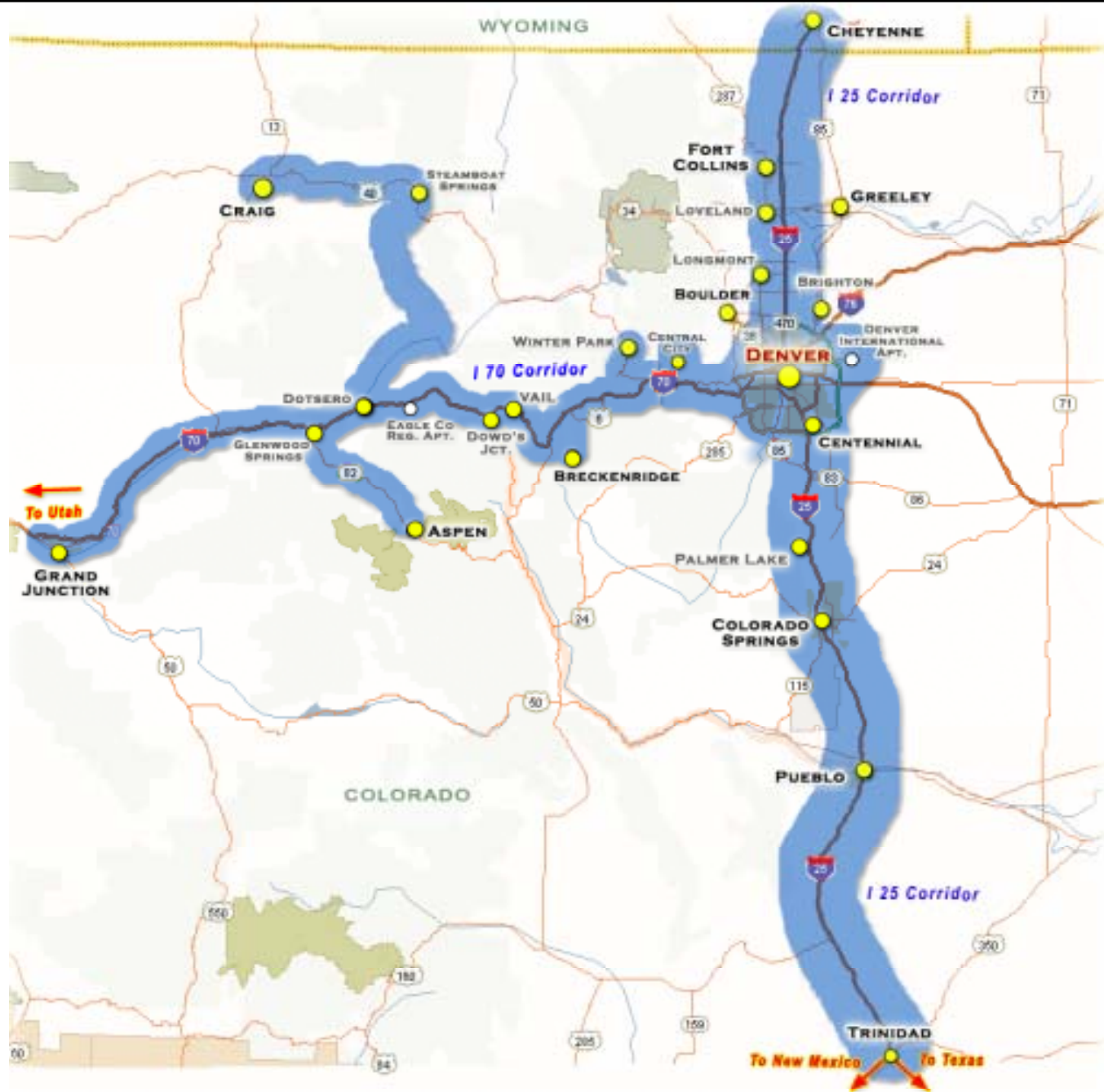
2

# Study Team Coordination

A high-speed train, likely a Shinkansen, is shown at a station platform. The train is white with a red stripe and is moving towards the right. The platform is visible on the right side, with some people walking. The background shows the station's glass and steel structure.

- **I-70 Coalition**
- **CDOT**
- **Freight Railroads**
- **MPOs**
- **RTD FasTracks**
- **Corridor Workshops**

# Study Area

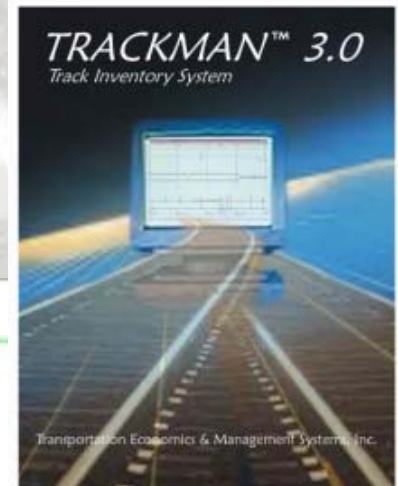
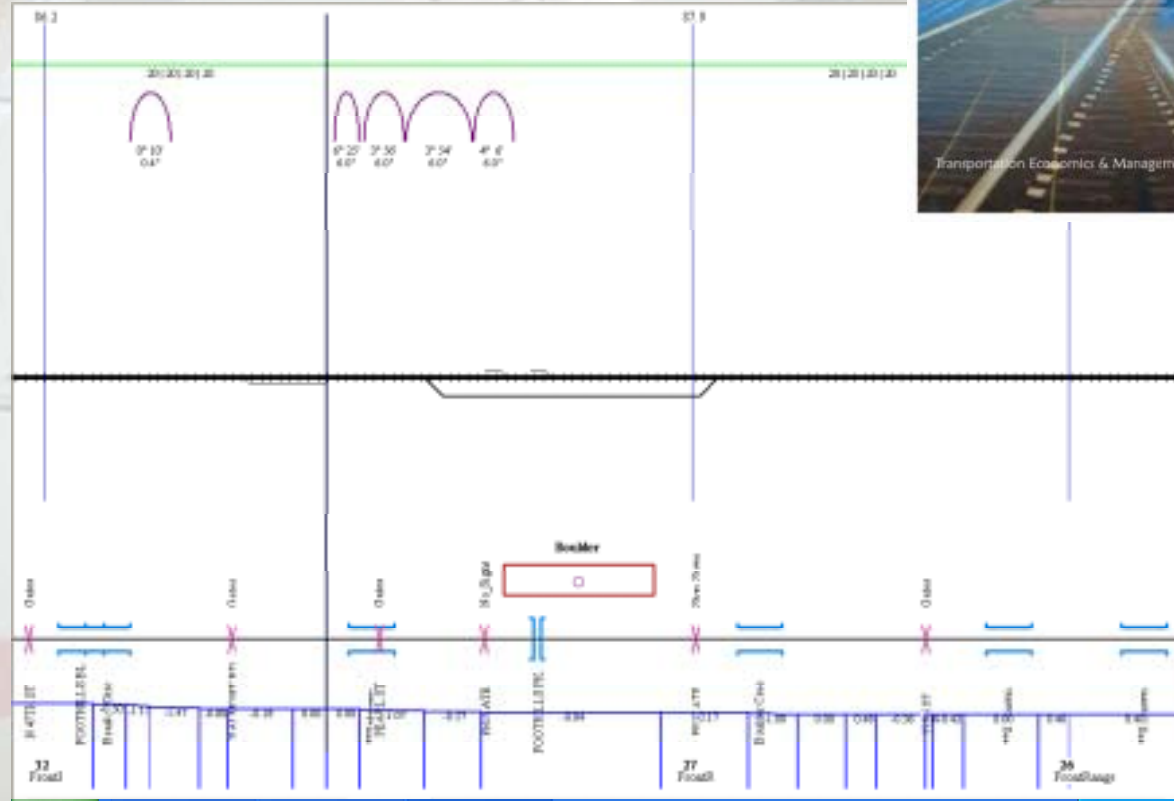


# TRACKMAN™ Database Development

**Key inputs: Speeds, curves, grades, rail and highway crossings, and other potential speed restrictions such as moveable bridges**

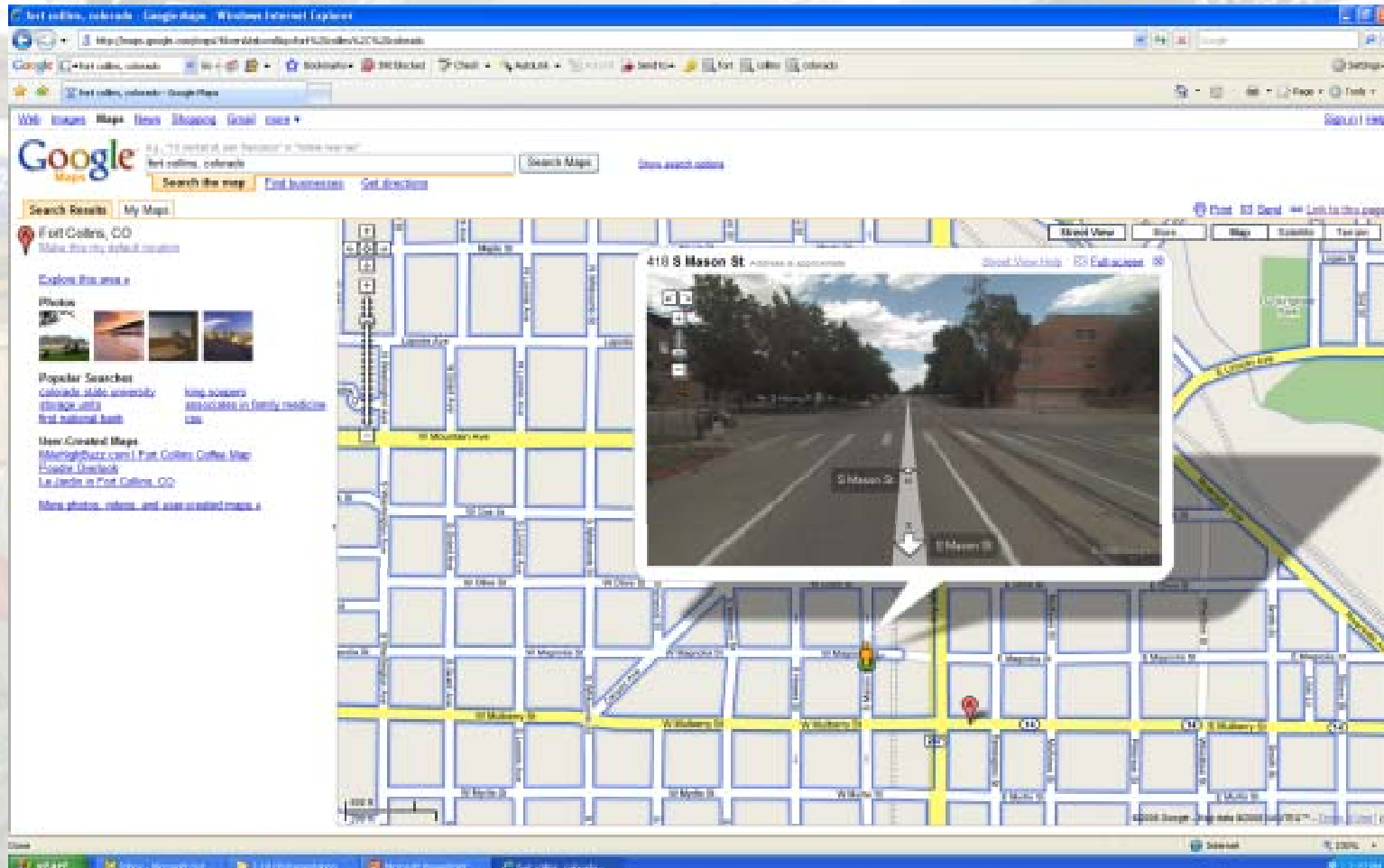
**All the data is being captured in a consistent computerized format, to facilitate train performance and cost evaluation**

*Sample Denver Data*



# Track Chart Verification

- TEMS initial update TRACKMAN™ based on Railroad Track Charts, FRA grade crossing database, and satellite imagery.



# Engineering Cost Development

- **Field Survey to Verify Existing Conditions and Update TRACKMAN™ Track Chart Data Base**
- **Unit Cost Adjustment to Local Conditions**
- **Cost Estimates will be Developed for New Alignments, Speed Improvements and Line Capacity Upgrades**
- **Cost Development Supported by TRACKMAN™ Upgrade Module**



# Incremental Rail: Equipment Options- (maximum operating speeds)

**79-mph**

**Conventional Amtrak**



**110-130 mph**

**Talgo T21**



# New Alignment: Equipment Options- (maximum operating speeds)

**150-185 mph**

**Siemens ICE**

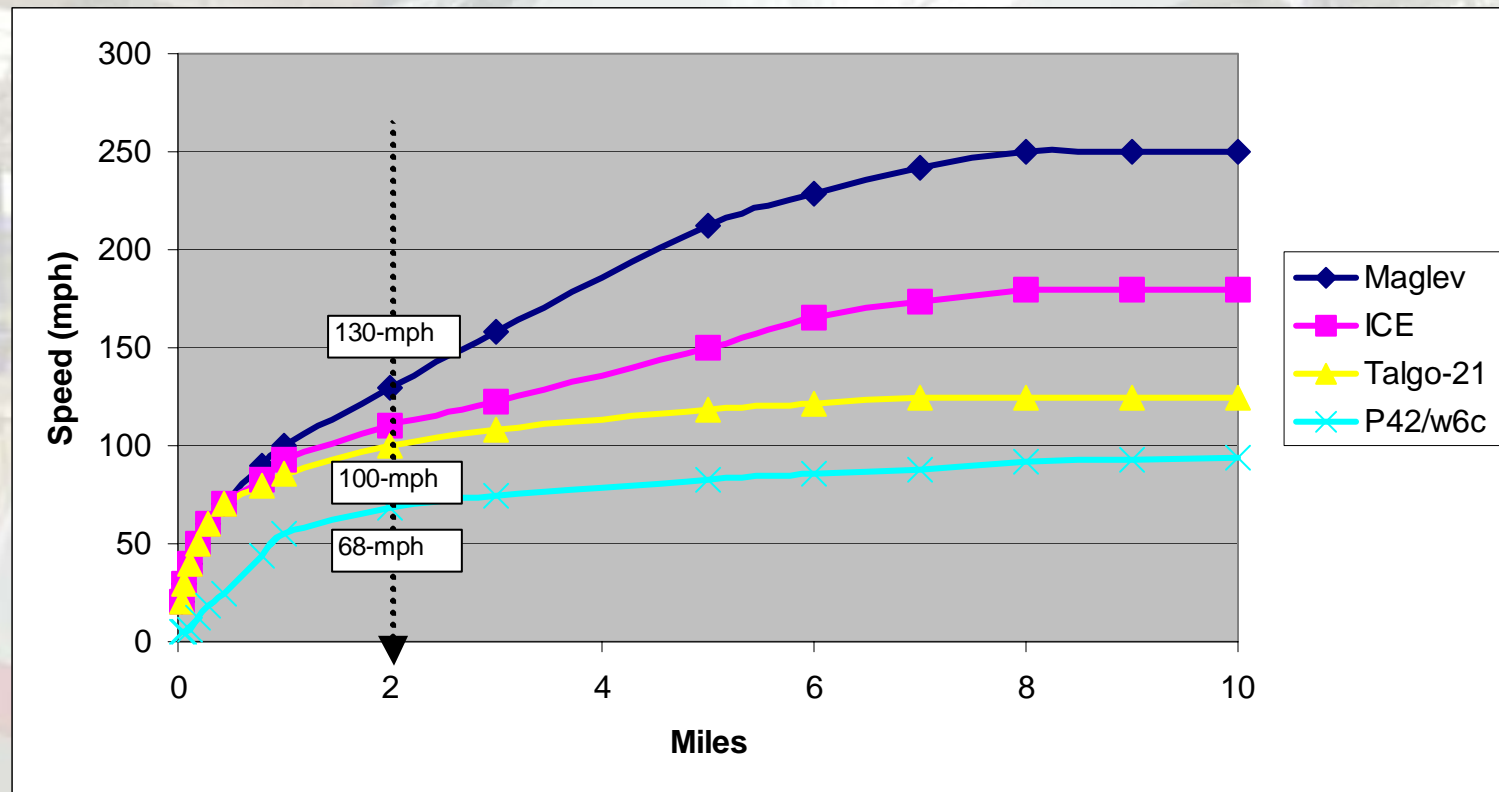


**250-mph**

**Transrapid Maglev**

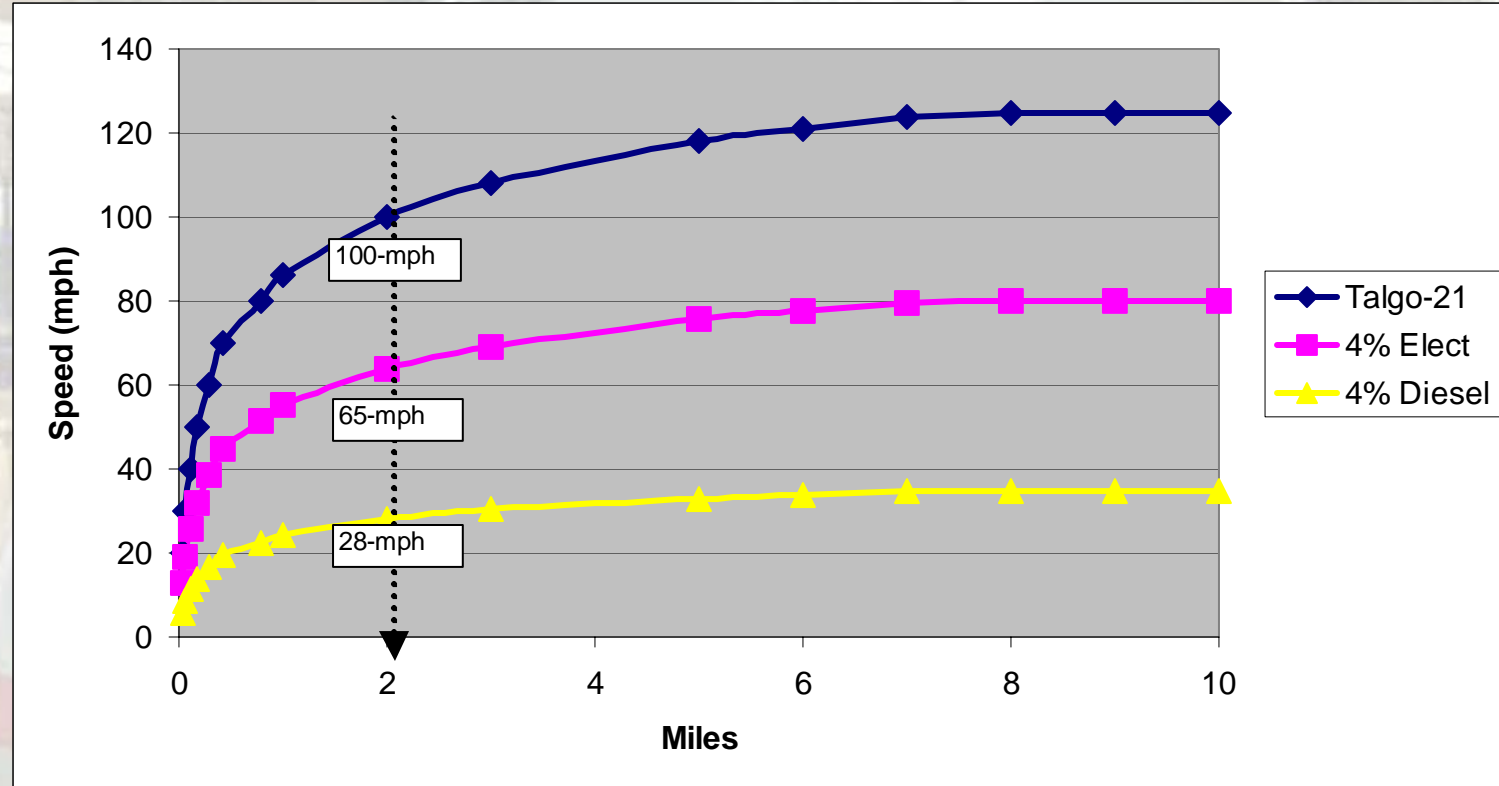


# Incremental Rail: Train Performance Curves\*



\*On Straight-and-Level Track. Achievable speed is also limited by infrastructure restrictions, which forms a key part of the Interactive Analysis.

# Incremental Rail: Train Performance Curves\*



\* On Straight-and-Level Track versus 4% Uphill Grade

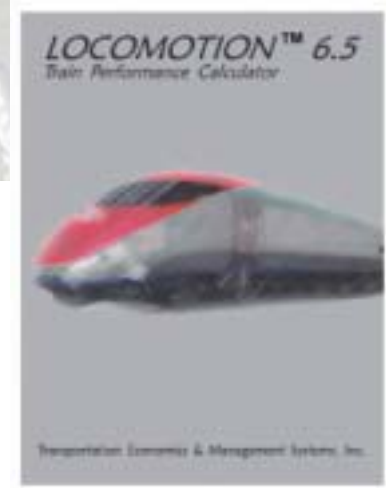
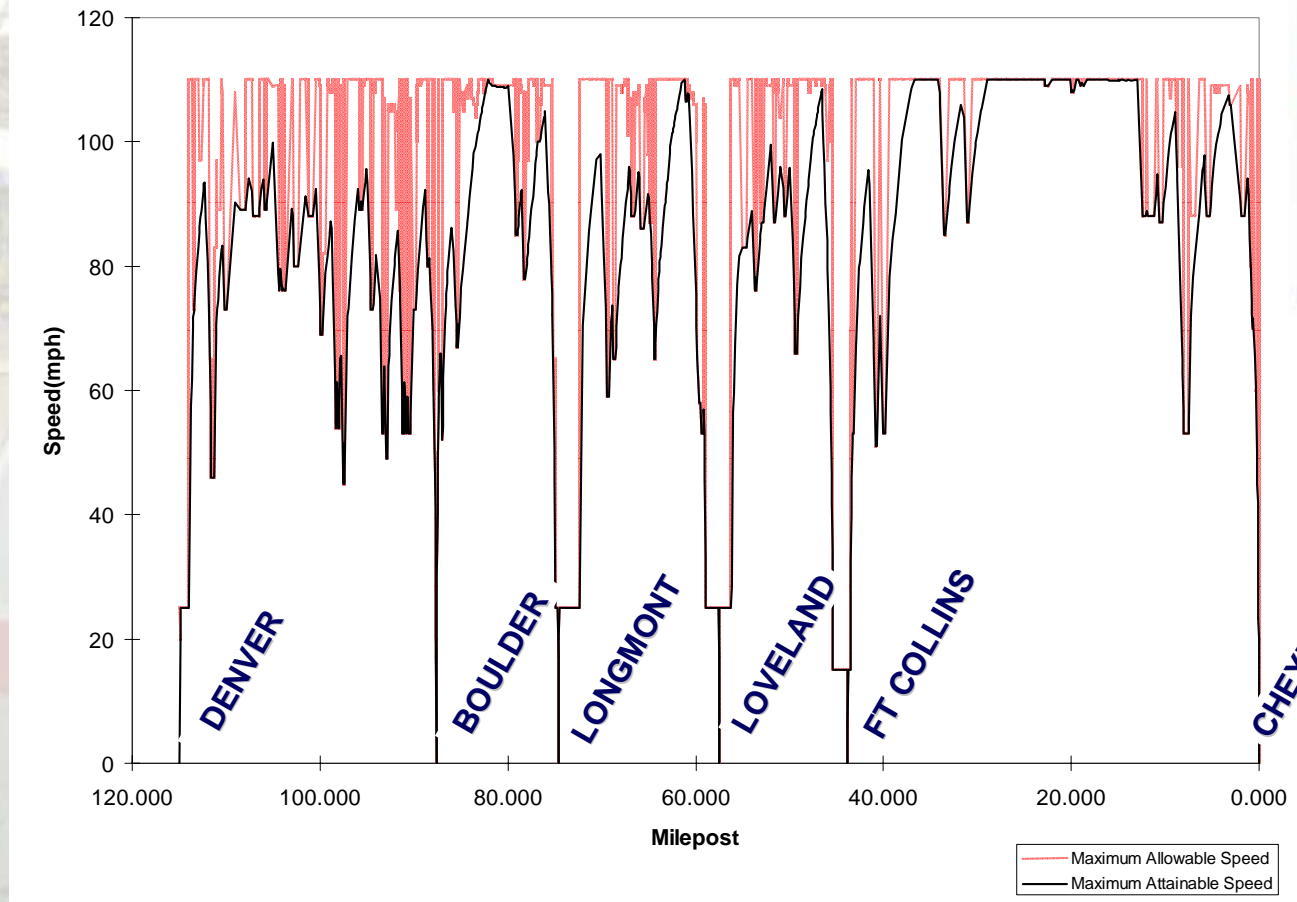
# Case Study: UP vs. BNSF Northern Options



# Train Performance Evaluation

("First Cut" and Preliminary)

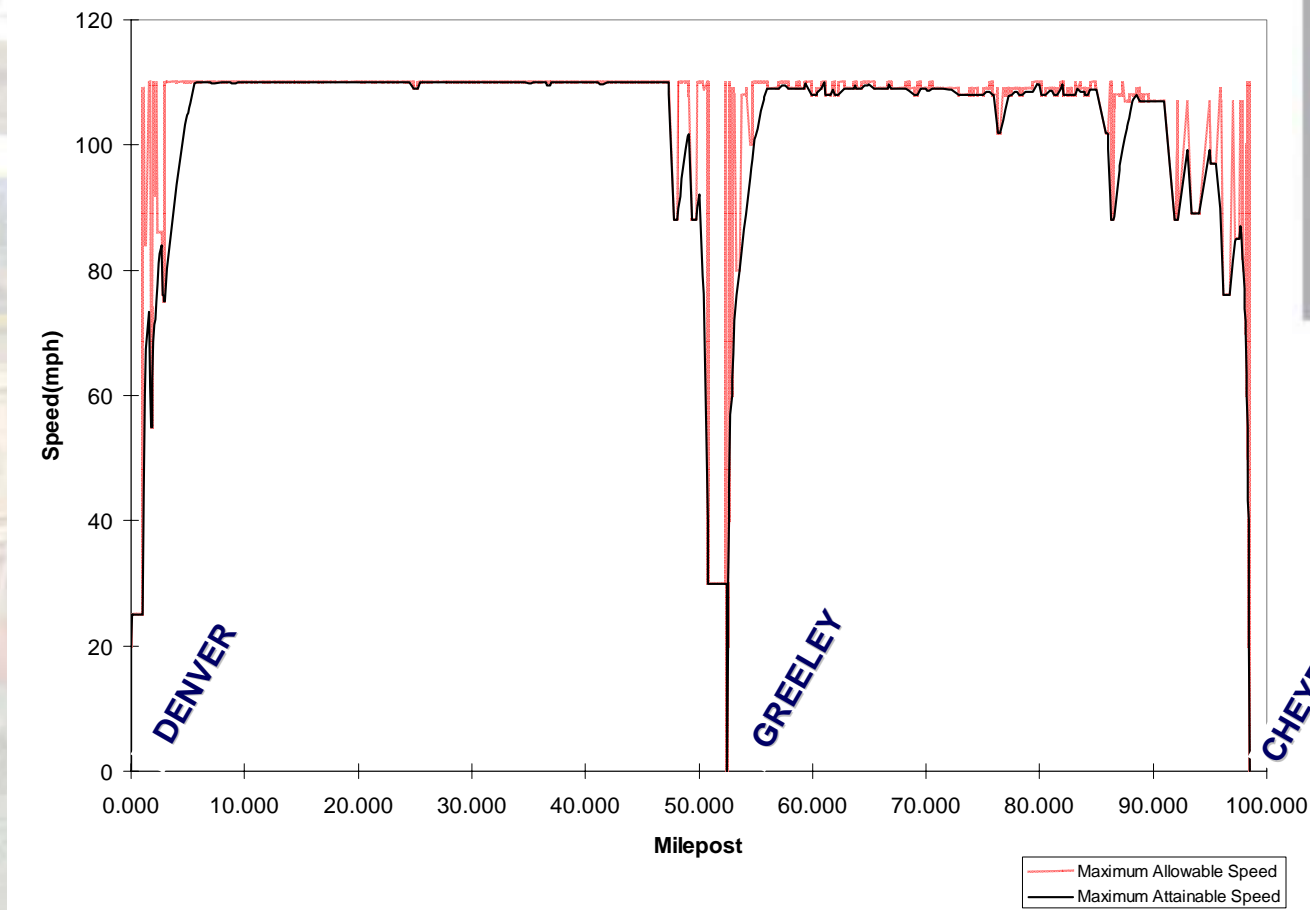
*Speed Profile - BNSF Line*  
*115 miles - 1:48 Running Time*



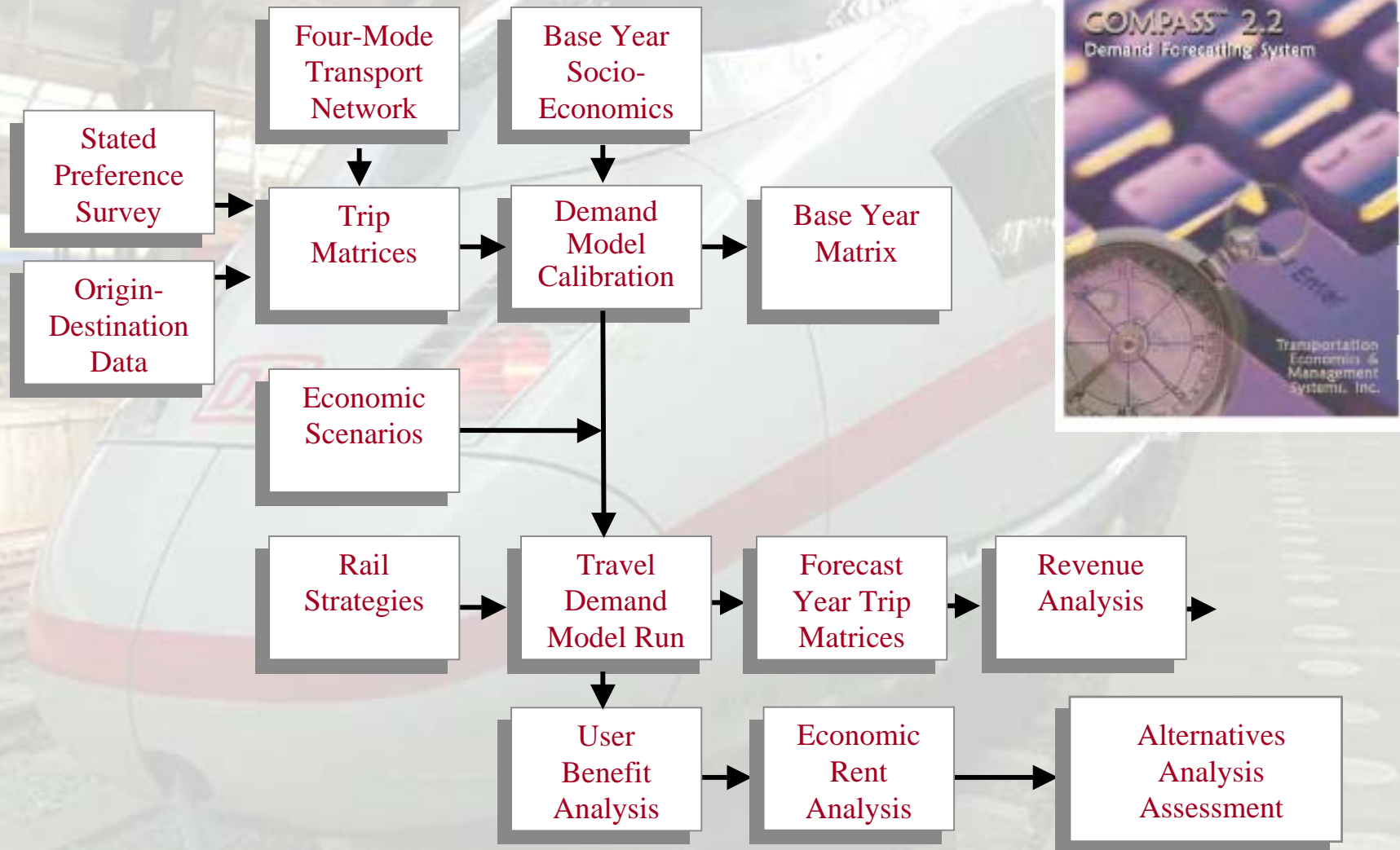
# Train Performance Evaluation

("First Cut" and Preliminary)

Speed Profile - UP Line  
98 miles - 1:05 Running Time

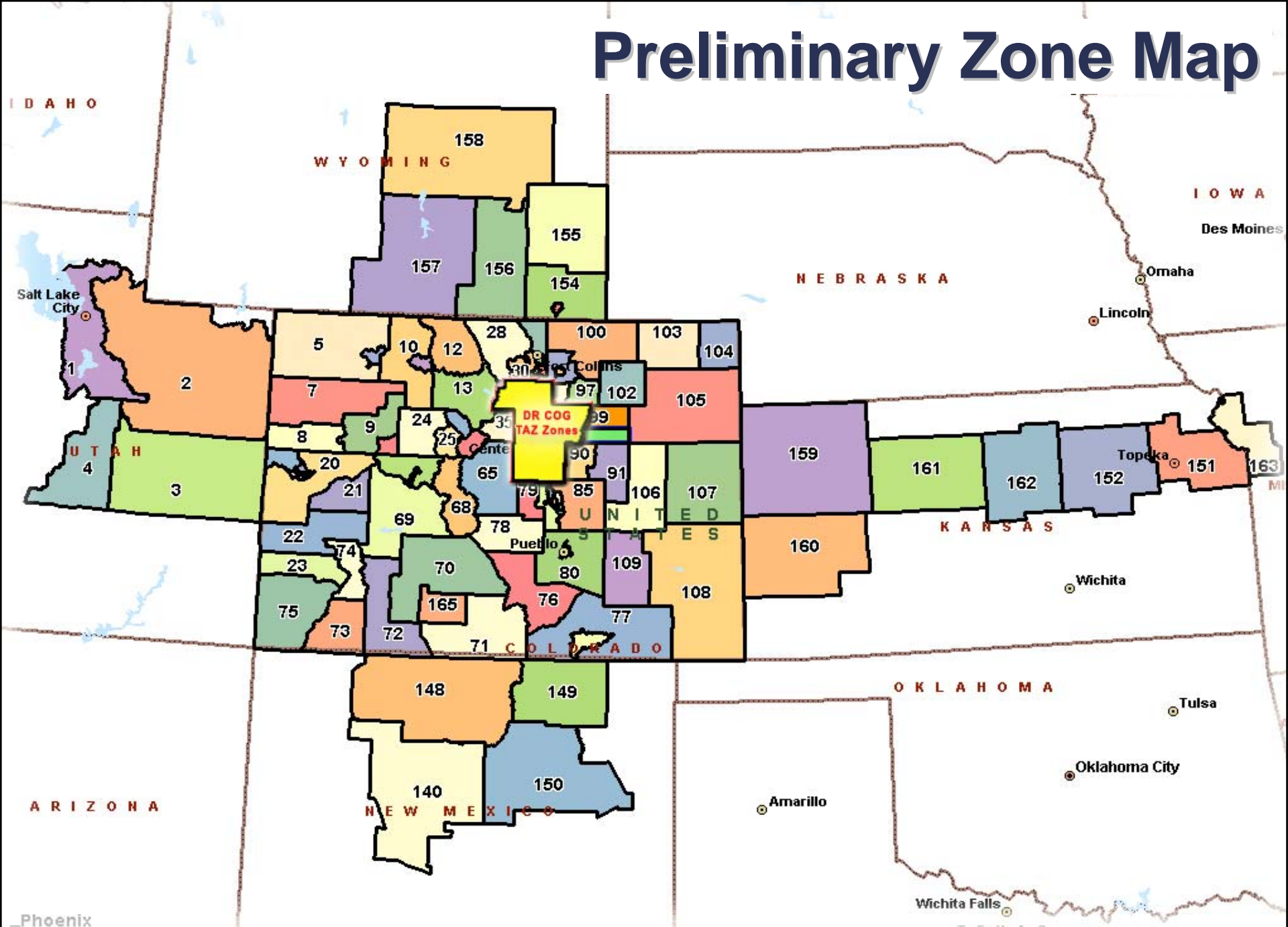


# COMPASS™ Model Structure

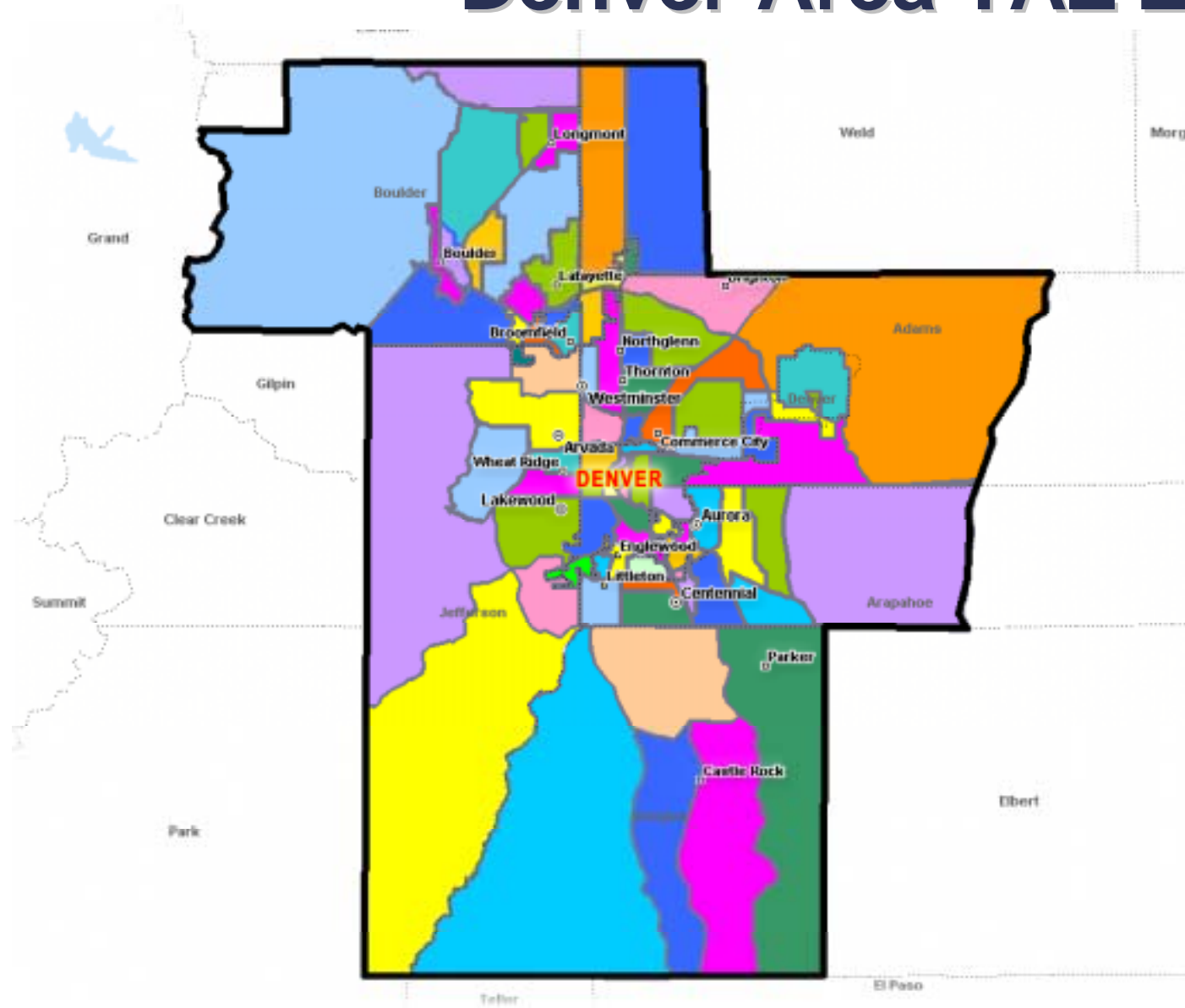




# Preliminary Zone Map

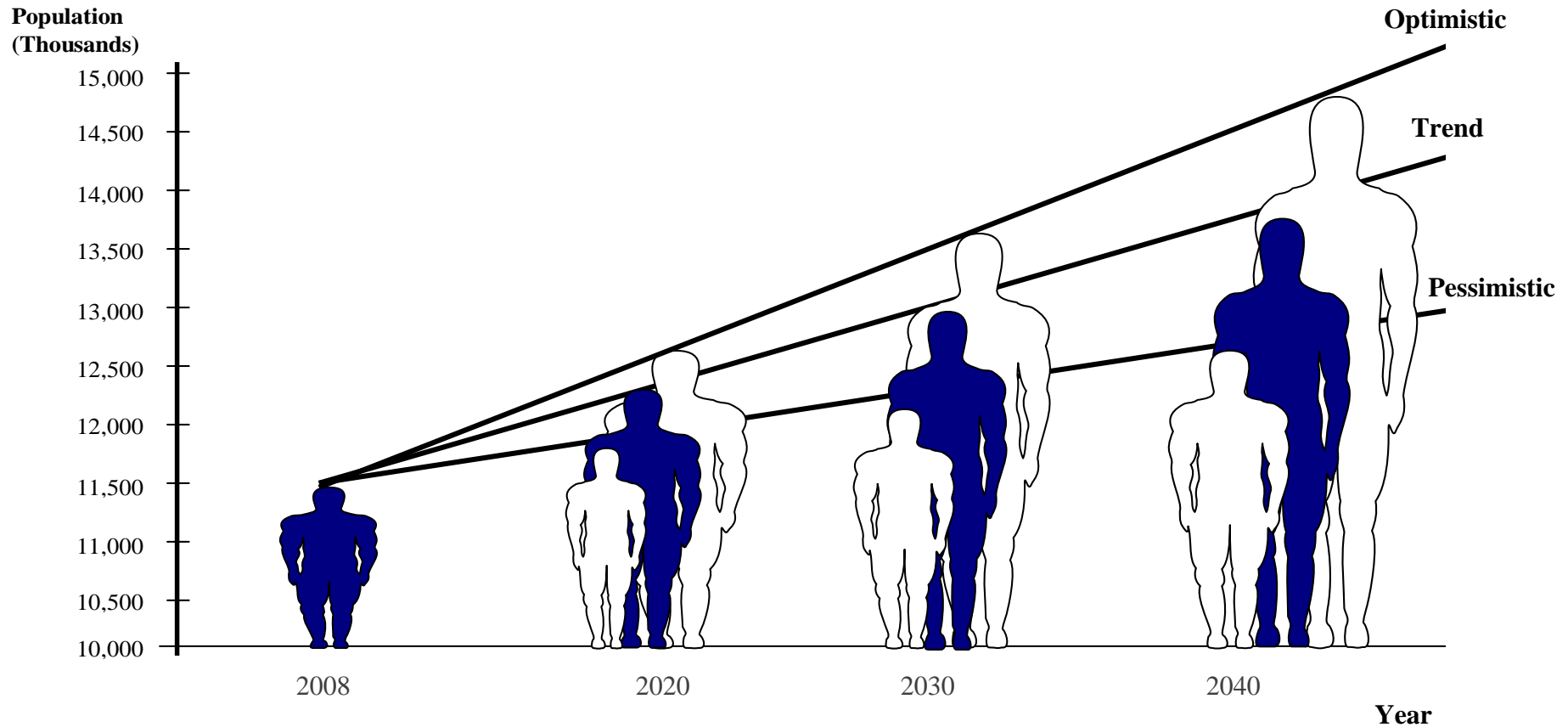


# Denver Area TAZ Zones



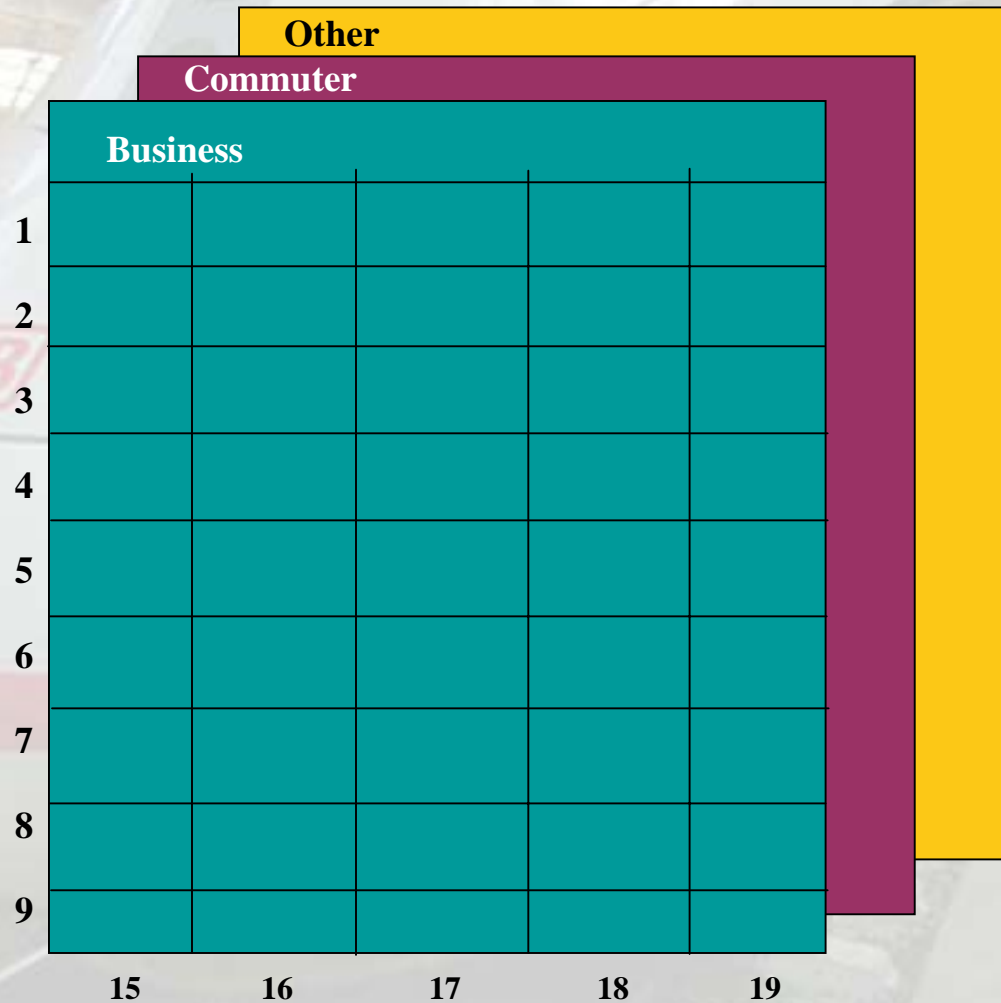
# Socioeconomic Projections

## Population/Employment/Income



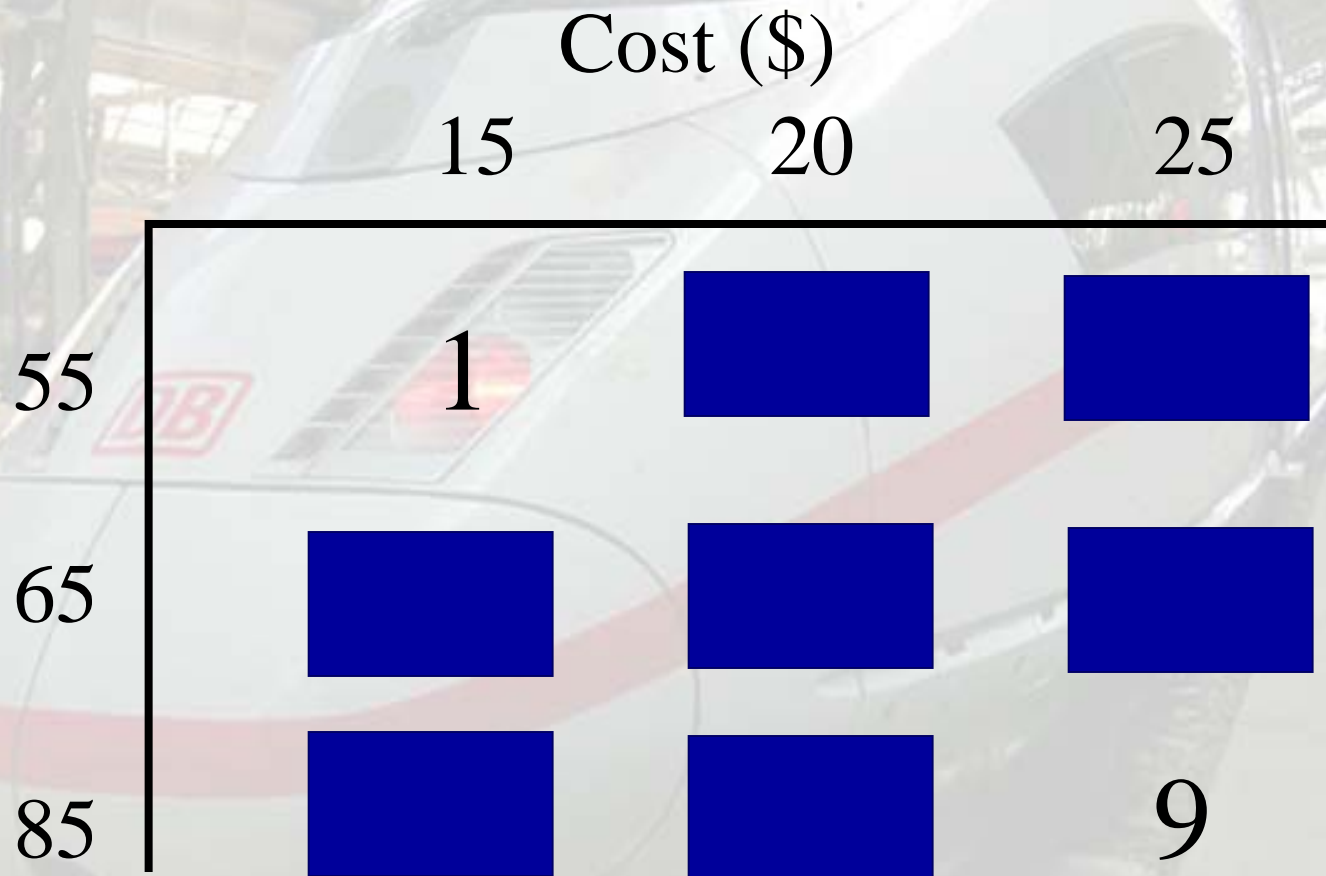
# RMRA Feasibility Study

## Sample Trip O/D Matrix



**CDOT  
and  
MPO Input**

# Trade-Off Analysis



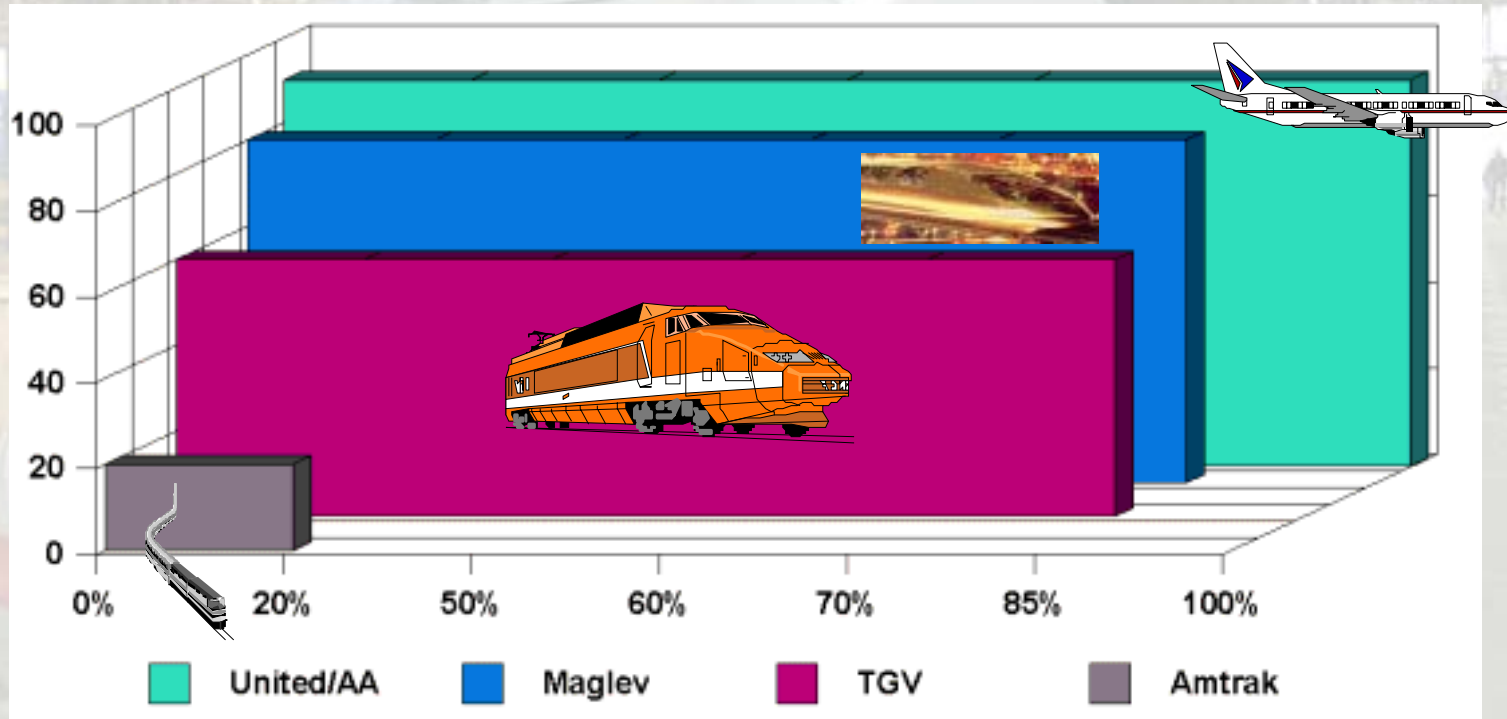
# Networks: Generalized Cost Components

	Public Modes	Auto
<b>Time</b>	In-vehicle Time Access/Egress Time Number of Interchanges Connection Wait Times Terminal Wait Times	Travel Time
<b>Costs</b>	Fare Access/Egress Costs	Operating Costs Tolls Parking (all divided by occupancy)
<b>Reliability</b>	On Time Performance	
<b>Schedule</b>	Frequency of Service Convenience of Times	

# Raising the Standard: Customer Services



# Association of Mode and Rider Bias





# Stated Preference Survey (example #1)

**Province of Alberta – Travel Survey**

**Dear Respondent:**  
 This survey is part of a transportation study conducted by Alberta Infrastructure and Transportation in order to better understand and serve travel needs for the Province of Alberta. Please take a few minutes to answer the questions on this form and return it to our representatives. The information you provide will be kept strictly confidential. Thank you for your cooperation.

- Please describe a recent weekday trip you have made using Highway 2:  
 Origin (City): \_\_\_\_\_ Postal Code \_\_\_\_\_  
 Destination (City): \_\_\_\_\_ Postal Code \_\_\_\_\_  
 What is the city and state/province of your primary residence? \_\_\_\_\_
- Please specify the number of people in the vehicle for this trip, including you. \_\_\_\_\_
- How frequently do you travel on Highway 2? (Check one box)  
 3 times or more per week     Twice a month     Less than once a month  
 Once a week     Once a month
- How did you complete this trip? (Check one box)  
 Drove directly from home or work to the destination and parked  
 Joined a carpool/ vanpool at a park-and-ride facility  
 Drove to a bus/train station or parking lot and completed the trip on transit  
 Other (specify): \_\_\_\_\_
- What was the primary purpose of your trip? (Check one box)  
 Business     Commute to/from work  
 Personal Business     Attend school/college  
 Recreation/Vacation     Attend special social event  
 Visit friends or relatives     Other \_\_\_\_\_
- What is your employment status? (Check one box)  
 Employed full-time     Employed part-time     Other \_\_\_\_\_
- The combined annual income of everyone in your household is:  
 Less than \$30,000     \$30,000 to \$50,000  
 \$50,000 to \$100,000     \$100,000 or more

## How much do you value your time when traveling?

The following questions about a hypothetical trip (between, for example, Calgary and Edmonton) will help us understand your travel choices. Option A on the left-hand side presents one method to reach the destination for a given cost and time, while Option B presents trade-offs in cost and time. As shown in the example, please indicate for each pair of choices the degree to which you prefer Alternative A or Alternative B.

Cost is the cost of a one-way trip, including gasoline, parking and any other fee you may incur. Time is the total travel time to get to your trip destination, including getting to your vehicle, etc.

Option A (Cost/Time)	Prefer a lot    Prefer a little    No Preference    Prefer a little    Prefer a lot 	Option B (Cost/Time)	
\$45 3 hrs		\$35 5 hrs	\$10 less 2hrs more
\$45 3 hrs		\$37 4 hrs	\$8 less 1 hr more
\$45 3 hrs		\$51 2½ hrs	\$6 more ½ hr less
\$45 3 hrs		\$57 2hrs 15mins	\$12 more 45mins less
\$45 3 hrs		\$65 2 hrs	\$20 more 1hr less

Thank you! Your participation in this survey is greatly appreciated.

# Stated Preference Survey (example #2)

## Transportation Survey Questionnaire – Visitors/Tourists

Dear Respondent:

This survey is part of a transportation study, being conducted for the Maryland Transportation Authority. This effort is designed to assist in improving travel conditions in Maryland. Please take a few minutes to answer the questions on this form. The information you provide will be kept strictly confidential. Thank you for your cooperation.

### General Information

1. Are you here on a vacation?  
Yes   
No   
If yes, how long are you here for a vacation?
  - a. For a day
  - b. For a weekend
  - c. Longer than a weekend
2. What is the Zip code of your origin? \_\_\_\_\_
3. Could you describe your trip route?
  - a. Drove along route 50
  - b. Drove along route 1
  - c. Drove along route 113
  - d. Drove along some other route
4. Did you experience any congestion?
  - a. Yes  If yes, for how long? \_\_\_\_\_
  - b. No
5. Could you give us the location where you experienced congestion? \_\_\_\_\_
6. Did you depart for this trip at a different time than your "ideal" time?  
Yes  If yes, by how much time? \_\_\_\_\_ No
7. Did you begin this trip...
  - a. early morning (before 8am)
  - b. mid-morning (8-11am)
  - c. noon (11am-1pm)
  - d. early afternoon (1pm-3pm)
  - e. mid-afternoon (3pm-6pm)
  - f. evening (after 6pm)
8. If you had the option of changing your departure time beforehand, then how would you have changed it?
  - a. Earlier than your scheduled departure  If yes, how early? \_\_\_\_\_
  - b. Later than your scheduled departure  If yes, how late? \_\_\_\_\_
  - c. Cannot change your departure time
9. How many times do you make this trip in one year \_\_\_\_\_

# Rating your travel time and cost preferences?

<p>Alternative A</p> <p>Cost: \$40 Time: 4 hrs</p>	<p>Prefer a lot    Prefer a little    No Preference    Prefer A little    Prefer A lot</p>	<p>Alternative B</p> <p>Cost: \$42 Time: 3½ hrs</p> <p><b>\$2 more ½ hour less</b></p>
<p>Alternative A</p> <p>Cost: \$40 Time: 4 hrs</p>	<p>Prefer a lot    Prefer a little    No Preference    Prefer A little    Prefer A lot</p>	<p>Alternative B</p> <p>Cost: \$46 Time: 3 hrs</p> <p><b>\$6 more 1 hour less</b></p>
<p>Alternative A</p> <p>Cost: \$40 Time: 4 hrs</p>	<p>Prefer a lot    Prefer a little    No Preference    Prefer A little    Prefer A lot</p>	<p>Alternative B</p> <p>Cost: \$52 Time: 2½ hrs</p> <p><b>\$12more 1½ hour less</b></p>
<p>Alternative A</p> <p>Cost: \$40 Time: 4 hrs</p>	<p>Prefer a lot    Prefer a little    No Preference    Prefer A little    Prefer A lot</p>	<p>Alternative B</p> <p>Cost: \$60 Time: 2 hrs</p> <p><b>\$20more 2 hours less</b></p>

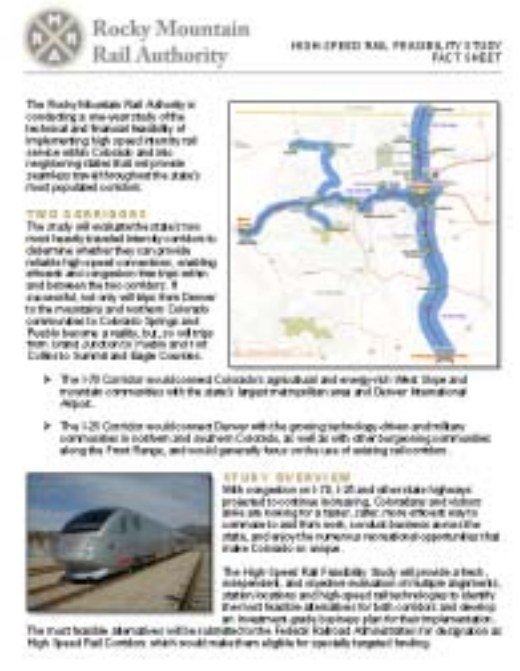
# Public Involvement Highlights

## Activity Since June 27

- **Project Overview Fact Sheet**
  - Core Messages
- **Stakeholder Outreach Approach Report**

## Upcoming Efforts

- **Statewide media launch**
- **Organize County Based Input Teams**
- **Launch Community Partnership Program**

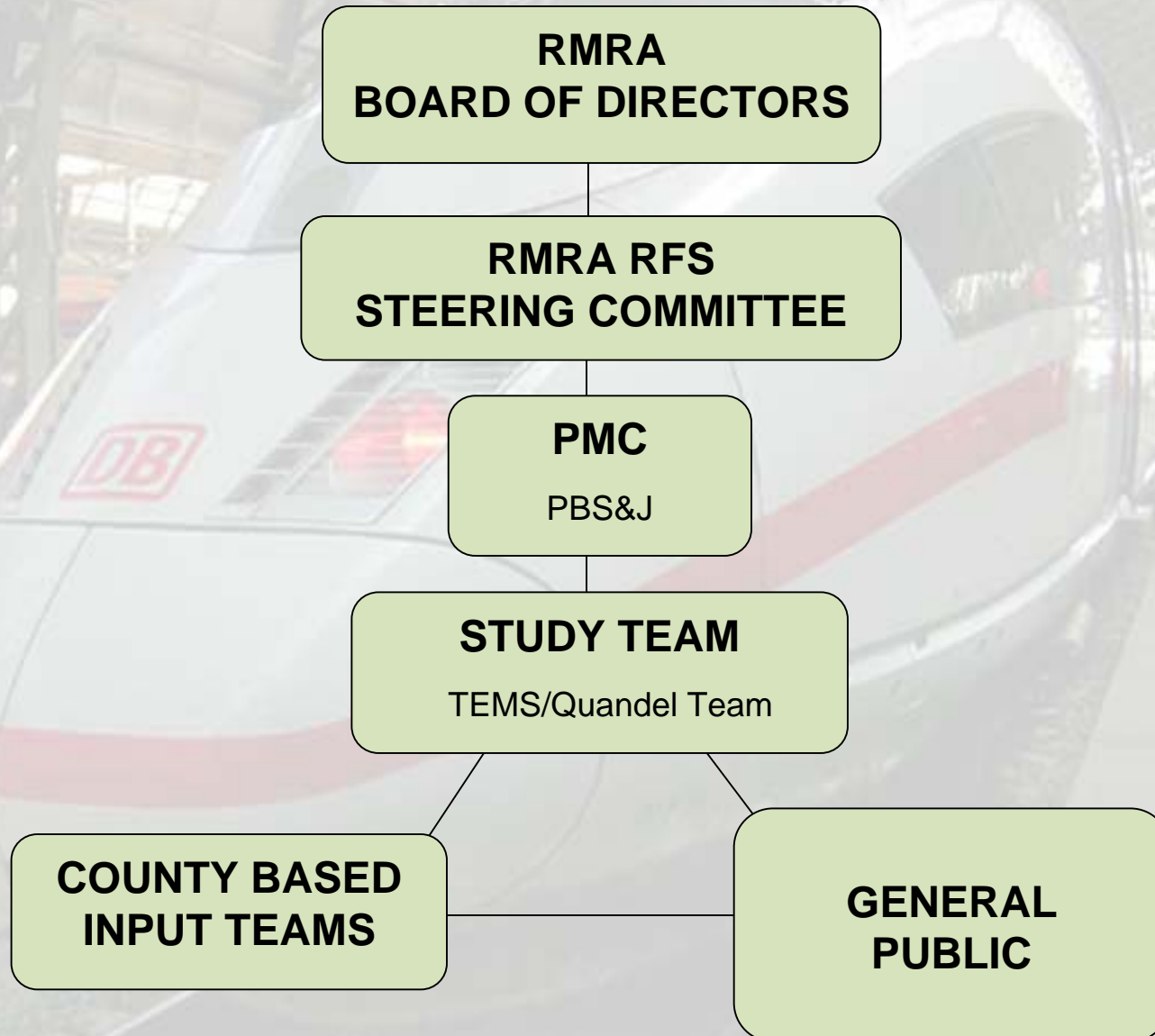


# Stakeholder Outreach Approach

## Three Phases of Outreach

- **Scoping (July-Sep)**
  - Introduce the study and its purpose
  - Gather input on local needs and desires
  
- **Alternatives Selection (Oct-Nov)**
  - Introduce and gather input on proposed alternatives
  - Stated Preference Survey
  
- **Alternatives Analysis (Dec-June)**
  - Summarize results of analysis and identify all feasible alternatives
  - Community Benefits

# Input and Decision Process



A high-speed train, likely a TGV, is shown at a station platform. The train is white with a red stripe and a red 'DB' logo on the front. The text 'Thank You' is overlaid in a bold, dark blue font. The background shows the station structure and some people walking on the platform.

**Thank You**