

**GRAND AVENUE**

COMMUTER RAIL CORRIDOR  
DEVELOPMENT PLAN

PRT Meeting 2.24.09

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## Agenda

- ◁ **Commuter Rail Overview**
  - Key Features
  - Vehicles
  - Stations
- ◁ **Project Integration: Grand Ave., Yuma West, System Plan**
  - Work plan integration/coordination
  - Stakeholder and agency involvement for 3 projects
- ◁ **Grand Ave. Stakeholder Group – list and outreach**
- ◁ **Grand Avenue Update**
  - Recent project activities
  - Tech Memo 1: Purpose and Need
  - Tech Memo 2: Existing and Future Conditions
  - Next Steps
- ◁ **Next Steps/Open Discussion**

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# Commuter Rail Overview (Refresher Course)



## What is Commuter Rail?

- ◁ Meets Federally mandated structural requirements for rolling stock
- ◁ Overall regulation by Federal Railroad Administration (FRA)
- ◁ Can share ROW, track with freight, intercity rail



## What is Commuter Rail?

- ⟨ Larger, heavier, roomier than light rail
- ⟨ Higher maximum speed, slower acceleration and deceleration, still has good travel time and reliability
- ⟨ Typically longer station spacing with emphasis on park-and-rides



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## What is Commuter Rail?

- ⟨ Locomotive-hauled coaches
- ⟨ Diesel Multiple Units (DMUs)



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# North American Commuter Rail Systems



# Commuter Rail Market

- < **Regular Routine**
- < **Home-to-Destination Trip Time Important**
- < **Wants**
  - On-time Performance
  - Clean Equipment
  - Secure Stations/Parking Lots



## Trip Purpose

- ◀ Commuters – Daily – Morning & Afternoon
- ◀ Mid-Day, Evenings, Weekends – Occasional Trips/Events
- ◀ Transfer Connections to Other Transit Services (Bus/LRT)



## Service Area



### LIGHT RAIL



STATION SPACING: 1/2 TO 1 MILE      SYSTEM EXTENT: 15 TO 20 MILES  
 MAXIMUM SPEED: 65 MPH      AVERAGE SPEED (WITH STOPS): 25 MPH



### COMMUTER RAIL



STATION SPACING: 5 TO 7+ MILES      SYSTEM EXTENT: 20 TO 75 MILES  
 MAXIMUM SPEED: 79 MPH      AVERAGE SPEED (WITH STOPS): 45 MPH



### INTERCITY RAIL



STATION SPACING: 20 TO 30 MILES      SYSTEM EXTENT: 50 TO 300 MILES  
 MAXIMUM SPEED: 110 MPH      AVERAGE SPEED (WITH STOPS): 55 MPH



## Average Travel Speeds

- ⟨ Commuter Rail – 45 mph
- ⟨ Light Rail – 25 mph
- ⟨ Local Bus – 15 mph
- ⟨ Rapid Bus – 24 mph



## Passenger Amenities

- ⟨ Comfortable Seating
- ⟨ Reading Lights
- ⟨ Rest Rooms
- ⟨ Luggage Racks
- ⟨ Bike Racks
- ⟨ Computer Connections
- ⟨ Computerized Information
- ⟨ Quiet Cars



## Stations

- ◀ **Minimal Time Spent at Stations**
- ◀ **Simple but High Tech**
  - Seating
  - Ticket Vending
  - Information & Public Address
- ◀ **Security – CCTV, Lighting**
- ◀ **Level Boarding**

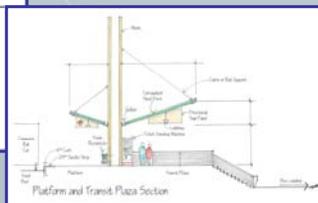
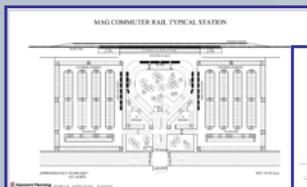


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## Stations

- ◀ **Spacing Determined by Community Structure**
- ◀ **Most Efficient 5-7+ Miles Apart**
- ◀ **Special Stations – For Event Venues**

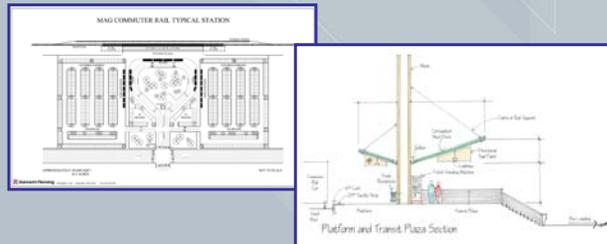


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## Stations

- ◁ **Prototype station** with average unit cost will be developed and adapted as needed
- ◁ **Not parcel-specific** but focused on nodes



## Conceptual Station Planning

**Process seeks to determine:**

- ◁ Number and spacing (location) of stations to optimize transit ridership along the corridor.
- ◁ What functions each station will serve (regional park-and-ride, neighborhood serving, destination, special generator, etc.).



## Conceptual Station Planning

### Conceptual station locations should provide:

- ⟨ Convenient access to the transit system;
- ⟨ Increased ridership;
- ⟨ Community benefits; and
- ⟨ Cost-effective implementation.



## Conceptual Station Location Evaluation Criteria

- ⟨ **Demographics:** population and employment density and existing/planned activity centers
- ⟨ **Accessibility:** vehicle, bus, bicycle and pedestrian connections
- ⟨ **Intermodal Connections:** ability to transfer to other HCT systems



## Conceptual Station Location Evaluation Criteria

- ◁ **Local Plans:** compatibility with land use and transportation plans
- ◁ **Fatal Flaws:** environmental or engineering constraints



## Conceptual Station Planning Process and Schedule

- ◁ **Late Feb – Early March 2009: Conceptual Station Location Identification and Assessment**
  - Confirm HCT Study station recommendations
  - Consider additional/modified conceptual station locations
- ◁ **March 2009: Conceptual Station Location Evaluation and Screening**
  - Apply set of evaluation criteria to conceptual station locations
  - Qualitatively rate conceptual station locations to determine those that will be carried forward or set-aside
- ◁ **April 2009: Recommended Conceptual Station Locations**
  - Provide PRT with initial recommendations for comment and feedback
  - Use recommended conceptual station locations for ridership forecasting in Spring/Summer 2009



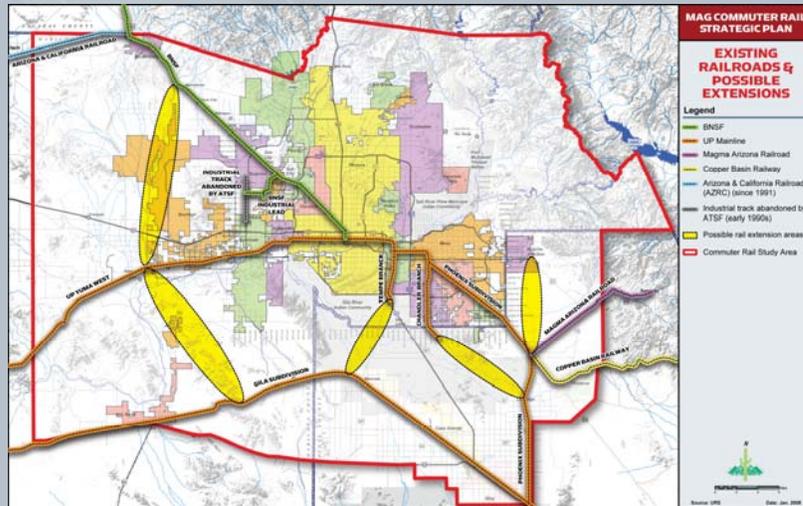
# Project Integration



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# Project Integration



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## Project Integration

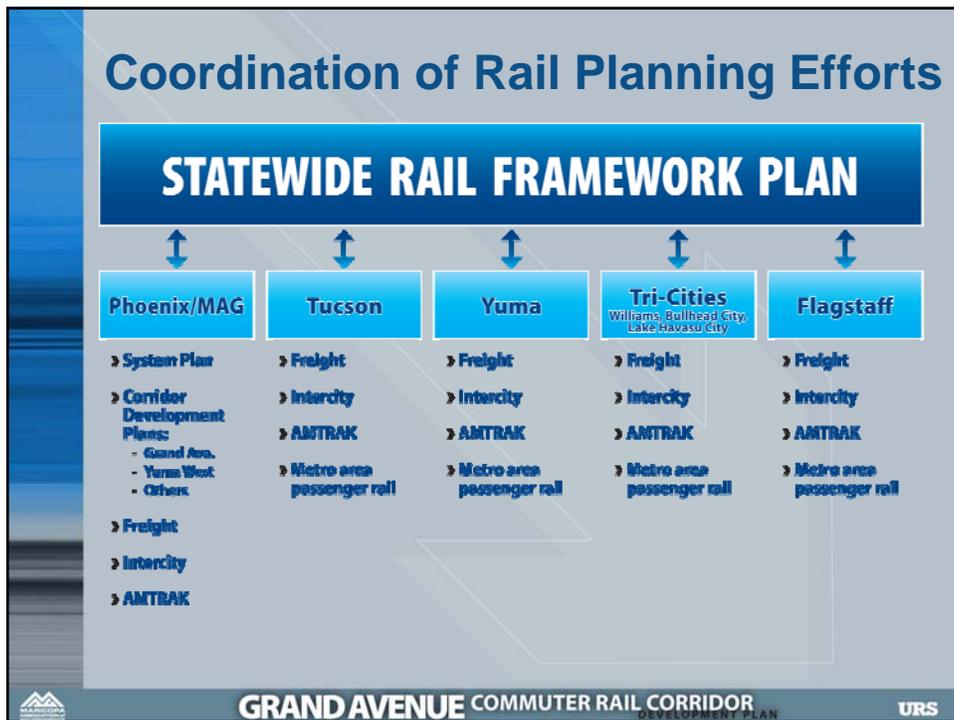
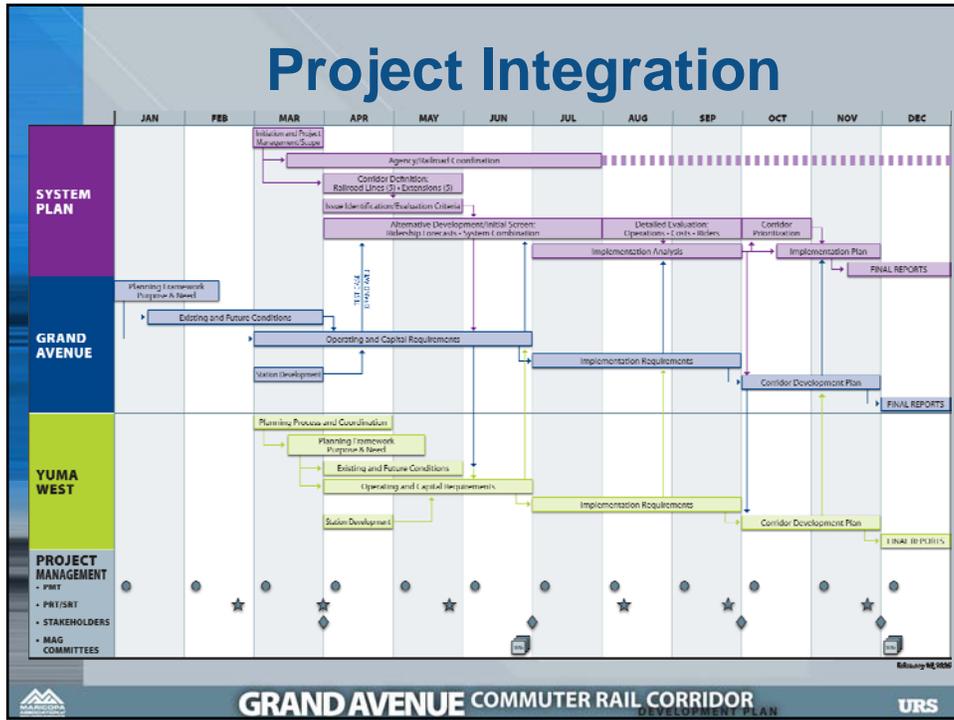
- ◁ **Draft Scopes and Budgets Prepared for System Plan, Yuma West Study**
- ◁ **Anticipate kickoff ~March 1**
- ◁ **Integration/coordination of 3 studies**
  - Project management
  - Ridership forecasting/cost-effectiveness
  - Financial/implementation planning



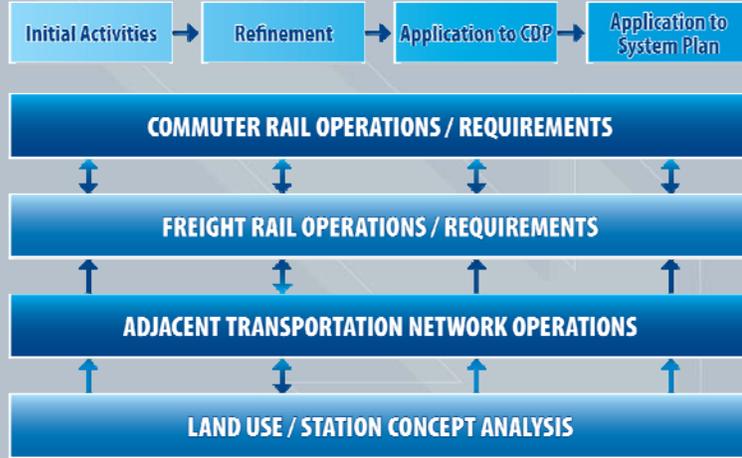
## Project Integration

- ◁ **Agency/stakeholder integration/coordination**
  - PMT
  - Project Review Teams
  - Stakeholder groups/meetings





# Corridor Development Plan (CDP) Technical Framework



# Corridor Development Plan (CDP) Technical Framework

Component	Initial Activities	Refinement	Application to Grand Ave. and Yuma West CDPs	Application to System Plan
<b>Commuter Rail Operations/ Requirements</b>	<ul style="list-style-type: none"> <li>◁ Initial scenario development                             <ul style="list-style-type: none"> <li>• Minimum/maximum</li> <li>• Initial engineering feasibility analysis</li> </ul> </li> <li>◁ Travel market analysis</li> </ul>	<ul style="list-style-type: none"> <li>◁ Compare initial scenarios to freight infrastructure</li> <li>◁ Conduct initial travel model development (w/MAG)</li> </ul>	<ul style="list-style-type: none"> <li>◁ Develop additional operating scenarios</li> <li>◁ Cost estimates</li> <li>◁ Model analysis (including cost/benefit results) for all scenarios</li> </ul>	<ul style="list-style-type: none"> <li>◁ Develop system scenarios (including interlining)</li> <li>◁ Cost estimates</li> <li>◁ Model analysis (including cost/benefit analysis)/ranking</li> </ul>
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<b>Adjacent Transportation Network Operations/ Requirements</b>	<ul style="list-style-type: none"> <li>◁ Data collection</li> <li>◁ Highway conditions analysis</li> <li>◁ Interface with railroad corridors</li> </ul>	<ul style="list-style-type: none"> <li>◁ Analyze future highway development/ infrastructure scenarios</li> </ul>	<ul style="list-style-type: none"> <li>◁ Highway modifications needed</li> <li>◁ Costs and cost/benefit analysis</li> </ul>	<ul style="list-style-type: none"> <li>◁ Systemwide highway issues, potential modifications</li> <li>◁ Costs</li> </ul>
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**Grand Avenue Stakeholder Group**

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**Grand Avenue Project Update**

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# Grand Avenue Update

- < Accelerated schedule for deliverables
- < Fewer GASG meetings than originally planned

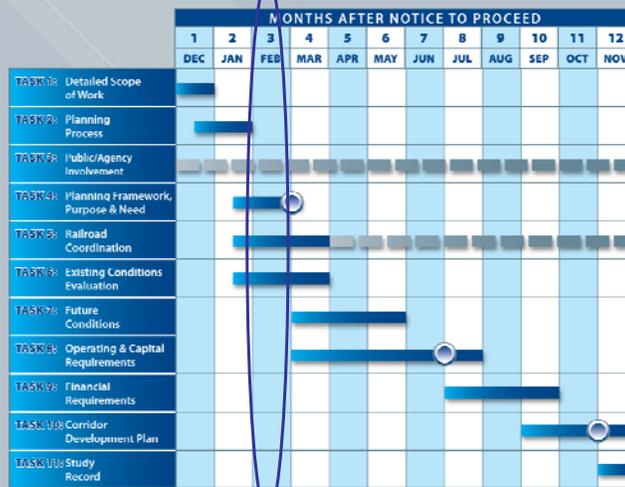


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# Grand Avenue Update

## SCHEDULE



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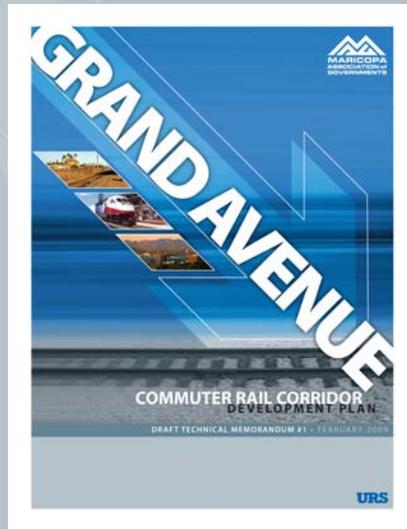
# Grand Avenue Update

## ◀ Activities so far:

- Corridor inspection tour
- Coordination with BNSF
- Development of Tech Memo 1 (Purpose and Need)
- Development of Conceptual Operating Plans



# Tech Memo 1: Purpose and Need



## Tech Memo 1: Purpose and Need

- ◀ **1<sup>st</sup> major deliverable**
- ◀ **Sets tone for entire project**
- ◀ **Major elements:**
  - Summary of plans, projects, and conditions
  - Purpose of project
  - Need for improvements
  - Project goals and objectives
- ◀ **Iterative process – may change as project proceeds**



## Tech Memo 1: Purpose and Need



## Tech Memo 1: Purpose and Need

### < Data Inputs:

- Corridor inspection
- Review of previous and existing transportation studies
- Review of land use and other municipal plans
- Review and observations of Grand Ave. facilities and operations
- Review of railroad facilities and operations



Picture s showing proximity of BNSF railway to Grand Avenue



BNSF Rail at Grand Avenue and 19th Avenue looking north



Bridge located in the Hassayampa River Preserve



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## Tech Memo 1: Purpose and Need

### < Proposed Project Purposes:

- **Improve mobility** between and among major **activity centers** in the corridor for **all population groups**
- Provide **high-speed, high-capacity multimodal** solutions that help **mitigate congestion** and **improve air quality**
- Provide a **high-quality** transportation system that functions **seamlessly** with other planned transportation improvements in the region



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## Tech Memo 1: Purpose and Need

### < Proposed Project Purposes:

- Provide a **high-quality** transportation system that facilitates and encourages **economic development** and redevelopment in the corridor



## Tech Memo 1: Purpose and Need

### < Purpose:

- Improve mobility between and among major activity centers in the corridor for all population groups

### < Need for Improvement:

- Increase in population and employment that is resulting in increased travel demand and intra-corridor trips
  - ▶ 61% population increase by 2030
  - ▶ 78% employment increase
  - ▶ Grand Ave. corridor is only direct route to CBD and other activity centers along the corridor

< **Goal:** Improve mobility through and within the corridor and to major activity centers

< **Objectives:** Increase overall corridor capacity for all modes; improve overall travel safety for all modes



## Tech Memo 1: Purpose and Need

### < Purpose:

- Provide high-speed, high-capacity multi-modal solutions that help mitigate congestion and improve air quality

### < Need for Improvement:

- Roadway improvements have not kept pace with demand
  - ▶ Significant improvements planned along corridor, including widening and intersection/interchange improvements
  - ▶ Number of intersections along corridor at LOS E or F in 2030 projected to be 67% greater than current

< **Goal:** Provide an alternative to the single-occupant vehicle for travel in the corridor

< **Objectives:** Provide alternative travel options; maximize the reduction in roadway travel demand through management practices and programs; facilitate lessening of truck traffic in corridor by coordinating freight railroad improvements.



## Tech Memo 1: Purpose and Need

### < Purpose:

- Provide high-speed, high-capacity multi-modal solutions that help mitigate congestion and improve air quality

### < Need for Improvement:

- Growth of VMT should be slowed to improve air quality
  - ▶ Portions of the corridor are non-attainment for CO and PM-10

< **Goal:** Improve environmental conditions in the corridor.

< **Objective:** Minimize environmental impacts caused by increased travel demand



## Tech Memo 1: Purpose and Need

### < Purpose:

- Provide a high-quality transportation system that functions seamlessly with other planned improvements

### < Need for Improvement:

- A high-capacity, high-speed travel corridor is needed to connect population and employment centers in the corridor and downtown Phoenix
  - ▶ Diagonal corridor provides direct connection
  - ▶ Commuter rail can provide travel time savings

< **Goal 1:** Improve the image of transit in the corridor by providing rapid and convenient service.

< **Objectives:** Maintain or improve travel times in the corridor; maintain or improve travel time reliability in the corridor.



## Tech Memo 1: Purpose and Need

### < Purpose:

- Provide a high-quality transportation system that functions seamlessly with other planned improvements

### < Need for Improvement:

- A high-capacity, high-speed travel corridor is needed to connect population and employment centers in the corridor and downtown Phoenix
  - ▶ Diagonal corridor provides direct connection
  - ▶ Commuter rail can provide travel time savings

< **Goal 2:** Provide a high-quality transportation alternative in the corridor.

< **Objective:** Provide a cost-effective transit option in the corridor; provide a system that integrates effectively and efficiently with other current and future transportation modes and systems.





# Conceptual Operating Plan

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# Conceptual Operating Plan

## ◊ Two Initial Operating Scenarios (form the lower and upper limits for additional scenarios):

- **2020: Startup (minimum case)** – initial concept with no major change in infrastructure such as relocation of yards
  - ▶ Four trains inbound in a.m., four outbound in p.m.
  - ▶ Hourly service
- **2040: Full Service (maximum case)** - requires major freight infrastructure changes
  - ▶ 15-minute peak/30-minute off-peak Phoenix to Beardsley
  - ▶ 30-minute peak/60-minute off-peak Beardsley to Wickenburg

## Conceptual Operating Plan

### ◀ BNSF business requirements that will influence operations:

- Location of the functions currently at MoBest Yard and Glendale Intermodal Facility
  - ▶ **If they remain at current locations**, could result in slower operating speeds and reconstruction of Grand Ave. to accommodate train service needs
  - ▶ **If relocated**, would allow more schedule flexibility; old sites could be converted to other uses



## Conceptual Operating Plan

### ◀ Next Steps:

- Develop additional scenarios using initial concepts as starting points:
  - ▶ Maximum passenger operations possible with current BNSF operations
  - ▶ Maximum passenger operations with current BNSF operations and additional infrastructure
  - ▶ Maximum passenger operations with different BNSF operations and different infrastructure



## Upcoming Activities

- ◁ **Finalize Tech Memo 1 based on PMT and PRT comments**
- ◁ **Refine operating plans**
- ◁ **Develop existing and future conditions tech memo**
  - Study area: Two mile radius of the project corridor, including TAZ's that are fully or partially contained within the radius
  - Data to be collected includes;
    - ▶ Traffic counts, level of service, bus ridership, demographic information, land use projections, activity centers, projected freight traffic, trip purpose etc...



## Upcoming Activities

- ◁ **Complete railroad inventory assessment and begin cost estimate (including hi-rail trip)**
- ◁ **GASG Meeting**



# Next Steps/Discussion

