Transportation Strategies and Analysis
Transportation Strategies

**Modeled in NEMS**
- EV incentives
- Biofuels
- Price changes
  - Carbon
  - Fuels
  - VMT

**Modeled in Transportation Tool**
- Land use/smart growth
- Active transportation
- Travel demand management
- System operations/traffic flow
- Shared mobility
- Freight/intermodal
- Highway preservation
- Transit investment
- Electric buses
Transit Investment Strategies

**Urban & Intercity Transit Investment & Services**
- Bus rapid transit
- Urban rail
- Commuter rail
- Intercity rail
- Bus service expansion
- Bus service efficiency

**Transit State of Good Repair**
- Bus
- Urban rail
- Commuter/intercity rail
Transportation Investment Strategy Tool - Modeling Approach

$ investment by strategy \times \text{Impact per $} = \text{Impact}

- By state
- By area type*

- By strategy
- By area type*

- GHG
- VMT
- Delay
- Costs
- Safety
- Air pollution
- Phys. activity

*Area type = urban, suburban, rural
Strengths & Limitations of Approach

**Strengths**
- Translates investment $ directly into GHG reductions
- Quantifies a range of benefits
- Considers differences in effectiveness by area type
- Uses data from TCI region where available

**Limitations**
- Not project-specific analysis
- Not based on geographic modeling
- Cost-effectiveness can vary widely within any given type of project
Strategy: Active Transportation

What is This?
• Investing in bicycle facilities, pedestrian improvements, and Complete Streets

Key Assumptions & Data Sources
• $ investment by facility type and area type
• Cost per mile
• New bicycle-miles traveled per new facility-mile (research/ modeling studies)
• Prior drive mode share of new cyclists
Strategy: Land Use/Smart Growth

What is This?
• Investments, incentives, and policy changes to encourage growth in transit-rich, walkable neighborhoods

Key Assumptions & Data Sources
• $ per household to shift to smart growth area (MA Chapter 40R incentives)
• VMT per capita by area type (travel surveys)
Strategy: Travel Demand Management

**What is This?**
- Programs and incentives to switch modes for commuting and other travel

**Key Assumptions & Data Sources**
- Cost-effectiveness of outreach from evaluations of TDM programs
- Modeling of mode shift incentives from EPA Commuter Model
Strategic System Operations/Efficiency

**What is This?**
- Traffic flow improvements to reduce emissions from traffic congestion and delays

**Key Assumptions & Data Sources**
- Cost-effectiveness from the Moving Cooler study
- Fuel savings per hour of delay from TTI Urban Mobility report
- Accounts for induced demand effects
Strategy: Transit Expansion

What is This?
- Expansion of BRT and/or rail transit services (urban, commuter, intercity)

Key Assumptions & Data Sources
- Data from 13 project studies in TCI region (OR)
- New services have same ridership productivity & mode shift as existing regional transit services
Strategy: Transit Operations

What is This?
• Improving speed and reliability of bus services

Key Assumptions & Data Sources
• Cost per mile of routes improved
• Relationship between travel speed and ridership
• % of new bus riders who previously drove
Strategy: Transit State of Good Repair

What is This?
• Investing in existing transit to maintain reliability, capacity, and speed

Key Assumptions & Data Sources
• % ridership loss per year as system degrades
• % of lost riders who drive
Strategy: Highway Preservation

What is this?
• Investments to keep roadways functioning safely, reliably, and at expected levels of service

Key Assumptions & Data Sources
• Investment scenarios using FHWA HERS model
• Fuel consumption increase from road roughness and traffic delays
Strategy: Freight/Intermodal Investment

What is This?
• Investments in freight rail and intermodal infrastructure to encourage mode shift from truck to rail & water

Key Assumptions & Data Sources
• Cost-effectiveness from studies of projects and investment plans in TCI region
## Economic Impacts

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<th>Active Transportation</th>
<th>TDM</th>
<th>System Operations</th>
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Conclusions

- The transportation tool can tell us roughly what level of GHG reduction (and other benefits) to expect for a given revenue stream and investment mix.

- Benefits of transportation investment are best measured across multiple metrics:
  - Consider: economic benefits, mobility, health, quality of life.

- There is quite a bit of variability in impacts across places and project types; specific investments should be evaluated on their own merits.