

# EPA's Travel Efficiency Assessment Method (TEAM): Development and Case Studies

Presented by:



United States Environmental Protection Agency  
Office of Transportation and Air Quality

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# Outline

- Introduction
- TEAM Analyses to Date
- Preliminary Results of Current Case Studies
  - Imperial Calcasieu Regional Planning and Development Commission (IMCAL)
  - Puget Sound Clean Air Agency (PSCAA)
  - Champaign County Regional Planning (CCRPC)
  - Northeast States for Coordinated Air Use Management (NESCAUM)
- Next Steps

# Travel Efficiency (TE) Strategies

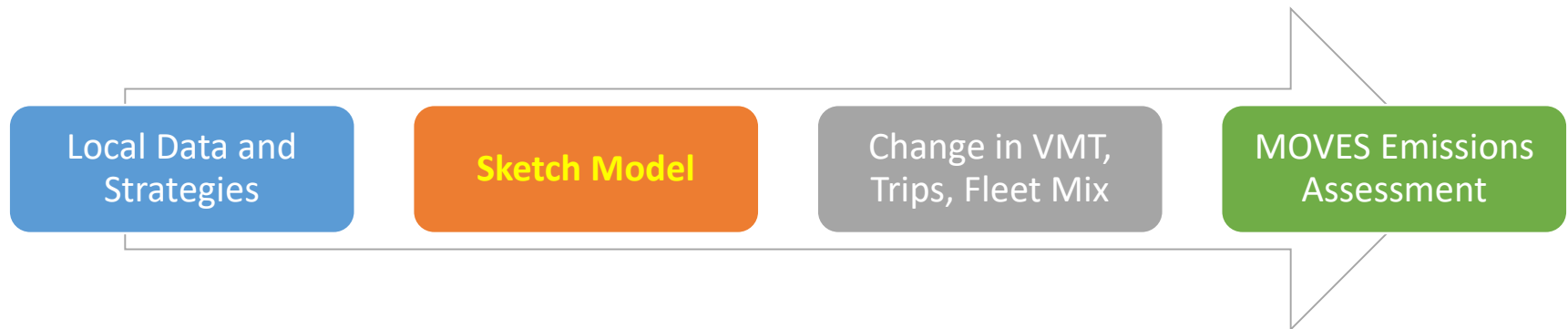
Strategies to reduce emissions by affecting travel activity – examples:

- Travel demand management
  - Telecommuting
  - Transit Subsidies
  - Carpool and Vanpool Programs
- Changes to public transit
  - Reduced Fares
  - Increased Frequency, Range
- Travel pricing
  - Road Pricing, Parking Pricing
- Changes to land use
  - Transit Oriented Development (TOD), Mixed Use, Jobs/Housing Balance

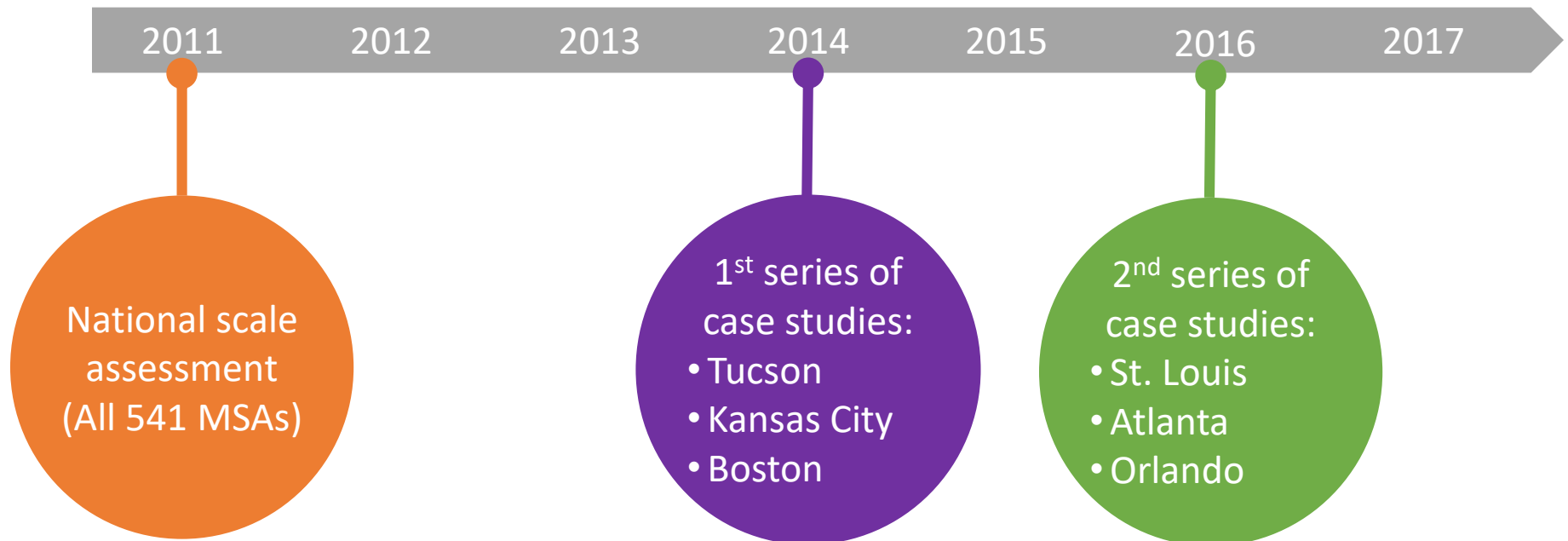


# The Travel Efficiency Assessment Method (TEAM)

- A method to rapidly assess multi-pollutant emission reductions from hypothetical travel efficiency scenarios at the local, state and national level
- TEAM substitutes a sketch planning tool for the traditional 4-step model



# Previous TEAM Analyses



# 2016 Case Study Findings

	Scenarios	Applied to	2040 Pooled Reductions
Atlanta	<ul style="list-style-type: none"> <li>• Expand telework and guaranteed ride home</li> <li>• Improve transit access times</li> <li>• Parking pricing</li> <li>• Increase density and mixed use land use</li> </ul>	<ul style="list-style-type: none"> <li>• Employees in 5 county core</li> <li>• Full 5 county area</li> <li>• Full 5 county area</li> <li>• Full 5 county area</li> </ul>	<ul style="list-style-type: none"> <li>• 12 million VMT/day</li> <li>• 124 kg/day PM<sub>2.5</sub></li> <li>• 535 kg/day NOx</li> <li>• 414 kg/day VOC</li> <li>• 2.8 million kg/day GHG</li> </ul>
St. Louis	<ul style="list-style-type: none"> <li>• TOD near existing light rail stations</li> <li>• Increase residential density and mixed development</li> <li>• Complete bicycle and pedestrian network</li> <li>• Complete light rail system</li> </ul>	<ul style="list-style-type: none"> <li>• 3 county core</li> <li>• Full 5 county area</li> <li>• Full 5 county area</li> <li>• Full 5 county area</li> </ul>	<ul style="list-style-type: none"> <li>• 1.9 million VMT/ day</li> <li>• 16 kg/day PM<sub>2.5</sub></li> <li>• 103 kg/day NOx</li> <li>• 80 kg/day VOC</li> <li>• 440,000 kg/day GHG</li> </ul>
Orlando	<ul style="list-style-type: none"> <li>• Expand employer programs including transit pass</li> <li>• Improve transit access and travel times</li> <li>• VMT pricing for entire region</li> <li>• Unlimited transit pass for with tuition and university employment</li> </ul>	<ul style="list-style-type: none"> <li>• Sub-pop. of 3 county area</li> <li>• Sub-pop. of 3 county area</li> <li>• 3 county VMT</li> <li>• Sub-pop of 3 county area</li> </ul>	<ul style="list-style-type: none"> <li>• 4.6 million VMT/day</li> <li>• 39 kg/day PM<sub>2.5</sub></li> <li>• 201 kg/day NOx</li> <li>• 117 kg/day VOC</li> <li>• 1.1 million kg/day GHG</li> </ul>

# Land Use Sketch Modeling Approaches

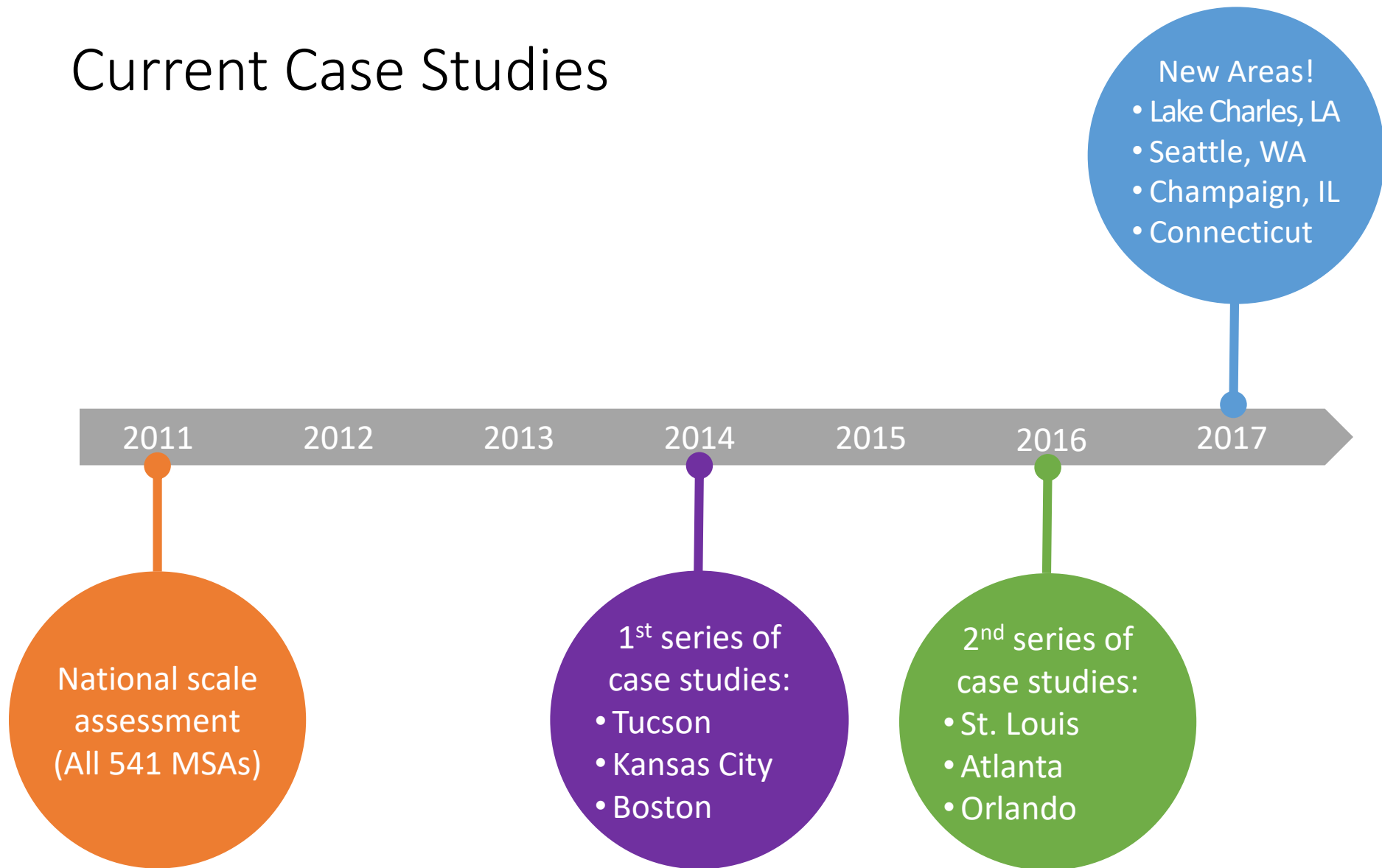
Category	Strategies That Can Be Analyzed	Data Needs
Land Use	<ul style="list-style-type: none"> <li>• Shifting population and employment growth to more compact neighborhoods and lower VMT generating neighborhoods</li> <li>• Jobs-housing balance initiatives</li> <li>• Mixed-use development</li> <li>• TOD programs</li> </ul>	<ul style="list-style-type: none"> <li>• Multivariate approach:               <ul style="list-style-type: none"> <li>• share of regional population in affected areas</li> <li>• increase in weighted average residential density (persons per square mile)</li> <li>• increase in job accessibility by car (30 min)</li> <li>• increase in job accessibility by transit (30 min)</li> <li>• average decrease in distance to transit</li> <li>• average increase in land use mixing</li> </ul> </li> <li>• Neighborhood approach:               <ul style="list-style-type: none"> <li>• share of regional population in affected areas</li> <li>• percent population by neighborhood type</li> </ul> </li> </ul>

# Multi-Variate vs Neighborhood Approach Results

	Multi-Variate Approach	Neighborhood Approach
Atlanta Light-Duty VMT	-9.28%	-8.82%
St. Louis Light-Duty VMT	-2.07%	-2.54%



# Current Case Studies





Region: Lake Charles, Louisiana MPO  
Sponsor: Imperial Calcasieu Regional  
Planning and Development  
Commission

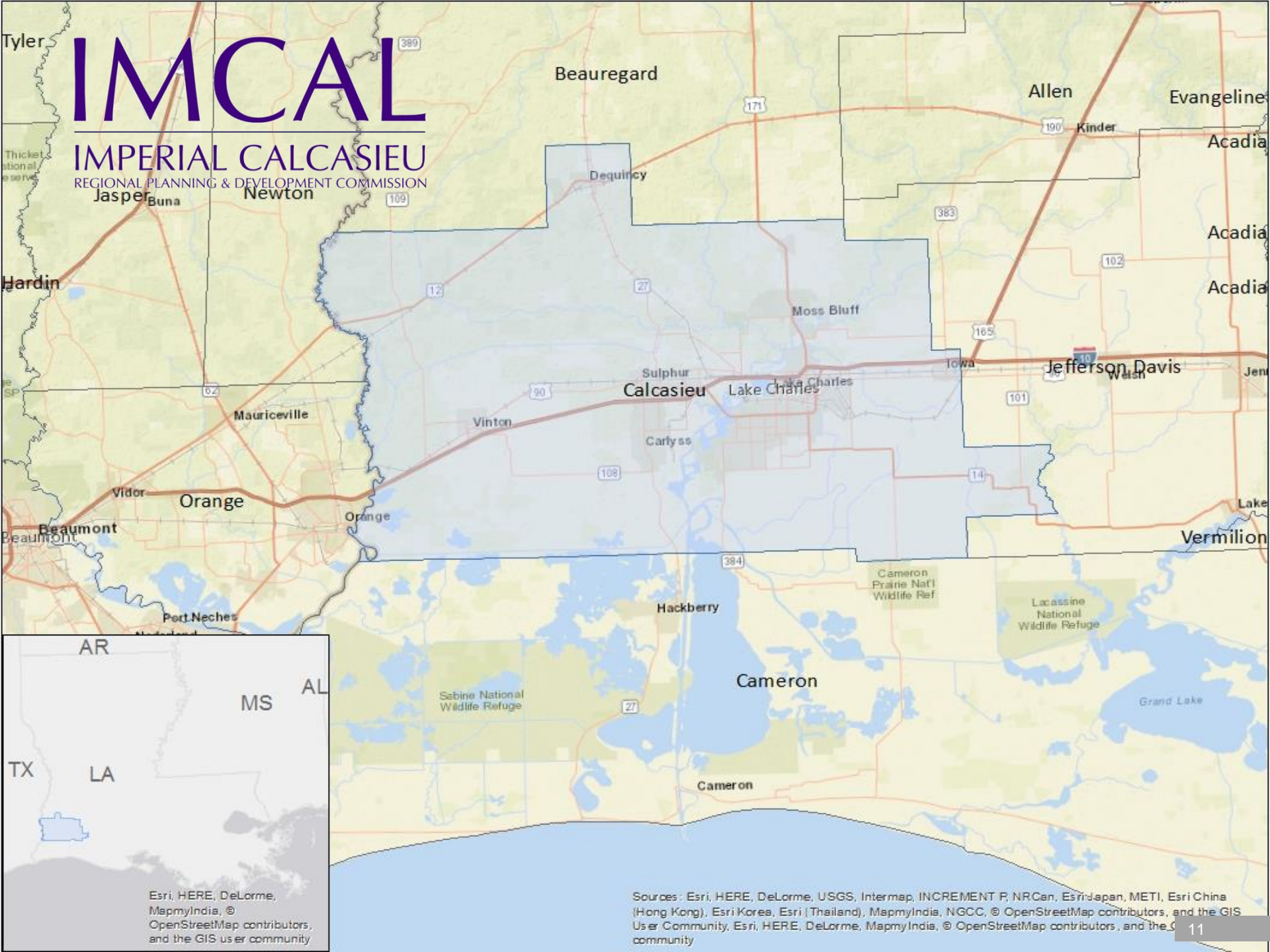
### Region Profile

- 5 parishes and 18 municipalities
- Preparing for massive regional growth in employment
- \$116.8 B in new or proposed industrial plants within the next 5 years

# IMCAL

## IMPERIAL CALCASIEU

REGIONAL PLANNING & DEVELOPMENT COMMISSION



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Scenarios	Applied to	Details	Effect on BAU VMT*
Scenario 1: TDM Employer Programs	Targeted to Petrochemical Employers (7,500 employees)	<ul style="list-style-type: none"> <li>• Provide \$50 per month subsidies for ridesharing or vanpooling to each employee</li> <li>• Offer ridematch programs and guaranteed/emergency ride home programs to employees</li> </ul>	-0.07%
Scenario 2: Scenario 1 + Transit Improvements	North Lake Charles (13,500 residents)	<ul style="list-style-type: none"> <li>• Reduce average transit trip times 16%</li> </ul>	-0.10%
Scenario 3: Scenario 2 + Parking Pricing	Downtown Lake Charles (13,000 daily travelers)	<ul style="list-style-type: none"> <li>• Establish a parking fee of 50 cents per hour for non-work trips to downtown</li> </ul>	-0.24%
Scenario 4: Scenario 3 + Smart Growth Land Use	Full Region (260,000 area residents)	<ul style="list-style-type: none"> <li>• Shift future growth away from lower density single use development styles and towards higher density mixed use development styles</li> </ul>	-1.05%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.



CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION

Region: Champaign-Urbana, Illinois

Sponsor: Champaign County Regional  
Planning Commission

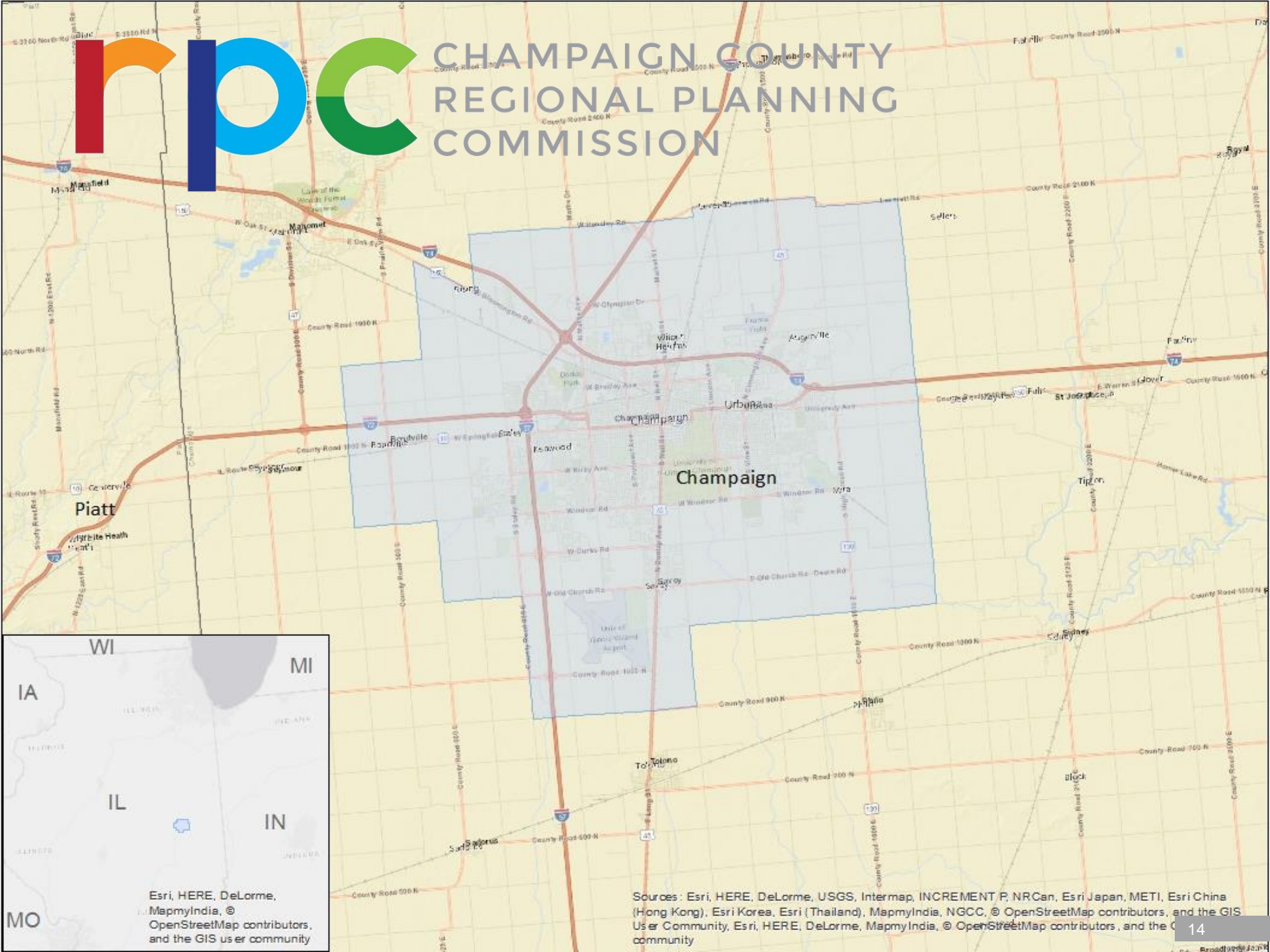
### Region Profile

- Home of University of Illinois
- Population of 161,000
- Preparing for long range plan update





# CHAMPAIGN COUNTY REGIONAL PLANNING COMMISSION



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Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 1: Expand Bicycle and Pedestrian Networks and Establish new transit hubs	Full Region	<ul style="list-style-type: none"> <li>• Restructure routes to reduce avg. in-vehicle passenger travel time by 60%</li> <li>• Increase transit frequency to reduce average bus passenger wait time by 20%</li> <li>• Expand bicycle facilities from 60 lane miles today to 410 lane miles in 2040</li> <li>• Expand sidewalk coverage of streets from 50% today to 100% in 2040</li> </ul>	-2.95%
Scenario 2: Scenario 1 + Smart Land Use	Full Region	<ul style="list-style-type: none"> <li>• Increase housing supply with multimodal access to employment centers by minimizing non-contiguous development and increasing neighborhood density by 4.5%</li> </ul>	-3.22%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.

Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 3: Scenario 2 + Parking Pricing	University of Illinois	<ul style="list-style-type: none"> <li>• Increase faculty/staff parking permit costs by 50%</li> </ul>	-7.86%
Scenario 4: Scenario 3 + High Speed Rail	Full Region	<ul style="list-style-type: none"> <li>• Reduce rail avg. in-vehicle time by 73% and wait time by 88%</li> </ul>	-8.08%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.





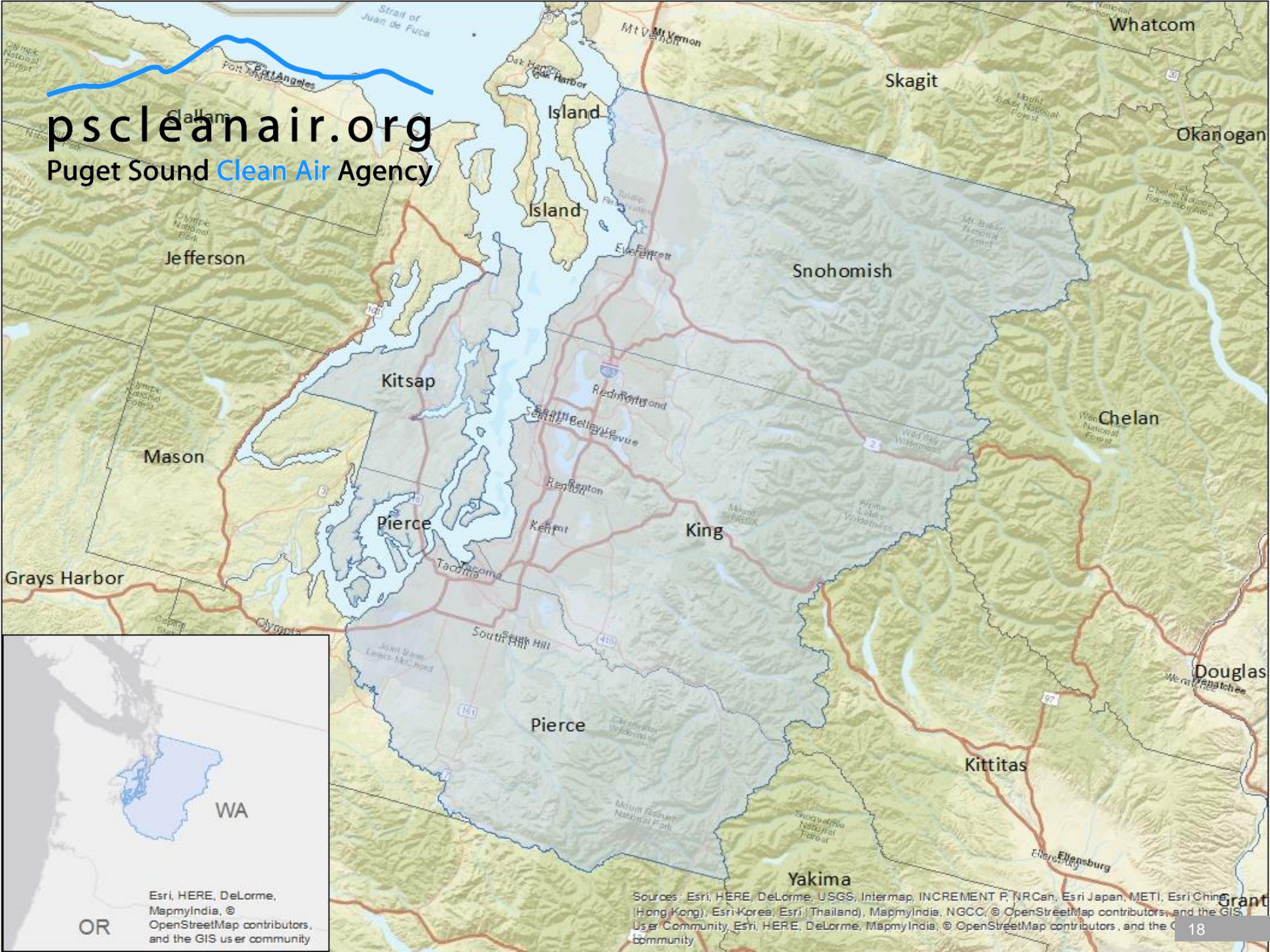
Region: Seattle, Washington

Sponsor: Puget Sound Clean Air Agency

### Region Profile

- 80 jurisdictions including county and city governments
- 2 million employees
- Engaged in climate planning efforts with 2030 and 2050 targets

pscleanair.org  
Puget Sound Clean Air Agency



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Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 1: Expand Commute Trip Reduction (CTR) Program	Additional 156,000 employees	<ul style="list-style-type: none"> <li>Expand commute trip reduction program requirement to employers of 50 or greater (from employers of 100 or greater). Expands access to an additional 160,000 employees</li> </ul>	-0.09%
Scenario 2: Scenario 1 + Expand access transit access to EJ/low-income populations	169,000 EJ/low-income residents	<ul style="list-style-type: none"> <li>Provide free transit passes to 169,000 EJ/low income community members</li> </ul>	-0.16%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.



Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 3: Scenario 2 + VMT Pricing	All travel in the 4 county region	<ul style="list-style-type: none"> <li>• Introduce 15 cents per mile VMT price</li> </ul>	-3.40%
Scenario 4: Scenario 3 + Smart growth land use	All regional jobs (2.98 million) and population (4.85 million)	<ul style="list-style-type: none"> <li>• All regional jobs and populations</li> <li>• Increase population density by 50%.</li> <li>• Increase accessibility to jobs by auto within 45 minutes by 3%.</li> <li>• Increase accessibility to jobs by transit within 45 minutes by 60%</li> <li>• Reduce distances to transit by 15%</li> <li>• Increase diversity of land use types by 5%</li> </ul>	-10.20%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.



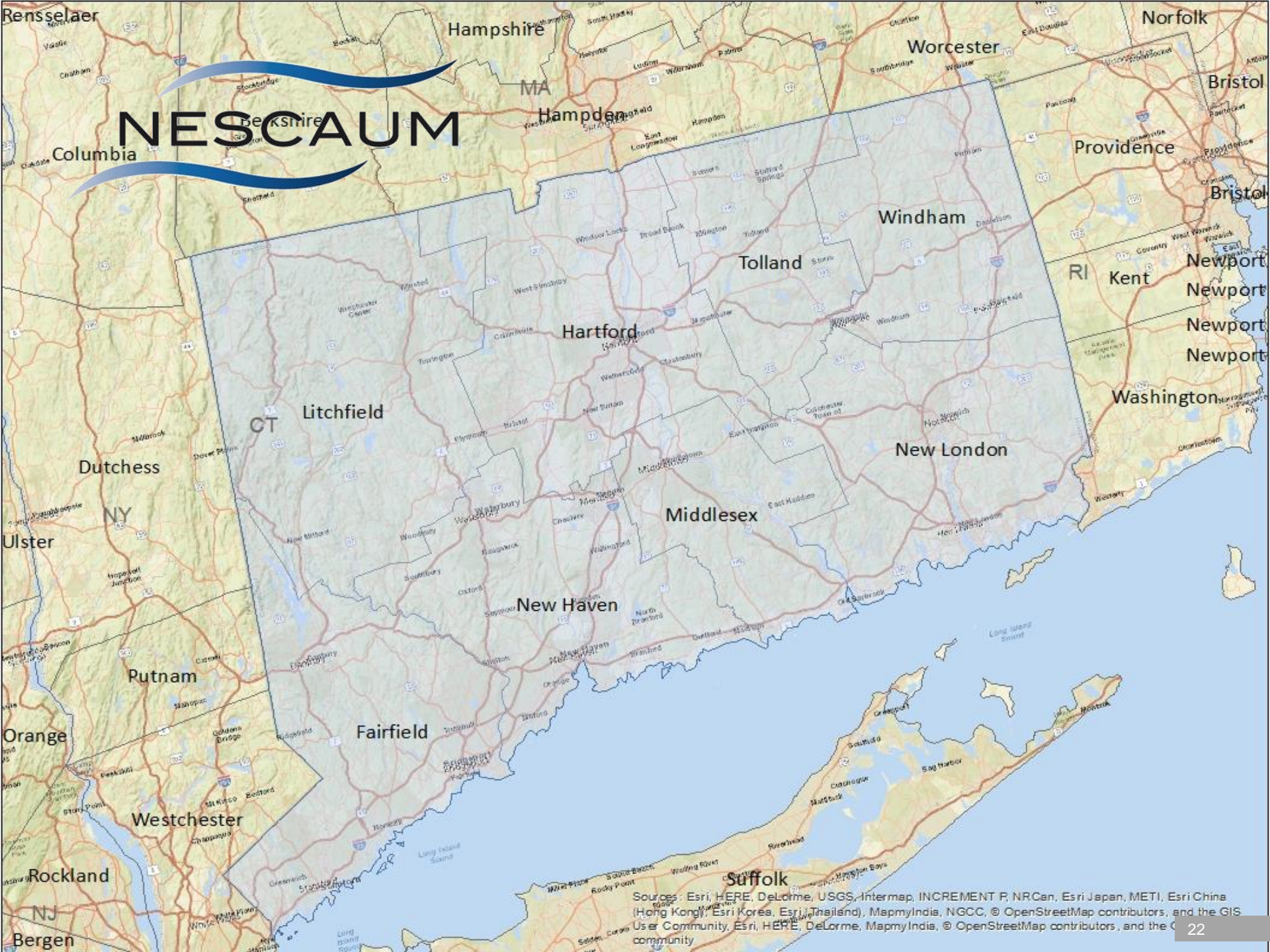
Region: State of Connecticut

Sponsor: Northeast States for  
Coordinated Air Use Management

### Region Profile

- Long-range GHG planning  
(Connecticut's Global Warming  
Solutions Act - 80% reduction in  
GHG emissions by 2050)
- New scale of analysis for TEAM
- Results/process could be adopted  
across NESCAUM partner states

# NESCAUM







Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 1: Commuter train improvements	NY-New Haven Corridor (1.35 million residents)	<ul style="list-style-type: none"> <li>Implement rail improvements that increase the frequency of service and reduce transit trip times by 15%</li> </ul>	-0.78%
Scenario 2: Scenario 1 + Local bus improvements	NY-New Haven Corridor (1.35 million residents)	<ul style="list-style-type: none"> <li>Increase transit service by extending coverage areas, providing connecting services between cities and reduce transit trip times by 33%</li> </ul>	-1.84%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.



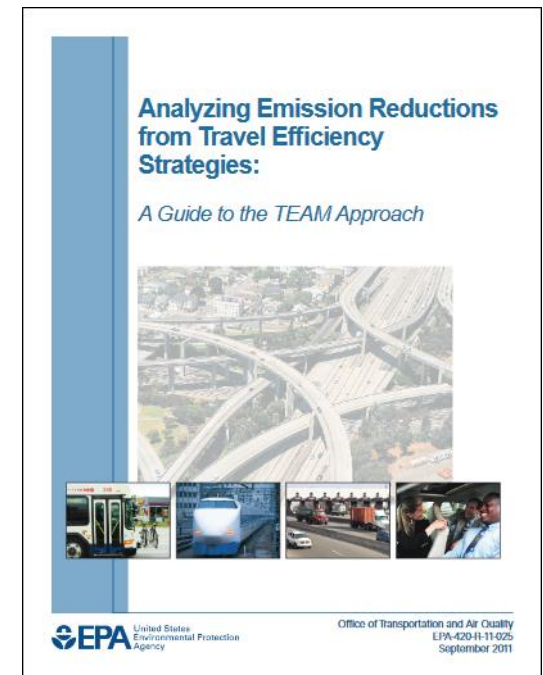
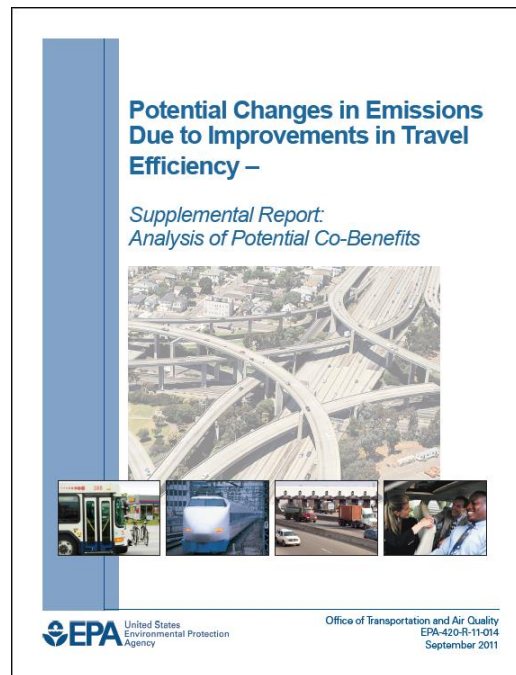
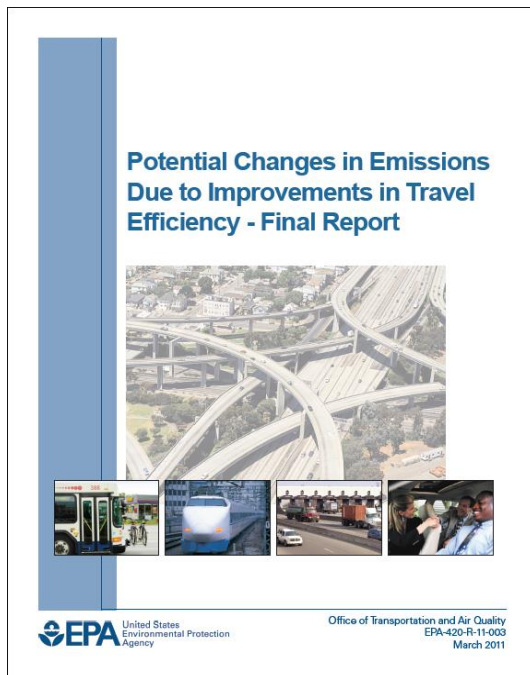
Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 3: Scenario 2 + Smart growth land use	NY-New Haven Corridor (1.35 million residents)	<ul style="list-style-type: none"> <li>Shifting population/employment in the New York to New Haven corridor to areas that have transit access by increasing typical neighborhood density by 15%</li> </ul>	-2.07%
Scenario 4: Scenario 3 + VMT pricing	Full State (4.01 million residents)	<ul style="list-style-type: none"> <li>Introduce a 5 cent per mile VMT price</li> </ul>	-7.54%

\*This value provides the reduction in VMT as compared with the “Business-As-Usual” 2040 outyear.



For more information on the TEAM approach, TEAM case studies, and other useful documents, please visit:

<https://www.epa.gov/state-and-local-transportation/transportation-related-documents-state-and-local-transportation#control>





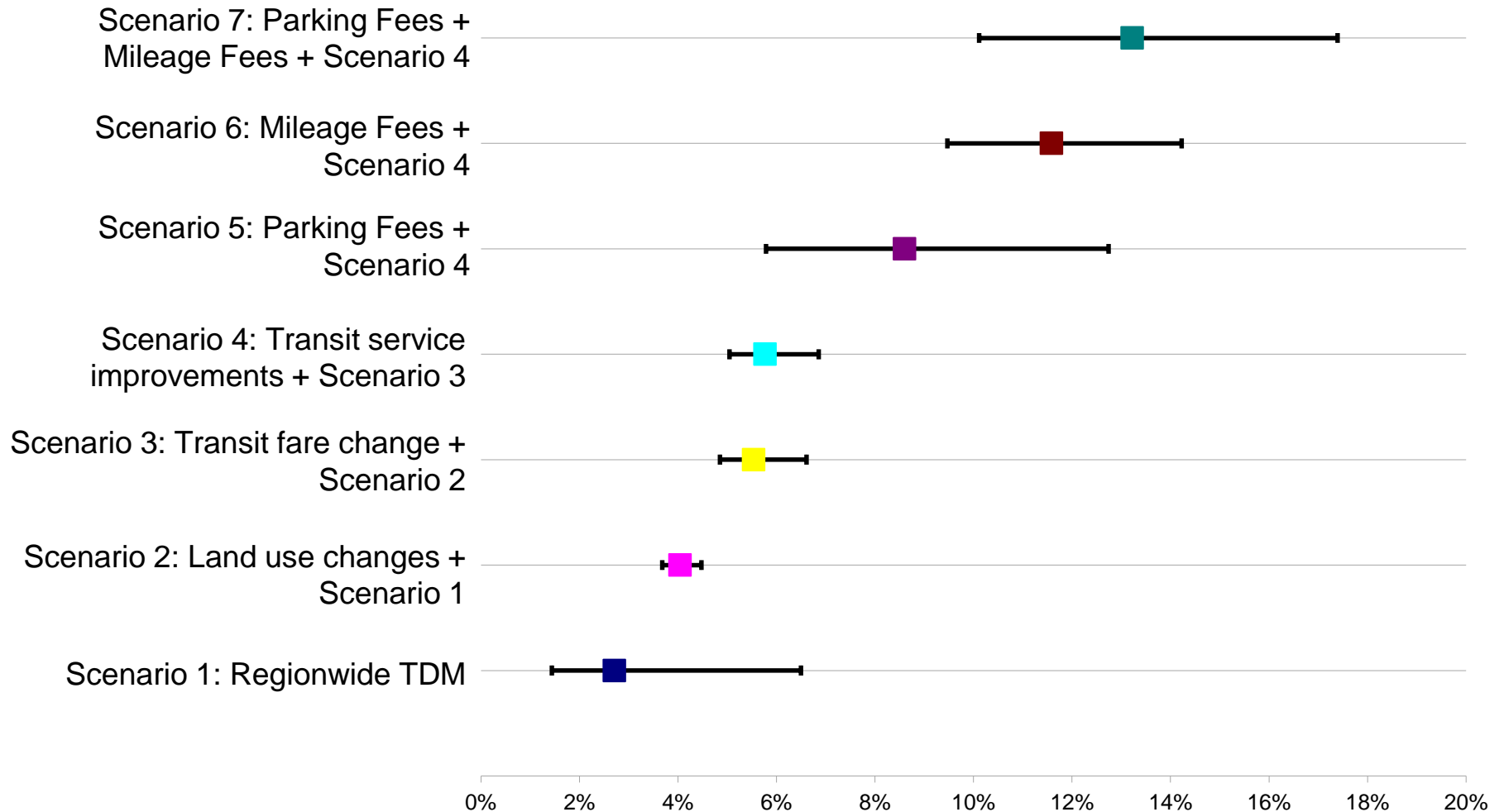
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State Measures and  
Transportation Planning  
Center (SMTPC)

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National  
scale  
Results

## Average and Range % Light-Duty VMT Reduction Across All Regions (2050)



# 2014 Case Study Results

	Scenarios	Applied to	2040 VMT Reductions
Tucson	<ul style="list-style-type: none"> <li>• Free transit pass for university affiliates</li> <li>• Expanded employer-based incentives</li> <li>• Bus-rapid transit corridors</li> <li>• Double parking pricing near university</li> </ul>	Region wide Region wide Sub area Sub area	<ul style="list-style-type: none"> <li>• -0.99%</li> <li>• -0.43%</li> <li>• -0.02%</li> <li>• -0.26%</li> </ul>
Kansas City	<ul style="list-style-type: none"> <li>• Expand access to telework and flexwork programs, Guaranteed Ride Home and ridematching</li> <li>• Improve transit and expand transit pass program</li> <li>• Increase residential density and mixed use</li> <li>• Implement mileage pricing and increase and expand coverage of parking costs.</li> </ul>	Region wide  Region wide Region wide Region wide	<ul style="list-style-type: none"> <li>• -0.93%</li> <li>• -2.35%</li> <li>• -2.49%</li> <li>• -12.06%</li> </ul>
Boston	<ul style="list-style-type: none"> <li>• Expand employer alt. travel programs</li> <li>• Increase residential density and mixed use</li> <li>• Add HOV lanes</li> <li>• Expand + improve transit network</li> </ul>	Region wide Region wide Region wide Region wide	<ul style="list-style-type: none"> <li>• -2.80%</li> <li>• -3.89%</li> <li>• -4.07%</li> <li>• -4.41%</li> </ul>