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

Presented by:

United States Environmental Projection Agency

Office of Transportation and Air Quality

AMPO Annual Conference

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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

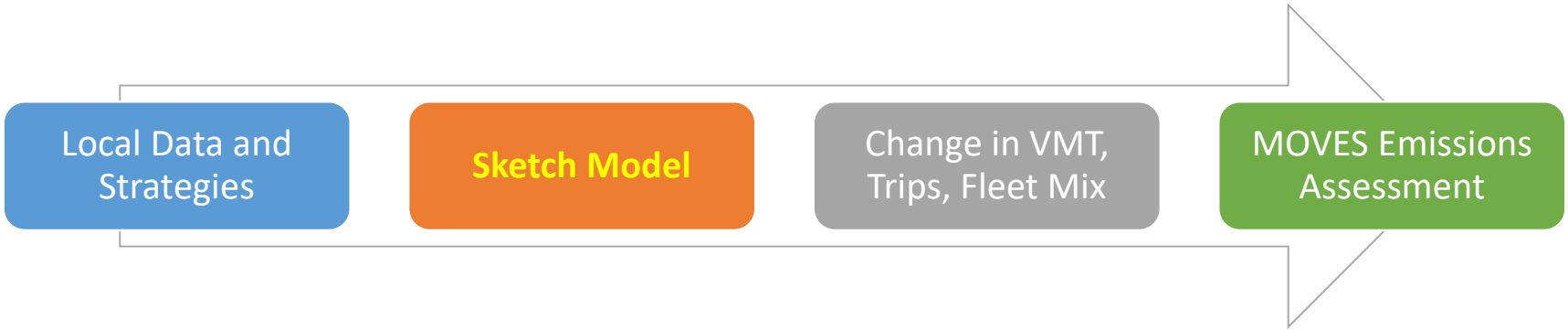
Strategies to reduce emissions by affecting travel activity – examples:

- 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

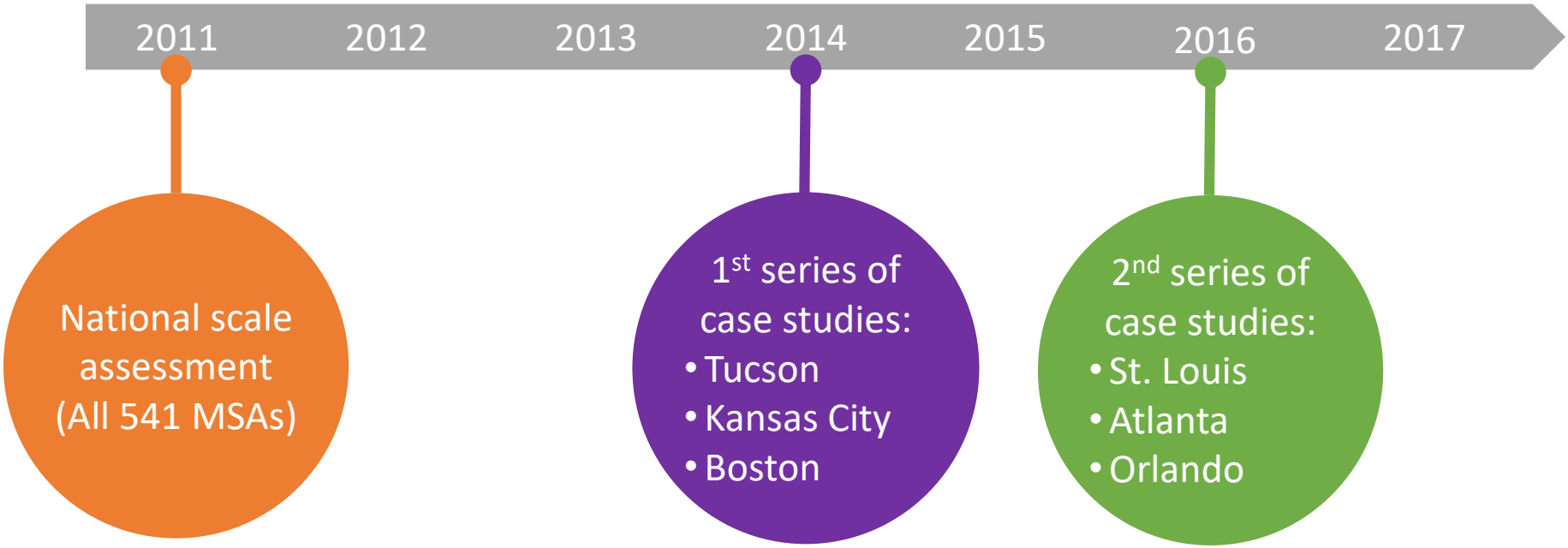
The Travel Efficiency Assessment Method (TEAM)

- 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	• Expand telework and guaranteed ride home • Improve transit access times • Parking pricing • Increase density and mixed use land use	• Employees in 5 county core • Full 5 county area • Full 5 county area • Full 5 county area	• 12 million VMT/day • 124 kg/day $PM_{2.5}$ • 535 kg/day NOx • 414 kg/day VOC • 2.8 million kg/day GHG
St. Louis	• TOD near existing light rail stations • Increase residential density and mixed development • Complete bicycle and pedestrian network • Complete light rail system	• 3 county core • Full 5 county area • Full 5 county area • Full 5 county area	• 1.9 million VMT/ day • 16 kg/day $PM_{2.5}$ • 103 kg/day NOx • 80 kg/day VOC • 440,000 kg/day GHG
Orlando	• Expand employer programs including transit pass • Improve transit access and travel times • VMT pricing for entire region • Unlimited transit pass for with tuition and university employment	• Sub-pop. of 3 county area • Sub-pop. of 3 county area • 3 county VMT • Sub-pop of 3 county area	• 4.6 million VMT/day • 39 kg/day $PM_{2.5}$ • 201 kg/day NOx • 117 kg/day VOC • 1.1 million kg/day GHG

Land Use Sketch Modeling Approaches

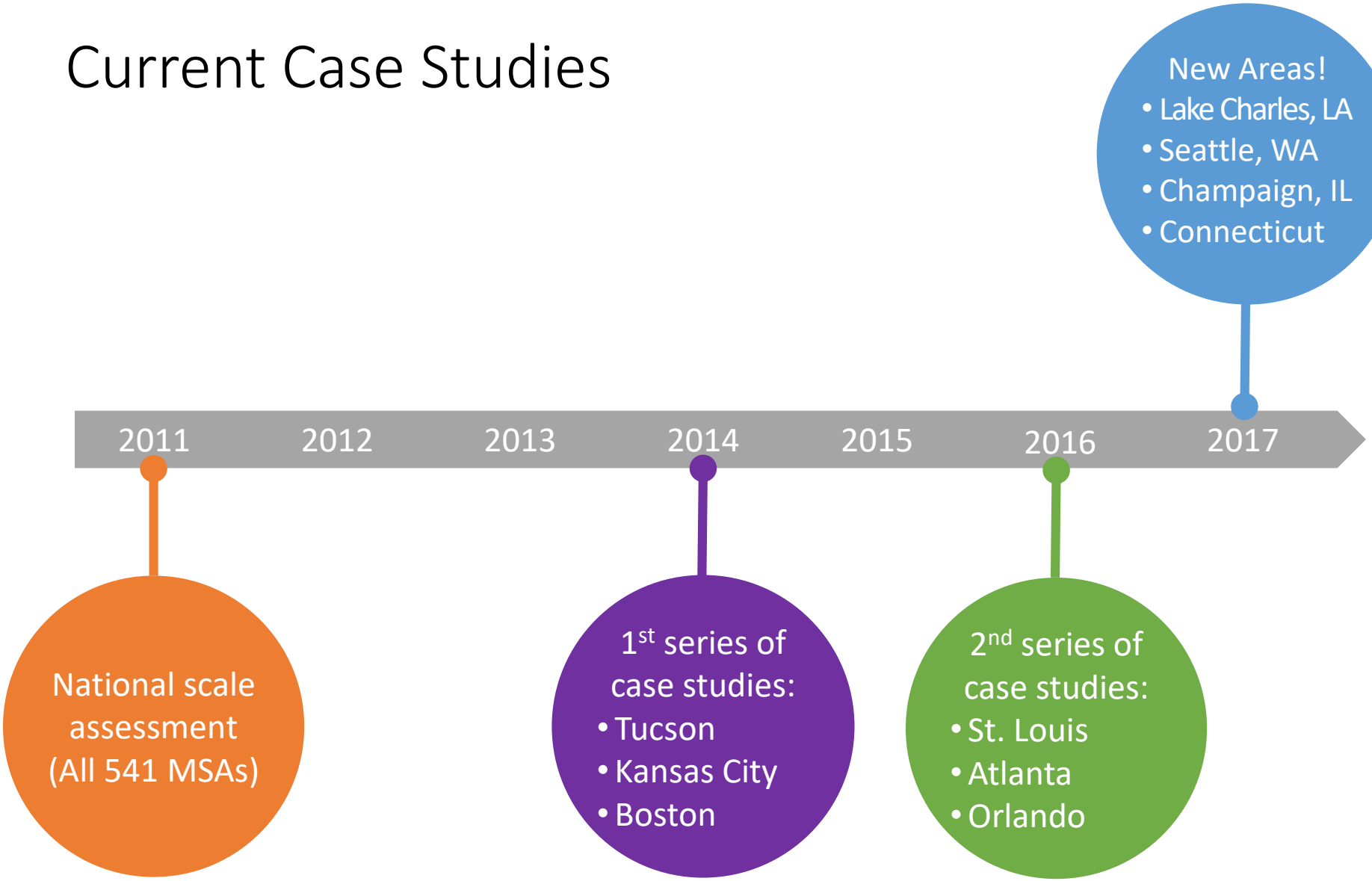
Category	Strategies That Can Be Analyzed	Data Needs

Land Use	• Shifting population and employment growth to more compact neighborhoods and lower VMT generating neighborhoods
	
	• Jobs-housing balance initiatives
	
	• Mixed-use development
	
	• TOD programs
		• Multivariate approach:
		  • share of regional population in affected areas
		  • increase in weighted average residential density (persons per square mile)
		  • increase in job accessibility by car (30 min)
		  • increase in job accessibility by transit (30 min)
		  • average decrease in distance to transit
		  • average increase in land use mixing
		
		• Neighborhood approach:
		  • share of regional population in affected areas
		  • percent population by neighborhood type

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



IMCAL

IMPERIAL CALCASIEU

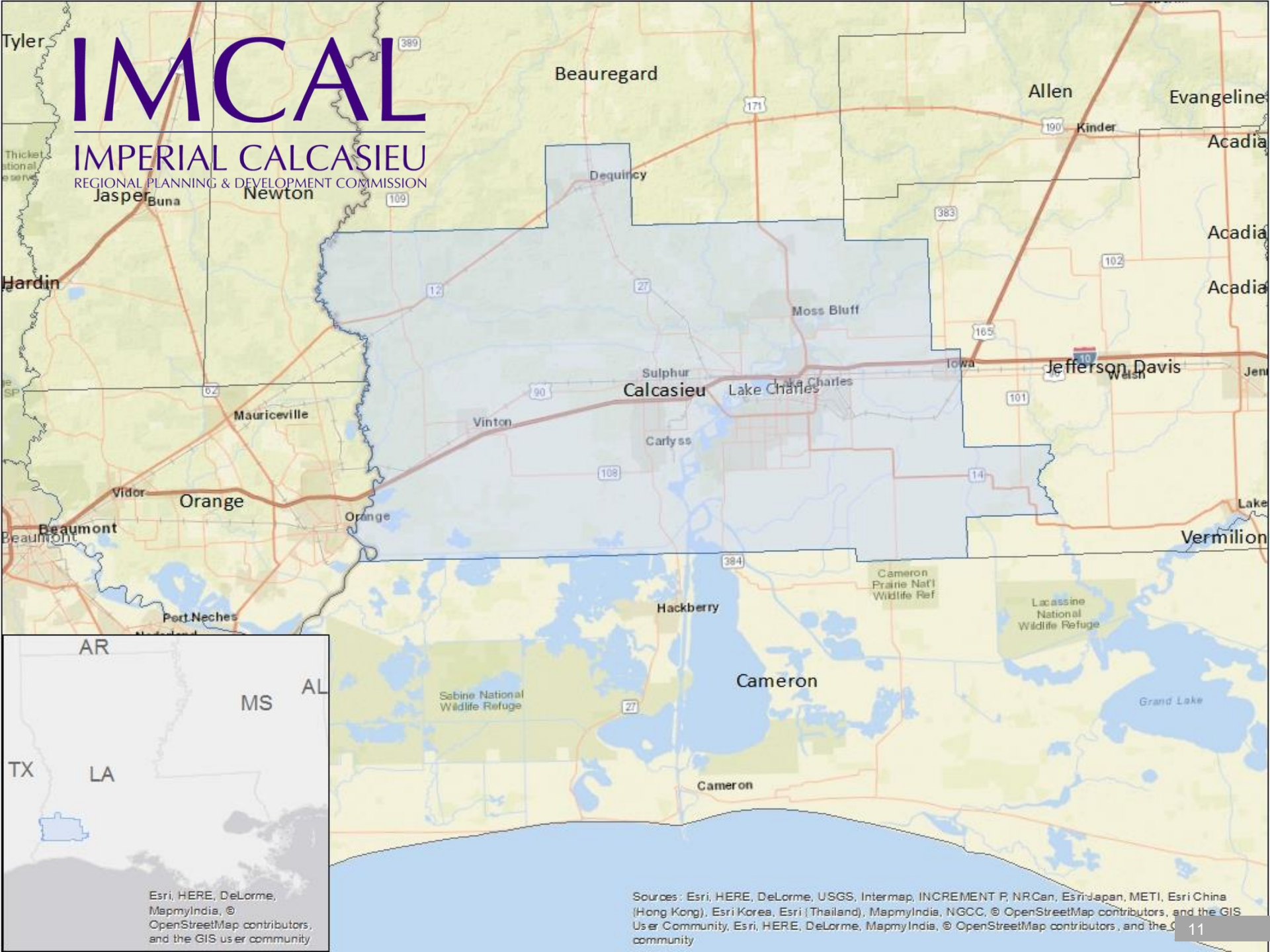
REGIONAL PLANNING & DEVELOPMENT COMMISSION

Region: Lake Charles, Louisiana MPO

Sponsor: Imperial Calcasieu Regional Planning and Development Commission

<u>Region Profile</u>

- 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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Sulphur
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Lake Charles
Jefferson Davis
Mauriceville
Vinton
Carlyss
Vidor
Orange
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IMCAL
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REGIONAL PLANNING & DEVELOPMENT COMMISSION

Scenarios	Applied to	Details	Effect on BAU VMT*
Scenario 1: TDM Employer Programs	Targeted to Petrochemical Employers (7,500 employees)	• Provide $50 per month subsidies for ridesharing or vanpooling to each employee • Offer ridematch programs and guaranteed/emergency ride home programs to employees	-0.07%
Scenario 2: Scenario 1 + Transit Improvements	North Lake Charles (13,500 residents)	• Reduce average transit trip times 16%	-0.10%
Scenario 3: Scenario 2 + Parking Pricing	Downtown Lake Charles (13,000 daily travelers)	• Establish a parking fee of 50 cents per hour for non-work trips to downtown	-0.24%
Scenario 4: Scenario 3 + Smart Growth Land Use	Full Region (260,000 area residents)	• Shift future growth away from lower density single use development styles and towards higher density mixed use development styles	-1.05%

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

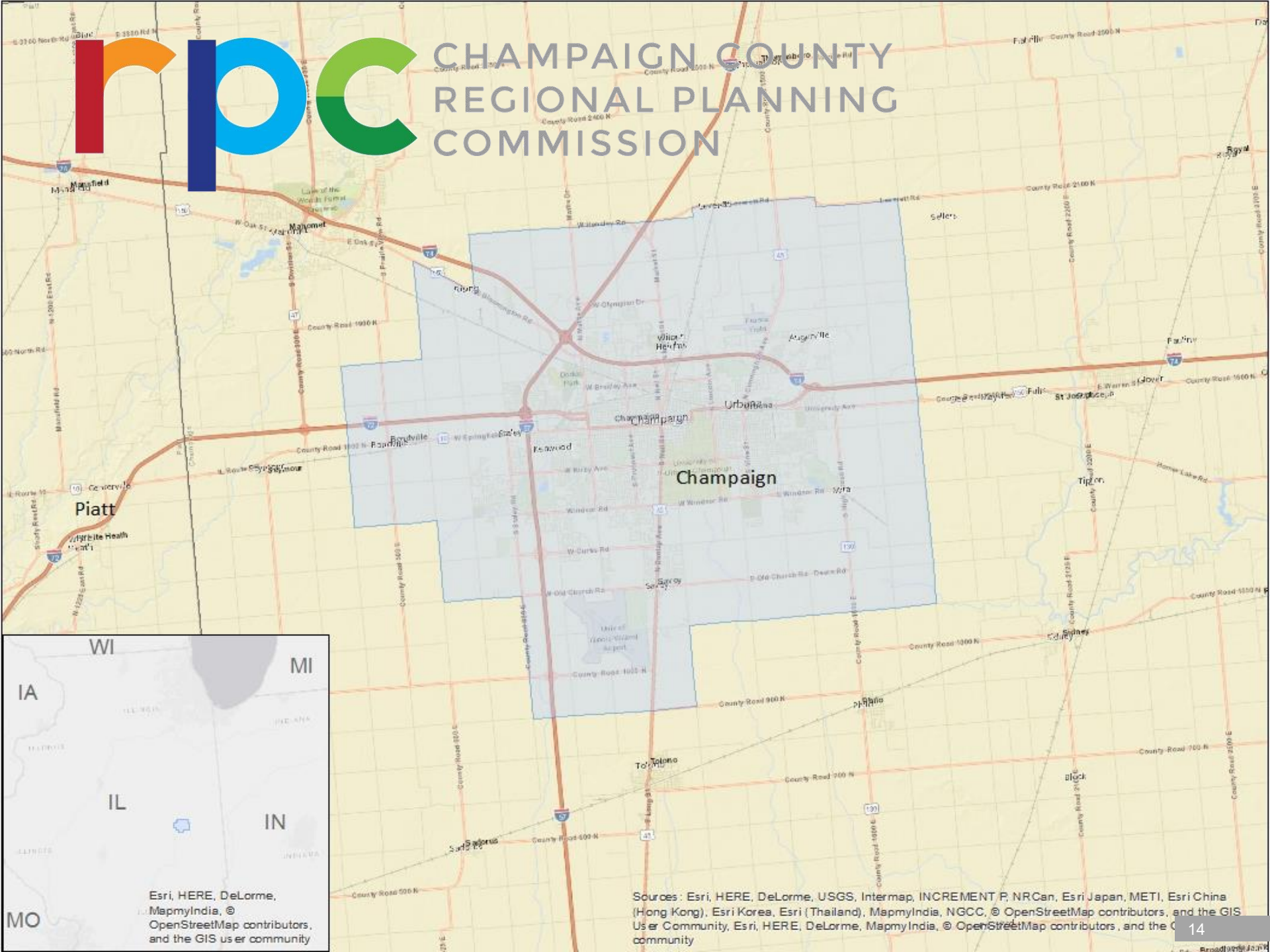
CHAMPAIGN COUNTY
REGIONAL PLANNING
COMMISSION

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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CHAMPAIGN COUNTY REGIONAL PLANNING COMMISSION

Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 1: Expand Bicycle and Pedestrian Networks and Establish new transit hubs	Full Region	• Restructure routes to reduce avg. in-vehicle passenger travel time by 60% • Increase transit frequency to reduce average bus passenger wait time by 20% • Expand bicycle facilities from 60 lane miles today to 410 lane miles in 2040 • Expand sidewalk coverage of streets from 50% today to 100% in 2040	-2.95%
Scenario 2: Scenario 1 + Smart Land Use	Full Region	• Increase housing supply with multimodal access to employment centers by minimizing non-contiguous development and increasing neighborhood density by 4.5%	-3.22%

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

CHAMPAIGN COUNTY REGIONAL PLANNING COMMISSION

Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 3: Scenario 2 + Parking Pricing	University of Illinois	• Increase faculty/staff parking permit costs by 50%	-7.86%
Scenario 4: Scenario 3 + High Speed Rail	Full Region	• Reduce rail avg. in-vehicle time by 73% and wait time by 88%	-8.08%

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

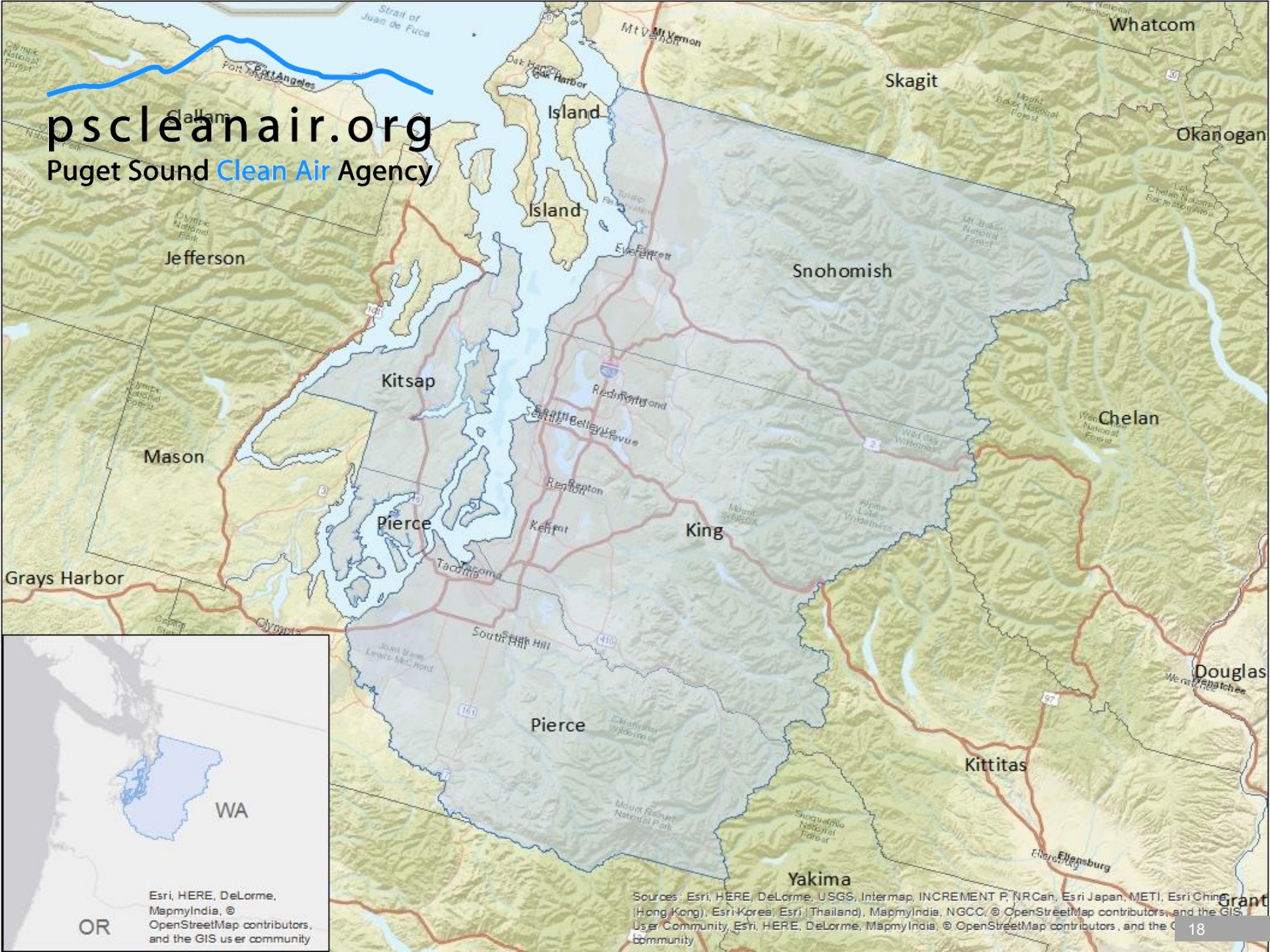
pscleanair.org
Puget Sound Clean Air Agency

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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pscleanair.org
Puget Sound Clean Air Agency

Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 1: Expand Commute Trip Reduction (CTR) Program	Additional 156,000 employees	• 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	-0.09%
Scenario 2: Scenario 1 + Expand access transit access to EJ/low-income populations	169,000 EJ/low-income residents	• Provide free transit passes to 169,000 EJ/low income community members	-0.16%

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

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Puget Sound Clean Air Agency

Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 3: Scenario 2 + VMT Pricing	All travel in the 4 county region	• Introduce 15 cents per mile VMT price	-3.40%
Scenario 4: Scenario 3 + Smart growth land use	All regional jobs (2.98 million) and population (4.85 million)	• All regional jobs and populations • Increase population density by 50%. • Increase accessibility to jobs by auto within 45 minutes by 3%. • Increase accessibility to jobs by transit within 45 minutes by 60% • Reduce distances to transit by 15% • Increase diversity of land use types by 5%	-10.20%

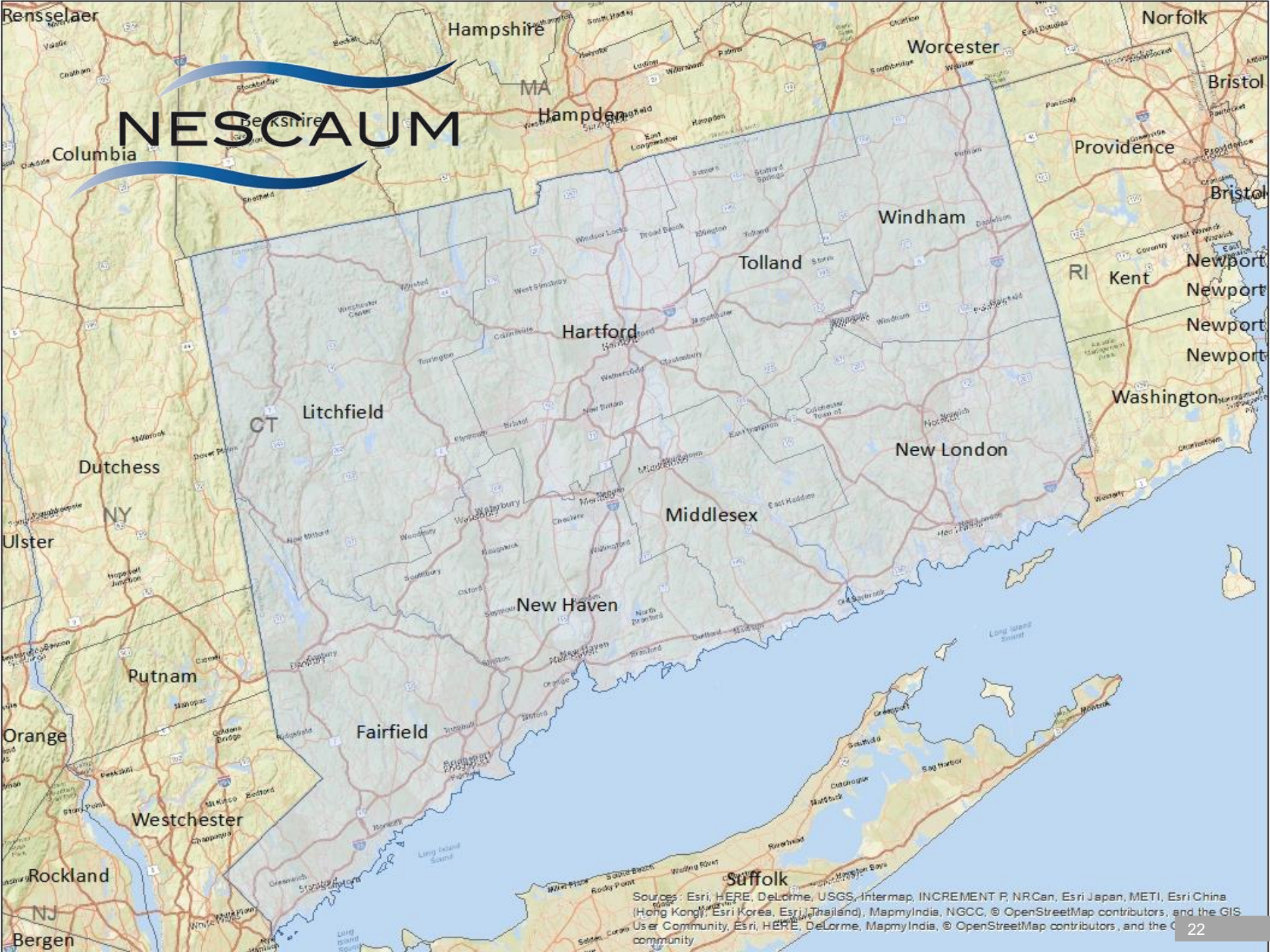
*This value provides the reduction in VMT as compared with the "Business-As-Usual" 2040 outyear.

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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NESCAUM

Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 1: Commuter train improvements	NY-New Haven Corridor (1.35 million residents)	• Implement rail improvements that increase the frequency of service and reduce transit trip times by 15%	-0.78%
Scenario 2: Scenario 1 + Local bus improvements	NY-New Haven Corridor (1.35 million residents)	• Increase transit service by extending coverage areas, providing connecting services between cities and reduce transit trip times by 33%	-1.84%

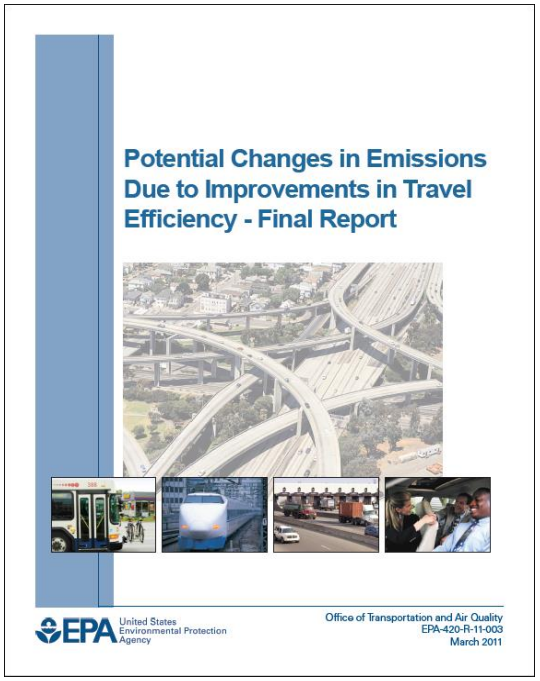
*This value provides the reduction in VMT as compared with the "Business-As-Usual" 2040 outyear.

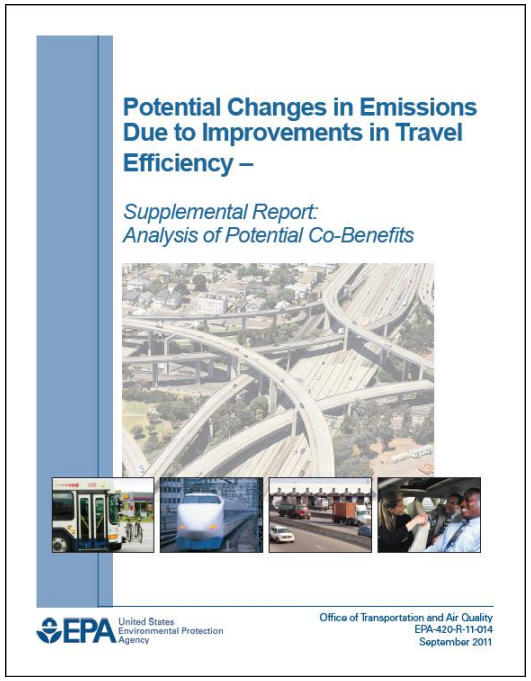
Selected Strategies	Applied to	Details	Effect on BAU VMT*
Scenario 3: Scenario 2 + Smart growth land use	NY-New Haven Corridor (1.35 million residents)	• Shifting population/employment in the New York to New Haven corridor to areas that have transit access by increasing typical neighborhood density by 15%	-2.07%
Scenario 4: Scenario 3 + VMT pricing	Full State (4.01 million residents)	• Introduce a 5 cent per mile VMT price	-7.54%

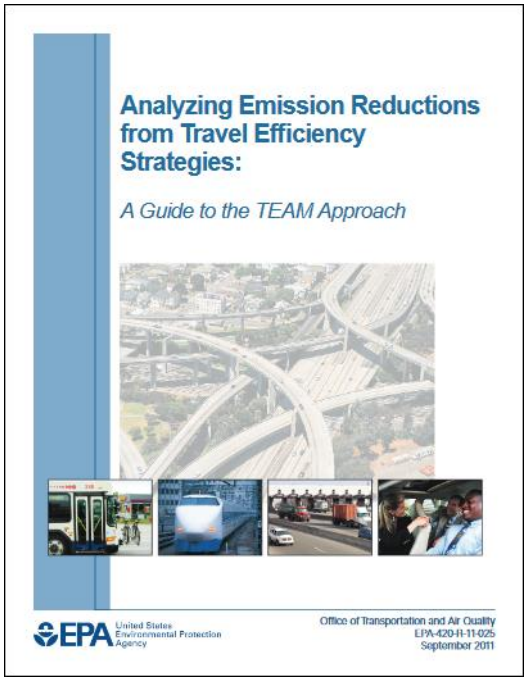
*This value provides the reduction in VMT as compared with the "Business-As-Usual" 2040 outyear.

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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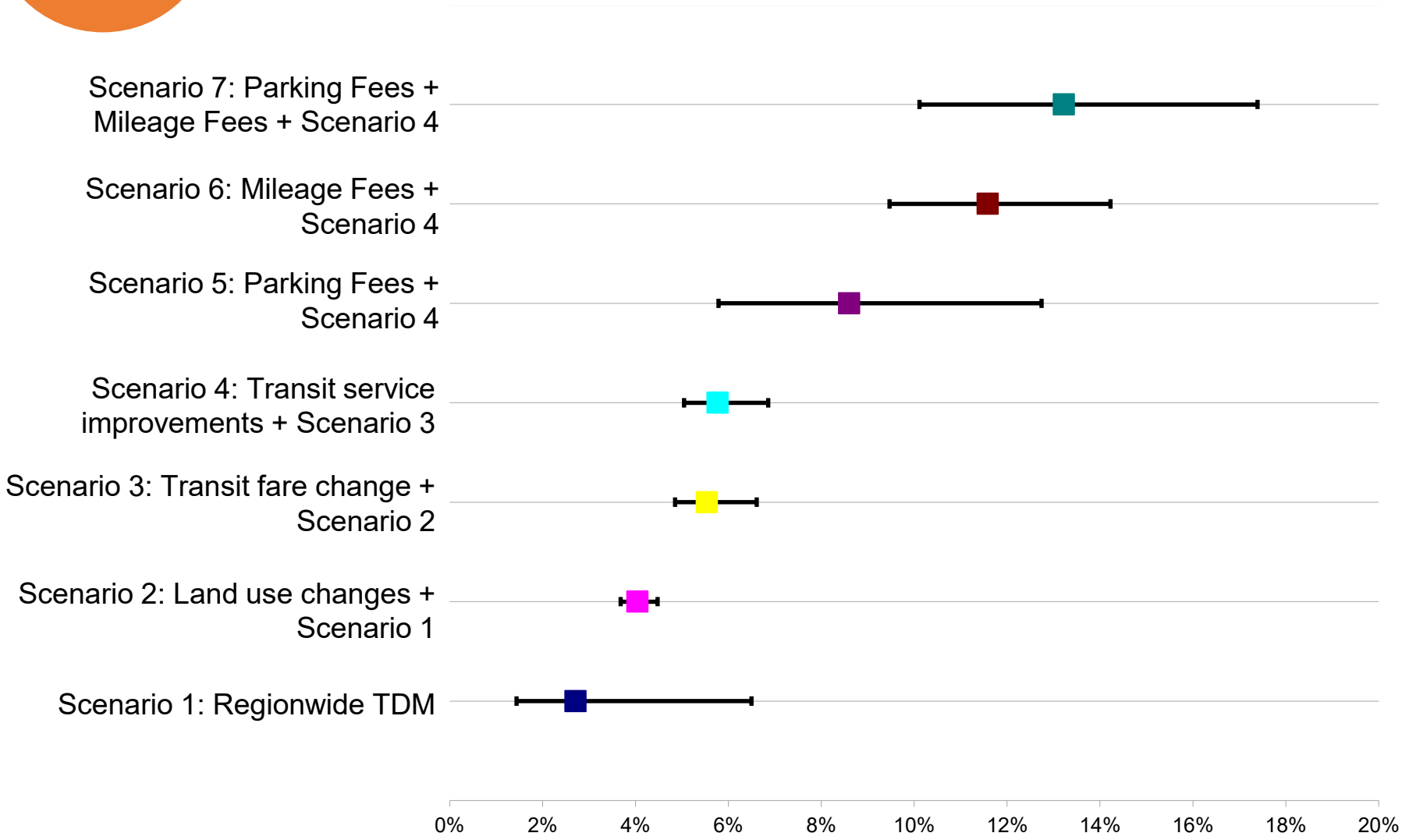
National scale Results

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



2014 Case Study Results

	Scenarios	Applied to	2040 VMT Reductions
Tucson	• Free transit pass for university affiliates • Expanded employer-based incentives • Bus-rapid transit corridors • Double parking pricing near university	Region wide Region wide Sub area Sub area	• -0.99% • -0.43% • -0.02% • -0.26%
Kansas City	• Expand access to telework and flexwork programs, Guaranteed Ride Home and ridematching • Improve transit and expand transit pass program • Increase residential density and mixed use • Implement mileage pricing and increase and expand coverage of parking costs.	Region wide Region wide Region wide Region wide	• -0.93% • -2.35% • -2.49% • -12.06%
Boston	• Expand employer alt. travel programs • Increase residential density and mixed use • Add HOV lanes • Expand + improve transit network	Region wide Region wide Region wide Region wide	• -2.80% • -3.89% • -4.07% • -4.41%