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Smart Growth Area Planning Tool (SmartGAP)

*Pilot Test for Thurston County,
Washington, conducted by
Thurston RPC*

Prepared for
New Partners for Smart Growth Conference

Prepared by
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Software Team

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Pilot Test Objectives

Test how a small/medium MPO would use SmartGAP

- Evaluate the whole MPO region
- Tested network installation for multi-user access

Software tests to understand

- Usability of the software
- Complexity of developing input data
- Usefulness of output metrics
- Reasonableness of the results

Generated feedback that informed

- Final updates to the software and user's guide
- Suggestions for future updates



Test Scenarios

| Scenario | Land Use | Transportation | Policy |
|----------|---|-------------------------|-----------------------------|
| #1 | Baseline | Baseline | Baseline |
| #2 | Baseline | + 20% in Transit Supply | Baseline |
| #3 | Baseline | + 20% in Roadway Supply | Baseline |
| #4 | Baseline | Baseline | +20% in Lane Miles with ITS |
| #5 | Shift 10% of Population and Employment to Close in Community and 10% to Urban Core. Proportional reduction from Suburban Area | Baseline | Baseline |
| #6 | Shift 20% of Population and Employment to Close in Community and 20% to Urban Core. Proportional reduction from Suburban Area | Baseline | Baseline |
| #7 | Shift 30% of Population and Employment to Close in Community and 30% to Urban Core. Proportional reduction from Suburban Area | Baseline | Baseline |
| #8 | Shift 30% of Population and Employment to Close in Community and 30% to Urban Core. Proportional reduction from Suburban Area | +20% in Transit Supply | +20% in Lane Miles with ITS |



Context and Preparation for Scenario Testing

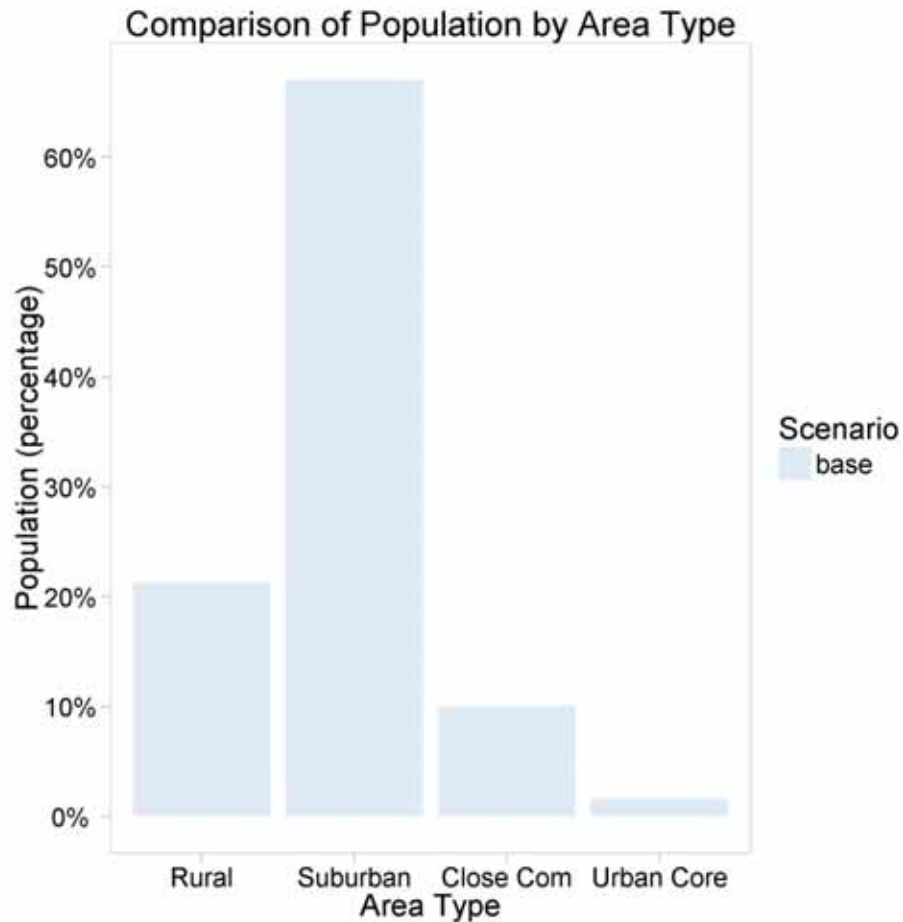
TRPC: Region Overview

Olympia, Washington metropolitan area

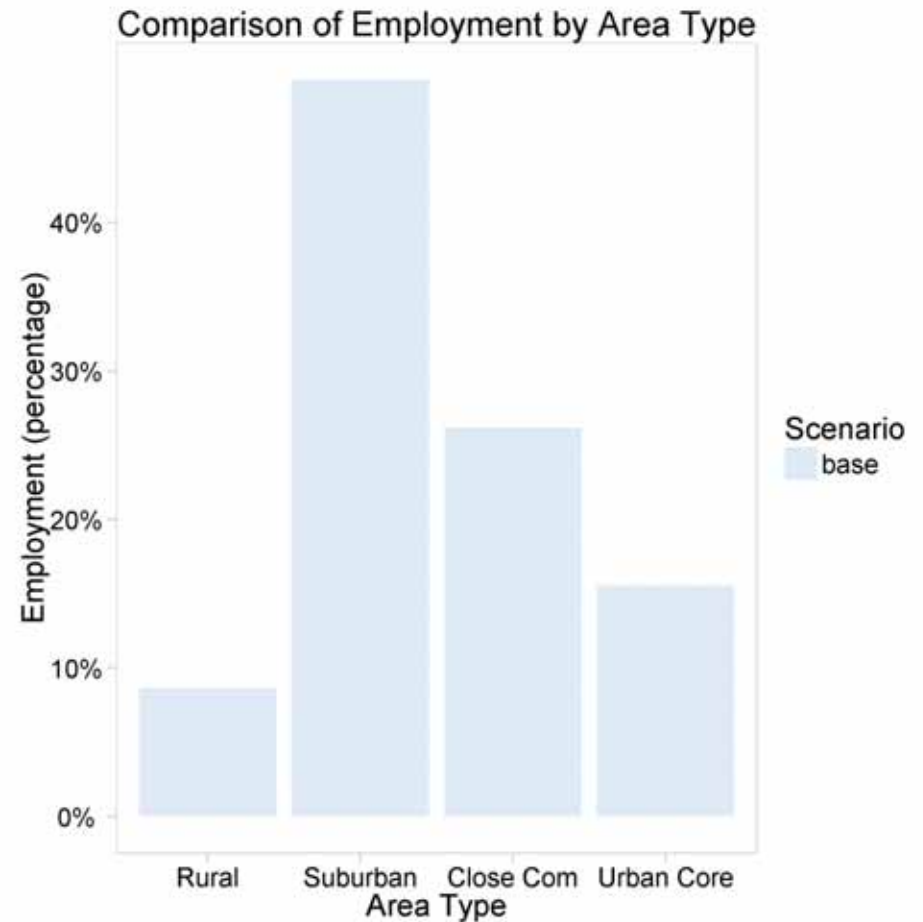
- Single county, Thurston
- 2010 population of 250,000 and 2040 projected population of 425,000 (growth of 69%)
- 2010 employment of 130,000 and 2040 project growth of 100%



TRPC: Population and employment



Overall population in the base case is ~65% suburban in 2040, ~20% rural, ~10% CIC and only ~2% urban core



Employment is slightly more evenly distributed, with ~50% in suburban, ~25% CIC, and ~15% urban core



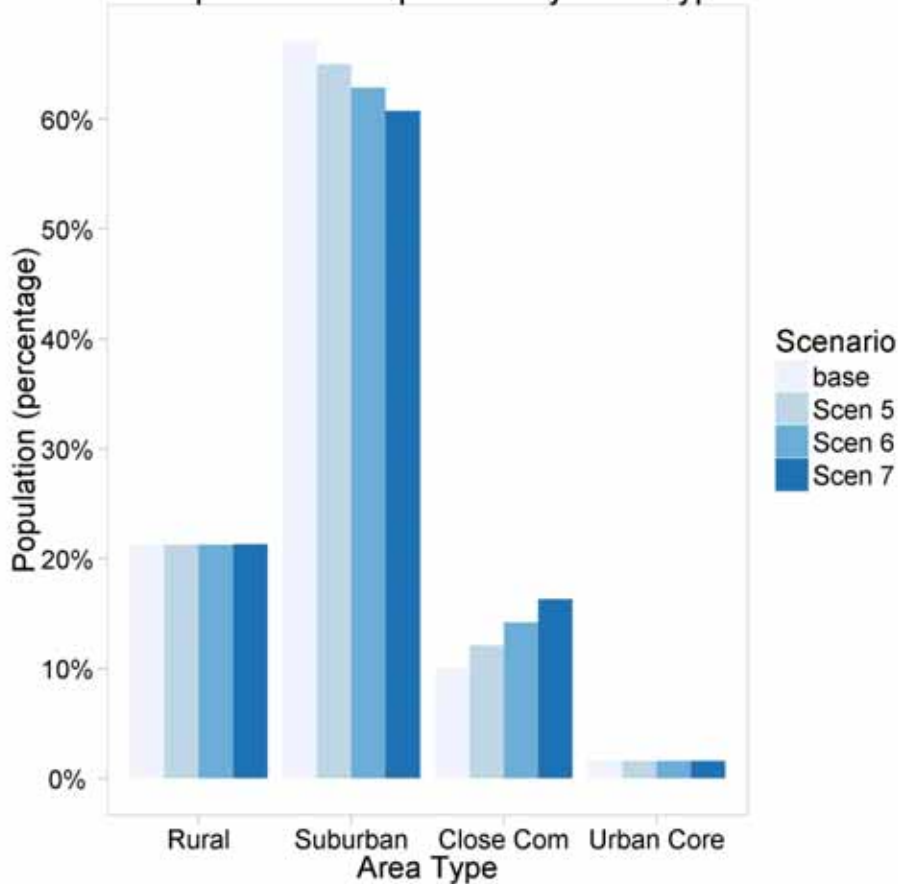
SmartGAP Place Types

| | Area Type | | | |
|------------------------------|------------|--------------------|----------|-------|
| Development Type | Urban Core | Close in Community | Suburban | Rural |
| Residential | ✓ | ✓ | ✓ | |
| Employment | ✓ | ✓ | ✓ | |
| Mixed-Use | ✓ | ✓ | ✓ | |
| Transit Oriented Development | ✓ | ✓ | ✓ | |
| Rural/ Greenfield | | | | ✓ |



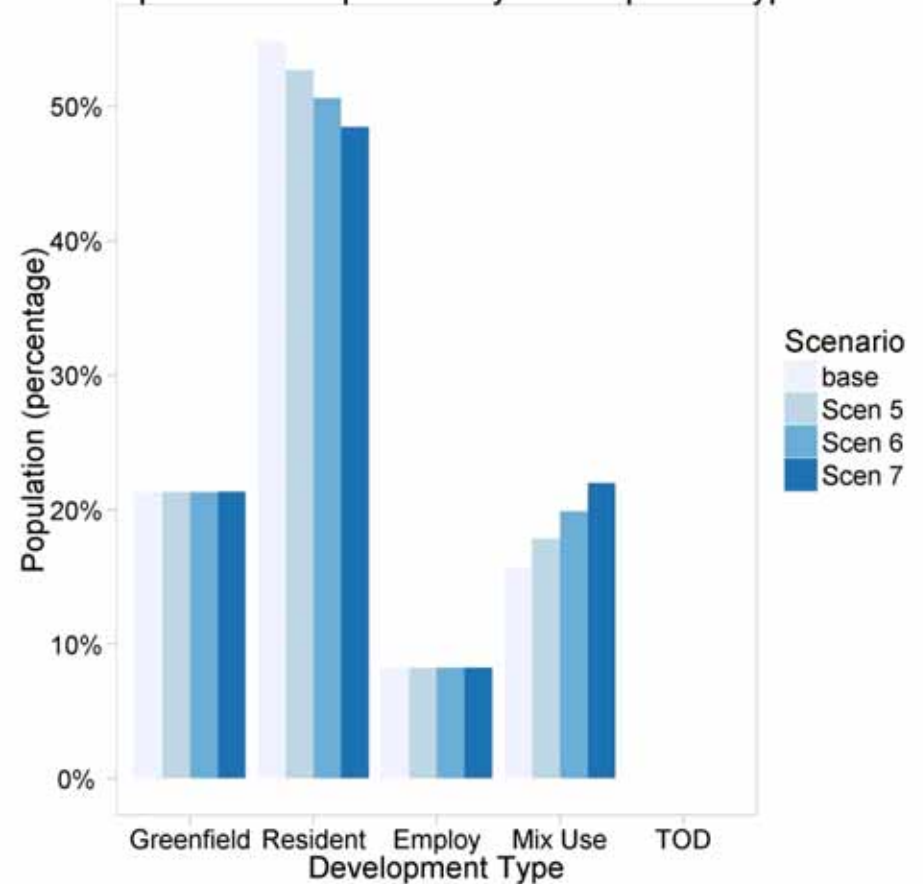
TRPC: Population allocation

Comparison of Population by Area Type



TRPC moved relatively modest amounts of growth from suburban to close in communities for their land use allocation scenarios

Comparison of Population by Development Type

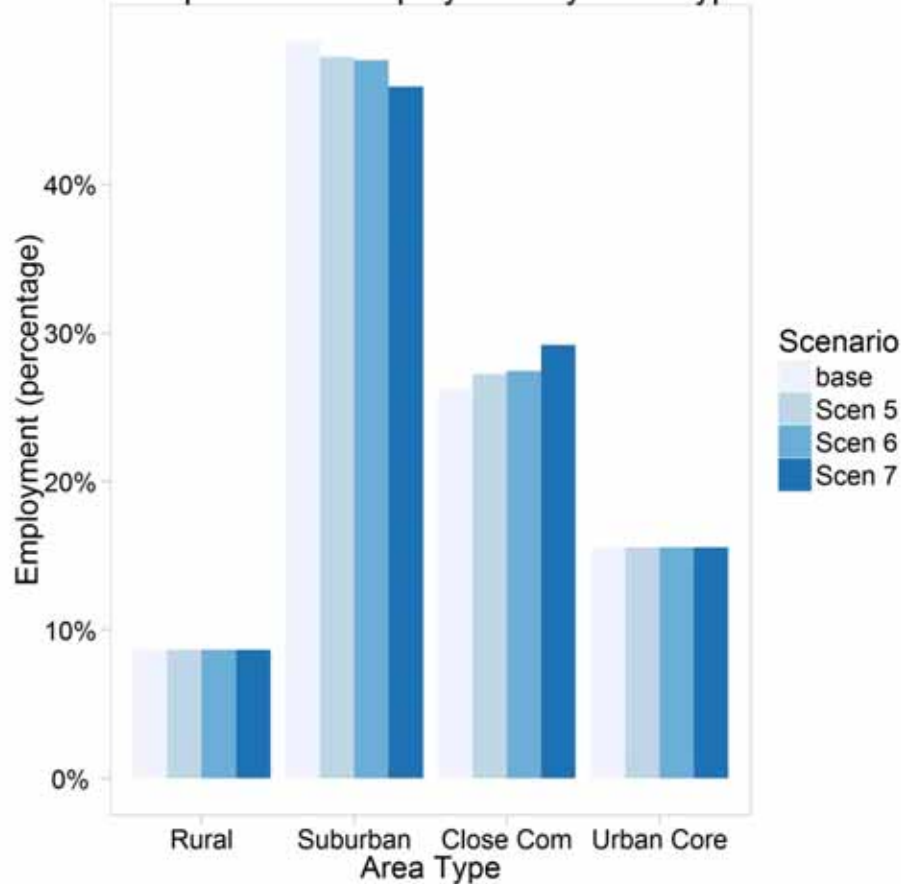


Similarly, new residential growth was moved in modest amounts from residential areas to mixed use areas



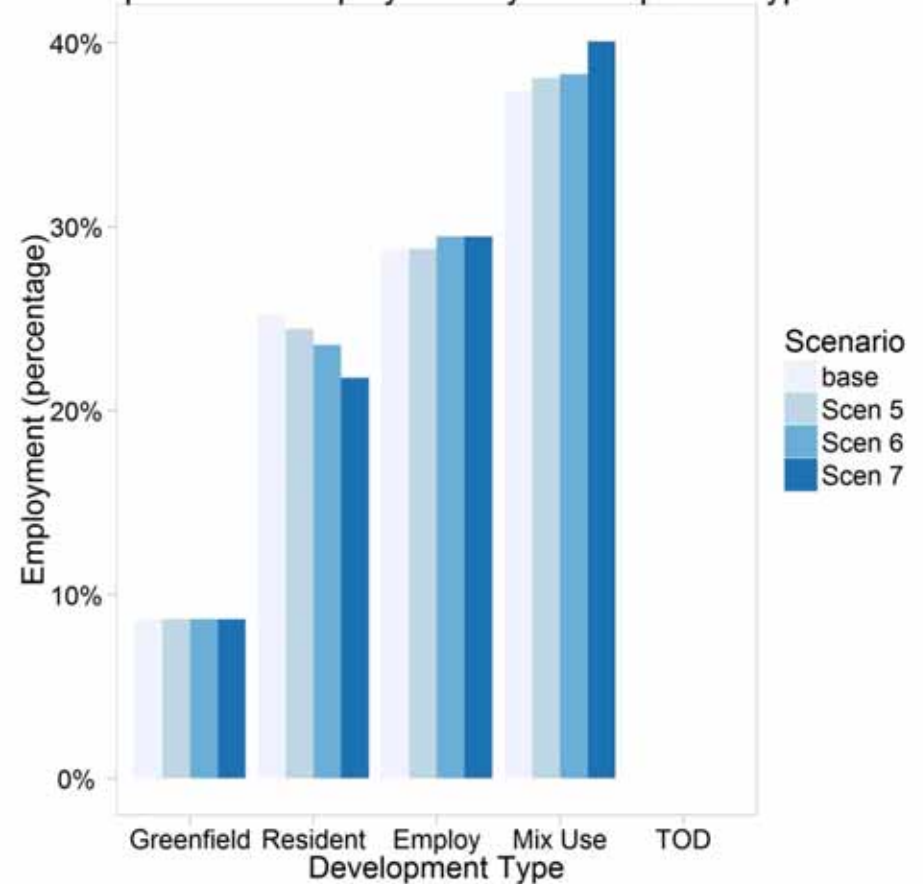
TRPC: Employment allocation

Comparison of Employment by Area Type



TRPC was similarly conservative with employment and moved relatively small amounts of growth from suburban to close in communities for their land use allocation scenarios

Comparison of Employment by Development Type



For new employment growth, small amounts were moved from residential areas to mixed use areas

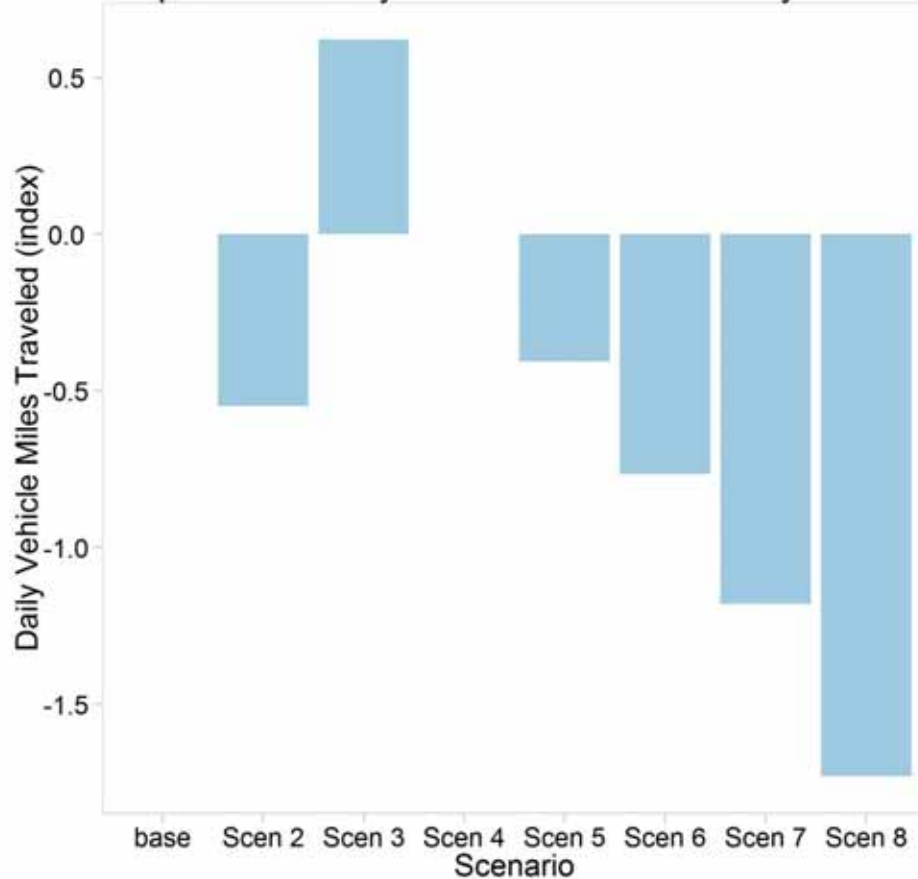


SmartGAP Demonstration

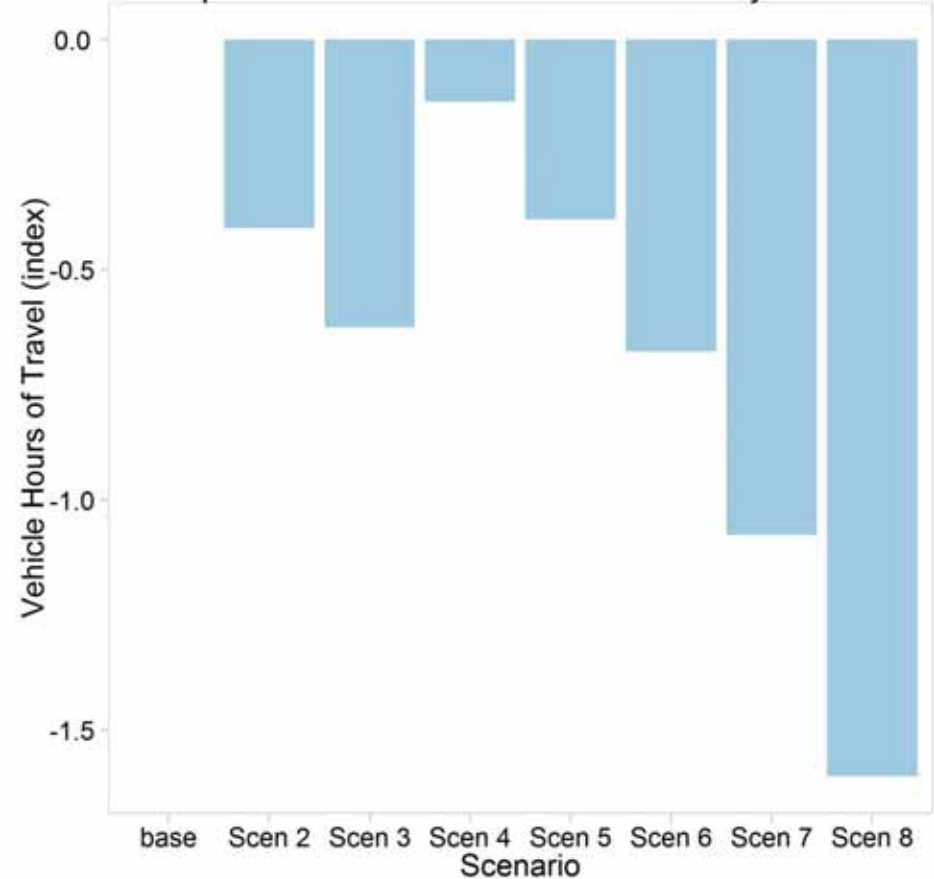
Scenario Testing Results

Change in Vehicle Miles and Vehicle Hours Traveled

Comparison of Daily Vehicle Miles Traveled by Scenario



Comparison of Vehicle Hours of Travel by Scenario

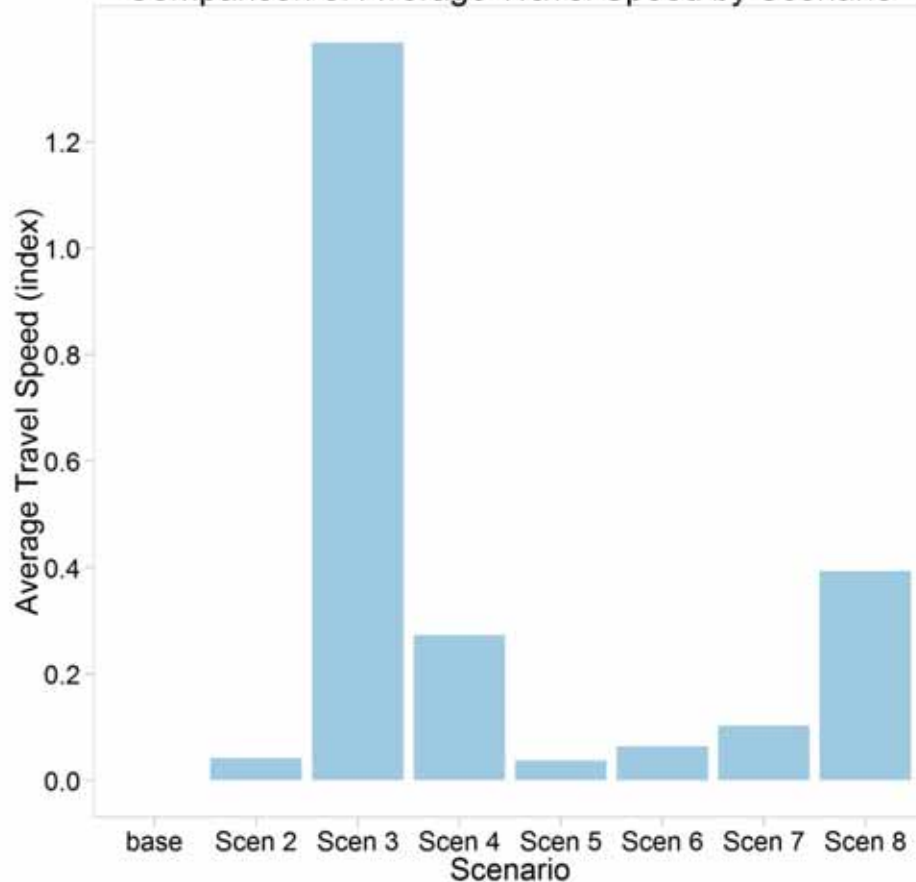


- VMT is sensitive to changes in demand and supply. The third scenario – adding highway lane miles – increases VMT slightly. Other scenarios – adding transit, or focusing development in central areas – reduces VMT.
- VHT responds slightly differently. VMT reductions tend to result in lower VHT, but also policies that reduce congestion can reduce VHT even with no change or an increase in VMT.

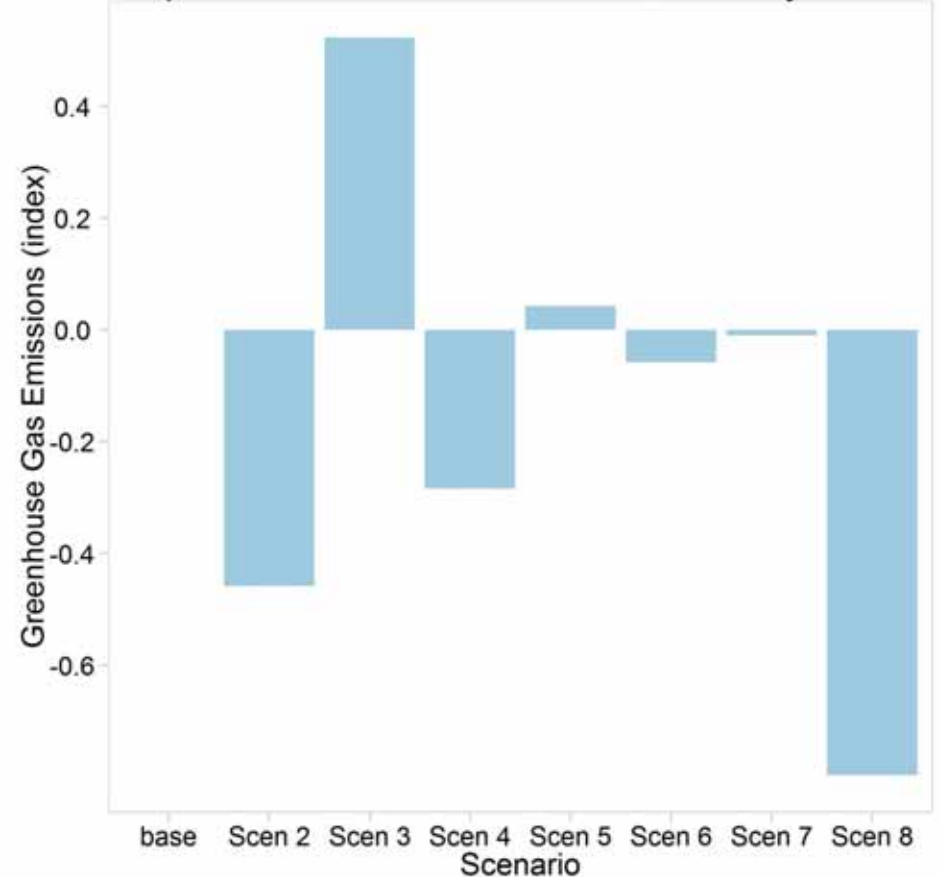


Changes in Average Speeds and GHG Emissions

Comparison of Average Travel Speed by Scenario



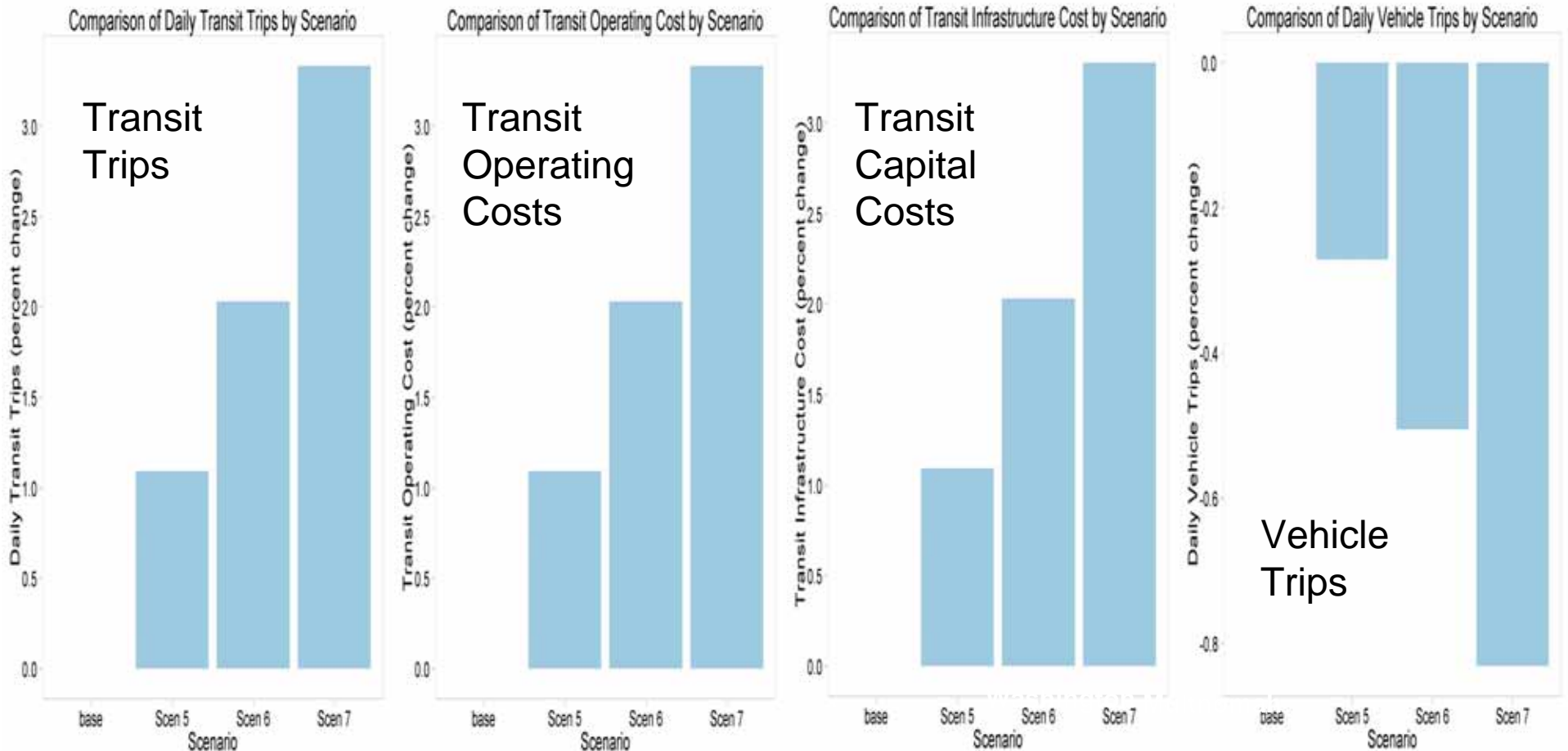
Comparison of Greenhouse Gas Emissions by Scenario



The pattern of reductions in GHG is affected by both change in VMT and also changes in congestion and travel speeds. Congestion reduction through ITS and additional transit provision have the largest impacts on GHG emissions



Transit and Vehicle Trips and Transit Costs



Transit trip metric is based on land use effects only: allocating growth to more transit accessible locations (i.e. CIC and mixed use) increases transit use. Operating costs and capital costs are proportion to use so follow the same pattern.

Vehicle trips are calculated in a similar way to transit trips – again the calculation is only based on land use effects. Allocating growth to more central and mixed use areas reduces vehicle trips.



Pilot Test Summary

- **Performance metrics were consistent with expectations**
- **Installation and input file preparation were easy**
 - TRPC were able to run the model across their network to allow multiple users within the MPO to use the same installation
- **Regional policy scenario testing is useful for**
 - Smaller MPOs and local jurisdictions without advanced travel demand models
 - Provides a fast way for agencies with good travel demand modeling tools to pre-screen policy scenarios before undertaking extensive travel demand modeling exercises that are resource intensive
- **Run times are reasonable**
 - Atlanta Regional Commission (ARC) took ~ 1 hour 45 minutes
 - **Thurston Regional Planning Commission (TRPC) took ~ 4 minutes**
 - Maryland DOT (MDOT) took ~17 minutes for Montgomery County and ~2 minutes for Cecil County
 - RSG Test Bed for Portland Metro Region took ~ 25 minutes





Vermont



Chicago



Salt Lake



New
Hampshire



DC Metro

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