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MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

IMPACT OF TELEWORKING ON THE TRANSPORTATION SYSTEM

Case Study

The COVID-19 pandemic fundamentally reshaped work and commute patterns, prompting millions of workers to transition to remote and hybrid arrangements. This seismic shift disrupted decades of traditional commuting behaviors, rapidly altering transportation systems, land-use patterns, and economic activities. Hybrid and flexible work arrangements have endured, presenting policymakers with complex challenges in aligning transportation infrastructure and land use with evolving travel behaviors.

THE CHALLENGE

The pandemic caused teleworking to shift from a relatively uncommon activity to a mainstay in many occupations. Before 2020, only 13% of employed time involved remote work. By mid-2020, teleworking exceeded 50% among some groups. As the pandemic waned, teleworking rates began to stabilize but remained higher than prepandemic levels. A 2021 survey revealed that Massachusetts residents expected to telework an average of 1.69 days per week, with hybrid work emerging as particularly resilient.

This enduring shift posed critical questions for the Massachusetts Department of Transportation (MassDOT):

- Would reduced commuting offset potential increases in non-commute travel?
- How might residential and workplace relocation affect transportation infrastructure?
- What policies could ensure teleworking's benefits are equally shared?

Understanding these dynamics was essential to plan sustainable and cost-effective transportation investments.

RSG'S SOLUTION

To address these challenges, RSG leveraged our survey-based research and strategic transportation planning capabilities, employing VisionEval's scenario modeling to deliver planning insights. This approach offered MassDOT a comprehensive understanding of teleworking's implications for travel behavior, land use, and economic outcomes.

RSG began by collecting and synthesizing extensive data tailored to Massachusetts' unique dynamics. A custom resident survey gathered granular insights into teleworking habits, commute patterns, and household characteristics. This survey data was complemented by inputs from the

National Household Travel Survey (NHTS) and socioeconomic trends such as income and vehicle ownership. Additionally, land-use patterns reflecting shifts between urban, suburban, and exurban growth were incorporated to evaluate changes in residential and employment distributions.

Using VisionEval's advanced scenario modeling, RSG developed four scenarios to explore a range of potential outcomes across two dimensions of change—degree of teleworking and land-use change:

- **Scenario 1**. Telework (Baseline): Prepandemic teleworking rates.
- **Scenario 2**. Moving to the Suburbs (Teleworking Expansion): A 44% increase in hybrid teleworking workdays.
- **Scenario 3**. Quiet Cities (Suburban Growth): Increased housing and employment in lower-density areas such as the suburbs.
- **Scenario 4**. Sustainable Urbanization (Urban Concentration): Greater density in urban centers alongside teleworking.

Scenario 3, with its high rate of full-time teleworking, achieved the greatest reduction in commute VMT. Scenario 4 also achieved notable reductions in commute VMT, driven by urban intensification and a strategic mix of residential and nonresidential land uses. However, the study found that reductions in commute VMT did not always translate to decreases in overall household VMT, as mode shifts and relocation to less dense areas often resulted in longer travel distances for other trip purposes. Even under hybrid working conditions, the average commute distance tended to increase.

The study also uncovered disparities in outcomes across scenarios. Lower-income households and those without vehicles were less likely to benefit from teleworking, underscoring the need for community-specific policies. Additionally, suburban growth scenarios modestly increased household VMT, while urban intensification yielded the greatest reductions, highlighting the importance of targeted land-use strategies.

By integrating rigorous data collection with VisionEval's advanced scenario modeling capabilities, RSG delivered actionable insights, empowering MassDOT to make informed transportation investments, promote sustainable development, and proactively address changing community needs across the Commonwealth.