Climate Change in Transportation Planning:

Addressing the Challenges Facing States & MPOs

Presented by

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Prepared for

1,000 Friends of Florida, Florida DOT, Florida DOH

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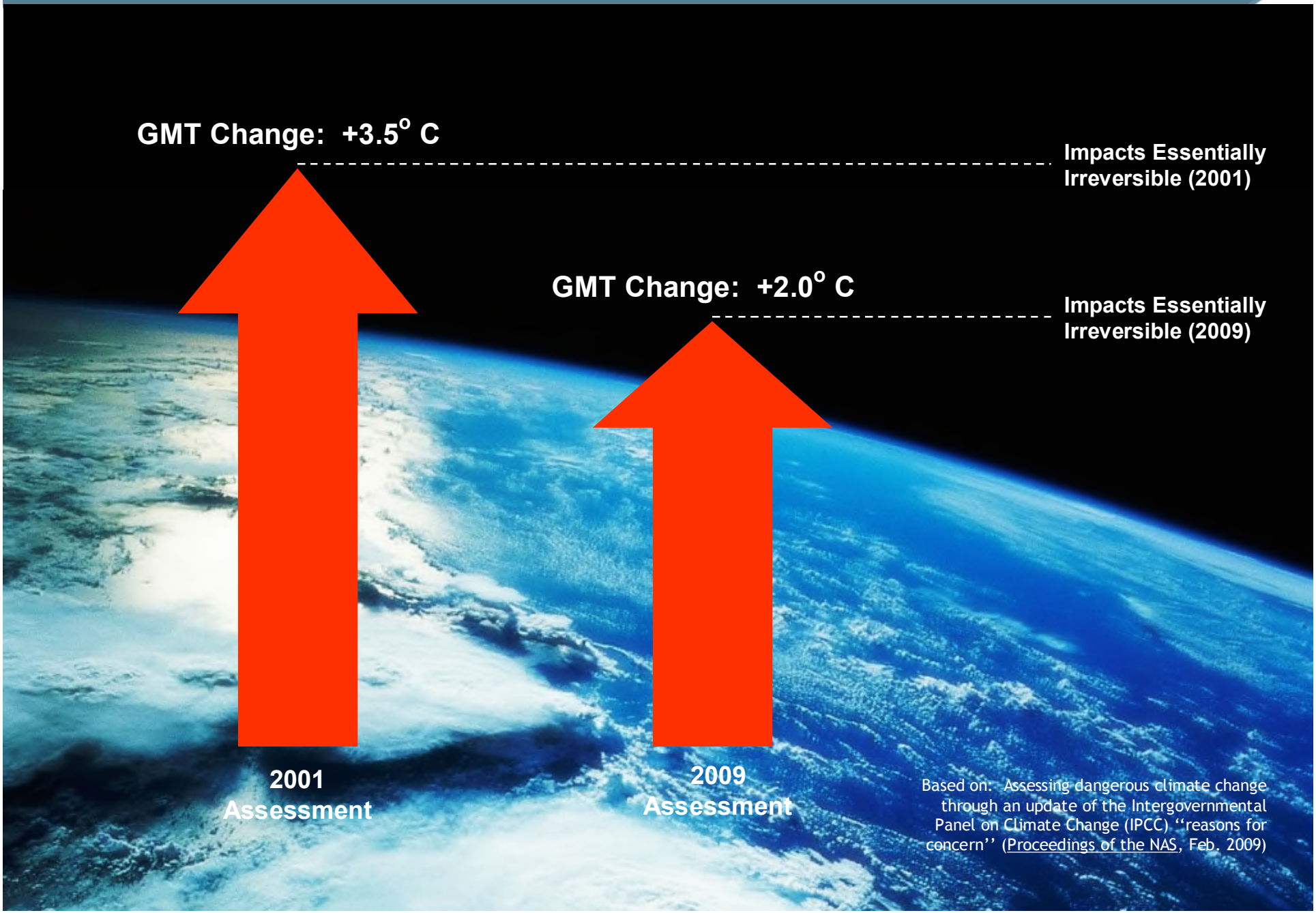
“Wait & See” Isn’t an Option



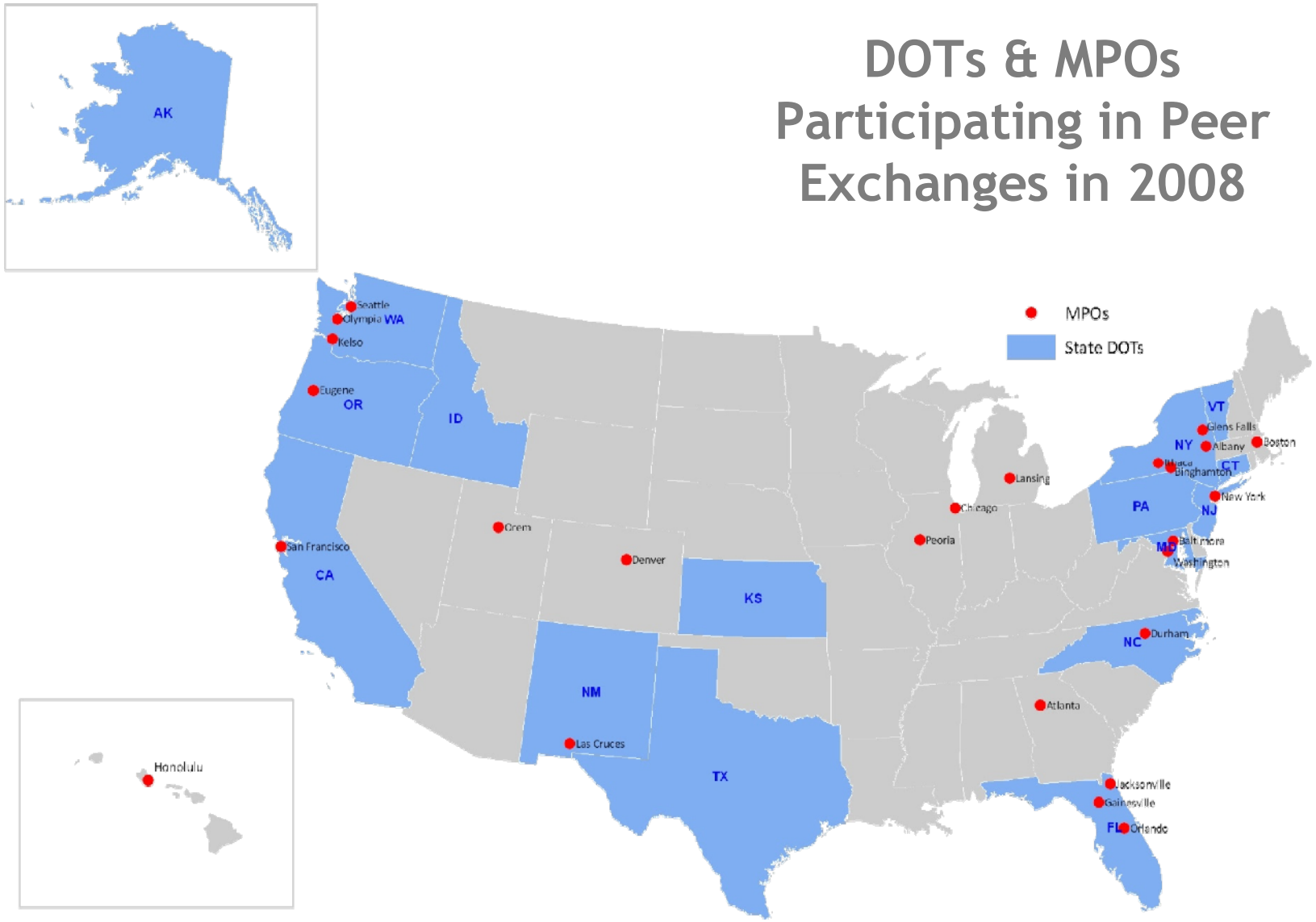
State of the Practice

Practitioner Perspectives

Examples

GCC & Transportation

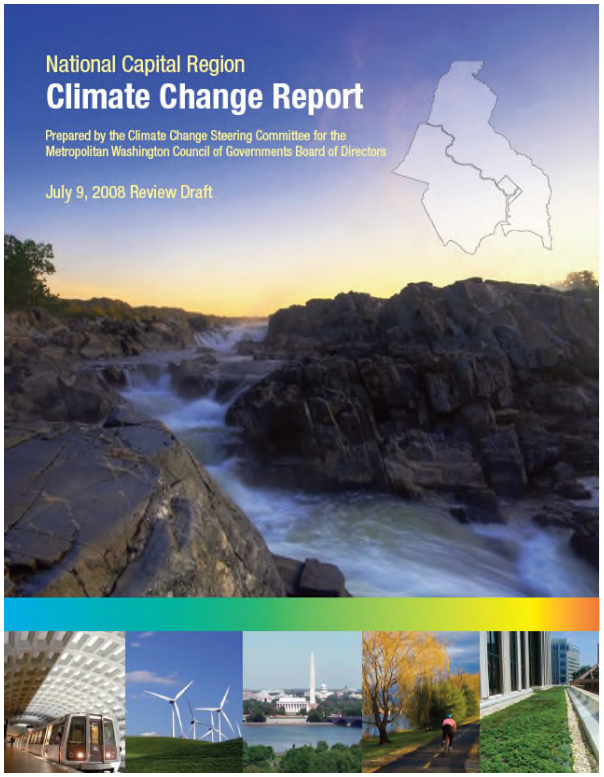
DOTs & MPOs Participating in Peer Exchanges in 2008



GCC & Transportation – Practitioner Perspectives

- Expand knowledge base/educate decision-makers & public - build awareness & credibility
- Performance-based planning and investment
- Harmonize efforts across jurisdictions, institutions and economic sectors
- Ensure credibility through improved analytical tools and methods
- DOTs & MPOs need financial & technical resources

Planning Activities – Washington, DC Region



MPO employed scenario planning approach to assess CC strategies in LRTP:

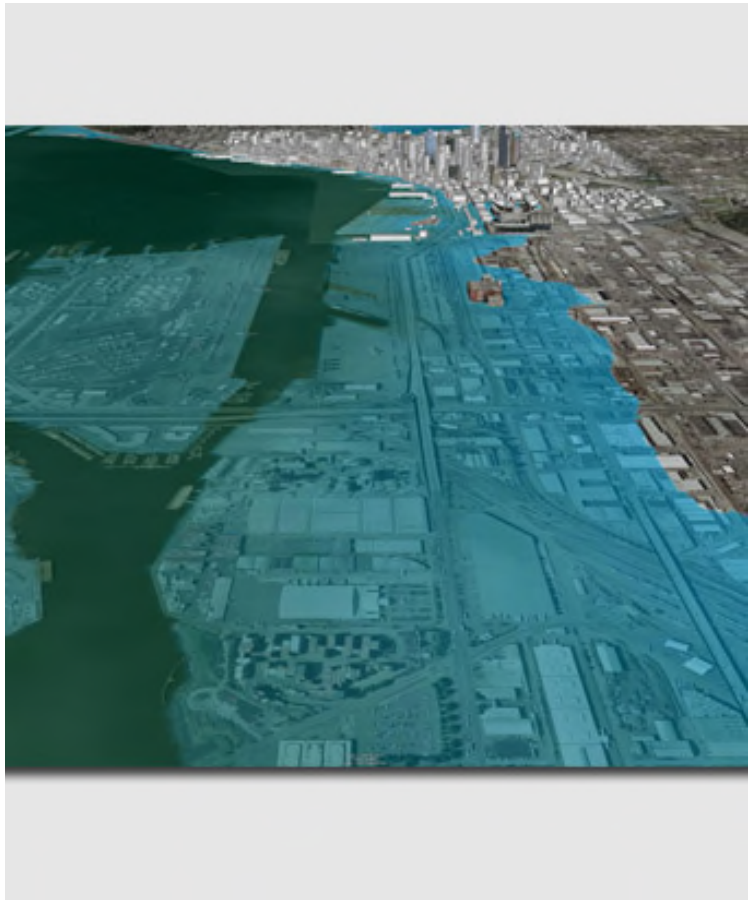
- "constrained long range plan" scenario
- "what would it take" (WWIT) scenario

Analyzed three categories for the WWIT scenario:

- Fuel efficiency
- Fuel carbon intensity
- Travel efficiency

Prioritized LRTP strategies based on GHG reduction effectiveness, scale, and cost-effectiveness

Planning Activities – Puget Sound (Seattle)



- Transportation 2040 (LRTP)
  - Policy Board direction to consider climate change in the update
  - CO2 analyses to be performed for EIS, comparison of alternatives
  - Also considering adaptation needs (accelerated pavement deterioration, flooded roadways, increased maintenance, etc.)
- Climate Change Technical Working Group – multiple agencies

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Adaptation Activities - Alaska

- Loss of shore-fast sea ice & melting permafrost pose major threats to infrastructure
- Governor established state-level Adaptation Advisory Group
- Examples of state & DOT adaptation activities:
  - Shoreline protection programs
  - Evacuation route planning
  - Relocation of at-risk infrastructure & communities
  - Permafrost protection
  - Seeking enhanced/expanded data collection & collaboration across agencies

Adaptation Activities - California

- Since 2008, Governor seeking to establish statewide climate change adaptation strategy
  - Agencies, including Caltrans, required to plan for sea level rise, shifting precipitation & extreme weather events
- CA's Climate Change Action Plan – possible adaptation options:
  - Use of ITS to manage impacts of weather changes
  - Revised infrastructure design
  - Researching rate of change(s)
- Statewide Information Strategy by mid-2009 to support infrastructure vulnerability assessment

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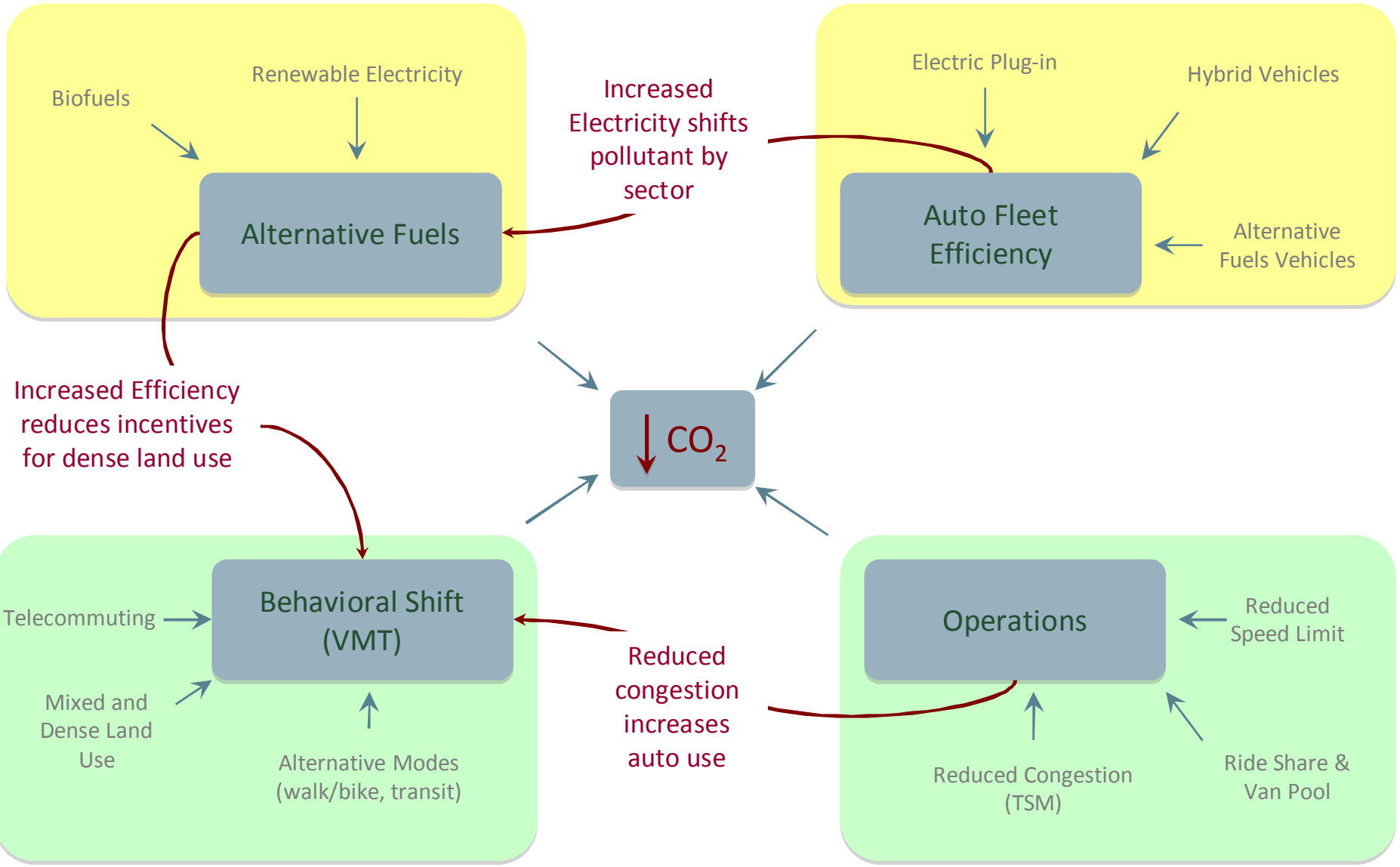
What Are We Facing?

Climate Change: A "Wicked Problem"

- Can't be solved in traditional linear fashion
- Problem definition evolves as new possible solutions are considered
- Complexity of GCC overwhelms most current institutional approaches
- May require radical changes to long-standing processes and institutional arrangements to make progress

Causal Pathway



What is Best Approach?

Results of Mid-size MPO Case Study:

6.0% Hybrid (20% usage)

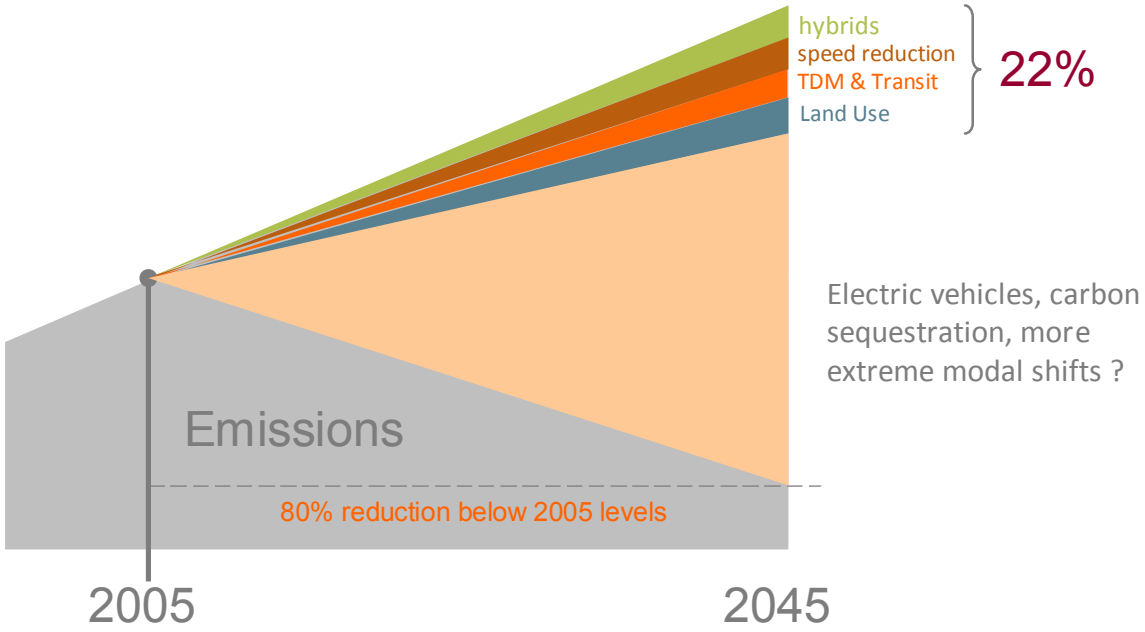
5.0% Speed to 65 MPH

2.0% TDM

1.5% Transit

7.0% Land Use (observed by 2045)

22% Total Reduction



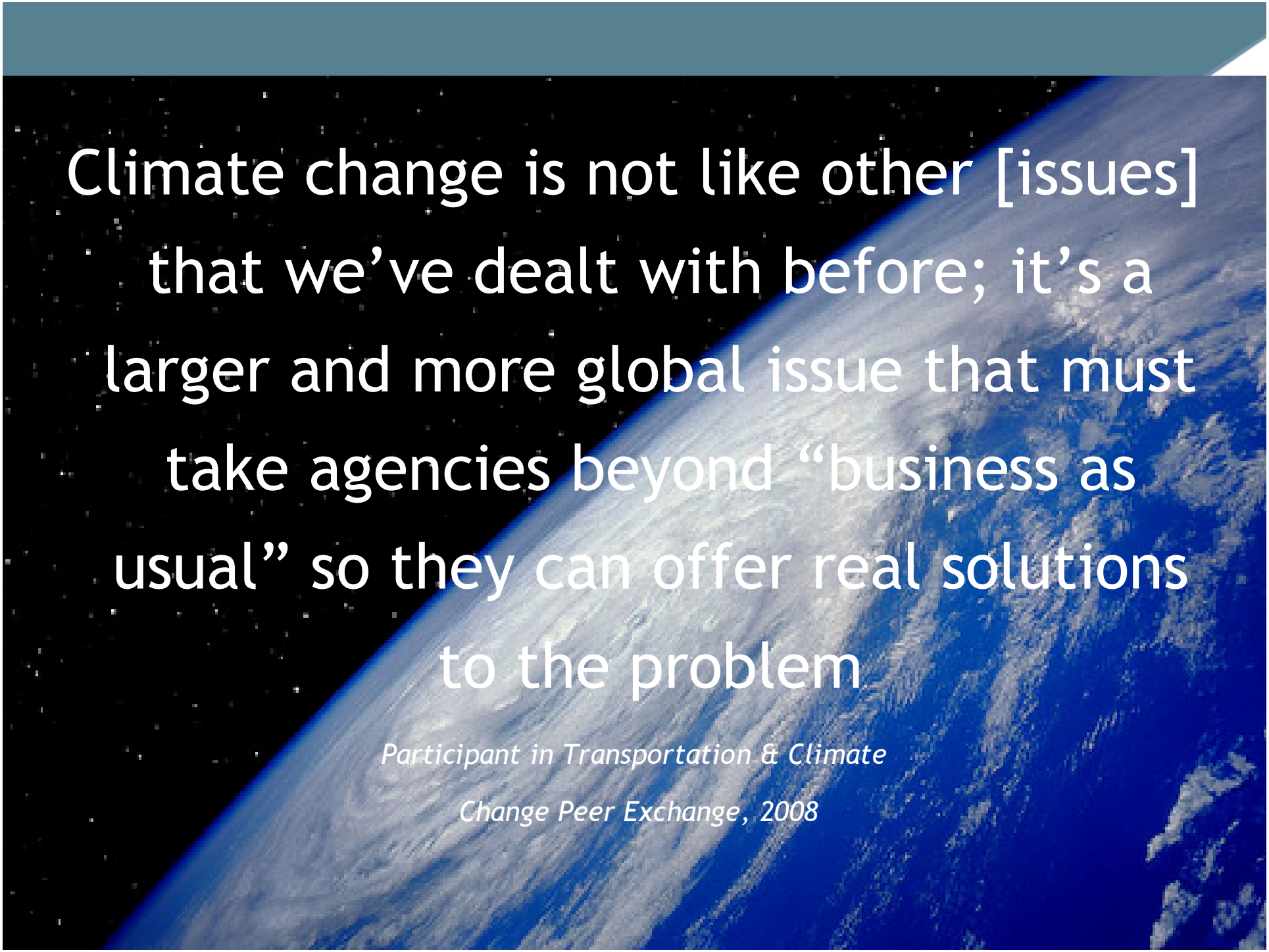
Planning within a Climate Change Framework

Challenges to Transportation Agencies

- Addressing climate change may be planning's biggest challenge
- Scale and scope of actions required to have appreciable impacts may be surprising to some
- Rate of increase in climate change impacts outpacing expectations and threatening infrastructure
- Smart transportation planning & investment today may buy more time for dealing with climate impacts

Meeting the CC Challenge

- Transitioning to carbon-reduction focus
- Need for innovation, creativity and results
- Moving beyond institutional "comfort zones"
- Ramping up cooperation & collaboration across agencies & jurisdictions
- Educating public & policy-makers
- Rethinking "sacred cows" (policies & projects)
- Accepting political risks and challenges


Climate change is not like other [issues] that we've dealt with before; it's a larger and more global issue that must take agencies beyond "business as usual" so they can offer real solutions to the problem
Participant in Transportation & Climate Change Peer Exchange, 2008

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Advanced Method for Estimating Transportation GHGs

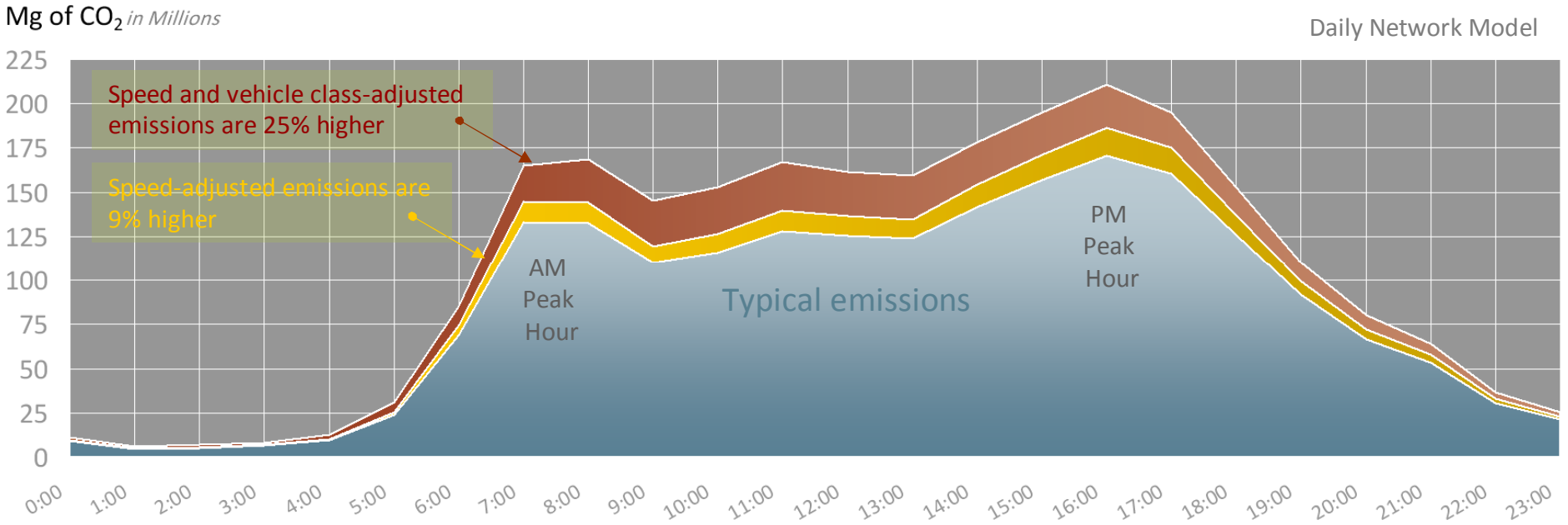
Speed-adjusted Estimate

- Calculate VMT by network link, vehicle type, and hour at *actual* operating speeds
- Use adjusted fuel economy and CO_2 emission curves by speed
- Apply adjustment curves to speed and class-weighted VMT

Methodology Requirement

- Estimate of traffic by time of day (to capture congested speeds)
- Estimate of fleet distribution by time of day
- Estimate of fuel economy by vehicle type
- Fuel economy-to- CO_2 emission curves by speed

Case Study for Chittenden County, Vermont

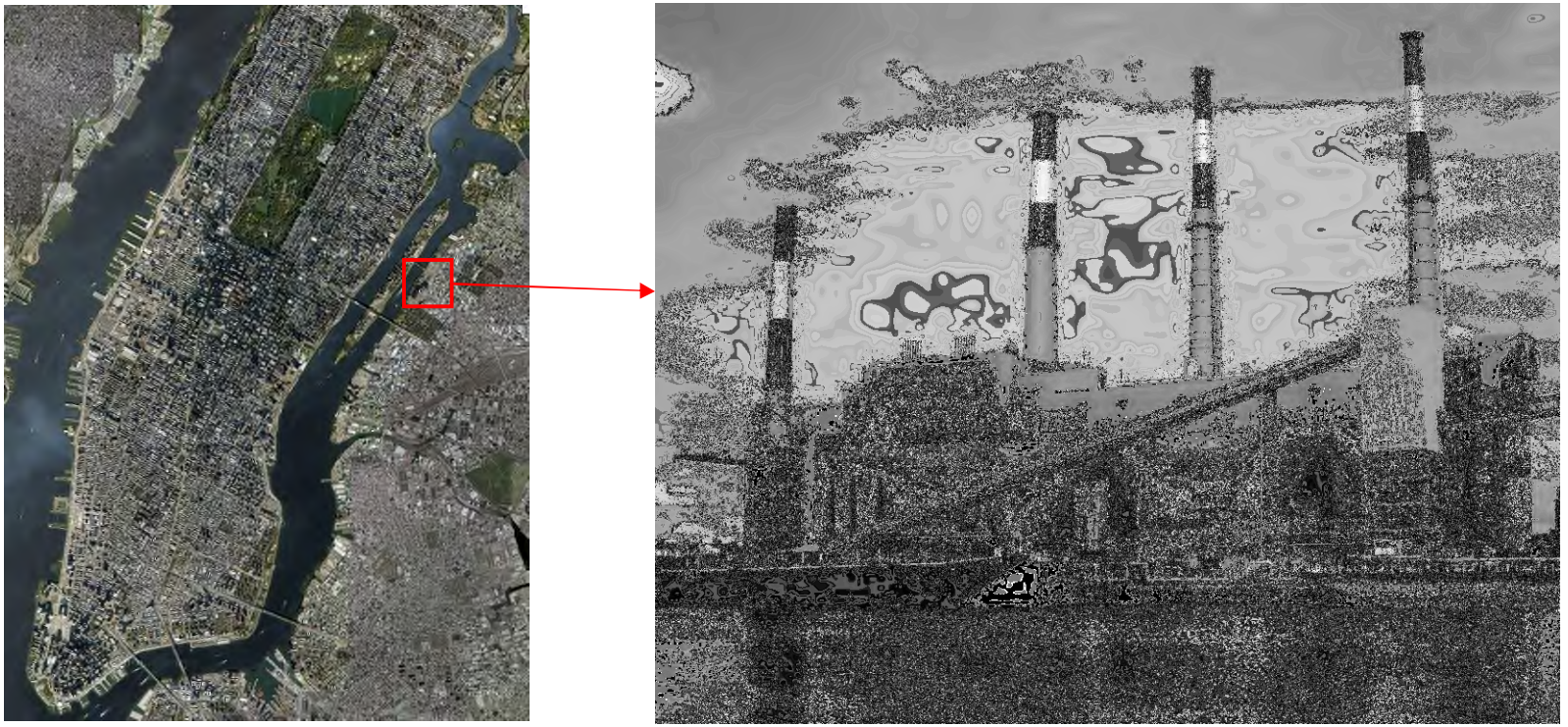


- Relative to typical, the speed-adjusted estimates are 9% higher.
- Relative to typical, the speed & class-adjusted estimates are 25% higher.

Case Study for Chittenden County, Vermont

Over 1 year, a carbon accounting error of this magnitude is equivalent to:

- Ignoring GHG emissions from residential energy consumption for all Chittenden County homes (~60,000)
- Ignoring the GHG emissions from 37,000 cars driving 12,000 miles/year each
- Turning the Ravenswood Power Station in Queens off for nearly 1 month



When the Standard Approach is Inadequate

When most of the traffic operates at lower than optimal speeds

- Congested regions
- Built areas with slower posted speed limits

When vehicle mix is significant

- % of heavy trucks in congested periods