Detailed assessment of global transport-energy models' structures and projections (2017)

Sonia Yeh, Gouri Shankar Mishra, Lew Fulton, Page Kyle, David L. McCollum, Joshua Miller, Pierpaolo Cazzola, Jacob Teter

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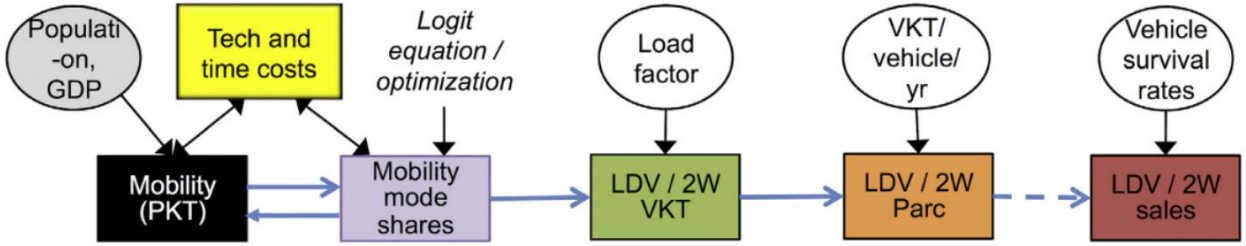
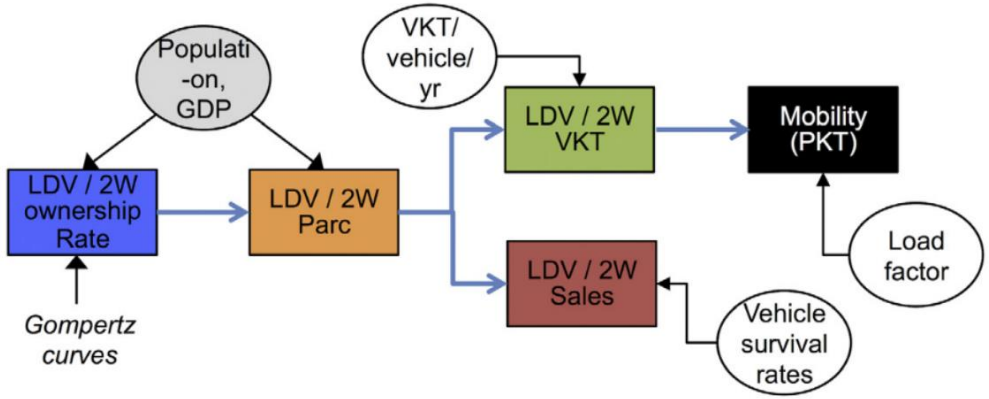
- Compare four global transportation models
- Find significant differences in the base-year data and key parameters
- Models show different strategies to achieve 2°C target
- Real new vehicle energy efficiency below target
- Propose improvements to data, modeling and model comparisons

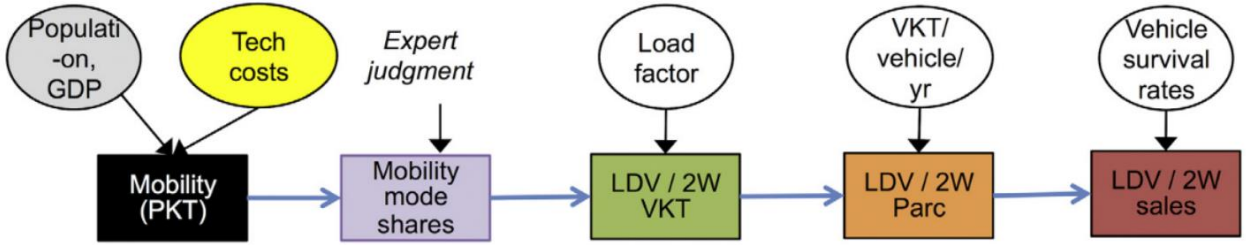
- GCAM
- MESSAGE
- Mobility Model (MoMo)
- Roadmap



GCAM MESSAGE

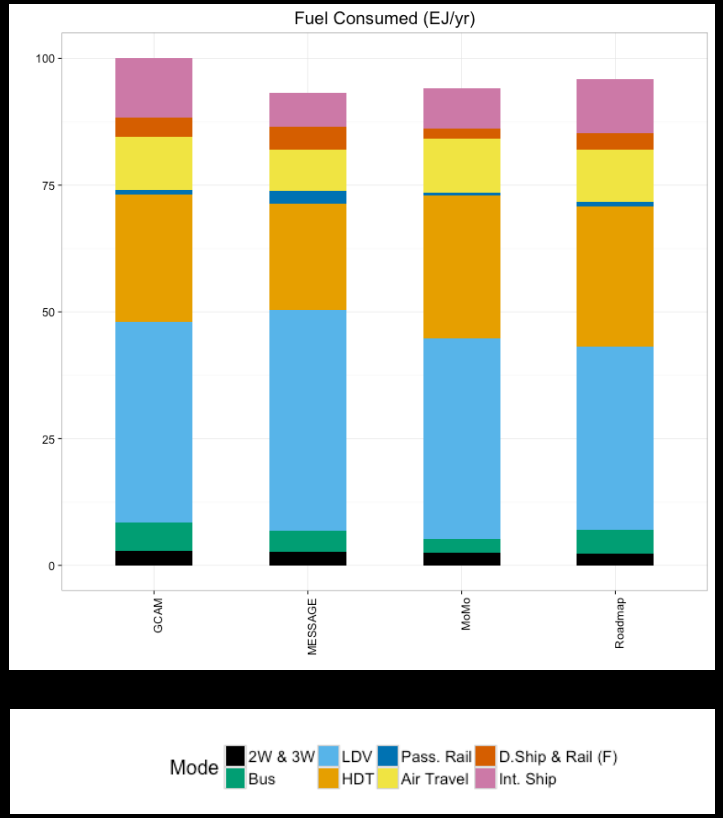


MoMo



Roadmap

Fuel consumption baseline 2010



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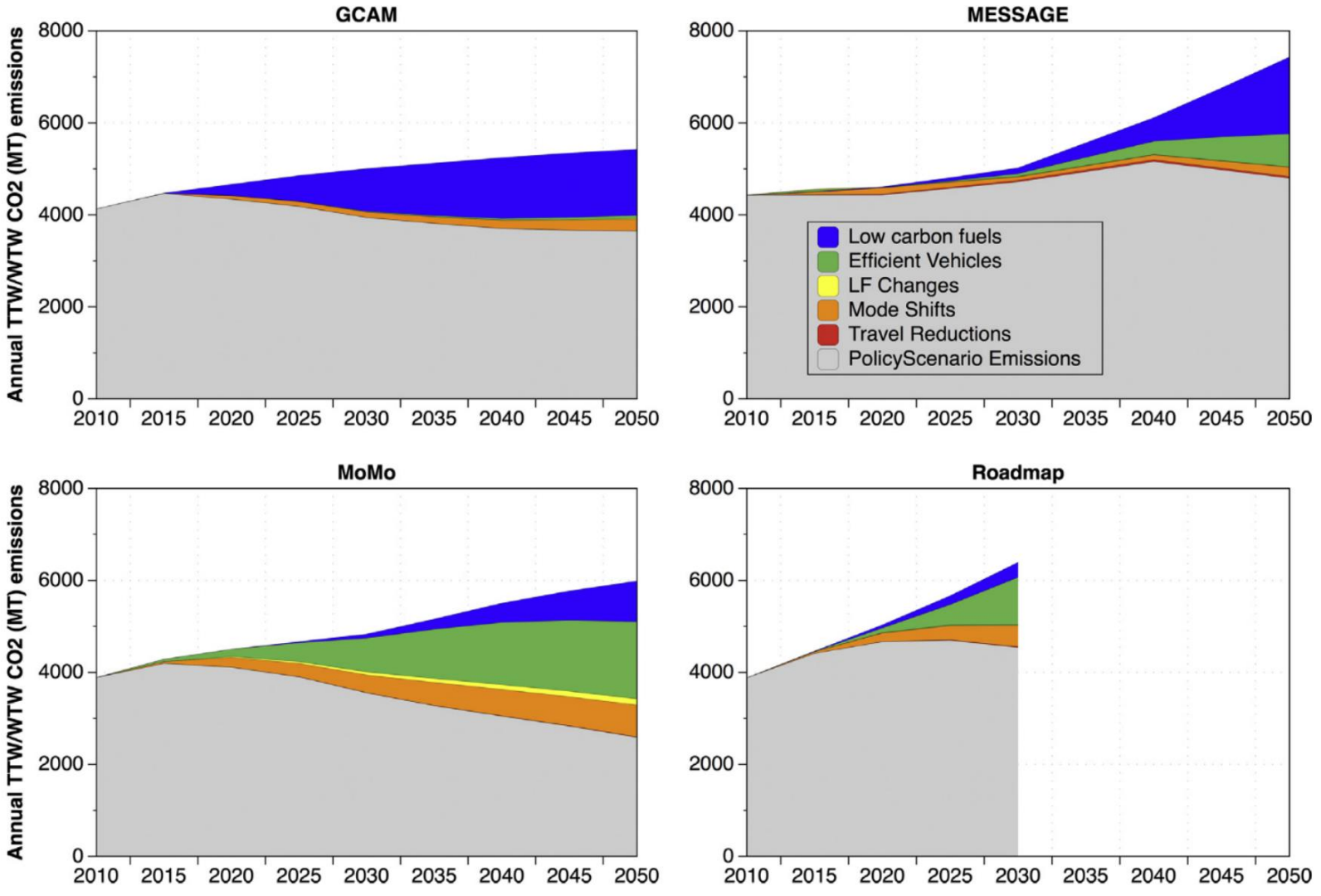
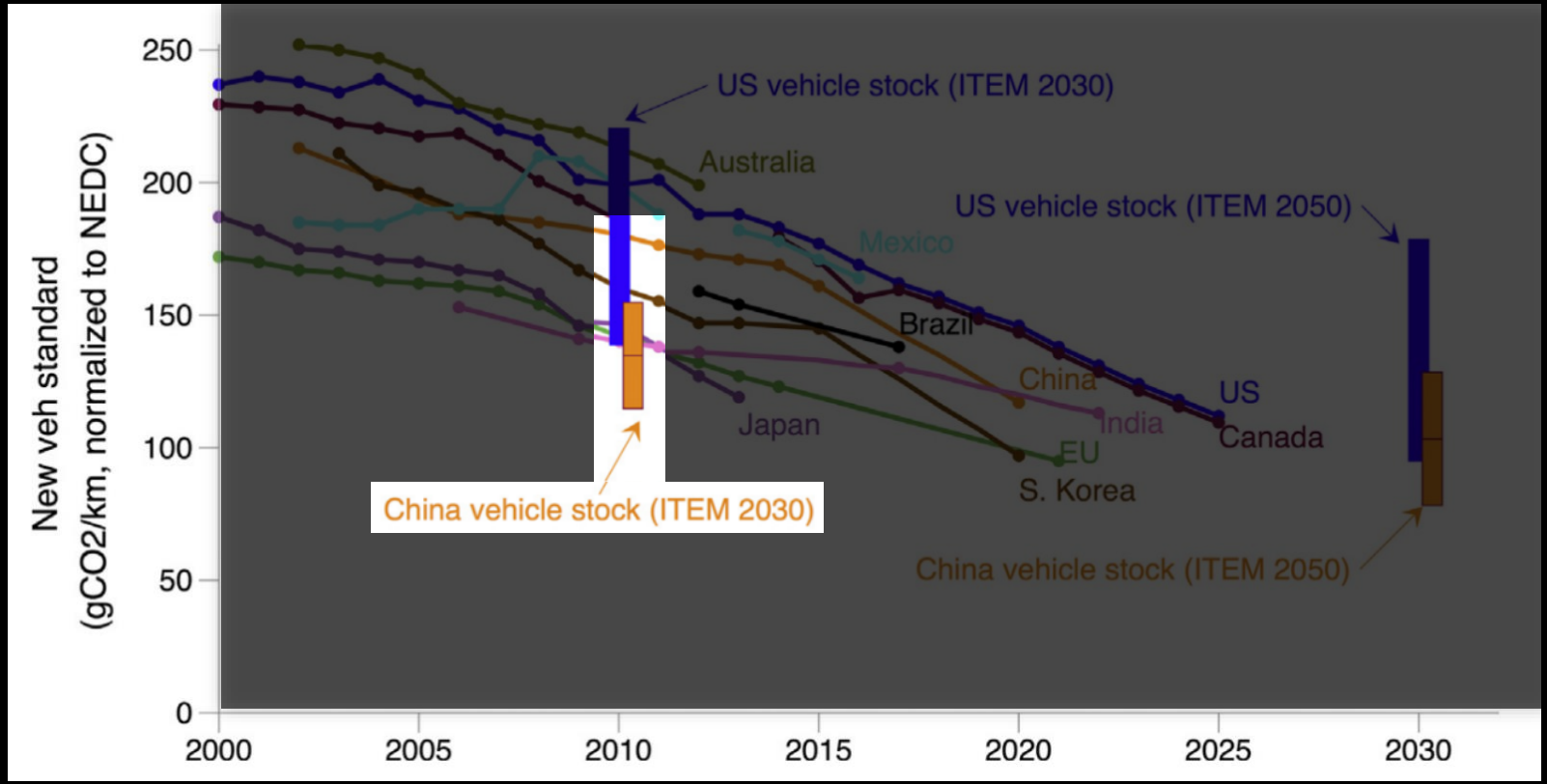

GCAM
MESSAGE
MoMo
Roadmap
Annual TTW/WTW CO2 (MT) emissions
8000
6000
4000
2000
0
2010
2015
2020
2025
2030
2035
2040
2045
2050
Low carbon fuels
Efficient Vehicles
LF Changes
Mode Shifts
Travel Reductions
PolicyScenario Emissions

Comparison to real vehicle stocks



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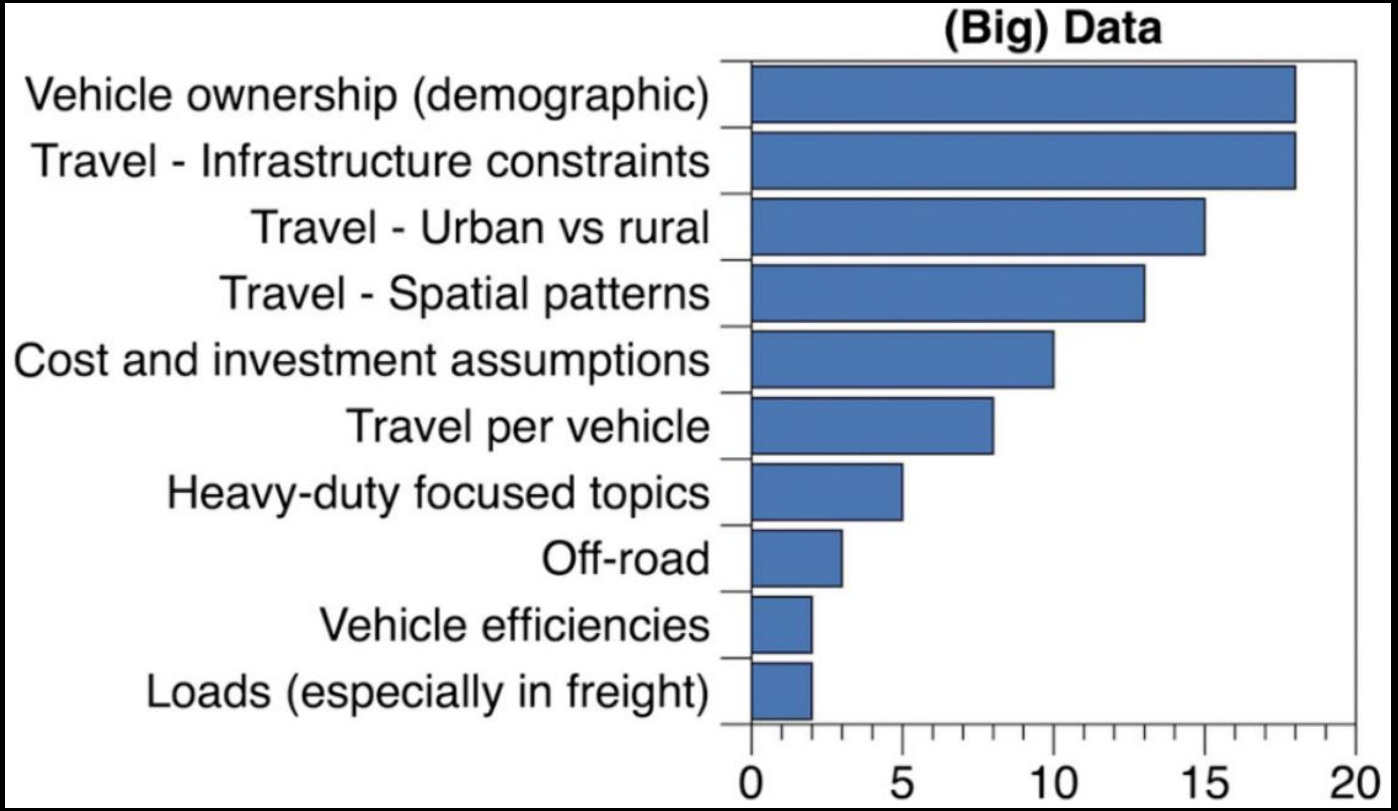
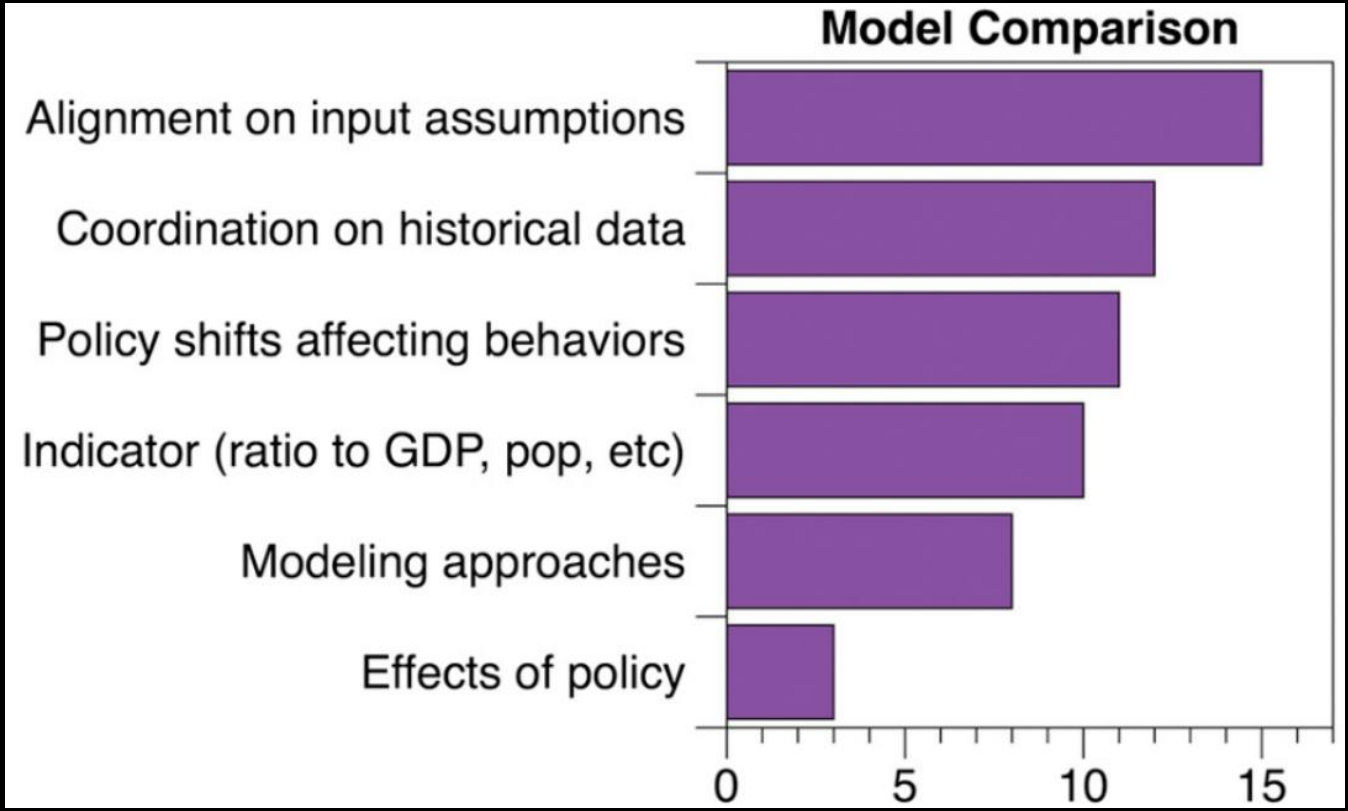
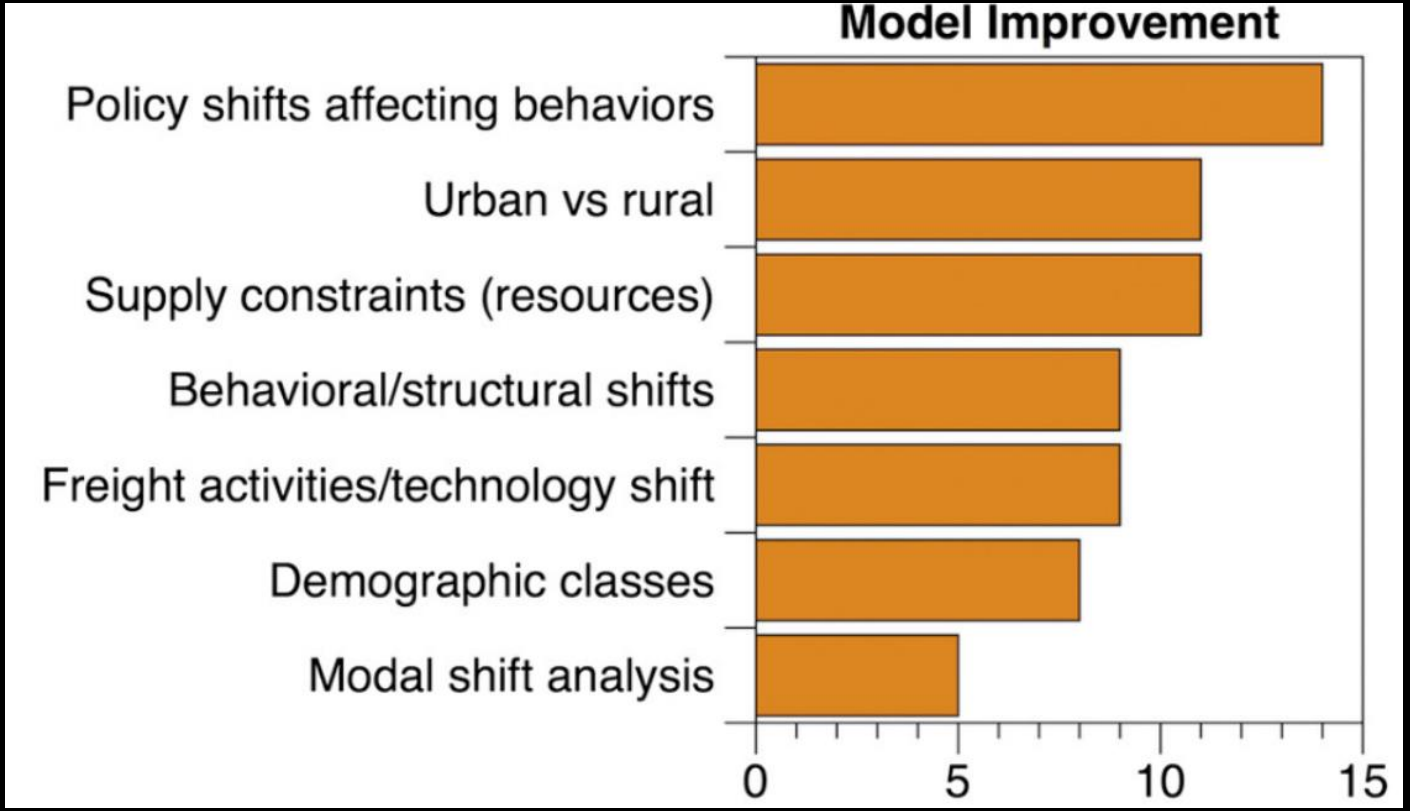
QUESTIONS?

Which options for improving the modelling of transportation do you see (based on this paper)?


(Big) Data
Vehicle ownership (demographic)
Travel - Infrastructure constraints
Travel - Urban vs rural
Travel - Spatial patterns
Cost and investment assumptions
Travel per vehicle
Heavy-duty focused topics
Off-road
Vehicle efficiencies
Loads (especially in freight)
0
5
10
15
20


Model Comparison
Alignment on input assumptions
Coordination on historical data
Policy shifts affecting behaviors
Indicator (ratio to GDP, pop, etc)
Modeling approaches
Effects of policy
0
5
10
15


Model Improvement
Policy shifts affecting behaviors
Urban vs rural
Supply constraints (resources)
Behavioral/structural shifts
Freight activities/technology shift
Demographic classes
Modal shift analysis
0
5
10
15

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