

# Driving to the Future

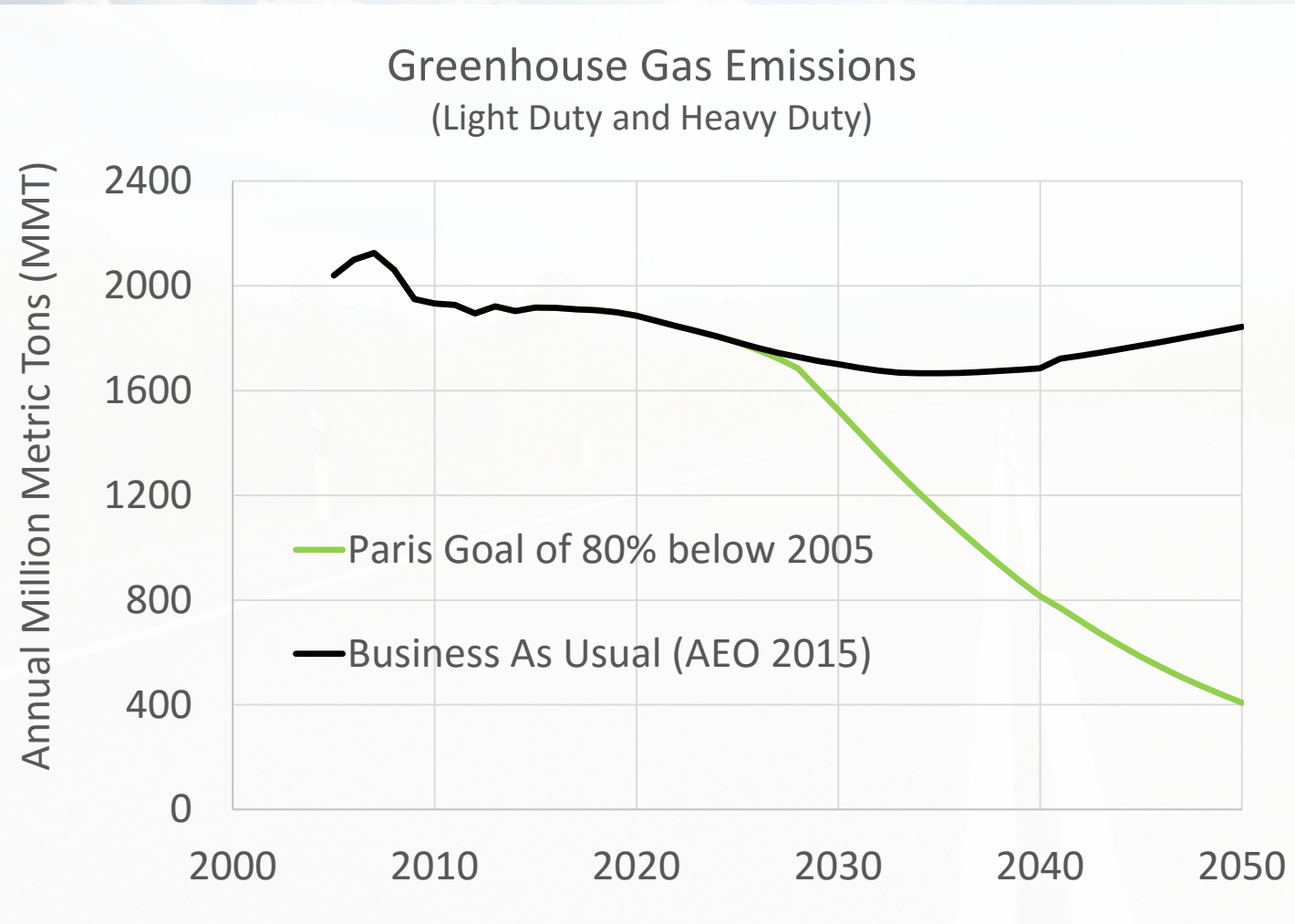
**Karl Simon**

Director, Transportation Climate Division  
United States Environmental Protection Agency





# The Challenge Ahead



Source: EPA's ATLAS model



We're heading here...



... but we need to go here



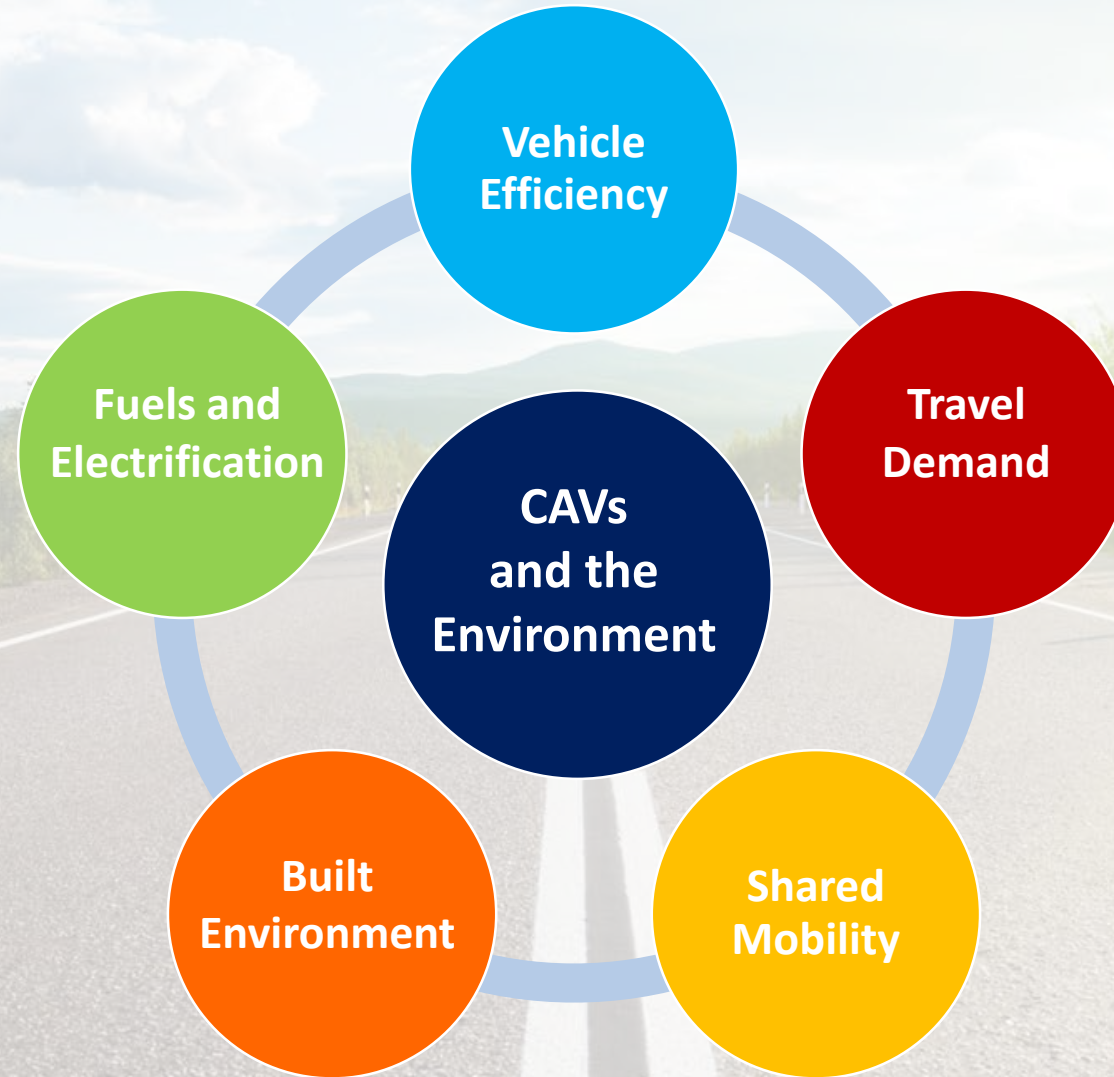
# Automated Vehicles to the Rescue?

Connected and automated vehicles (CAVs)  
*could* be part of the solution

But it's not clear if they will help reduce,  
or increase overall emissions

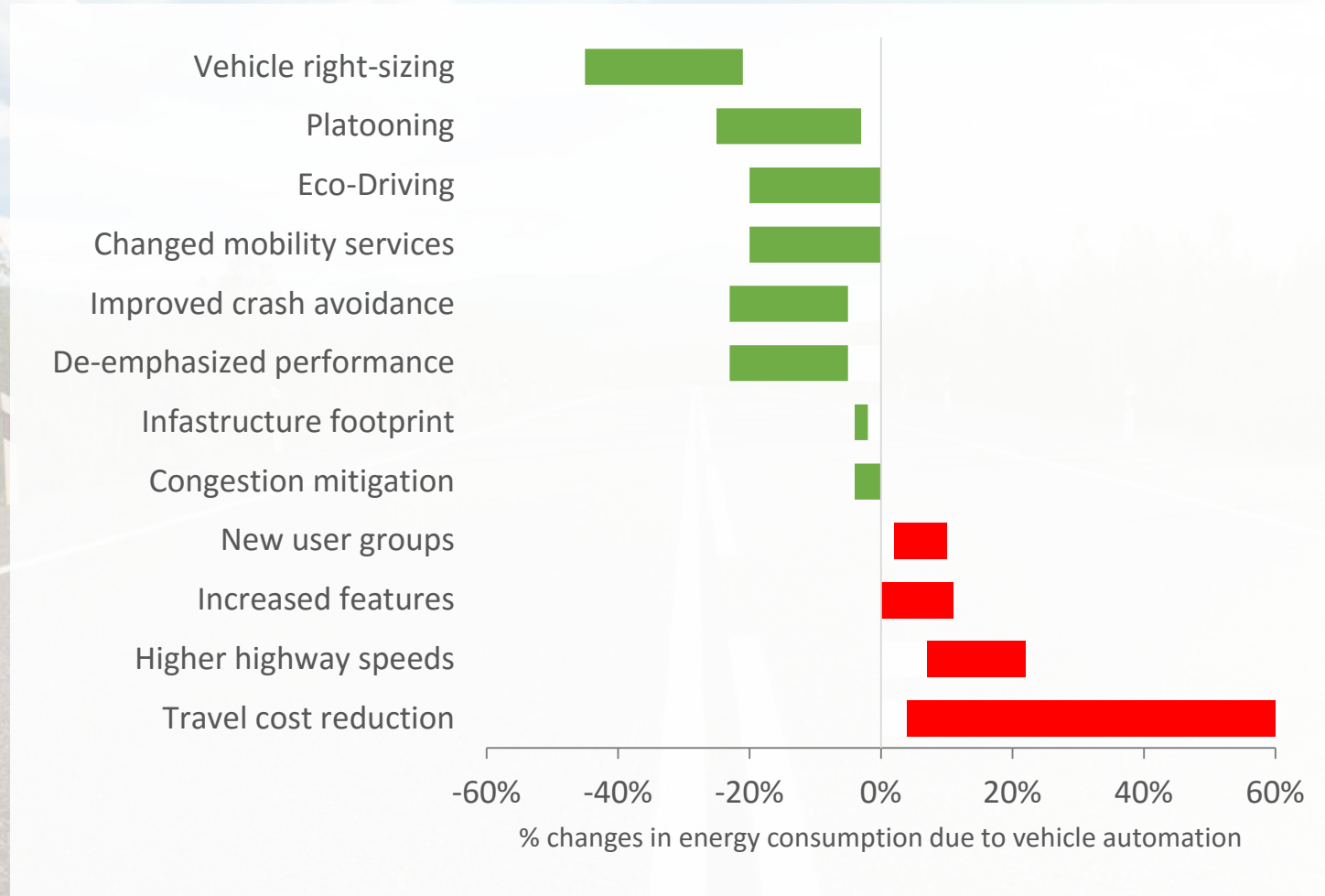


# CAVs will Impact the Environment



*Source:* Simon K.; Alson, J; Snapp, L; Hula, A. Can Transportation Emission Reductions be achieved autonomously? Environ. Sci. Technol., 2015, 49 (24), pp 13910–13911.

# Leading Research Illustrates Uncertainty



Source: Wadud, Z.; MacKenzie, D.; Leiby, P. Help or Hindrance? The travel, energy, and carbon impacts of highly automated vehicles. *Transportation Research Part A*, 2016, 86, pp 1-18.



# Electrification Can Be Part of the Answer

The electricity grid is getting cleaner and the trend will continue.

CAVs and electrification may be a good match

Efficient, electric CAVs with low Greenhouse Gas electricity can ***drastically reduce emissions*** from transportation

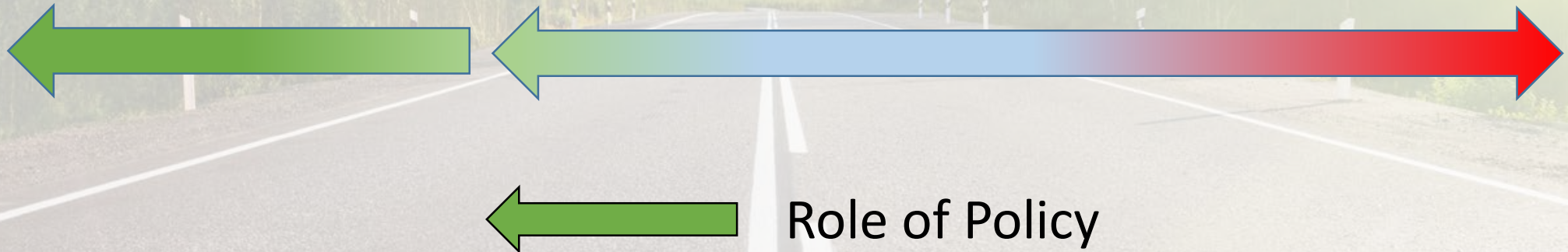


# Overall Impact is To Be Determined

Electrification  
**?? Decrease**  
in GHG

“Have Our Cake and Eat it Too”  
**40% decrease**  
in energy/ GHG

“Dystopian Nightmare”  
**100% increase**  
in energy/GHG



Source: Wadud, Z.; MacKenzie, D.; Leiby, P. Help or Hindrance? The travel, energy, and carbon impacts of highly automated vehicles. Transportation Research Part A, 2016, 86, pp 1-18.







**Karl Simon**

Director, Transportation Climate Division  
United States Environmental Protection Agency

“Driving Innovation in Clean Transportation”

