



Study Overview

Transportation Workshop
for Minnesota Legislators

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Study Objective

Evaluate strategies that can be implemented to reduce greenhouse gas (GHG) emissions from Minnesota's transportation sector.



Research Study Team

University of Minnesota

CTS

- Laurie McGinnis, Principal Investigator
- Jan Lucke, Coordinator

Civil Engineering

- Julian Marshall, Principal Investigator
- Tyler Patterson, Masters Student
- Chris Weyandt, Undergrad. Student
- Steve Hankey, Extension Student

Mechanical Engineering

- David Kittelson, Principal Investigator
- Win Watts, Research Associate
- Adam Boies, PhD Student

HHH Institute of Public Affairs

- Elizabeth Wilson, Principal Investigator
- Peter Nussbaum, Masters Student



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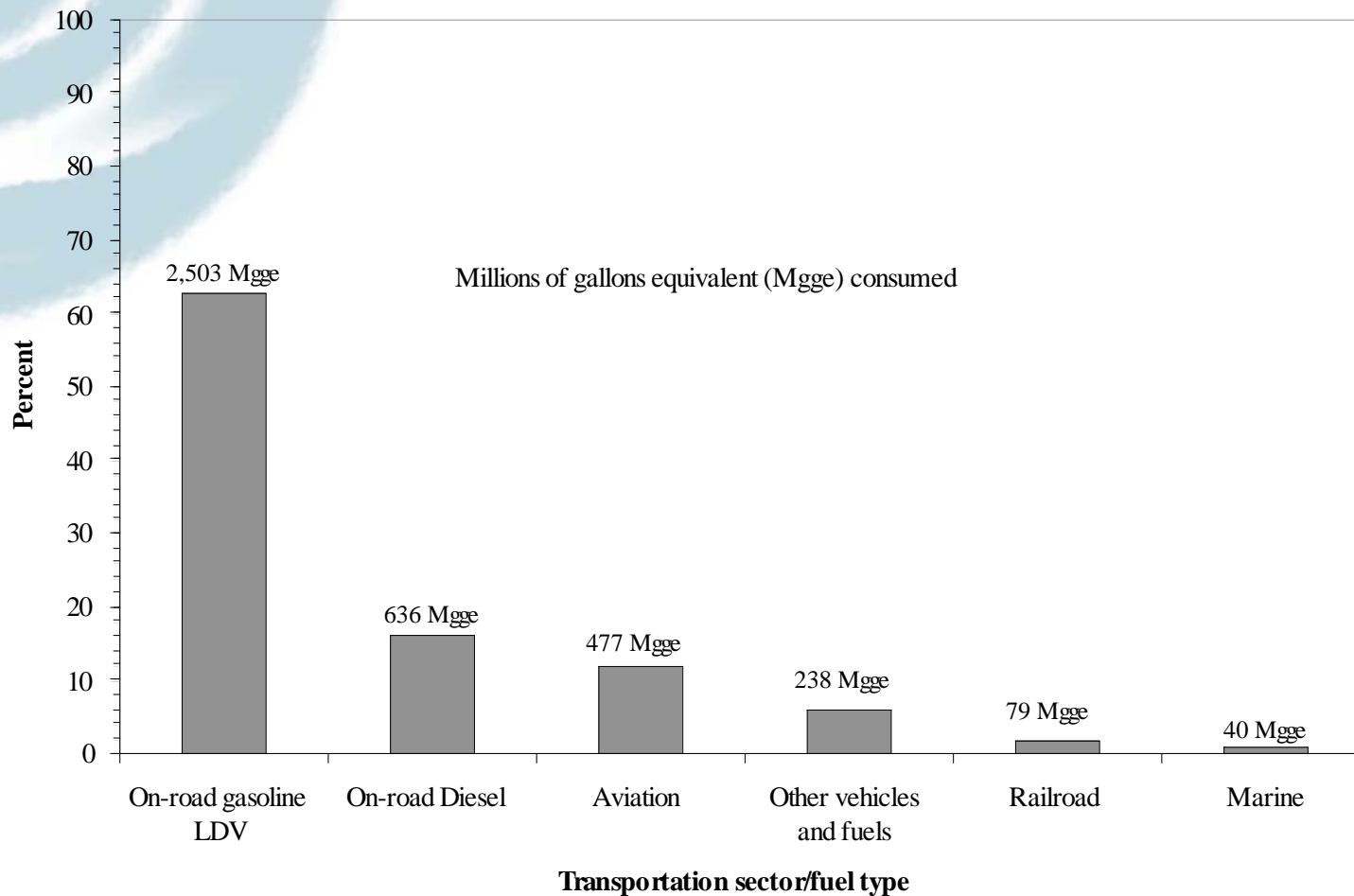


Transportation GHG Emissions Reduction Goals

- Reduction targets for total GHG emissions established by the 2007 Minnesota Next Generation Energy Act. Percent reductions referenced to 2005 total emissions:
 - 15% by 2015
 - 30% by 2025
 - 80% by 2050
- Study assumed transportation's reduction target proportional to transportation's share of total GHG emissions (~24%)



Minnesota Transportation Sector GHG Emissions



Minnesota Comparison to U.S.

- Minnesota above average for:
 - Transportation sector's GHG emissions growth
 - Transportation sector's GHG emissions/capita
 - Vehicle miles traveled (VMT) growth 1995 - 2005
 - VMT per person
- Minnesota below average for:
 - Transportation sector's percentage of total GHG emissions, largely due to contributions of coal-fired electricity



Analytical Framework

$$E = F \times C \times A$$

$$\text{Emissions} = \underbrace{\left(\frac{\text{Gallons}}{\text{Mile}} \right)}_{\text{Fuel Consumption}} \times \underbrace{\left(\frac{\text{Carbon}}{\text{Gallon}} \right)}_{\text{Carbon Content}} \times \underbrace{\left(\text{Vehicle Miles Traveled} \right)}_{\text{Activity}}$$





Study Findings Take Home Points

- Transportation sector can achieve its targets
 - More efficient vehicles
 - Low-carbon fuels
 - Land use and system change—including driver behavior
- Must start now

