



Land Use and Transit

Transportation Workshop
for Minnesota Legislators
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Land Use and System Shifts

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

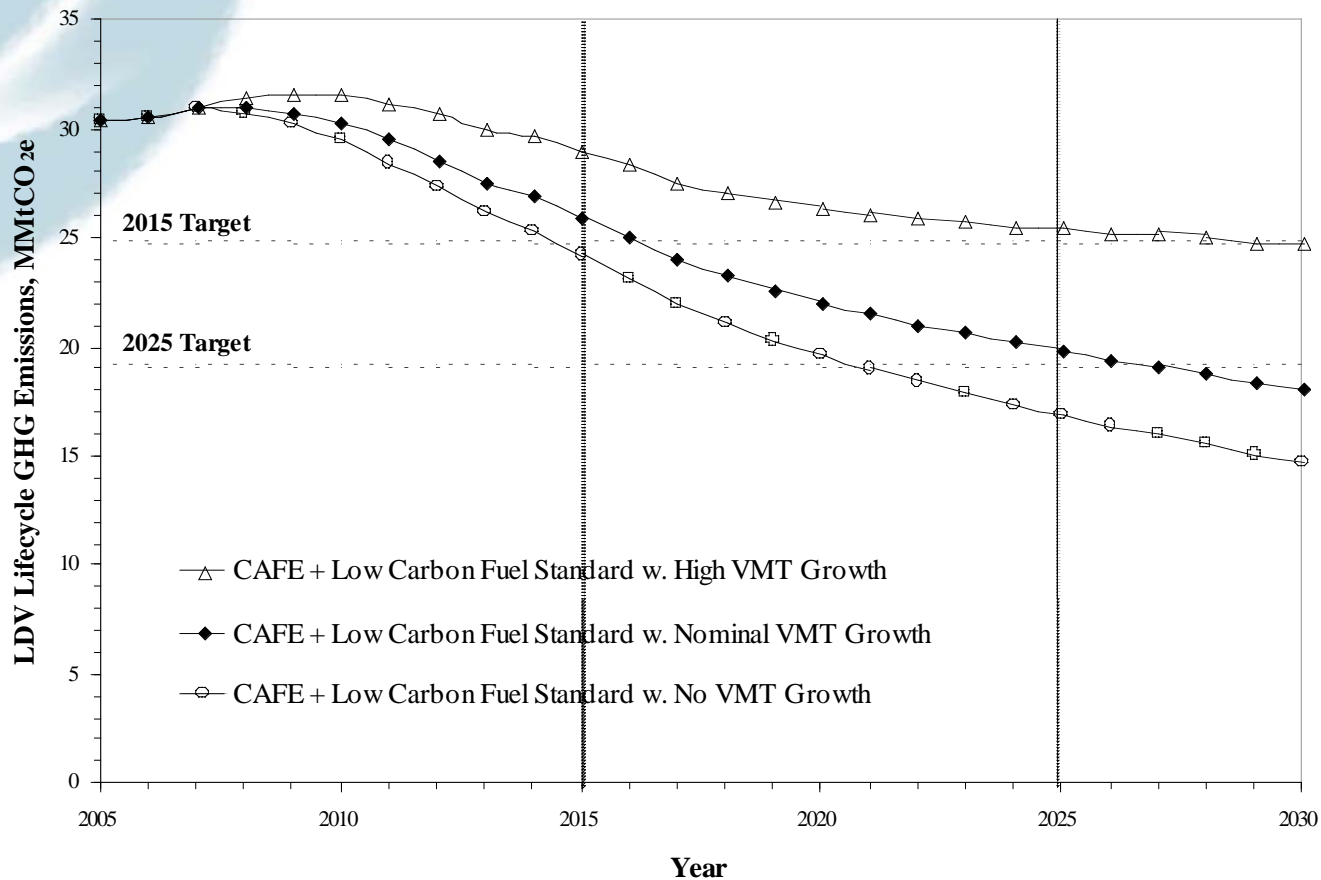
$$\text{Emissions} = \underbrace{\left(\frac{\text{Gallons}}{\text{Mile}} \right)}_{\text{Fuel Consumption}} \times \underbrace{\left(\frac{\text{Carbon}}{\text{Gallon}} \right)}_{\text{Carbon Content}} \times \underbrace{\left(\text{Vehicle Miles Traveled} \right)}_{\text{Activity}}$$



Minnesota VMT Trends: Historical and Projected



Effect of VMT Growth Assumption on Emissions Reductions Strategies

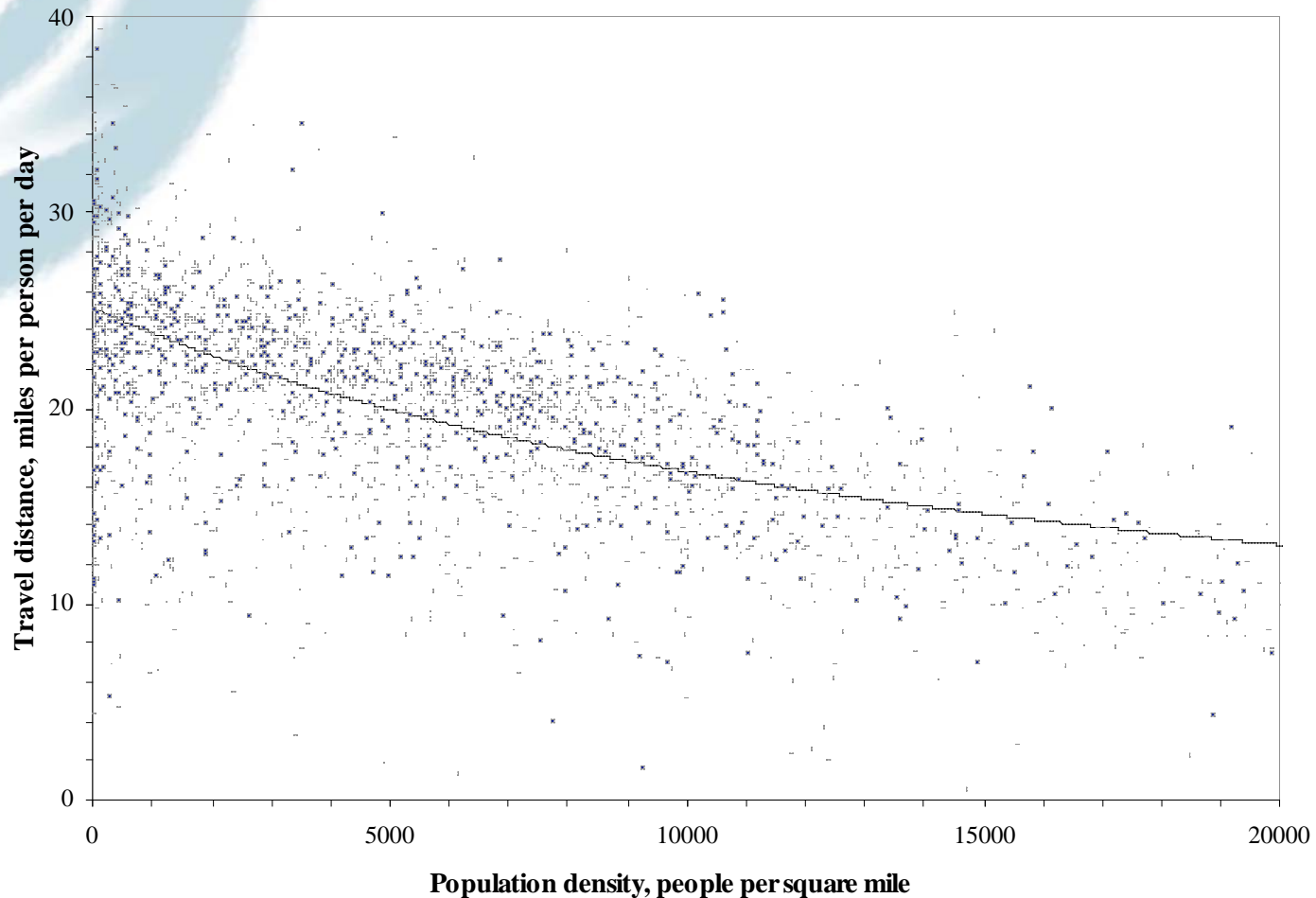


Strategies for VMT Reduction

- **Pricing techniques**
 - Congestion
 - Parking
 - Pay as you drive insurance
- **Alternative travel modes**
 - Mass transit
 - Non-motorized (bike, walk)
- **Land use strategies**
 - Population densification
 - Smart growth: transit-oriented development, mixed use
- **Flexible commutes**
 - Telecommuting
 - Flexible schedules, compressed schedules
- **Process alteration**
 - GHG emissions estimates in Environmental Impact Statements and local government plans
 - Educating public and private sectors

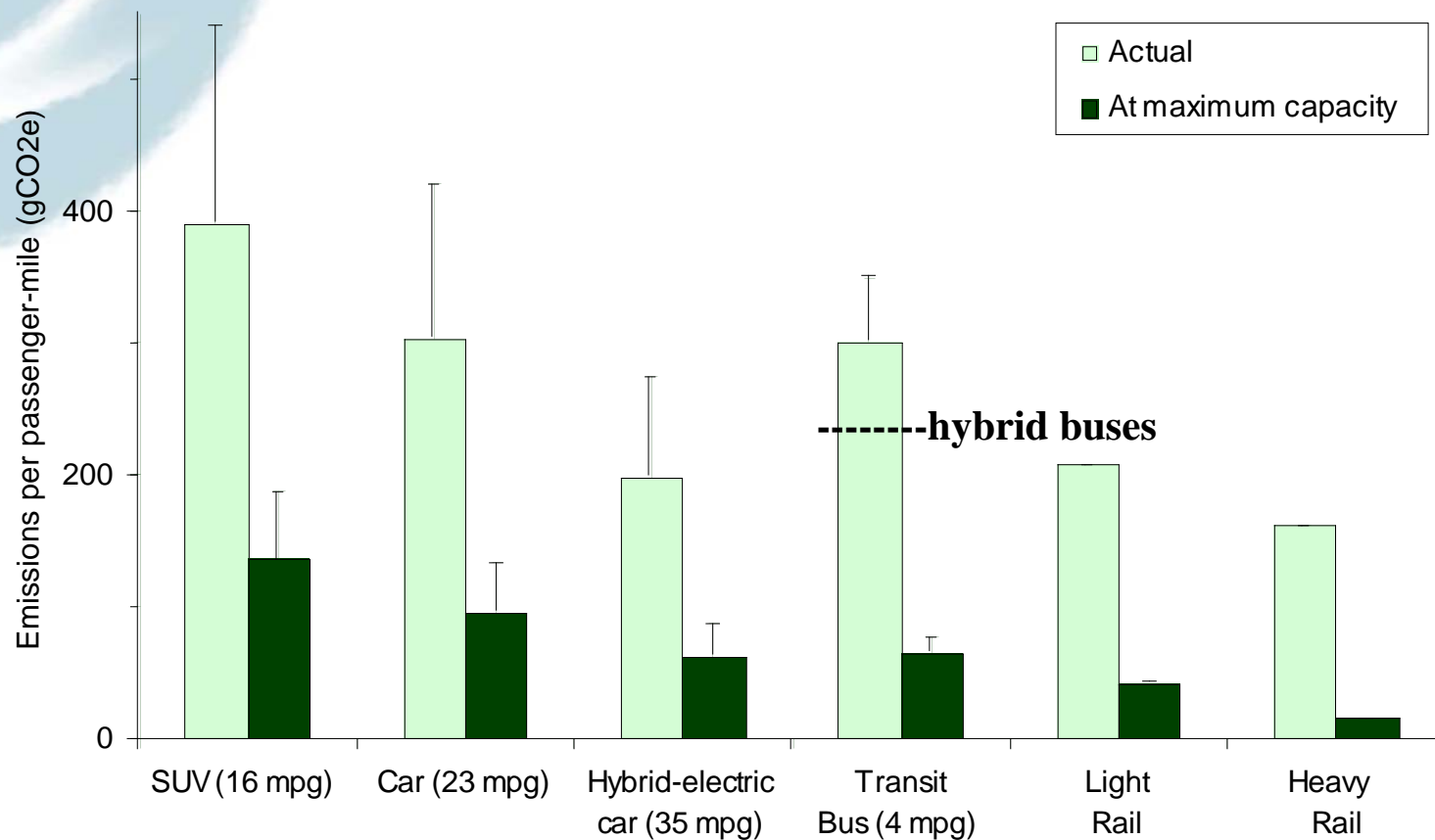


Correlation of Daily VMT per Person to Population Density



GHG Emissions By Travel Mode - Average Emissions

U.S. average GHG emissions per passenger-mile



Metro Area VMT Reduction Strategy Impacts

Strategy	Increase in statewide VMT, 2005 - 2025	Statewide year-2025 VMT reduction, relative to a do-nothing scenario (0.9% annual VMT increase)
Do-nothing	19.6%	0.0%
Smart growth		
Aggressive	13.3%	5.3%
Comprehensive	15.5%	3.4%
Limited	17.8%	1.5%
Construction of light rail transit network	17.0%	2.2%
Construction of bus rapid transit network	17.0%	2.2%
Pay-as-you-drive insurance (10% penetration)	18.4%	1.0%
General transit improvements	19.3%	0.3%
Employer / municipal parking-pricing plans	19.3%	0.3%
Construction of commuter rail	19.5%	0.1%