Climate Change & VMT: Why How Much we Drive Matters A Lot

Steve Winkelman
Center for Clean Air Policy (CCAP)

Transportation Research Board Executive Committee
Summer “Red Meat” Policy Session:
“Transportation’s Role in Climate Change Mitigation”
June 13, 2008
Develop/implement state climate plans: CA, CT, NY…

US Climate Policy Initiative

Smart Growth and Climate Change
  » CCAP Transportation Emissions Guidebook
  » VMT and Climate Policy Dialogue
    – AASHTO, state DOTs, MPOs, CARB, FHWA, EPA, NGOs…

Urban Leaders Adaptation Initiative
  » “Ask the Climate Question”: Chicago, King County, LA, Miami, Milwaukee, Nassau, Phoenix, San Fran, Toronto

European Climate Policy Dialogue

Future Actions Dialogue with climate negotiators

GHG policy projects in China, Mexico, Brazil, India
Climate Change Context

- IPCC: Likely warming: 1.1°C to 6.4°C by 2100
- Emerging consensus: limit warming to 2°C to 3°C
- US must cut GHGs 60-80% below 1990 levels by 2050
- Delayed action means higher risks and costs
- Transportation about 1/3 of US CO2 emissions
- Three choices:
  1. Proportional reductions in all sectors
  2. Fewer cuts in some sectors, compensate in others
  3. Fail to meet GHG targets
Transportation

CO$_2$

Vehicles
Fuels
VMT

1/3 of US CO2 emissions & growing fast
2005 CO2 Levels are 25% above 1990 levels
(1990 levels are 20% < 2005 levels)

Source: S. Winkelman based on EIA AEO 2008.
**CO₂ Targets:** 60-80% < 1990 in 2050
≈33% < 1990 in 2030: 30 by ‘30

Source: S. Winkelman. See citations in *Growing Cooler*.
CAFE: 35 MPG new vehicles in 2020. 2030 CO2 is 11% < 1990 levels

Source: S. Winkelman based on EIA AEO 2008 (revised) and Growing
Energy Bill: CAFE & -10% Fuel GHG by 2025. 2030 CO2 is 20% < 1990

Source: S. Winkelman, based on EIA, HR6 and Growing Cooler.
VMT Growth to Wipe Out Energy Bill Savings: 2030 CO2 is 21% above 1990

Source: S. Winkelman based on EIA, HR6 and Growing Cooler.
Aggressive Case: 50 mpg in 2030 & -20% Fuel GHG. CO2 is 4% < 1990

Source: S. Winkelman based on AEO 2008, HR6, stock model calculations and sources cited in Growing Cooler.
By how much can we slow VMT growth?

Ewing, Bartholomew, Winkelman, Walters & Chen (ULI 2008)

If 60% of new growth is compact:

• **4%** national VMT reduction by 2030 (from trend)
• Half the CO2 savings of 35 MPG CAFE
  » 80 MMTCO2 in 2030
  » $260 billion fuel cost savings through 2030
• **Just from land use** - excludes pricing, other
• Up to **38%** with comprehensive policy set
By how much can we slow VMT growth? (continued)

- “Moving Cooler” (ULI)
  Cambridge Systematics (Bill Cowart)
  » 18-21% reduction in VMT growth by 2030
    – Apply best practices: PAYD insurance, smart growth, transit, parking measures, TDM, bike/walk

- AASHTO goal:
  » Cut VMT growth in half:
    +2 trillion VMT instead of +4T VMT from 2006-2055
  » 23% reduction in VMT growth in 2030
### Alternative VMT per Capita Goals

(Calculations for Light Duty Vehicles)

<table>
<thead>
<tr>
<th>Case</th>
<th>2030 VMT vs. 2007</th>
<th>2007 - 2030 VMT Growth</th>
<th>2030 GHG vs. 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Current (2007)</td>
<td>NA</td>
<td>NA</td>
<td>23%</td>
</tr>
<tr>
<td>b) EIA Forecast (AEO 2008)</td>
<td>152%</td>
<td>1.8%</td>
<td>22%</td>
</tr>
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**VMT SCENARIOS***

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<tr>
<td>c) 50mpg CAFE, -20% Fuel GHG</td>
<td>154%</td>
<td>1.9%</td>
<td>-4%</td>
</tr>
<tr>
<td>d) Cut VMT growth in half**</td>
<td>126%</td>
<td>1.0%</td>
<td>-21%</td>
</tr>
<tr>
<td>e) Flat VMT per capita</td>
<td>121%</td>
<td>0.8%</td>
<td>-25%</td>
</tr>
<tr>
<td>f) -10% VMT per capita</td>
<td>109%</td>
<td>0.4%</td>
<td>-32%</td>
</tr>
<tr>
<td>g) -17% VMT per capita</td>
<td>100%</td>
<td>0.0%</td>
<td>-38%</td>
</tr>
<tr>
<td>h) -30% VMT per capita</td>
<td>85%</td>
<td>-0.7%</td>
<td>-47%</td>
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</tbody>
</table>

**Target:** -20% to -47%

*Note: All scenarios assume 50 mpg CAFE in 2030 and 20% fuel GHG savings

** This is AASHTO's sustainability goal.
But what’s really up with VMT?

And how do we know?
VMT: Historic (FHWA) and Forecast to 2030 (EIA)
Zoom in on VMT: 1995-2015

Historic (FHWA)

Forecast (AEO 2008)
VMT and Gasoline Prices: 1981 - 2007

Problem Solved??

CCAP 2008 based on EIA, FHWA, BLS, EPA
Flattening VMT as a Policy Opportunity

- Combination of price and demographics
- Permanent behavior shift unlikely
- Transit ridership up, but providers can’t afford to keep up with growing demand
  - Economic hardship exacerbated for folks in places with limited travel choices
- Climate protection requires major cuts
- Need federal, state, regional & local policies to increase choices and hold down VMT
What’s the State of the Data?

- We lack robust methodologies for converting traffic counts into VMT data by vehicle type
- Traffic counters not necessarily placed in strategic locations or based on statistical requirements
- Key travel surveys have been defunded or terminated in recent years
- We lack data on state, regional and local fuel consumption
  » We track wholesale sales. State tax depts have retail sales data…
- We lack robust measurement of on-road vehicle fuel economy (real world vs. label)
CCAP Travel Data Webinars – Initial Recommendations

- Restore or improve surveys that are gone or scaled back (HPMS, NHTS, VIUS)
- Design a new national panel survey on vehicle use and vehicles in use
- TRB should conduct a study on what it would take and cost to improve travel data to quality levels achieved in other OECD countries
- GAO should study the shortcomings on travel data for GHG emissions planning and policy, with recommendations
- $50 million per year would go a long way
  - Less than 0.1% of $60 billion/year in surface transp funding
CCAP Strawman Proposal: Climate Incentive Program for VMT/GHG Reduction

- States & MPOs must set VMT/GHG goals
- Launch bottom-up discovery process to determine appropriate goals for each location
- Use cap & trade revenues to
  - Fund goal development and implementation
  - Improve: travel data, models, planning
- A funded obligation (not an unfunded mandate!)
  - New responsibilities require new resources
- Set the stage for climate-friendly transp bill
Green-TEA
A Legacy for the Planet?

- Business as usual policy will increase VMT
  » Funding formulas reward VMT, fuel use, lane miles

- Will the next transportation bill make the climate problem better or worse?

- Tie funding to GHG performance

- Major funding for data improvement, planning, model improvement
**Negative $/ton: Sacramento 2050 Blueprint vs. Business as Usual (CCAP)**

### Infrastructure Costs (savings)
- Major transportation capital: $1.9 billion
- Other infrastructure (water, utilities, etc.): $7.5 billion
- Other infrastructure: $9.4 billion

### Annual Costs (savings) in 2050
- Private fuel costs: $655 million
- Transit operating costs: $121 million

### Cumulative CO2 Savings
- **7.2 MMTCO2 (14%)**

### Net Present Value

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Just Transportation Costs</td>
<td>- $500 million</td>
</tr>
<tr>
<td>With Infrastructure savings</td>
<td>- $1,400 million</td>
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### Cost per ton CO2

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<th>Cost/ton</th>
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<tbody>
<tr>
<td>Just Transportation Costs</td>
<td>- $70/ton</td>
</tr>
<tr>
<td>With Infrastructure savings</td>
<td>- $200/ton</td>
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Excludes savings from building energy use, mitigation land purchases ($8.3 billion), and reduced congestion.
The Story of Alice & Benny...
2 km drive

Source: Larry Frank
Sidewalks...

...are as sexy as hybrids!
For more information…

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Transportation:  www.ccap.org/transp.htm
Adaptation:  www.ccap.org/domestic/ULAI.htm