Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices

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Dialogue. Insight. Solutions.

CCAP report by Steve Winkelman, Allison Bishins and Chuck Kooshian with assistance from Transportation for America, Smart Growth America, Environmental Defense Fund, HDR, Rails to Trails Conservancy, and Natural Resources Defense Council

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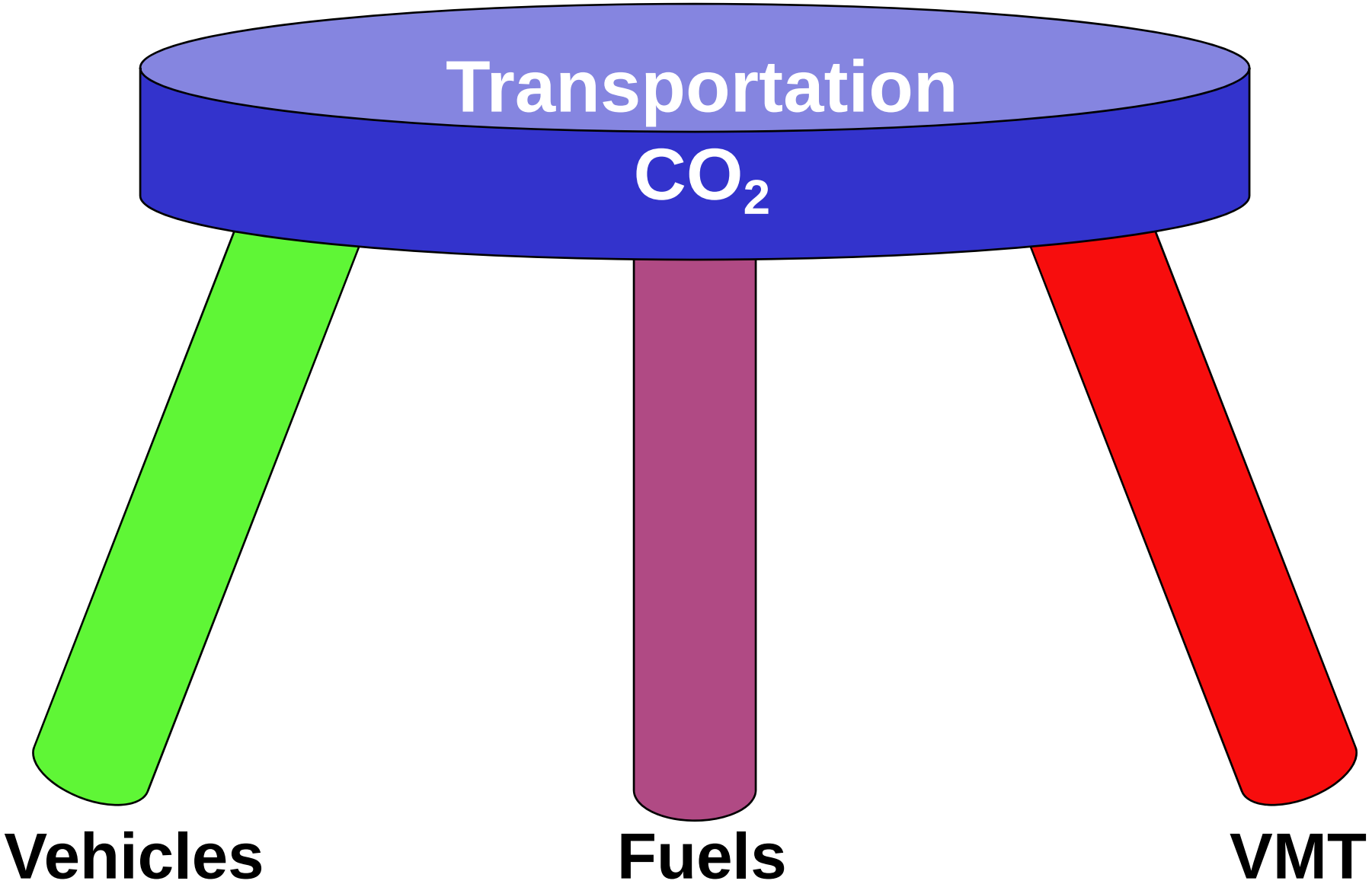
Dialogue. Insight. Solutions.

- Help govts craft & implement climate policy
- Dialogues: Int'l, US, VMT, State Executives
- Urban Leaders Adaptation Initiative

  "**Ask the Climate Question**"
- Research: Economic Benefits of Smart Growth
  - » Cost-Effectiveness of Travel Efficiency (June 2009)
  - » "Growing Wealthier" (Fall 2009)
- International Climate Policy and Transportation
  - » Developing country transport GHG policies



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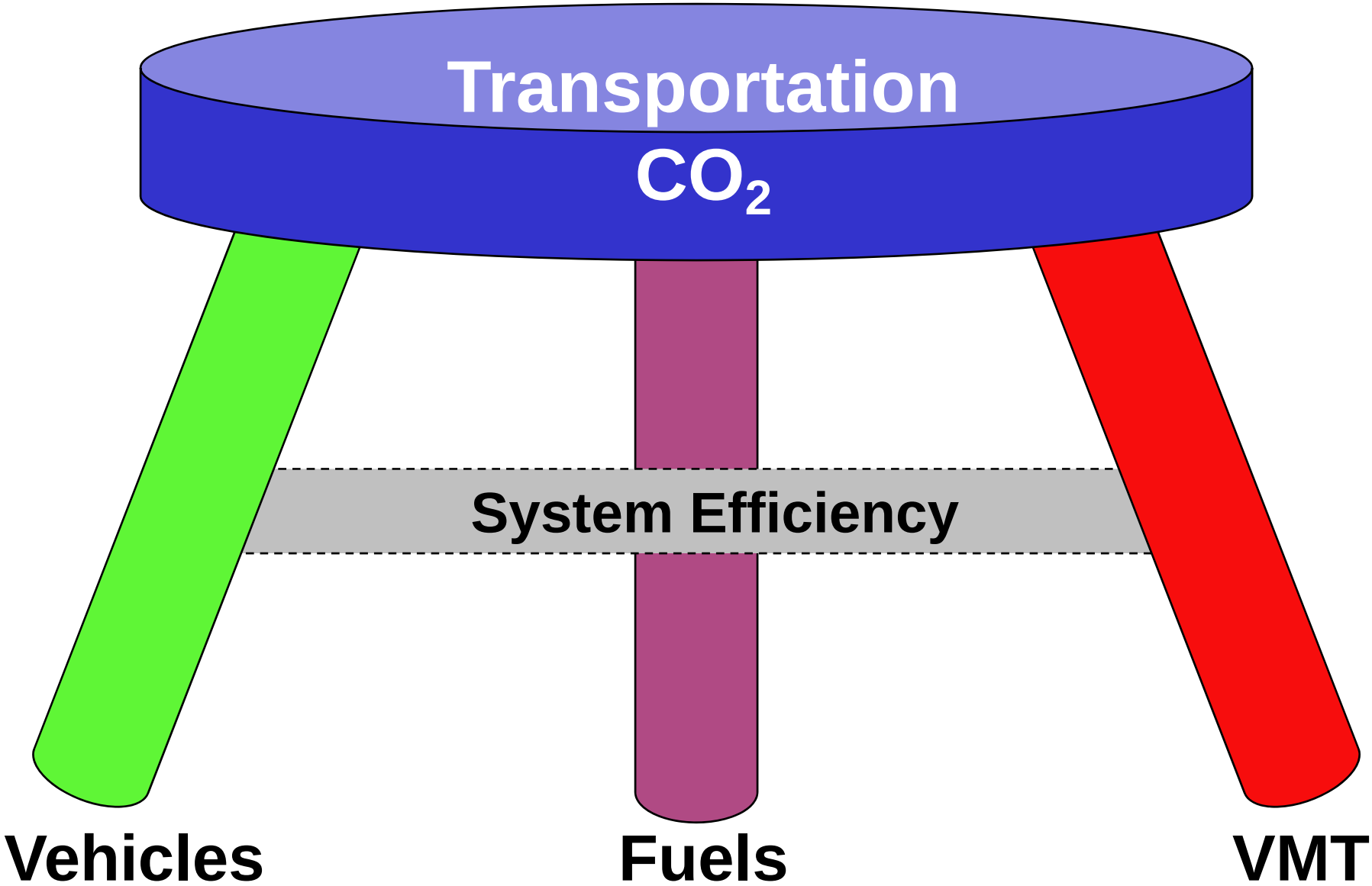
The 3-Legged Stool



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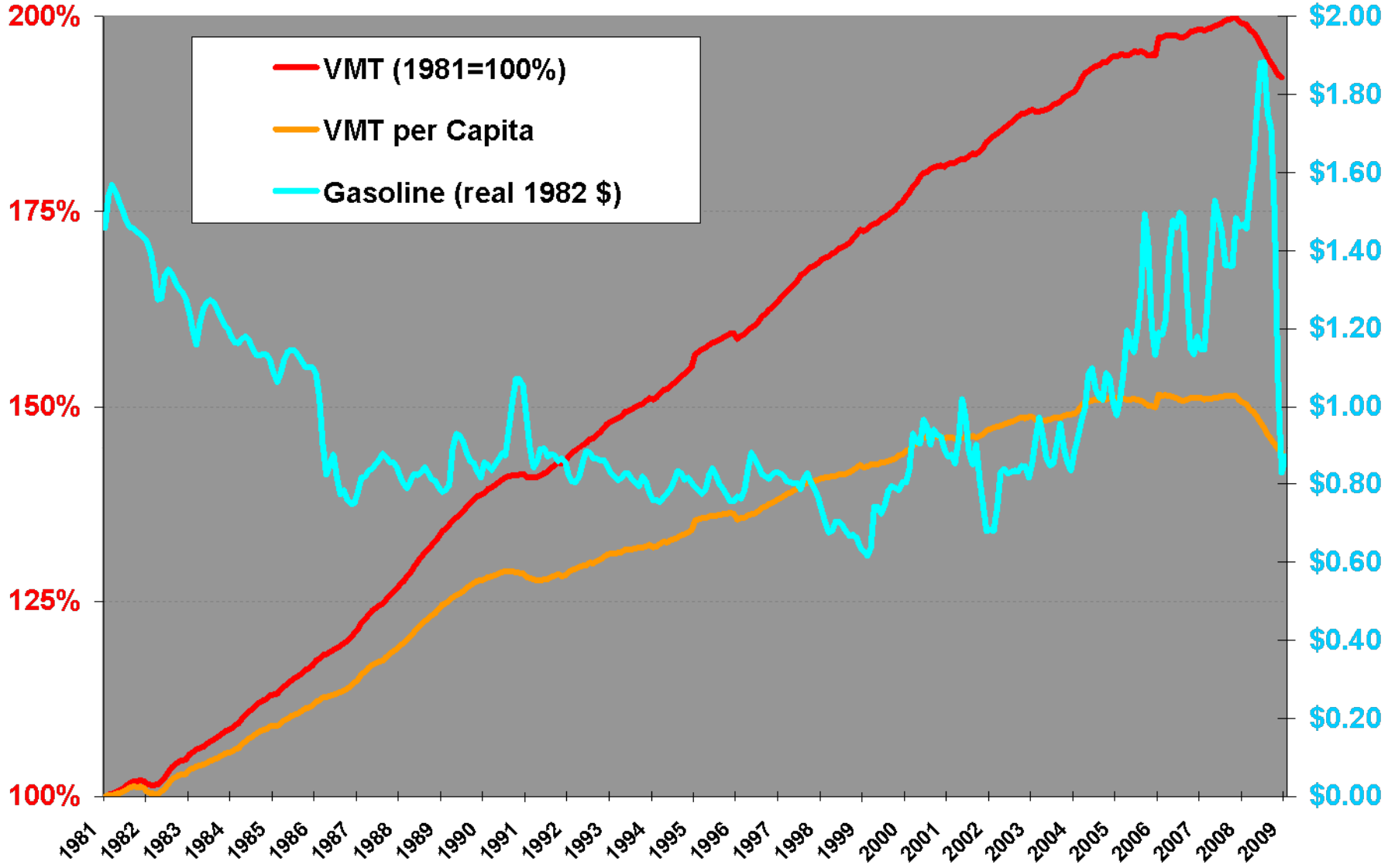
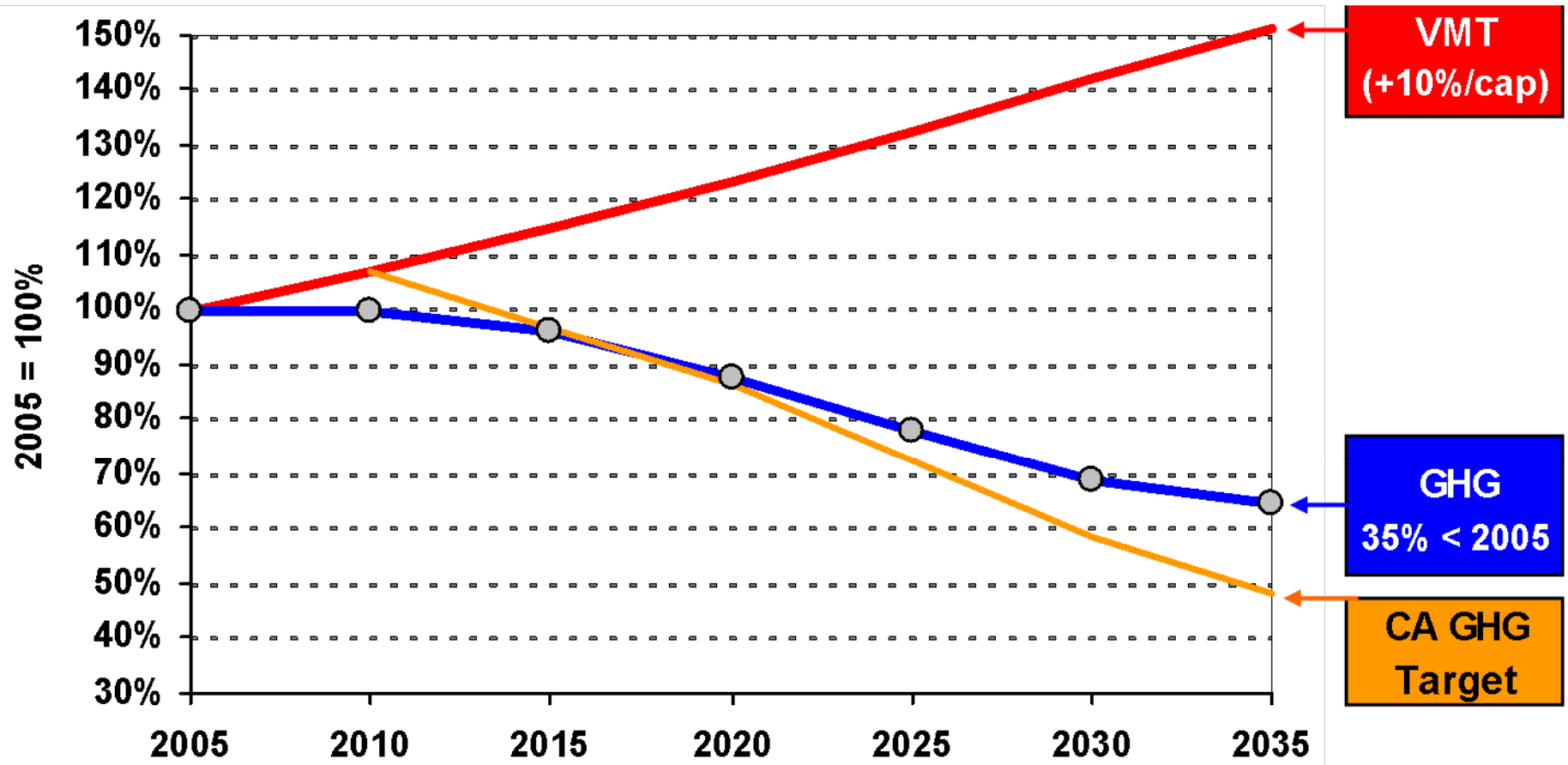
The Fourth Leg?

VMT and Gasoline Prices: 1981 - 2008



S. Winkelman, CCAP, 2009: based on FHWA, US Census, EIA, BLS

If California VMT +10%/capita (vs. 2005), 55 mpg (new) in 2030, Fuel: -15% GHG



Source: S. Winkelman, CCAP. Assumes 55 mpg LDV vehicle standards in 2030, 15% LCFS.

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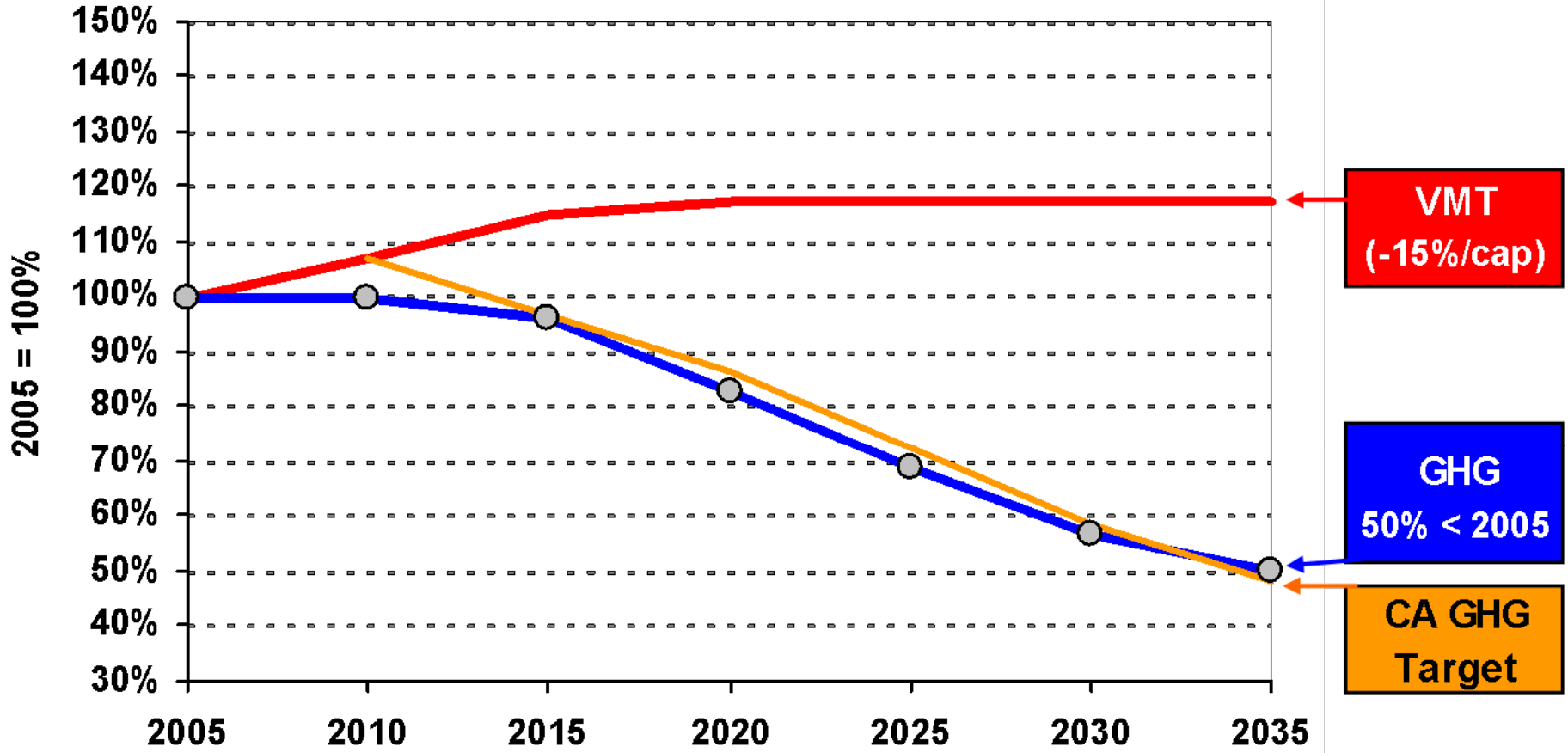
If California VMT -15%/capita (vs. 2005), 2035 GHG 50% < 2005 GHG



Source: S. Winkelman, CCAP. Assumes 55 mpg LDV vehicle standards in 2030, 15% LCFS.

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Best Practices: Measured VMT Reductions

- Portland, 1990-2007
  - » VMT/capita fell 8-10% while US rose 8%
  - » Annual savings: $1.1 billion in driving costs, $1.4 billion in time saved
- Arlington, 1980-2005
  - » Estimated 20-30% reduction in VMT/capita
  - » VMT per household is 60% lower than DC region
- Atlantic Station, initial project surveys
  - » 36-59% VMT reduction vs. regional averages
- NYC, 2002-7
  - » Traffic: -1%. Pop +2%. Jobs +6%. Transit +8%. Bike +70%

Best Practices:

Modeled VMT Reduction Projections

- Sacramento
  - » Blueprint/MTP projected to reduce VMT/capita 6-10% through 2035
  - » Likely to be greater savings under SB375
- Georgia
  - » Comprehensive transit, system efficiency, and TDM will reduce VMT/capita by 7% over 20 years
- Johnston
  - » Comprehensive policies could cut VMT by 20% in 20 years
- Moving Cooler
  - » Comprehensive policies could cut VMT by 20% in 2030

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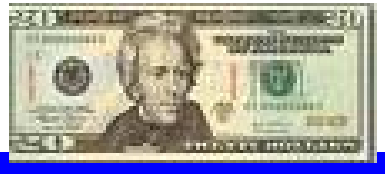
Climate Models don't pick it up: "It's not a real $20 bill!"



- Price signal isn't enough
  - » Many Americans lack rich, practical transportation choices
- $50/ton → cut 4% VMT
  - » Models predict 5% of US GHG savings from transportation
- Modelers assume high cost per ton for travel efficiency
  - » Portland, Arlington, NYC, Atlanta experience is ignored
- Models miss major GHG benefits
  - » E.g., shorter drive trips, walk, bike → 2-4X transit benefits
- Models miss major economic benefits
  - » Infrastructure, local taxes, leveraged private investment

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Economic Benefits of Smart Growth (detailed in "Growing Wealthier")

- Smart growth, done well, can:
  - » Meet market demand for walkable areas
  - » Protect housing values in a downturn
  - » Reduce net infrastructure costs
  - » Increase walking and biking; reduce obesity
  - » Reduce overall household costs
  - » Leverage private investments in communities
  - » Reduce energy and water consumption
  - » Improve public health and reduce medial costs
  - » Improve U.S. energy security

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Estimating $/ton CO2
Local Example: Atlantic Station

- 138 acre redevelopment project in Atlanta: compact and transit-oriented
- Avg daily VMT 36-59% lower than regional average
  - » Based on initial measurements
  - » EPA had projected 30% VMT reduction
- 0.63 MMTCO2 over 50 years (CCAP calc)
- Loan: $195 million. Increased tax revenues: $30 million/yr
  - » Also saves consumers 73 million gallons of gasoline
- Will likely be **zero cost or net savings per ton CO2** due to future revenue and savings

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Estimating $/ton CO2 Regional Example: Sacramento

- SACOG spent $4 million on Blueprint scenario planning, modeling, public engagement

- The adopted smart growth scenario projected to:
  - » Save 7.2 MMTCO2 through 2050
  - » Reduced infrastructure costs: **-$9.4 billion**
  - » Increased transit operating costs: +$121 million/year
  - » Reduced consumer fuel costs: -$655 million/year

- CCAP calculates NPV: $1.4 billion

- **Net *savings* of $198/ton CO2 saved**

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State Example: Georgia

- McKinsey and Co. study:
  Investments in transit, HOV/HOT, demand management, and the freight system could yield net economic benefits:

- Economic benefits: **$400 billion** over 30 years
  - » 320,000 jobs over 20 years

- VMT savings of **7% per capita** 2010-30

- CCAP calculates cumulative transportation GHG savings of 18 MMTCO2.
  - » Benefit of **$22,000 per ton CO2**

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Estimating $/ton CO2 Bicycle Example: Portland

- Portland, Oregon
  - » Invested substantially in bicycle infrastructure
  - » Documented associated GHG reduction benefits

- Rails-to-Trails Conservancy calculation on bicycling infrastructure through 2040
  - » Reduce GHGs by 0.73 MMTCO2
  - » Save $1.4 billion from fuel and health care cost
  - » Net savings: **$1,664 per ton CO2** reduced

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Helping Attract Private Investment

Street Cars & Economic Development

- Portland: $73 million public investment, helped attract $2.3 billion in private investments within two blocks
  - » 30 fold return on investment
- Little Rock: $20 million attracted $200 million
- Tampa: $60 million attracted $1 billion

Source: Center for Transit Oriented Development, *Street Smart*

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Estimating $/ton CO2
Pricing Example: Mileage Based Insurance

Brookings Studies:

- Changing all car insurance policies to “pay as you drive” (PAYD) can save the US $50-60 billion/yr

- Universal PAYD system in California would
  - » Reduce VMT by 8%
  - » Meet **8% of AB32 2020 goals**
  - » Reduce annual fuel use by 1.2 billion gallons
  - » 2/3 of households in California would have lower premiums, saving an average of **$276 per vehicle per year**

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Estimating $/ton CO2 Short-term measures

- OECD/IEA: U.S. can quickly cut oil use by 14% at less than $3 per of ton CO2, via:
  - Car-pooling
  - Telecommuting
  - Compressed work week
  - Eco-driving

- Enforcing 55 mph highway speed limits
  - » Additional 2.4% savings
  - » $39/ton CO2

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Summary: "Cost per Ton" of CO2

- Higher cost - speed limit enforcement: $39/ton
- Lower cost - eco-driving, telecommuting: $3/ton
- Net savings
  - » Infill and TOD (Atlanta, Arlington)
  - » Regional smart growth (Sacramento)
  - » Comprehensive policies (Georgia)
  - » Bicycle infrastructure (Portland)
  - » Pay-as-you-drive insurance
- Savings greater when full vehicle costs included
  - » Average costs of vehicle operation: $0.55 per mile
    - – GHG emissions of a light duty vehicle: 0.46 kg CO2e per mile
  - » Any cost-free policy will yield *savings* of $1,196/ton

Do. Measure. Learn.
(Repeat)

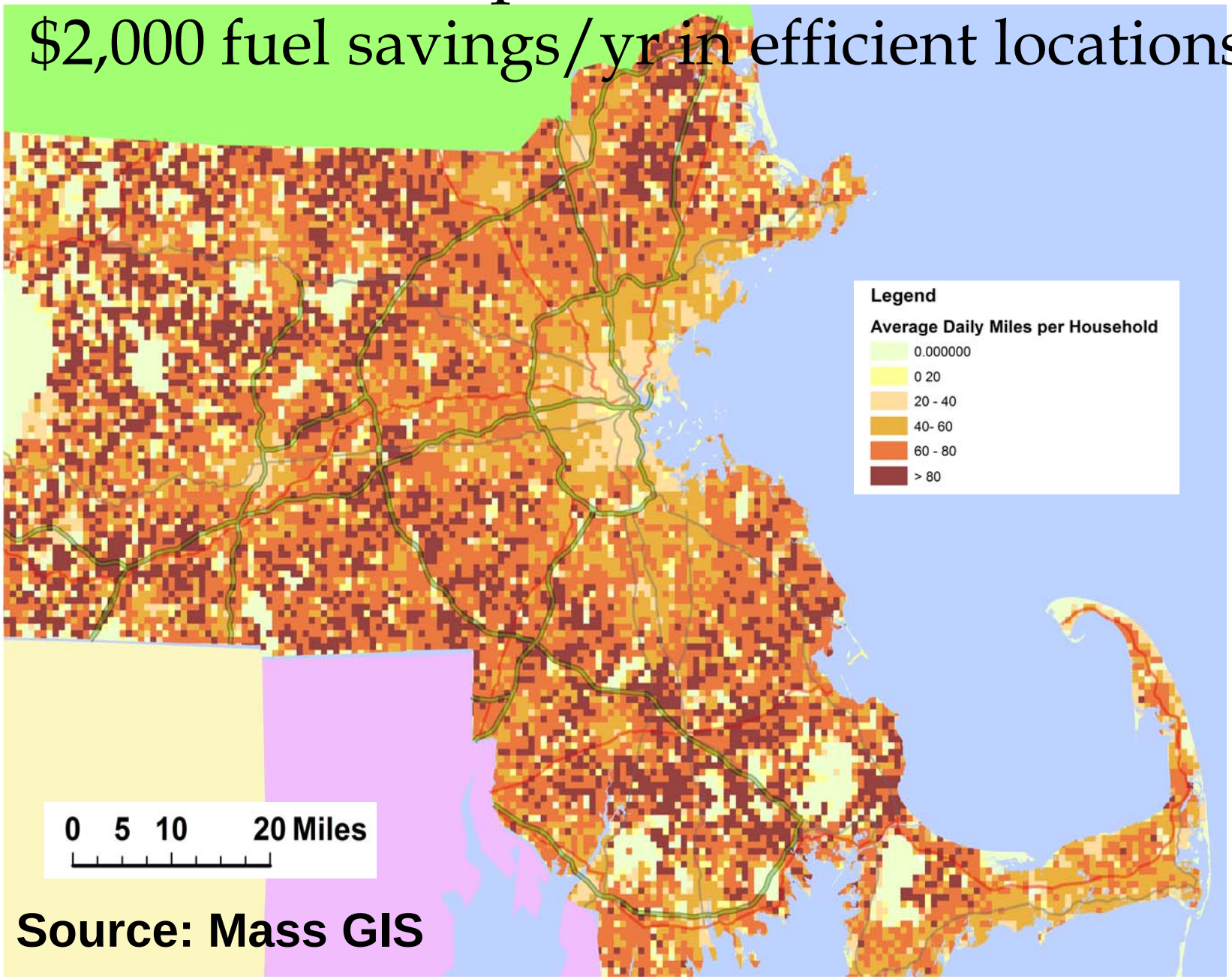
- **Do**: Implement directionally correct measures
  - » Smart growth, TOD, TDM, NMT….
- **Measure**: See what happens
  - » VMT, fuel sales, traffic flow
- **Learn**: Where and why did it happen?
  - » Apply lessons to policy design

Need better data

- » CCAP travel data recommendations
- » Short-term opportunities: odometer, retail fuel sales

VMT per Household

$2,000 fuel savings/yr in efficient locations



Source: Mass GIS

Federal Opportunities

- Climate bill
  - » Waxman-Markey: 0 - 1% for travel efficiency
  - » CLEAN-TEA: 10% of climate allowance value
  - » CCAP VMT dialogue proposal: Do More, Get More.
  - » Prime the pump – start to **Do. Measure. Learn.**
- Transportation bill extension
  - » Fund data and planning improvements to transition to performance-based policy.
  - » Odometer. Fuel Sales.
- How Green is your TEA?
  - » **Ask the Climate Question**: $500 billion cut GHGs?
  - » 1% for measurement, evaluation, research, planning

Closing Thoughts

- High VMT growth a policy choice, not pre-ordained
- Travel efficiency can reduce GHGs and save $
- Planning and incentives as important as regulation & technology for climate resiliency
- Smart growth planning is the applied R&D to invent walkable, efficient communities
- You can’t manage what you don’t measure.
- **You don’t get what you don’t ask for**

Thanks!

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Executive summary and full report available at: www.ccap.org

Fall 2009:

"**Growing Wealthier**:

The Economic Benefits of Smart Growth"

Transportation & Climate Policy Resources

www.ccap.org

- **Travel Data and Modeling Recommendations to Support Climate Policy and Performance-Based Transportation Policy** (January 2009)
- **Winkelman testimony to House Subcommittee on Technology and Innovation** "The Role of Research in Addressing Climate Change in Transportation Infrastructure" (March 2009)
- **Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices:** *An economic case for investment of cap-and-trade revenues* (June 2009)
- **Winkelman testimony to Senate Committee on Environment and Public Works**: "Transportation's Role in Climate Change and Reducing Greenhouse Gases" (July 2009)
- **Growing Wealthier: The Economic Benefits of Smart Growth** (forthcoming)