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Climate Change Mitigation Strategies in the U.S.

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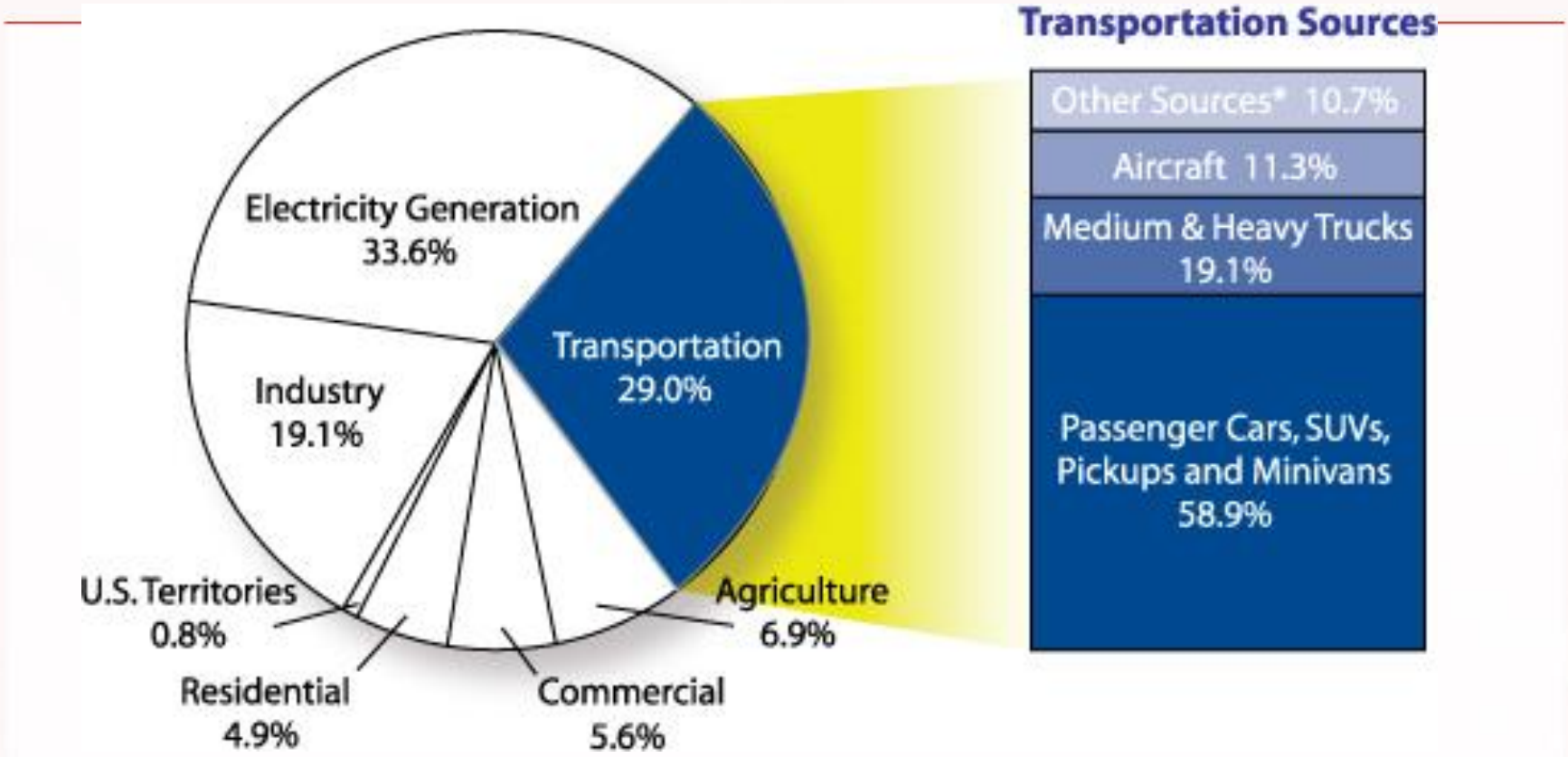
Transportation-Related GHG Emissions*



* Includes bunker fuels

Source: U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007 (U.S. EPA, 2009)

Status of U.S. Legislation

- In June 2009, the American Clean Energy and Security Act was passed by the U.S. House of Representatives, which established a national cap-and-trade program

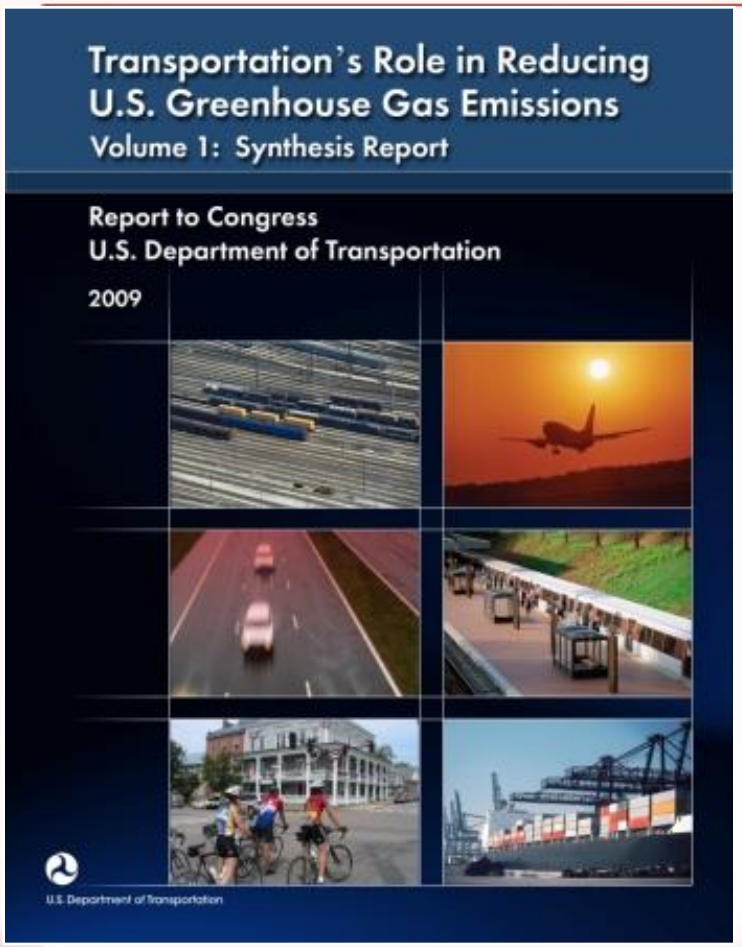
- In May 2010, The American Power Act was introduced in the U.S. Senate, but failed to pass

- It is not anticipated that any climate change legislation will be passed in the U.S. Congress due to differing political views on the issue

What is the full array of transportation strategies to reduce GHG?

Five GHG "legs"	Examples
1. Vehicle efficiency	• Higher CAFE standards
2. Low-carbon fuels	• CA's low carbon fuel standard
3. VMT Reductions (including land use)	• Less travel, could be in part due to land use changes
4. Vehicle/System Operations	• Signalization, ITS, Eco-driving
5. Construction, Maintenance, and Agency Operations	• Materials, maintenance practices

DOT Report to Congress



Produced by the U.S. DOT Climate Change Center

Analyzes:

- Transportation greenhouse gas (GHG) emissions levels and trends
- Strategies for reducing these emissions

Scope:

- Full range of strategies
- All transportation modes
- Primarily synthesis
- GHG reduction, costs, co-benefits, impact on DOT goals, key interactions

http://ntl.bts.gov/lib/32000/32700/32779/DOT_Climate_Change_Report_-_April_2010_-_Volume_1_and_2.pdf

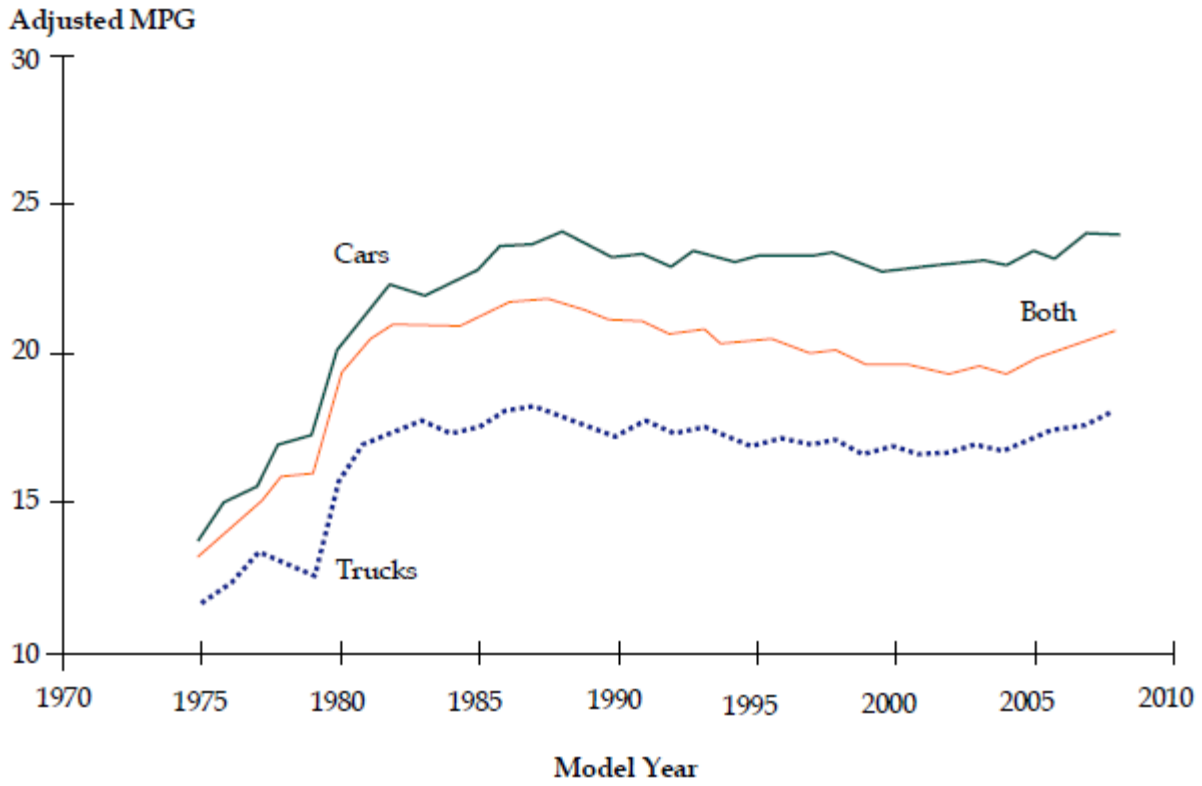
Co-Benefits of GHG Mitigation Strategies

- Most of the strategies to reduce GHG emissions also reduce transportation energy consumption

  - ✓ Reduced energy consumption
  - ✓ Reduce costs
  - ✓ Promote sustainability

U.S. Fuel Economy Trends

Figure 3.2 Fuel Economy Trends



Source: U.S. EPA (2008a).

Recent Vehicle Efficiency Standards Regulations/Announcements

- Joint DOT and EPA rulemaking to establish vehicle CAFÉ and GHG emissions standards – Model Years 2012-2016 (May 2010)

- New fuel efficiency and GHG emission reduction program for medium and heavy-duty vehicles - Model Years 2014-2018 (Aug. 2011)

- Administration proposal to raise fuel economy standards to 54.5 mpg by 2025 (July 2011)

Alternative and Renewable Fuels

- There are many alternative and low-carbon fuels currently available and in development to reduce GHG emissions associated with conventional petroleum-based fuels (ethanol, biodiesel, hydrogen, electricity, LPG, synthetic fuels and CNG)

- Important to consider “life-cycle” emissions when evaluating and analyzing alternative fuels

- Renewable fuel standards took effect in July 2010 under the Energy Independence and Security Act of 2007 (36 billion gallons by 2022)

Vehicle/System Efficiency

- Greater system efficiency can be achieved through a variety of mechanisms including:

  - ✓ Traffic Management (signal coordination, incident management, ramp metering
  - ✓ Real-time traveler information
  - ✓ Highway bottleneck relief
  - ✓ Reduced speed limits
  - ✓ Truck idling reduction

Reduce carbon-intensive travel activity

- Strategies to reduce carbon-intensive travel activity:
  - ✓ Pay-as-you-drive insurance
  - ✓ Congestion pricing
  - ✓ Urban and intercity transit
  - ✓ Non-motorized travel
  - ✓ Land use
  - ✓ Parking management
  - ✓ Commuter/worksite trip reduction
  - ✓ Telework and compressed work week
  - ✓ Individualized marketing
  - ✓ Eco-driving

Construction, Maintenance & Operations

- Construction, maintenance and operations activities can help reduce GHG emissions, including:
  - ✓ LED traffic lights
  - ✓ LED roadside lighting
  - ✓ Low carbon pavement
  - ✓ Reduced roadside mowing
  - ✓ Vegetation management on Right-of-Way (ROW)
  - ✓ Solar panels/wind on ROW
  - ✓ Alternative fuels and hybrid vehicles in DOT fleets
  - ✓ Alternative fuel buses

Summary

- **Many strategies are needed to reduce transport GHG. Will need full mix of strategies including:**

  - ✓ Maximize energy efficiency of current vehicle technology
  - ✓ Decarbonize vehicles and fuels world-wide
  - ✓ Adopt pricing measures to reward conservation and tech innovation
  - ✓ Push “eco driving” and system/speed management
  - ✓ Adopt more efficient land use
  - ✓ Support carpools & vanpools, biking, walking, transit use, trip chaining, telecommuting
  - ✓ Adopt low carbon, energy-conserving strategies in construction, maintenance, and agency operations
  - ✓ Retrofit legacy fleets to reduce PM and black carbon
  - ✓ Implement wide-ranging freight technology and logistics improvements