Promising Greenhouse Gas Emissions Reduction Strategies for the Transportation Sector:

- Low Carbon Fuels,
- Leveraging Transit with Land Use, and
- Ports and Goods Movement Opportunities

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April 16, 2010
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Global atmospheric concentration of CO₂

Sources: TP Whorf Scripps, Mauna Loa Observatory, Hawaii, institution of oceanography (SIO), university of California La Jolla, California, United States, 1999
Emissions Paths to Stabilisation

Source: Stern Review - Lem -- Jack Faucett Associates
The Contribution of the Transportation Sector to Greenhouse Gas Emissions in the United States

- The transportation sector (red) produces 28% of GHG emissions in the United States
Comparison of Transportation % Share of GHG Emissions at City, County, and State Level

<table>
<thead>
<tr>
<th></th>
<th>Transport Sector</th>
<th>Community Wide Inventory</th>
<th>Transport as % Share of Community Total</th>
<th>Year of Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Baltimore</td>
<td>2,254,410</td>
<td>9,226,075</td>
<td>24.4%</td>
<td>2007</td>
</tr>
<tr>
<td>County of Baltimore</td>
<td>4,897,796</td>
<td>11,548,267</td>
<td>42.4%</td>
<td>2006</td>
</tr>
<tr>
<td>State of Maryland</td>
<td>32,500,000</td>
<td>99,200,000</td>
<td>32.8%</td>
<td>2005</td>
</tr>
</tbody>
</table>
US Forecast New LDV and Total LDV Fleet Fuel Efficiency with Obama 2009 CAFE
Promising Greenhouse Gas Emissions Reduction Strategies for the Transportation Sector: Low Carbon Fuels
Biofuels Show Net Costs, Not Savings, as a GHG Mitigation Measure

New Hampshire (lowest) $72 / ton

Wyoming (Highest) $136 / ton

National Average $97 / ton
Low Carbon Fuel Standard (LCFS) Offers More Versatile Policy Tool

- LCFS allows for consideration of:
  - Different Fuel Types
    - Electric Vehicles, Hybrids. Hydrogen Fuel Cell. Natural Gas V. etc
  - Technology/Fuel Combinations:
    - Hybrid Biodiesel
    - Plug-in Hybrid & Flex-Fuel Engine
  - Synergies with Energy Supply Strategies
    - Cleaner Electricity Increases GHG Reduction Potential
LCFS policy increasingly under consideration among the states

**States**
- Oregon
- Washington
- California
- Montana
- Colorado
- New Jersey
- Massachusetts

**Multi-State Regions**
- 11 Northeastern States and Mid-Atlantic States
- 10 State Midwestern Governor’s Association (MGA)

**States**
- Minnesota
- Iowa
- New Hampshire
- Vermont
- Maryland
- South Carolina
State of New Jersey LCFS Scenarios: Plug-in Hybrids and Electric Vehicles

- **Plug-in Hybrids**: $410 / ton
- **Electric Vehicles**: $237 / ton
- **Biofuels**: $86 / ton
  - Conventional Electricity
  - Clean Electricity

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Promising Greenhouse Gas Emissions Reduction Strategies for the Transportation Sector:

Leveraging Transit with Land Use
Oregon State Highway VMT (in Billions)
State of New Jersey VMT per capita historic trend

VMT per Capita

Data from NJDOT and U.S. Census

2008 data are

4/16/2010

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The baseline forecast of VMT in the absence of new technologies and institution of certain “best practices” is based on VMT data provided by the New Jersey Department of Transportation (NJDOT).

Based on historical trends, VMT are increasing at an annual rate of 1.7% over the 2005 baseline value of 64.2 billion VMT and at that rate would reach 82.6 billion VMT in 2020.

If instead VMT increases were held to 1% per year, the level would reach 74.5 billion VMT in 2020, or about 8.1 billion VMT/year less.

GHG emissions associated with vehicle travel would decline accordingly.
Global Comparisons Show Gradient of Per Capita Transportation Energy Use in Urban Areas

Figure 3.2. Energy use per capita in private passenger travel versus urban density in global cities, 1990.
“Transit/Land Use Leverage”

- The analysis of the potential for VMT efficiency and associated GHG emissions reduction relies upon a body of research and policy analysis that incorporates the concept of ‘transit/land use leverage’.

- Statistical studies of cities around the world have shown that those with significant transit investments show a more energy-efficient use of the transportation system that is not fully accounted for simply by 'mode shift' from private automobiles to bus and rail transit.
USDOT/FTA and APTA both recognize Transit/Land Use Leverage

- The American Public Transportation Association (APTA) and the United States Federal Transit Administration (FTA) have both recognized the role and contribution of transit leverage and have provided information to assist transit agencies and policy analysts to consider the effects of transit leverage.
Philadelphia and New York Transit Agency
Greenhouse Gas Emissions Inventories

SEPTA
475K MT CO2-e

- 44%
- 37%
- 13%
- 2%
- 4%

NY MTA
2.3M MT CO2-e

- 45%
- 34%
- 12%
- 7%
- 2%

Legend:
- Electricity (Traction)
- Revenue Fleet (Traction)
- Non-Revenue Fleet (Non-Traction)
- Electricity (Non-Traction)
- Heating (Non-Traction)
Emissions Displaced by Transit

- Mode Shift from Private Autos
- Reduced Congestion
- Lower Car Ownership & Shorter Trips
- Transit/Land Use Leverage

Emissions Produced by Transit

- Tailpipe Emissions
- Electricity Use for Traction
- Stationary Sources
The “Transit Paradox”: As Transit Agency Emissions Go Up, Regional Emissions Go Down
APTA GHG Standards
Guideline Recommendation

- National default multiplier of 1.9
- Used for sketch-planning applications
- Default considered a placeholder until specific studies undertaken
- Recommend future additional work that is disaggregated by size and type of region and transit system
Overall Transit Agency
GHG Avoidance Multiplier

SEPTA
Overall Transit Multiplier: 3

NY MTA:
Overall Transit Multiplier: 8
Promising Greenhouse Gas Emissions Reduction Strategies for the Transportation Sector:

Ports and Goods Movement
Goods Movement Produces 27% of Transportation Sector GHG Emissions

2008 Data
Source: AEO 2010

- Light Duty Vehicles: 57%
- Commercial Light Trucks: 18%
- Freight Rail: 5%
- Freight Trucks: 5%
- Shipping: 2%
- Air: 2%
- Other: 2%
- Passenger (other): 2%

2008 Data
Source: AEO 2010
A View of Port Related Greenhouse Gas Emissions
Port Categories of Transportation Related GHG Emissions

Marine Ports
- Ocean Going Vessels
- Harbor Craft
- Cargo Handling Equipment
- Railroad
- Agency Fleets
- Heavy-Duty Vehicles
Port of New York and New Jersey 2008 Estimates of GHG Emissions

- Ocean going vessels: 22%
- Harbor vessels: 56%
- Cargo handling equipment: 4%
- Rail: 16%
- Heavy Duty Vehicles: 2%

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Summary of Port of NY/NJ Baseline Forecast and 3 Reduction Scenarios (JFA)
### Potential Goods Movement GHG Reduction Estimates for Port of New York and New Jersey

<table>
<thead>
<tr>
<th>Three Preliminary GHG Emissions Reduction Scenarios*</th>
<th>Total Emissions Reduction Potential Estimate (MMtCO2e in year 2030)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative</td>
<td>0.72</td>
</tr>
<tr>
<td>Moderate</td>
<td>2.16</td>
</tr>
<tr>
<td>Aggressive</td>
<td>5.75</td>
</tr>
</tbody>
</table>

*Estimated Using JFA PORT VISION 1.0*
Truck Anti-Idling: National Scenario Summary
(2020 year, 2007$)*

*Estimated Using FREIGHT VISION 1.0
Truck-to-Rail Shift: National Scenario Summary
(2020 year, 2007$)*

*Estimated Using FREIGHT VISION 1.0
Thank You for your interest:

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