TRANSPORTATION AND CLIMATE CHANGE IN MARYLAND

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Climate Change Milestones:

- April 2007 - Executive Order;
- January 2008 - Report from the Climate Change Commission;
- May 2009 – GHG Emission Reduction Act
- November 2009 – Climate Action Plan Implementation Status Report, MDOT
Maryland Basics:

- Maryland has 4,360 miles of tidal shoreline
- Average temperature in College Park, MD has increased 2.4°F since 1900
- Over the past 100 years, sea level in the Chesapeake Bay region has risen 1 foot
- 13 Islands have already been lost
- Future Projection: Sea level will rise an additional 2 – 3 feet by 2100
Maryland Priority Funding Areas / Protected Lands and New Potential Developed Acres by 2030

Current Policies
New Developed Acres

Smart Growth
New Developed Acres

Protected Lands
Municipalities
Municipal Comment Area
PFA
PFA Comment Area

MDP
Created November 2007
2030 Land Use for Maryland
Current Trends

Legend
- Development
- Agriculture
- Forest
- Water

0 5 10 20 30 40 Miles
Scope of Challenge:

Housing Affordability by Census Tract for Repeat Buyers, 2002 – 2006

(based on Median HH incomes)
Percent of 2002 Housing Sales by Census Tract Affordable to Repeat Home Buyers *

* Based on Statewide Median Household Incomes

Source: The Maryland Department of Planning, Planning Data Services
Percent of 2003 Housing Sales by Census Tract Affordable to Repeat Home Buyers *

* Based on Statewide Median Household Incomes

Source: The Maryland Department of Planning, Planning Data Services
Percent of 2004 Housing Sales by Census Tract Affordable to Repeat Home Buyers *

* Based on Statewide Median Household Incomes

Source: The Maryland Department of Planning, Planning Data Services
Percent of 2005 Housing Sales by Census Tract Affordable to Repeat Home Buyers *

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Percent of 2006 Housing Sales by Census Tract Affordable to Repeat Home Buyers

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Source: The Maryland Department of Planning, Planning Data Services
Maryland GHG Sector Sources:

- Electricity Consumption, 38%
- Transportation, 32%
- Off-Road, 8%
- On-Road, 92%
- Industrial Fuel Use, 8%
- Industrial Process, 3%
- Waste, 3%
- Agriculture, 3%
- Residential / Commercial Fuel Use, 13%
- Fossil Fuel Industry (CH4), 0.5%
Milestone Action details:

**April 2007**

Governor O’Malley’s Executive Order

- 25% reduction by 2020 from 2006 baseline levels
- Established Maryland Commission on Climate Change (MCCC)
- Members include:
  - (16) Agency Heads;
  - (6) General Assembly Members;

**August 2008**

Climate Action Plan (CAP)

- 42 Policy Options Across all Sectors –
- 8 Transportation & Land Use Policy Options
  - TLU-2: Land Use
  - TLU-3: Transit
  - TLU-5: Intercity Travel
  - TLU-6: PAYD
  - TLU-8: Bike / Ped
  - TLU-9: Pricing
  - TLU-10: Technologies
  - TLU-11: GHG Impact Analysis

**May 2009**

2009 GHG Emission Reduction Act

- Established Implementation requirements, but **NO Financial Commitments**
  - by 12/31/11 – Submit Draft Implementation Plan
  - by 12/31/12 – Final Implementation Plan Adopted
  - in 2016 General Assembly will Conduct a Mid-Course Review
Purpose:

- To quantify the GHG emission reduction contribution that the transportation sector can make by 2020 through:
  - Technology Improvements;
  - Increasing System Efficiencies;
  - VMT Reduction;
  - Use of Low-Carbon Fuels;
  - Fuel Consumption Reductions.

http://www.mde.state.md.us/assets/document/Air/ClimateChange/Appendix_C_%20MDOT_CLimate_Action_Process.pdf
Process:

1. Update the 2006 baseline and 2020 base forecast
2. Establish transportation sector GHG emissions reduction target
3. GHG emissions assessment by Category (GHG reductions and costs)
   - Category 1 – *Technology and fuel* programs
   - Category 2 – *Open and funded projects 2006-2020* (CTP, MPO TIPs & CLRTPs)
   - Category 3 – *TERMS* open and funded 2006-2020
   - Category 4 – *TLU* strategies (established in Phase I)
4. Produce initial GHG emission estimates and costs
Process:

• Inter-Agency Process (including MPA)
  – Coordinating Committee
  – TLU Working Groups

• Developed 72 Strategies to Implement the CAP’s 8 Transportation Policy Options

• 57 Strategies Recommended to Move Forward

• 44 Capable of Implementation by 2020
TLU Strategy Process:

- Eight transportation and land use policy options were outlined in the CAP.
- Phase I defines TLU strategies for each TLU policy option
- Phase I identifies 44 “critical” and “important” short/mid-term TLU strategies
- Phase II produces a macro-level assessment of the range of GHG reduction and cost for the 44 TLU strategies
### An Additive Process -

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<tr>
<th>Funded and Committed Program</th>
<th>TLU Strategies</th>
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<tr>
<td><strong>Category 1</strong>&lt;br&gt;Technology and fuels</td>
<td><strong>Category 4</strong>&lt;br&gt;TLU Strategies</td>
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<td><strong>Category 2</strong>&lt;br&gt;2006-2020 Plans and Programs</td>
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- Total Estimated 2020 GHG Emission Reductions

- Emissions estimates are completed for each Category.
- Each Category is mutually exclusive from one another.
- Emissions estimation process avoids any potential for double counting.
Strategy: **Land Use and Location Efficiency**

- Working Group recommendation for added emphasis on integrated land use and transportation planning
  - State, regional and local programs on best practices
  - Providing staff and technical resources
  - Development and implementation of expanded existing and new smart growth planning and implementation tools

- Evaluates two alternative population density scenarios based on the 2020 MPO (BMC, MWCOG) land use forecasts

- Recognizes that marginal shifts in land use could occur by 2020
Strategy: Transit

- Working Group supports the goal of doubling transit ridership (compared to 2000) by 2020 through the Phase I recommended strategies
  - Increasing the attractiveness and convenience of transit
  - Improving the operational efficiency of the system
  - Adding new on-road transit system capacity

- GHG reduction and cost estimates based on:
  - Incremental transit trips required above 2020 transit forecast to achieve doubling goal (translated to VMT reduction)
  - Incremental cost estimate based on cost per added trip
Strategy: PAYD

- Working Group focuses on short-term strategies that enhance connectivity and reliability of intercity passenger modes

- Longer term strategies include consideration of rail and truck freight bottlenecks and intermodal connections

- 2020 approach includes improving passenger convenience at intermodal connections (BWI, Amtrak stations, intercity bus terminals)
  - BWI airport increase non-auto arrival mode share from 12% to 20%
  - Intercity passenger terminals increase non-auto arrival by 5%
Strategy: PAYD

- Working Group identifies the following policy goal
  - Make PAYD Insurance coverage available to all Maryland drivers as early as possible
  - Push for adoption of incentives or pilot programs to support PAYD Insurance for Maryland drivers by 2012

- MIA goal focuses on a maximum deployment target of 20% by 2020

- Assumes a 5% decrease in VMT per PAYD Insurance policy
Strategy: **Bike & Pedestrian**

- Working Group strategies support the CAP goal of increasing bike and pedestrian mode share to 15% in urbanized areas by considering:
  - Infrastructure design and construction policies and funding
  - Regulatory and land use strategies improving bike and pedestrian amenities
  - Education and marketing measures

- Build out of *Maryland Trails Plan* and added 2 scenarios of pedestrian facility deployment around activity centers, transit stations and schools
Working Group addressed three pricing strategies along with a ramp-up of employee commute options that include -

- VMT fees
- Congestion pricing and managed lanes
- Parking impact fees
- Increase in employer commute incentives

VMT fees and facility pricing GHG reduction based on employing travel cost elasticities at various pricing levels

Commute programs GHG reductions based on Maryland specific EPA Commuter Model scenarios
Strategy: Transportation Technology

Maryland Climate Action Plan
Draft Maryland Department of Transportation Implementation Status Report

- Working Group goal to reduce GHG emissions through deploying technologies designed to cut GHG emission rates include -
  - Idling reduction (freight vehicles and school buses)
  - Engine/vehicle replacements (state and transit fleets)
  - Promotion of fuel efficient technologies
  - Transportation system efficiency improvements

- GHG reductions assessed based on strategy specific research on reductions in fuel consumption per unit deployed
Strategy: Major Project Assessment

- Working Group focus to understand impacts of major projects on GHG emissions
- Develop guidance for state and other project sponsors
- Implementation approach includes -
  - Participate in national policy discussions
  - Evaluation of GHG impacts through NEPA process
  - Evaluation of GHG impacts through state/regional plans
- No quantification of potential GHG emission benefits
MDOT’s Draft Implementation Status Report Results

Maryland Transportation Sector 2020 GHG Emissions
Base Forecast, Emission Reduction Target and Emission Reduction Estimates

- 37.77 Base Forecast
- -3.76 National Fuel Economy Standard
- -1.00 MD Clean Car
- -0.28 Renewable Fuels
- -1.38 Plans & Programs
- -0.73 TERMS
- -1.62 TLU Strategies
- -3.16 Target Shortfall: -3.86-2.32 mmt

25% Reduction Goal

2006

2020
The 44 TLU strategies result in a 2020 GHG reduction between 1.6 – 3.2 mmt at a capital cost estimated between $4.8 to $6.0 billion not included in current funding program.
Where Now?

“Carbon Neutral” Corridor Study

Transportation Facilities