

Appendix M

Climate Change Integration Notes

Current 2030 RTP (Efforts already in place)**Current Action****Legislation/Benefit**

<u>Improve public transit:</u>	
1. Continue to evaluate and work toward intracounty transit and filling in regional transit gaps.	<ul style="list-style-type: none">• CLEAN-TEA• American Power Act• Federal Surface Transportation Policy and Planning Act• Increase total usage of public transportation• Inter-city transit (bus and rail) has the potential to reduce GHG by 0.2-0.9% by 2030*
2. Examine transit funding levels to support changes in ridership patterns and/or restructure paratransit to meet rising demand.	
3. Work with transit agencies to improve efficiency and desirability by funding projects that reduce travel time, expanding regional transit and ridesharing information through real-time travel updates, and expanding the use of smart cards.	
4. Increase access to transit with technology, service expansion, park-and-rides, bus stop facilities, sidewalks and bicycle lockers.	
5. Support efforts to extend passenger rail service from Wilmington to Dover and Perryville to Newark including the creation of transit supportive development along the intended corridor.	
6. Support signal priority for transit and BRT systems specifically in NCC.	
7. Support bus and HOV lanes on I-95 and SR 1.	
8. Fund enhancements to park and ride facilities and transit system, specifically within transportation justice areas.	
<u>Improve non-motorized networks:</u>	
9. Improve bicycle and pedestrian facilities by funding pedestrian improvements within pedestrian priority areas, dedicating funding	<ul style="list-style-type: none">• CLEAN-TEA• American Power Act• Reduce VMT

for maintenance, and working with transportation agencies to improve crossing facilities.	<ul style="list-style-type: none">• Non-motorized improvements have the potential to reduce GHG emissions by 0.2-0.6% by 2030*• Improved livability and healthy communities• Mobility for non-drivers
10. Implement recommended walkability enhancements within identified transportation justice areas and continue to retrofit facilities to meet ADA standards.	
11. Establish a network of pedestrian and bicycle facilities in partnership with member agencies to promote healthy communities.	
12. Coordinate with DOTs and schools to develop and implement Safe Routes to School programs.	
13. Promote non-motorized plans and programs such as the NCC Greenway Plan, Wilmington Bicycle Plan, and Walkable Community Workshops.	
<u>Improve ridesharing:</u>	
14. Continue partnerships with ridesharing agencies to increase options for carpooling.	<ul style="list-style-type: none">• CLEAN-TEA• American Power Act• Reduce VMT• Reduce congestion and delays• Reduce GHG emissions by up to 0.2% by 2030
15. Enhance park and ride facilities through use of technology to increase efficiency.	
<u>Reduce surface congestion:</u>	
16. Continue to complete annual Congestion Management Progress report and integrate into TIP.	<ul style="list-style-type: none">• Surface Transportation Authorization Act• CLEAN-TEA• American Power Act• Federal Surface Transportation Policy Program• Reduce VMT• Reduce surface transportation delays• Maximum 0.5% reduction in GHG emissions by 2030*
17. Plan, fund and implement a comprehensive goods movement program based on findings from the WILMAPCO freight plan.	
18. Fund projects to make better use of Intelligent Transportation Systems.	
19. Conform to Air Quality Conformity Requirements.	
<u>Make smarter land use decisions:</u>	
20. Expand transportation systems within the Center and Community Transportation Investment Areas.	<ul style="list-style-type: none">• Surface Transportation Authorization Act

21. Work with land use agencies to encourage future growth in areas with existing infrastructure (infill development).	<ul style="list-style-type: none">• CLEAN-TEA• American Power Act• Reduce VMT and SOV trips• Reduce surface transportation delays• Promoting use of existing transit and rail facilities• Increase density in urban areas• Urban transit has the potential to reduce GHG emissions by 0.2-0.9% by 2030*• Land use changes have the potential to reduce GHG emissions by 1-4% by 2030 and 3-8% by 2050.
22. Limit projects within Rural Transportation Investment Areas for preservation and safety.	
<u>Promote multi-modal alternatives:</u>	
23. Continue to plan for and fund multi-modal projects.	<ul style="list-style-type: none">• Surface Transportation Authorization Act• CLEAN-TEA• American Power Act• Reduce VMT and SOV trips• Reduce surface transportation delays• Promote use of public transportation• Trip reduction programs have potential to reduce GHG emissions by 0.2-0.6% by 2030*
24. Coordinate with implementing agencies on planning and design of complete streets, and implement at Complete Streets Policy through the TIP.	
25. Ensure affordable transportation choices which can include public transit, car sharing, employer-provided transit, and reverse commute services.	
<u>Other actions being taken but not in RTP 2030</u>	
26. Sea Level Rise (SLR) planning and evaluation.	<ul style="list-style-type: none">• Surface Transportation Authorization Act• Promote future livability and sustainability

Potential Future Action for 2040 RTP**Proposed Action****Legislation/Benefit**

Reducing Transportation Energy Use Work Group (Delaware) Final Report (2009):	
27. Explore the feasibility of creating a phased BRT throughout the Mid-Atlantic area (DE, MD, PA and NJ).	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Federal Surface Transportation Policy and Planning Act • Reduce VMT and SOV trips • Reduce delay and congestion
28. Adopt a goal that by 2030, the total vehicle miles traveled (VMT) in Delaware will not exceed the levels in 2009.	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Surface Transportation Authorization Act • Federal Surface Transportation Policy and Planning Act • Reduce VMT and SOV trips
29. Support increased funding for fixed-route transit to 20% of total transportation funding in region and creation of a dedicated funding stream for the system.	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Reduce VMT and SOV trips
30. Explore integrated bus systems where DART can be combined with other transit services such as UD's transit, Unicity in Newark to improve efficiency.	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Reduce VMT and SOV trips • Promote public transit
31. Engage business stakeholders to encourage employer-sponsored commute benefits through setting minimum trip reduction standards, providing resources, and implementing tax incentives.	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Reduce VMT and SOV trips • Reduce peak hour congestion • Reduce 0.2-0.6% reductions in GHG by 2030*
32. Continue to encourage the implementation of Smart Growth policies and techniques such as Transit oriented design (TOD) where feasible.	<ul style="list-style-type: none"> • CLEAN-TEA • Surface Transportation Authorization Act • American Power Act • Reduce VMT and SOV trips • Aggressive smart growth policies will reduce VMT by 5.3%, comprehensive by 3.4% and limited by 1.5% by 2025 (Univ. of Minnesota, 2008)

33. Support a sliding scale for vehicle registration fees based on energy consumption per mile and miles driven per year.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce VMT and SOV trips
34. Increase non-motorized spending from 1% of the total share to 2-3% of total transportation spending in the Wilmington region and throughout the state.	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Reduce VMT • Improve livability and healthy communities
<u>DVRPC Strategies (http://www.dvrpc.org/EnergyClimate/)</u>	
35. Prepare the region for alternative energy such as solar, wind, and biofuel power as it relates to transportation.	<ul style="list-style-type: none"> • Surface Transportation Authorization Act • American Power Act • Improve energy efficiency
36. Promote energy efficient traffic signals and streetlights.	<ul style="list-style-type: none"> • Surface Transportation Authorization Act • American Power Act • Improve energy efficiency
<u>US DOT- Transportation's Role in Reducing U.S. GHG Emissions (2010):</u>	
37. Promote public info campaigns on travel alternatives, use of real-time traffic information, eco-driving, telecommuting, etc.	<ul style="list-style-type: none"> • CLEAN-TEA • American Power Act • Federal Surface Transportation Policy and Planning Act Reduce VMT and SOV trips • Reduce delay • Reduce GHG emissions by 0.1-0.2% by 2030* • Promotes traveler awareness/satisfaction
38. Encourage pricing strategies such as VMT fees, pay-as-you-drive (PAYD) insurance, higher motor fuel taxes, intercity tolls, congestion pricing etc.	<ul style="list-style-type: none"> • American Power Act • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • Reduce VMT and SOV trips • More efficient traffic operations • Reduce GHG emissions by 0.7-

	3.1% within 5-10 years assuming pricing implementation of an additional 2-5 cents/mile
39. Promote reduced speed limits (i.e. 70 to 60 mph or 65 to 55mph) on national highways.	<ul style="list-style-type: none"> • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce GHG emissions by 1.1 to 1.8 % by 2030 (27-43 mmt CO₂)*
40. Support alternative fuel sources for vehicles and transit buses (hybrid, LNG, fuel cell, battery electric, etc.) Provide information on vehicle purchasing.	<ul style="list-style-type: none"> • Federal Surface Transportation Policy and Planning Act • American Power Act • Reduce GHG emissions by 22% by 2050 • Reduce reliance on foreign fuels
41. Support fuel efficient vehicles through CAFE standards and other public awareness programs on vehicle purchasing.	<ul style="list-style-type: none"> • Federal Surface Transportation Policy and Planning Act • American Power Act • Surface Transportation Authorization Act • Reduce reliance on foreign fuels
42. Promote improvements in railroad technologies such as modifications of the power system, locomotive efficiency, and railroad activities.	<ul style="list-style-type: none"> • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Improve freight efficiency and encourage modal shift.
43. Support reduced impacts during construction and maintenance of transportation infrastructure such as using recycled materials and using alternative fuels in transportation agency vehicles and equipment.	<ul style="list-style-type: none"> • CLEAN-TEA • Surface Transportation Authorization Act • American Power Act • Reduce emissions by 2-3 mmt CO₂ per year. • Improve energy efficiency
44. Promote safety strategies that reduce the number and severity of crashes.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act

	<ul style="list-style-type: none"> • American Power Act • Reduce delays and congestion • Improve safety
45. Promote truck idling reduction strategies-laws, technology, education, and land use decisions. Examples of these strategies include: providing electrical hookups at truck parking spaces, anti-idling laws, automatic shut down and start up systems for engines, etc.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce emissions 1.3-6.1 mmt CO2 in 2030 • Improve energy efficiency
46. Promote increased truck size and weight limits to allow operators to carry more goods per truck.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce the # of trucks on the road • Reduce emissions by 0.6 mmt CO2 in 2030
47. Promote bottleneck relief strategies such as implementing median barrier treatments, paved shoulders, auxiliary lanes, and reconstruction of interchanges.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce delays and congestion • Reduce emissions by 1-6 mmt CO2 in 2030
48. Promote urban consolidation centers (UCC) where deliveries can be consolidated for subsequent delivery into the urban area.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce number of large trucks on urban streets • Reduce less than 1 mmt CO2 in 2030
49. Promote modal diversion where freight traffic such as trucking can be shifted to rail or marine.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation

	<ul style="list-style-type: none"> Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce number of large trucks on urban streets • Reduce 0.2-4.7 mmt CO2 in 2030
50. Promote parking management such as changes to parking supply, pricing, and other strategies to create disincentives to driving.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce VMT and SOV
51. Encourage commute reduction programs through options such as telework, compressed work week, and flexible work schedules.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Reduce VMT and SOV
52. Increase the energy efficiency of transportation agency buildings through certifications such as LEED and EPA Energy Star.	<ul style="list-style-type: none"> • Surface Transportation Authorization Act • Improve energy efficiency
MD Climate Action Plan (2008)	
53. Support forest management and limit development in these areas.	<ul style="list-style-type: none"> • Surface Transportation Authorization Act • American Power Act • Reduce land use impacts • Promote carbon sequestration
54. Support in-state biofuel production to offset diesel consumption.	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Improve energy efficiency
55. Support auto-free tourism development throughout the state.	<ul style="list-style-type: none"> • Surface Transportation Authorization Act • American Power Act • Reduce VMT
56. Implementation of a clean-car program to spur use of plug-in	<ul style="list-style-type: none"> • Federal Surface Transportation Policy and Planning Act

hybrids.	<ul style="list-style-type: none"> • Surface Transportation Authorization Act • American Power Act • Improve energy efficiency
57. Adopt a “Green Port Strategy” for port facilities. (http://www.greenport.net/gp-content/welcome-to-greenport/ecoports-2009.html)	<ul style="list-style-type: none"> • CLEAN-TEA • Federal Surface Transportation Policy and Planning Act • Surface Transportation Authorization Act • American Power Act • Improve energy efficiency at ports

*based on transportation sector emissions in 2030 (U.S. DOT, 2010)

Notes: Marine and aviation not included in depth.

Vehicle and fuel technology strategies only generally discussed

*U.S. DOT, 2010**Transportation's Role in Reducing U.S. Greenhouse Gas Emissions (page 5-5)***Strategies to Reduce Carbon-Intensive Travel Activity***Pricing*

- **VTM Fees** - Charging drivers per mile of travel.
- **Intercity Tolls** - Applying tolls to rural Interstate and other limited-access highways.
- **Pay-as-You-Drive Insurance** - Converting a significant portion of the essentially fixed cost of insurance to a marginal cost based on mileage.
- **Congestion Pricing** - Pricing roadway facilities when they are congested in order to reduce traffic on those facilities to an improved level of service.
- **Cordon/Area Pricing** - Applying a fee for vehicles to enter or operate within a selected area, such as a central business district.

Transit, Nonmotorized, and Intermodal Travel

- **Transit Expansion, Promotion, Service Improvements** - Investing in new fixed-guideway urban transit, expanding coverage of bus systems, increasing the frequency and/or time coverage of service on existing routes, or making other improvements to the quality of service on urban transit systems.
- **Intercity Bus and Rail** - Bus and rail passenger services (improvements to existing Amtrak services, or investment in new high-speed rail corridors) in corridors up to 500 miles between major city pairs.
- **Nonmotorized Transport** - Capital investments in nonmotorized infrastructure (e.g., bicycle facilities, sidewalks), or supporting activities such as design standards, bicycle parking at destinations, or education programs, to encourage bicycling, walking, and other forms of nonmotorized transport.
- **Passenger Intermodal Improvements** - Coordinating infrastructure and services to facilitate transfers between modes in order to maximize the efficiency of travel and minimize passengers' time and costs.

Land Use and Parking

- **Land Use** - Coordinated regional transportation and land use planning to develop and implement growth policies (e.g., zoning for compact, walkable communities), in conjunction with supportive infrastructure investment, to reduce vehicle travel.
- **Parking Management** - Changes to parking supply, pricing, or other management techniques to create disincentives to driving.

Commute Travel Reduction

- **Worksite Trip Reduction Programs** - Requirements for employers to reduce single-occupancy vehicle trips by their employees, or outreach, assistance, and incentive programs to encourage them to do so.
- **Telework** - The practice of working from a location other than the regular workplace and using modern telecommunications and computer technology to bridge the resulting distance.
- **Compressed Work Week** - A scheduling system whereby a regularly scheduled number of hours are worked in a shortened span of time.
- **Flexible Work Schedules** - Employer-facilitated alternatives to a standard 9:00 a.m. to 5:00 p.m. work schedule for commuting employees.
- **Ridematching, Carpooling, and Vanpooling** - Programs such as ridematching databases, vanpooling programs, and other supportive actions to increase vehicle occupancies for work trips.

Public Information Campaigns

- **Information on Travel Choices** - Mass marketing and individualized marketing campaigns to provide people with information on the full range of travel options and impacts of their choices.
- **Information on Vehicle Purchase** - Information directed at influencing consumers' purchasing decisions by providing complete information on the environmental, cost, and other impacts of their purchases.
- **Driver Education/Eco-Driving** - Education programs directed at increasing vehicle fuel efficiency by affecting both driver behavior and vehicle maintenance.

*U.S. DOT, 2010**Transportation's Role in Reducing U.S. Greenhouse Gas Emissions**(Table 5.2: page 5-11)*

Strategy	GHG Reduction (2030)	Direct Cost per Tonne	Net Included Cost per Tonne	Cobenefits	Key Federal Policy Options
5.4 Land Use and Parking					
5.4.1 Land Use	Moderate-High 1.2-3.9% (2030) 2.5-7.7% (2050)	Low	Net Savings	+	Transportation funding incentives to support regional and local planning for efficient land use Federal inter-agency policy coordination to support efficient development patterns and practices
5.4.2 Parking Management	Low 0.2%	Unknown	Unknown	+/-	
5.5 Commute Travel Reduction					
5.5.1 Worksite Trip Reduction Programs	Low-Moderate 0.1-0.6%	Low-Moderate	Net Savings	+	Funding for regional employer outreach and commuter support programs
5.5.2 Telework	Low 0.4%	High	Moderate	+	Expanded tax incentives for alternative commute measures (telework, transit subsidies, etc.)
5.5.3 Compressed Work Week	Low 0.1-0.3%	Low	Unknown	+	(Federal requirement for States to implement employer trip reduction ordinances)
5.5.4 Flexible Work Schedules	N/A	Low	Unknown	+	
5.5.5 Ridematching, Carpool, Vanpool	Low 0.0-0.2%	Moderate	Unknown	+	
5.6 Public Information Campaigns					
5.6.1 Information on Travel Choices	Low 0.3-0.4%	Moderate-High	Unknown	+	Funding for individualized marketing programs—additional pilots, broader-scale implementation
5.6.2 Vehicle Purchasing	Low 0.1-0.2%	Unknown	Unknown	+	Continuation/expansion of outreach programs
5.6.3 Eco-Driving	Moderate-High 0.8-4.3%	Unknown	Net Savings	+	Requirements for auto manufacturers to incorporate in-vehicle fuel efficiency feedback Requirements for States to teach eco-driving practices in driver training and drivers' manuals Funding for eco-driving education
Combined Benefits	4.9-17% (2030) 6.4-21% (2050)				

*U.S. DOT, 2010**Transportation's Role in Reducing U.S. Greenhouse Gas Emissions**(Table 5.2; page 5-12)*

Strategy	GHG Reduction (2030)	Direct Cost per Tonne	Net Included Cost per Tonne	Cobenefits	Key Federal Policy Options
5.1 Pricing					
5.1.1 VMT Fees	Moderate 0.8-2.3%	Moderate	Net Savings	-	Establishment of national VMT fee, or requirements or incentives for State-level implementation R&D to address privacy as well as technical issues with monitoring
5.1.2 Intercity Tolls	Low <0.1%	High	Net Savings - Moderate	-	See VMT fees; plus removal of restrictions on tolling Interstate highways
5.1.3 Pay-as-You-Drive Insurance	Moderate-High 1.1-3.5%	Low-Moderate	Net Savings	+/-	Federal requirement that States 1) allow or 2) require insurers to offer mileage-based insurance Demonstration projects (?)
5.1.4 Congestion Pricing	Low-Moderate 0.4-1.6%	High	Net Savings	+/-	Requirements or incentives for metro-level implementation R&D to address privacy as well as technical issues with monitoring (same issues as VMT fee)
5.1.5 Cordon/Area Pricing	0.1%	High	Net Savings	+/-	Requirements or incentives for city or metro-level implementation
5.3 Transit, Nonmotorized, and Intermodal Travel					
5.3.1 Transit Expansion, Promotion, Service Improvements	Low-Moderate 0.2-0.9% (2030) 0.4-1.5% (2050)	High	Net Savings - High	+	Funding for transit investment and services
5.3.2 Intercity Passenger	Low 0.3%	High	Net Savings - High	+	Funding for intercity and high-speed rail expansion, intercity bus route expansion National rail plan and policy framework to reconcile passenger and freight rail needs
5.3.3 Nonmotorized Transport	Low-Moderate 0.2-0.6%	Moderate - High	Net Savings	+	Funding for bike/pedestrian projects Requirement for States to adopt complete streets/design policies for alternative mode accommodation