

## **TRANSPORT OVERVIEW**

Transportation is expected to be a major driving force behind a growing world demand for energy over the next twenty years. It is the largest end-use of energy in developed countries and the fastest growing end-use in most developing countries. At the same time, adequate, efficient and effective transport systems are critical to sustainability on many fronts, including access to markets, employment, education, health care and other basic services critical to poverty alleviation. Clean and energy efficient transportation contributes to sustainability of health, environment and energy resources. In addition to energy usage and air quality impacts, transportation has significant implications for climate change, a major priority of the Obama Administration. The President is committed to aggressive action to reduce the impacts of climate change and ensure that the U.S. is a leader in the global effort to reduce greenhouse gas emissions. Currently, transportation accounts for about 30 percent of total U.S. greenhouse gas emissions.

The U.S. government is working to confront climate change and reduce the transportation sector's greenhouse gas emissions, while meeting demands for an expanded accessible and efficient transportation system. While some of these initiatives are coordinated independently by individual U.S. agencies, others are being carried out by new or pre-existing partnerships between U.S. agencies and private or academic partners, or between U.S. agencies and foreign countries. These initiatives hold great potential to increase sustainability and provide knowledge and lessons that will enhance sustainability around the world.

### **1. Domestically-Focused Agencies and Programs**

#### **1.A. Interagency**

##### **American Recovery and Reinvestment Act of 2009 (ARRA)**

(<http://www.recovery.gov/?q=content/act>): As part of the \$150 billion investment in new infrastructure, ARRA enacted the largest increase in funding of our nation's roads, bridges and mass transit systems since the creation of the national highway system in the 1950s.

##### **DOT-HUD-EPA Interagency Partnership for Sustainable Communities**

(<http://www.epa.gov/dced/2009-0616-epahuddot.htm>) : On June 16, 2009, the U.S. Department of Transportation (DOT), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Environmental Protection Agency (EPA) joined together to help improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide. Through a set of guiding livability principles and a partnership agreement that will guide the agencies' efforts, this partnership will coordinate federal housing, transportation and other infrastructure investments to protect the environment, promote equitable development and help to address climate change.

## **1.B. U.S. Department of Transportation**

The U.S. Department of Transportation recognizes the importance of sustainability in the U.S. transportation system and has made environmental sustainability a central goal of its policies and programs. Several agencies within DOT carry out programs that are relevant to CSD 18/19 topics. These agencies and programs include:

### **DOT/Office of Safety, Energy, and Environment**

(<http://ostpxweb.dot.gov/policy/safetyenv.htm#environment>): The Office has primary responsibility for developing and reviewing transportation legislation and regulations and coordinating national transportation policy initiatives relating to environmental and energy matters. The Office reviews and analyzes the environmental implications of domestic transportation policy to provide a basis for advising management actions and decisions. Major policy areas of the Office include climate change, sustainability and quality of life, environmental stewardship and streamlining, alternative fuels, species and habitat protection and the National Environmental Policy Act, among others.

**DOT/Climate Change Center** (<http://climate.dot.gov>): The Climate Change Center provides a unifying structure for DOT's actions and policies that address climate change issues within a multi-modal context. The Center is the focal point in DOT for information sharing and technical expertise on transportation and climate change. Through coordination of ongoing and new research within the operating administrations, policy analysis, partnerships and outreach, the Center encourages multi-modal approaches to increase transportation energy efficiency and reduce transportation-related greenhouse gas emissions, as well as to reduce the impacts of climate change on transportation.

### **DOT/Maritime Administration (MARAD)/Environment and Safety**

([http://www.marad.dot.gov/environment\\_safety\\_landing\\_page/environment\\_and\\_safety\\_landing\\_page.htm](http://www.marad.dot.gov/environment_safety_landing_page/environment_and_safety_landing_page.htm)): The maritime industry must comply with a broad array of requirements in the areas of air and water quality, hazardous waste disposal, protection of marine mammals and fisheries, and prevention of the spread of aquatic invasive species. The industry's mobile nature necessitates that standards be set at the international and national level. Safety standards must also be set at an international level, and MARAD plays a key role in asserting the need for consistent, uniform international laws and policies. MARAD also works with the shipbuilding industry to find technological solutions to environmental problems associated with the construction and design of ships and encourages cooperative research programs in regional and international bodies that are working to solve these problems. MARAD is currently leading an effort with U.S. universities, research institutions and government agencies to establish independent U.S. ballast water treatment technology testing facilities that would certify ballast water systems to International Maritime Organization standards.

**DOT/Federal Transit Administration (FTA):** FTA is dedicated to building the capacity of public transportation and ensuring that world-class public transportation systems provide access and mobility for all Americans—including urban and suburban commuters, rural workers and their families, persons with disabilities, older adults, Native Americans living on tribal lands and visitors to national parks and public lands. Over the past 25 years, FTA has successfully leveraged state and local funding to revitalize, expand and enhance urban and rural public transportation systems throughout the country, making public transportation available to far more Americans than ever before. As a result, public rail, bus, trolley, ferry and other transit services have reached greater levels of safety, reliability, availability, and accessibility.

FTA has invested billions of dollars in major capital transportation projects that serve the nation's metropolitan areas. It has also provided rigorous oversight to help manage quality, cost and risk on these complex projects. In many of the nation's largest cities, public transportation now carries roughly one-third of all work trips destined for central business districts and is an essential link between these districts and other destinations. Since 1984, the number of cities with publicly funded passenger rail service has more than doubled. The size of the nation's transit bus fleet has grown by more than 25%, and nearly every bus in the U.S. is accessible to people with disabilities and senior citizens. Since the mid-1990s, the nation's overall public transportation ridership has grown by more than one-third.

FTA's efforts have also benefited smaller communities. A decade ago, two of every five residents in rural and small urban communities did not have access to public transportation. Since then, FTA has been instrumental in bringing new public transportation options to dozens of these communities. Tribal areas also benefit from FTA investments that afford greater accessibility and mobility options. FTA programs that support sustainable transportation include:

- **Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER)**  
([http://www.fta.dot.gov/index\\_9440\\_9920.html](http://www.fta.dot.gov/index_9440_9920.html)): The Recovery Act has provided \$8.4 billion in funding for transit. These funds will support projects in bus and rail car manufacturing, operation and maintenance; fixed guideway improvements; and work that supports the operation of high efficiency buses, among other sustainable transport efforts. \$100 million of these funds is specifically directed towards a new program, TIGGER, to support transit agencies in pursuing cutting-edge technologies to reduce their energy usage and greenhouse gas emissions.
- **Mobility Management Resources**  
([http://www.fta.dot.gov/planning/metro/planning\\_environment\\_2366.html](http://www.fta.dot.gov/planning/metro/planning_environment_2366.html)): FTA spearheads a partnership with nine federal departments to develop and deliver community based transportation services. This pioneering "mobility management" approach has brought together public and private operators of vanpool, rideshare, bus and other services to ensure that persons with disabilities, older Americans and individuals without automobiles can readily access sustainable public transportation where and when they need it most.

- **New Starts-Small Starts Program** ([http://www.fta.dot.gov/planning/planning\\_environment\\_5221.html](http://www.fta.dot.gov/planning/planning_environment_5221.html)): This discretionary program supports locally planned, implemented and operated major transit capital investments, including fixed guideway transit systems and substantial corridor-based systems such as commuter rail, light rail, heavy rail, bus rapid transit, streetcars and ferries. Before a local project sponsor can receive grant funding for construction, each project is evaluated based on the following criteria: mobility improvements, environmental benefits, cost effectiveness, operating efficiencies, transit supportive land use, economic development and local financial commitment. Project sponsors also need to complete necessary environmental and planning studies, demonstrate consistency with regional transportation plans, and obtain the capacity to construct and finance a major transit project.

#### **DOT/Federal Railroad Administration (FRA)**

- **Passenger Rail Investment and Improvement Act of 2008** (<http://www.fra.dot.gov/downloads/PRIIA%20Overview%20031009.pdf>): The Passenger Rail Investment and Improvement Act of 2008 (PRIIA) reauthorizes the National Railroad Passenger Corporation (Amtrak) and strengthens the US passenger rail network by tasking Amtrak, FRA, states and other stakeholders to improve service, operations and facilities. PRIIA focuses on the development of high-speed rail corridors and on intercity passenger rail, including Amtrak's long-distance routes and the Northeast Corridor (NEC), as well as state-sponsored corridors throughout the U.S.
- **Recovery Act – High Speed Rail** (<http://www.fra.dot.gov/Downloads/Final%20FRA%20HSR%20Strat%20Plan.pdf>): The Recovery Act addresses America's transportation challenges by launching a new and efficient high-speed passenger rail network in 100-600 mile [corridors](#) that connect communities across America. FRA has published a [Strategic Plan](#) that outlines the vision for High Speed Rail that would transform the nation's transportation system. The plan calls for rebuilding existing rail infrastructure while developing a comprehensive high-speed intercity passenger rail network through a long-term commitment at both the federal and state levels.

#### **DOT/Federal Highway Administration (FHWA)**

- **Office of Planning Environment and Realty** (<http://www.fhwa.dot.gov/environment/>): The Office of Planning, Environment and Realty (HEP) hosts FHWA's Sustainable Transport and Climate Change Team. This new team addresses a broad range of issues

related to transportation, climate change and sustainability. The Climate Change Team provides leadership and policy development on climate change mitigation, climate change adaptation and sustainability issues. The Team works with other federal agencies on research and education initiatives and provides outreach, education and technical assistance to FHWA offices, departments of transportation and other stakeholders.

- **Bicycle and Pedestrian Program**  
(<http://www.fhwa.dot.gov/environment/bikeped/index.htm>): The Bicycle & Pedestrian Program of FHWA's Office of Human and Natural Environment promotes bicycle and pedestrian transportation use, safety and accessibility. The Program issues guidance and is responsible for ensuring that requirements in legislation are understood and met by states and other implementing agencies. FHWA also sponsors resources such as the Pedestrian and Bicycle Information Center (<http://www.pedbikeinfo.org>) to provide information on a variety of engineering, education and enforcement topics.
- **Congestion Mitigation and Air Quality Improvement Program (CMAQ)**  
(<http://www.fhwa.dot.gov/environment/cmaqpgs/>): Created by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, CMAQ was designed to realign the focus of transportation toward a more inclusive, environmentally sensitive and multimodal approach. CMAQ helps areas meet and maintain air quality standards and improves the health and environmental sustainability of communities through activities such as transit, bicycle and pedestrian infrastructure and diesel vehicle retrofit projects. CMAQ projects typically reduce motor vehicle emissions by encouraging changes in travel behavior that reduce vehicle miles traveled (VMT), by improving traffic flow or by implementing technologies to reduce the rate of emissions. The program also supports innovative solutions to transportation and air quality challenges, including intermodal freight partnerships, public-private partnerships and transportation demand management programs for state and local governments.
- **Nonmotorized Transportation Pilot Program**  
(<http://www.fhwa.dot.gov/environment/bikeped/nntp.htm>): This program's goal is to demonstrate how walking and bicycling infrastructure improvements can increase mode share for walking and bicycling. Four communities (Columbia, MO; Marin County, CA; Minneapolis, MN; and Sheboygan County, WI) are each receiving \$25 million to improve walking and bicycling networks.
- **Surface Transportation Environment and Planning Cooperative Research Program (STEP)** (<http://www.fhwa.dot.gov/HEP/STEP/index.htm>): The goal of this cooperative research program is to improve understanding of the complex relationship between surface transportation, planning and the environment. STEP funds can be awarded to state and governments, metropolitan planning organizations, universities, federal agencies or the private sector for purposes that include bicycle and pedestrian health, environmental streamlining and stewardship, congestion and air quality.

- **Transportation Enhancement (TE) Activities**  
(<http://www.fhwa.dot.gov/environment/te/>): TE activities are set-asides for projects that expand transportation choices and enhance the transportation experience for communities through specified categories that include bicycle and pedestrian activities, scenic and historic highway programs and historic preservation. FHWA also funds the National Transportation Enhancements Clearinghouse to provide technical assistance and information on transportation enhancements to the public.
- **Travel Model Improvement Program (TMIP)** (<http://tmip.fhwa.dot.gov/>): TMIP is a partnership between FHWA, FTA, the Office of the Secretary of Transportation, and the Environmental Protection Agency. The program helps planning agencies improve their techniques for informing decision makers on how growth in population and employment, investments in transportation infrastructure and development patterns are likely to affect air quality, travel, congestion and quality of life. TMIP works cooperatively with the Metropolitan Capacity Building Program (MCB), the Association of Metropolitan Planning Organizations (AMPO), and the American Association of State Highway and Transportation Officials (AASHTO). TMIP maintains a clearing house of documents of potential interest to planners at <http://tmip.fhwa.dot.gov/resources/clearinghouse/>.
- **Transportation, Community and System Preservation (TCSP) Program**  
(<http://www.fhwa.dot.gov/tcsp/>): TCSP is a comprehensive initiative of research and grants to investigate the relationships between transportation, community and system preservation plans and practices and to identify private sector initiatives to improve these relationships. States, metropolitan planning organizations and local and tribal governments are eligible for discretionary grants to carry out projects that integrate transportation, community and system preservation plans and practices. Eligible projects improve the efficiency of the transportation system; reduce environmental impacts of transportation; reduce the need for costly future infrastructure investments; ensure efficient access to jobs, services and trade centers; and/or examine community development patterns and investments that support TCSP goals.

#### **DOT/Federal Aviation Administration (FAA)**

- **Office of Environment and Energy**  
([http://www.faa.gov/about/office\\_org/headquarters\\_offices/aep/research/](http://www.faa.gov/about/office_org/headquarters_offices/aep/research/)): The Office of Environment and Energy develops, recommends and coordinates national aviation policy relating to environmental and energy matters, which includes noise and emissions. The Office's Research and Development (R&D) Program supports FAA's Flight (strategic) Plan ([http://www.faa.gov/about/plans\\_reports/media/flight\\_plan\\_2009-2013.pdf](http://www.faa.gov/about/plans_reports/media/flight_plan_2009-2013.pdf)). It also provides scientific understanding, develops new technologies, fuels and operations and provides analyses to support achieving the Next Generation Air Transportation System and its goal of environmental protection that allows for sustained growth.

- **Aviation Climate Change Research Initiative (ACCRI)**  
[\(http://www.faa.gov/about/office\\_org/headquarters\\_offices/aep/aviation\\_climate/\)](http://www.faa.gov/about/office_org/headquarters_offices/aep/aviation_climate/): Launched in partnership with the National Aeronautics and Space Administration (NASA) and other US agencies, ACCRI seeks to improve our scientific understanding and modeling capabilities regarding climate change and aviation. In 2008, ACCRI issued a report on research priorities to address the climate impacts of aviation, “A Report on the Way Forward: A Review of Research Gaps and Priorities.”
- **Partnership for Air Transportation Noise & Emissions Reductions (PARTNER)**  
 [\(http://web.mit.edu/aeroastro/partner/index.html\)](http://web.mit.edu/aeroastro/partner/index.html): PARTNER is a leading aviation cooperative research organization and Center of Excellence co-sponsored by the FAA, National Aeronautics and Space Administration (NASA), and Transport Canada. PARTNER fosters breakthrough technological, operational, policy and workforce advances for the betterment of mobility, economy, national security and the environment. Among other things, PARTNER is producing critical life-cycle greenhouse gas analyses of various sustainable alternative fuels for aviation.
- **Continuous Low Energy, Emissions, and Noise (CLEEN)**  
 [\(http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/publications/oep/version1/solutionsets/sse/#esum.\)](http://www.faa.gov/about/office_org/headquarters_offices/ato/publications/oep/version1/solutionsets/sse/#esum): Enhancements to engines and airframe technology have been the source of most improvement in aviation’s environmental performance during the last three decades. The recently launched CLEEN Program was developed to encourage the development of promising environmental improvements in aircraft technology. CLEEN is focused on reducing current levels of aircraft noise, emissions that degrade air quality, greenhouse gas emissions and energy use by spurring the maturation of technologies into product design and manufacturing.
- **Next Generation Air Transportation System (NextGen)**  
 [\(http://www.faa.gov/news/fact\\_sheets/news\\_story.cfm?newsid=8145.\)](http://www.faa.gov/news/fact_sheets/news_story.cfm?newsid=8145): NextGen seeks to accelerate the implementation of operational improvements to reduce the fuel burn of aircraft. NextGen has saved more than 2.7 million metric tons of carbon emissions annually in the US by establishing Reduced Vertical Separation Minimum (RVSM) in the high altitude structure in 2005. It is also accelerating the implementation of Required Area Navigation (RNAV), Required Navigation Performance (RNP) and other terminal procedures to further improve the system’s fuel efficiency. NextGen is focused on the testing and deployment of procedures such as continuous descent arrival (CDA), which keeps aircraft at more fuel efficient altitudes longer and utilizes an idle descent profile to touchdown, reducing noise and fuel burn and improving air quality. Demonstrations of CDA at Atlanta have shown that air carriers can eliminate from 0.34 to 0.45 metric ton of carbon dioxide per arrival. Demonstrations of more efficient air traffic procedures under the Atlantic Interoperability Initiative to Reduce Emissions (AIRE) and the Asia-South Pacific Initiative to Reduce Emissions (ASPIRE) have garnered carbon dioxide reductions on a per-flight basis of around 1.4 metric tons and 10.7 metric tons, respectively.

- **Civil Aviation Alternative Fuels Initiative (CAAFI)** (<http://www.caafi.org/>): CAAFI seeks to advance and deploy alternative aviation fuels that reduce emissions locally and globally. CAAFI's partners include airlines, manufacturers, airports, petroleum firms and other federal agencies. FAA and these partners are implementing a road map to facilitate the use of alternative fuels for commercial aviation. Through the work of CAAFI, American Society for Testing and Materials (ASTM) International approved use of a 50 percent generic blend of conventional jet fuel and jet fuel derived via the Fischer-Tropsh (F-T) process. The blend is generic in that the F-T process could use biomass, coal or gas as its feedstock. This approval sets the basis for the future approval of a wide range of alternative aviation fuels, including renewable biofuels.

**DOT/University Transportation Centers (UTCs)** (<http://utc.dot.gov/>): Managed by DOT's Research and Administrative Technology Administration (RITA), UTCs advance transportation technology and expertise through education, research and technology transfer at university-based centers of excellence. UTCs conduct research on surface transportation issues regarding environmental and energy matters.

**Corporate Average Fuel Economy Program (CAFE)**: In 1975, Congress enacted the Energy Policy and Conservation Act (EPCA), mandating a regulatory program for motor vehicle fuel economy to meet the energy independence and security, environmental and foreign policy facets of the need to conserve energy. DOT's National Highway Traffic Safety Administration (NHTSA) has been setting CAFE standards per EPCA since the enactment of the statute. Fuel economy gains since 1975, due both to the standards and market factors, have resulted in savings of billions of barrels of oil and in the avoidance of billions of metric tons of carbon dioxide (CO<sub>2</sub>) emissions. In December 2007, Congress enacted the Energy Independence and Securities Act (EISA), amending EPCA to require, among other things, attribute-based standards for passenger cars and light trucks. The most recent CAFE rulemaking action was the issuance of standards governing model years 2011 cars and trucks, which raised CAFE standards for cars from 27.5 miles per gallon (mpg) to 30.2 mpg (294 g/mi of tailpipe emissions of CO<sub>2</sub>) and for trucks from 23.5 to 24.1 mpg (369 g/mi of tailpipe emissions of CO<sub>2</sub>).

On May 19, 2009, President Obama announced a National Fuel Efficiency Policy aimed at increasing fuel economy and reducing greenhouse gas pollution for all new cars and trucks sold in the U.S., while also providing a predictable regulatory framework for the automotive industry. The policy seeks to set harmonized federal standards to regulate both fuel economy and greenhouse gas emissions while preserving the legal authorities of DOT, EPA and the State of California. The program covers model years 2012 to 2016 and ultimately requires an average fuel economy standard of 35.5 mpg in 2016. Building on the 2011 standard set in March 2009, this represents an average increase of 5 percent per year from 2012 to 2016. On September 15, 2009, DOT and EPA issued a joint proposed rule establishing a national program that would improve motor vehicle fuel economy and reduce greenhouse gas emissions.

### **1.C. U.S. Environmental Protection Agency (EPA)**

The United States Environmental Protection Agency's commitment to sustainability is born out by its mission to protect human health and the environment. Through its evolution toward increasingly innovative approaches to environmental protection, EPA is making sustainability the next level of environmental protection, drawing on advances in science and technology, application of diverse government regulations and policies, and promotion of green business practices.

#### **EPA/Emissions Standards for Mobile Sources under Clean Air Act**

<http://www.epa.gov/air/caa/title2.html>

#### **EPA/Office of Transportation and Air Quality (OTAQ)**

(<http://www.epa.gov/otag/>) protects public health and the environment by regulating air pollution from motor vehicles, engines, other mobile sources and the fuels used to operate them, and by encouraging travel choices that minimize emissions. These "mobile sources" include cars and light trucks, heavy trucks and buses, nonroad recreational vehicles (such as dirt bikes and snowmobiles), farm and construction machines, lawn and garden equipment, marine engines, aircraft, and locomotives. Additionally, OTAQ has developed Partnership programs under which voluntary actions can be taken to reduce emissions, save energy and utilize best practices.

#### **EPA/Clean Diesel Regulations**

EPA has finalized regulations that will dramatically cut emissions from new diesel-powered engines. These include the 2008 Locomotive and Marine Diesel Rule (<http://www.epa.gov/otag/regs/nonroad/420f08004.htm>), the 2007 Heavy-Duty Highway Engine Rule (<http://epa.gov/otag/highway-diesel/regs/2007-heavy-duty-highway.htm>), and the Clean Air Nonroad Diesel Rule (<http://www.epa.gov/nonroad-diesel/2004fr.htm>).

#### **EPA/Ultra-Low-Sulfur Diesel Fuel**

Information on the U.S. ultra-low sulfur diesel fuel program is available at [www.clean-diesel.org](http://www.clean-diesel.org).

#### **National Clean Diesel Campaign (NCDC)**

([www.epa.gov/cleandiesel/](http://www.epa.gov/cleandiesel/)) To meet the challenge of reducing harmful exhaust from diesel engines, the U.S. Environmental Protection Agency (EPA) established the National Clean Diesel Campaign (NCDC). Under the NCDC, the EPA has promulgated and is now implementing clean fuel and vehicle emission regulations that will lead to dramatic emission reductions in new diesel-powered engines. These include the heavy-duty highway engine, non-road diesel, and marine diesel rules.

- **The Clean Agriculture USA Program**  
(<http://www.epa.gov/otag/diesel/agriculture/index.htm>) is an innovative program that works through collaborative partnerships across the country to bring cost-effective diesel emission-reduction initiatives into the field. The program works with state and

local governments, fleet managers, equipment owner and operators, and farmers to lower the emissions of particulate matter and nitrogen oxides from existing diesel engines. Specifically, EPA encourages technology provides technical support, funds demonstration projects, identifies funding opportunities, and offers education and outreach.

- **The Clean Construction USA Program**  
(<http://www.epa.gov/otaq/diesel/construction/index.htm>) promotes the reduction of diesel emissions from construction equipment and vehicles by encouraging contractors, owners, and operators of construction equipment to properly maintain their equipment, reduce idling, retrofit diesel engines with verified technologies, replace older equipment, use cleaner fuels, and repower equipment (i.e. replace older engines with newer, cleaner engines).
- **The Clean Ports USA Program**  
(<http://www.epa.gov/otaq/diesel/ports/index.htm>) is an incentive-based program designed to reduce emissions from existing diesel engines and nonroad equipment at ports. It encourages port authorities, fleet owners, drayage truckers, and rail and locomotive owner/operators to voluntarily implement emission reduction strategies.
- **The Clean School Bus USA Program**  
(<http://www.epa.gov/otaq/schoolbus/index.htm>) The Program's goals are to reduce children's exposure to diesel exhaust and the amount of air pollution created by diesel school buses. The Program brings together partners from business, education, transportation, and public-health organizations to work toward encouraging policies and practices to eliminate unnecessary public school bus idling, upgrade ("retrofit") buses that will remain in the fleet with better emission-control technologies and/or fueling them with cleaner fuels, and replace the oldest buses in the fleet with new, less-polluting buses.
- **Regional Diesel Collaboratives**  
U.S. EPA has partnered with leaders from state and local governments, the private sector, and environmental/health groups across the U.S. to form seven regional diesel collaboratives with the aim of leveraging resources and expertise to reduce diesel emissions from in-use vehicles. These collaboratives keep track of past, current, and upcoming diesel retrofit programs/demonstration projects in their respective regions. Below are links to the seven diesel collaboratives in the U.S.:
  - Blue Skyways Collaborative (Central corridor of the Midwest):  
[www.blueskyways.org](http://www.blueskyways.org)
  - Mid-Atlantic Diesel Collaborative: [www.dieselmidadatlantic.org](http://www.dieselmidadatlantic.org)
  - Midwest Clean Diesel Initiative: [www.epa.gov/midwestcleandiesel/](http://www.epa.gov/midwestcleandiesel/)
  - Northeast Diesel Collaborative: [www.northeastdiesel.org](http://www.northeastdiesel.org)

- Rocky Mountain Clean Diesel Collaborative: [www.epa.gov/region8/air/rmcdc.html](http://www.epa.gov/region8/air/rmcdc.html)
- Southeast Diesel Collaborative: [www.southeastdiesel.org](http://www.southeastdiesel.org)
- West Coast Diesel Collaborative: [www.westcoastdiesel.org](http://www.westcoastdiesel.org)

### **The National Clean Diesel Emissions Reduction Program (DERA)**

(<http://epa.gov/otaq/diesel/grantfund.html>) enables EPA to offer funding assistance for diesel emission reduction projects through the following four components:

- **National** Clean Diesel Funding Assistance program contains the majority of the funding dedicated to deployment of EPA-verified and certified technologies through competitive grants.
- National Clean Diesel **Emerging** Technologies Program fosters the deployment of innovative technologies through a national grant competition. To qualify as an emerging technology, a manufacturer must have an EPA approved application and test plan for verification.
- Smartway Clean Diesel **Finance** Program allows EPA to issue competitive grants to establish national low-cost revolving loans or other financing programs that will provide funding to fleets to reduce diesel emissions.
- **State** clean Diesel Grant Program makes funds directly available to States in establishing new diesel emission reduction programs.

In February of 2009, President Barack Obama signed the American Recovery and Reinvestment Act which provided approximately \$ 300 million in additional funding for DERA. Specific information on DERA funding and projects that have been awarded grants can be found at [www.epa.gov/otaq/diesel/projects.htm](http://www.epa.gov/otaq/diesel/projects.htm)

In July 2005, the U.S. EPA released a report on diesel retrofit technology application and program implementation experience in the U.S. since 2000. The report, *Diesel Retrofit Technology and Program Experience*, identifies over 220 retrofit projects throughout the U.S. The report is designed to serve both as a reference tool on diesel retrofit technologies and programs in the U.S. and to document valuable lessons learned from the projects. This report, as well as other documents on clean diesel programs, technologies, emission reductions strategies, and cost-effectiveness, is available on EPA's website at: [www.epa.gov/cleandiesel/publications.htm](http://www.epa.gov/cleandiesel/publications.htm).

### **Verified Diesel Retrofit Technologies**

Retrofit technologies verified for emission performance and durability by the U.S. EPA and California Air Resources Board (CARB) are listed in the following websites: U.S. EPA-verified retrofit technologies ([www.epa.gov/otaq/retrofit/verif-list.htm](http://www.epa.gov/otaq/retrofit/verif-list.htm)) and CARB-verified retrofit technologies ([www.arb.ca.gov/diesel/verdev/vt/cvt.htm](http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm))

### **EPA/SmartWay<sup>SM</sup>**

([www.epa.gov/smartway](http://www.epa.gov/smartway)) EPA's SmartWay Transport Partnership works with transportation technology and freight industry partners (shippers, carriers, logistics companies) to accelerate the deployment of fuel saving, low emission technologies and operational best practices across the global freight supply chain. The SmartWay program began in February 2004 and now has over 2,500 partners, including many of the world's largest multinational retailers, manufacturers and transportation providers, such as Wal-Mart, Fed-Ex, UPS, Nike, IKEA and others. SmartWay partners in the U.S. commit to logistics efficiency improvements which achieve fuel savings, as well as CO<sub>2</sub>, NO<sub>x</sub>, and PM reductions. Based on data collected, SmartWay Partners reduced over 1 million metric tons of carbon equivalent (MMTCE) emissions for 2009.

SmartWay has established a benchmark for clean, efficient freight goods movement globally. Twelve nations participated in an International SmartWay Summit in 2008. As a result, a SmartWay "Green Truck" project is underway in China, financed by the World Bank. An expanded "Green Freight" project is being planned for the Guangdong province this year.

France and Australia have modeled freight sustainability programs after SmartWay while the European Union and Mexico are evaluating SmartWay as a model for freight transport efficiency programs being developed there. To respond to growing international interest, SmartWay is developing a multi-modal supply chain carbon accounting system which may be used to quantify the carbon inventory of a company's global freight supply chain.

### **EPA/Green Vehicle Guide**

(<http://www.epa.gov/greenvehicles/Index.do;jsessionid=9df45d640230bc191bd18a56c7e4b9e9a7b14ef28fd20e506c3f7abceb56d717>) web site provides information about the emission levels and fuel economy of cars and light trucks by model year. Based on those characteristics, the guide then rates how "green" each vehicle is both overall and within its class. Future model years will be added to the guide as the data become available. The guide includes an emission rating system, in which one can enter the year, make and model of the vehicle they are considering, along with the state in which the car would be operated. The guide then provides a score based on emissions levels and fuel efficiency.

### **EPA/EcoCAR**

(<http://www.ecocarchallenge.org/>) is a consortium of government, industry and academic leaders that work with students to build the environmental vehicles of the future. EPA's Office of Transportation and Air Quality will serve as a major sponsor of the EcoCAR NeXt CHALLENGE competition, providing technical advising and mentoring in the areas of greenhouse gas and tailpipe emissions.

### **EPA/Smart Growth Program**

(<http://www.epa.gov/dced/index.htm>) helps communities improve their development practices and get the type of development they want. This program works with local, state, and national

experts to discover and encourage successful, environmentally sensitive development strategies. EPA offers many tools and resources to help communities learn about and implement smart growth approaches ([http://www.epa.gov/dced/sg\\_implementation.htm](http://www.epa.gov/dced/sg_implementation.htm)). Policies and regulations vary from community to community and state to state. Many federal policies, particularly those related to the environment, transportation, and housing, affect how communities develop, but the federal government generally does not directly regulate development. The federal government can help states and municipalities better understand the impacts of development patterns, but development decisions are predominately under state and community jurisdiction.

Two publications (*Getting to Smart Growth*, Volume 1 and 2), prepared by the International City/County Management Association (ICMA) and the Smart Growth Network with support from EPA, describe concrete techniques of putting smart growth principles into practice. English and Spanish versions are available ([http://www.epa.gov/dced/getting\\_to\\_sg2.htm](http://www.epa.gov/dced/getting_to_sg2.htm)). Lastly, **The Smart Growth Network** (SGN) (<http://www.smartgrowth.org>) is a partnership of government, business and civic organizations that support smart growth – growth in and around urban areas that takes into account all land uses and priorities. Since its creation in late 1996, the Network has become a storehouse of knowledge about smart growth principles, facilitating the sharing of best practices and acting as a catalyst for implementation of ideas.

### **Related EPA Funding**

- The State Clean Diesel Grant Program (<http://www.epa.gov/otaq/diesel/prgstate.htm>) allocates funding to states to implements state grant and loan programs
- The SmartWay Innovative Financing Program (<http://www.epa.gov/otaq/smartway/transport/what-smartway/financing.htm>) provides information on state incentive programs and several lenders who offer loans to help finance technologies that improve freight fuel economy.
- EPA's Environmental Financial Tools (<http://www.epa.gov/efinpage/efinfin.htm>) include links to sources of financing such as the Environmental Finance Program (EFP) and EPA Programs and Offices.
- A Guidebook of Financial Tools (<http://www.epa.gov/efinpage/guidebook.htm>) provides an overview and analysis on how to pay for environmental programs.
- Environmental Financial Advisory Board (EFAB) Report on Innovative Finance Programs for Air Pollution Reduction (12 pp, 6K, November 2007) provides recommendations for financing programs that reduce emissions from mobile sources.

## **2. Internationally-Focused Agencies and Programs**

### **2.A Organisation for Economic Co-operation and Development (OECD) Environmentally Sustainable Transport (EST)**

([http://www.oecd.org/department/0,3355,en\\_2649\\_34363\\_1\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/department/0,3355,en_2649_34363_1_1_1_1_1,00.html)) EST is a new approach to transport policy development using a backcasting methodology. Current work

focuses on developing implementation strategies and identifying best practices for EST in OECD regions

## **2.B U.S. Environmental Protection Agency**

### **U.S. EPA Clean Diesel Demonstration Programs**

To demonstrate the benefits of using diesel retrofit technologies and ultra-low sulfur diesel fuel in other countries, the U.S. EPA initiated demonstration projects during 2005 through 2007 in Beijing, China; Bangkok, Thailand; Mexico City, Mexico; Pune, India; and Santiago, Chile. Links to information on these demonstration projects are provided below:

- Beijing, China: [www.epa.gov/OMS/retrofit/china2.htm](http://www.epa.gov/OMS/retrofit/china2.htm)
- Bangkok, Thailand: [www.cleanairnet.org/baq2004/1527/article-59239.html](http://www.cleanairnet.org/baq2004/1527/article-59239.html)
- Mexico City, Mexico: [www.embarq.org/en/project/mexico-city-diesel-retrofit](http://www.embarq.org/en/project/mexico-city-diesel-retrofit)
- Pune, India: [newdelhi.usembassy.gov/pr040506.html](http://newdelhi.usembassy.gov/pr040506.html),  
<http://urbanairpune.org/clean.html> or <http://epa.gov/international/air/india.htm>
- Santiago, Chile: [http://www.unep.org/pcfv/PDF/TruckFilterProgramme\\_Chile.pdf](http://www.unep.org/pcfv/PDF/TruckFilterProgramme_Chile.pdf)

Additional information on these demonstration programs, as well as other international diesel retrofit projects, is available on EPA's website

([www.epa.gov/international/air/transport.htm#idrp](http://www.epa.gov/international/air/transport.htm#idrp)).

There are several other successful diesel retrofit programs and demonstration projects currently ongoing in other parts of the world as well, including:

#### *Asia*

- Hong Kong: [www.epd.gov.hk/epd/english/environmentinhk/air/prob\\_solutions/cleaning\\_air\\_at\\_road.html](http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/cleaning_air_at_road.html)
- South Korea: [eng.me.go.kr/docs/news/press\\_view.html?seq=264](http://eng.me.go.kr/docs/news/press_view.html?seq=264)
- Tokyo, Japan: [www.dieselnet.com/standards/jp/tokyofit.html](http://www.dieselnet.com/standards/jp/tokyofit.html)

#### *Europe*

- London: [www.tfl.gov.uk/roadusers/lez/default.aspx](http://www.tfl.gov.uk/roadusers/lez/default.aspx)
- Sweden: [www.dieselnet.com/standards/se/zones.html](http://www.dieselnet.com/standards/se/zones.html)
- Switzerland: [www.bafu.admin.ch/luft/00596/00597/00609/index.html?lang=en](http://www.bafu.admin.ch/luft/00596/00597/00609/index.html?lang=en)
- (The Association for Emissions Control by Catalyst (AECC) maintains a website that summarizes diesel retrofit programs in Europe: [www.dieselretrofit.eu](http://www.dieselretrofit.eu))

#### *North America*

- British Columbia, Canada: [www.bcairsmart.ca/transportation/heavyduty.html](http://www.bcairsmart.ca/transportation/heavyduty.html)
- Ontario, Canada: [www.ec.gc.ca/cleanair-airpur/CAOL/canus/great\\_lakes/c3\\_e.cfm](http://www.ec.gc.ca/cleanair-airpur/CAOL/canus/great_lakes/c3_e.cfm)

## **Marine Vessels**

### **Reducing Air Pollution from Ocean-Going Vessels Internationally**

Emissions from the transportation sector present significant challenges to the quality of the air we breathe. EPA is working to address air pollution from this sector. Our goals include reducing the emissions of greenhouse gases (GHG), in particular CO<sub>2</sub>, from the transportation sector. We also aim to reduce global anthropogenic NO<sub>x</sub>, SO<sub>x</sub> and particulate matter (PM) emissions, which have health and ecosystem consequences and can be transported large distances from their sources.

The maritime transport industry – which includes ocean-going cargo vessels, coastal vessels, cruise ships, among others -- is responsible for moving the bulk of the world's trade. Seventy-five percent of internationally-traded goods are carried by ocean-going vessels. (The World Shipping Council, [www.worldshipping.org/liner\\_shipping\\_co2emissions\\_policy\\_september.pdf](http://www.worldshipping.org/liner_shipping_co2emissions_policy_september.pdf).)

Shipping via ocean-going vessels is comparatively efficient and low-cost, and many types of cargo simply cannot be transported economically by other transport modes. However, the sheer scale of this global industry, combined with the low quality fuel and relative lack of emissions controls on the diesel engines normally used for maritime shipping, leads to significant emissions. As part of this program, EPA is conducting several activities. For example, in 2009 EPA initiated a fuel switching project involving maritime carriers and several ports in the U.S. and Mexico, to demonstrate air quality improvements possible from this practice.

On July 17, 2009, the joint proposal from the United States and Canada to amend MARPOL Annex VI to designate specific areas of our coastal waters as an Emission Control Area (ECA) was accepted in principle at the International Maritime Organization (IMO). France has joined the ECA proposal on behalf of its island territories of Saint-Pierre and Miquelon, which form an archipelago off the coast of Newfoundland. The proposal (<http://www.epa.gov/oms/oceanvessels.htm#emissioncontrol>) will circulate among member states for six months. In March 2010, member states who are parties to International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI will vote to adopt an amendment designating the North American ECA. Designation of this ECA will deliver substantial public health benefits to many people living in the U.S., Canada and French territories, as well as to marine and terrestrial ecosystems.

### **Partnership for Clean Fuels and Vehicles**

U.S.EPA is a founding and supporting member of the Partnership for Clean Fuels and Vehicles (PCFV), a public-private global initiative of more than 110 countries, hosted by the United Nations Environment Program, to promote cleaner fuels and vehicles in developing and transition countries. PCFV is a key initiative in light of the rapid evolution of transportation demand in developing countries, the exponential increase in personal vehicle ownership and the significant impacts of transportation on urban air quality and greenhouse gas emissions. The PCFV promotes the global elimination of lead in gasoline; the phase down of sulfur in diesel fuel to 50 parts per million (ppm), which in turn enables the adoption of cleaner vehicle standards and technologies. Since 2005, PCFV has assisted 47 countries in gaining access to low sulfur fuels (improving the air for more than 1.1 billion people), and has been instrumental in achieving the phase-out of leaded gasoline in more than 180 countries, affecting more than 6.2

billion people. For more information, see [www.unep.org/pcf](http://www.unep.org/pcf) and [www.epa.gov/international/air/pcf.html](http://www.epa.gov/international/air/pcf.html)