The Path Forward

Reducing Emissions from Mobile Sources in Ozone Advance Areas

Office of Transportation and Air Quality

September 27, 2012

WELCOME!

- Identifying the Impact of Mobile Sources in Ozone Advance Areas
- National Regulations Affecting Mobile Source Emissions
- NOx and VOC Reduction Programs and Initiatives
  - Diesel Emission Reduction Strategies
  - Transportation Control Measures/Travel Efficiency

Data Sources

- Ozone Advance Counties/Parishes/Tribal Lands
  - http://www.epa.gov/ozoneadvance/
- 8-Hr Ozone Design Values (2009-2011)
  - Used to designate and classify nonattainment areas, as well as to assess progress towards meeting the NAAQS
  - http://www.epa.gov/airtrends/values.html
- National Emissions Inventory (NEI 2008)
  - To download the data, navigate to this site (http://www.epa.gov/ttnchie1/net/2008inventory.html) and scroll to the Sector Summaries section. Select "County or Tribe", "CAP–Nitrogen Oxides", your preferred geographic aggregation, and all sectors except for Biogenics and Fire
- National Air Toxics Assessment (NATA 2005)
  - Census Tract Shapefile
  - Census Tract Diesel Exposure Spreadsheet

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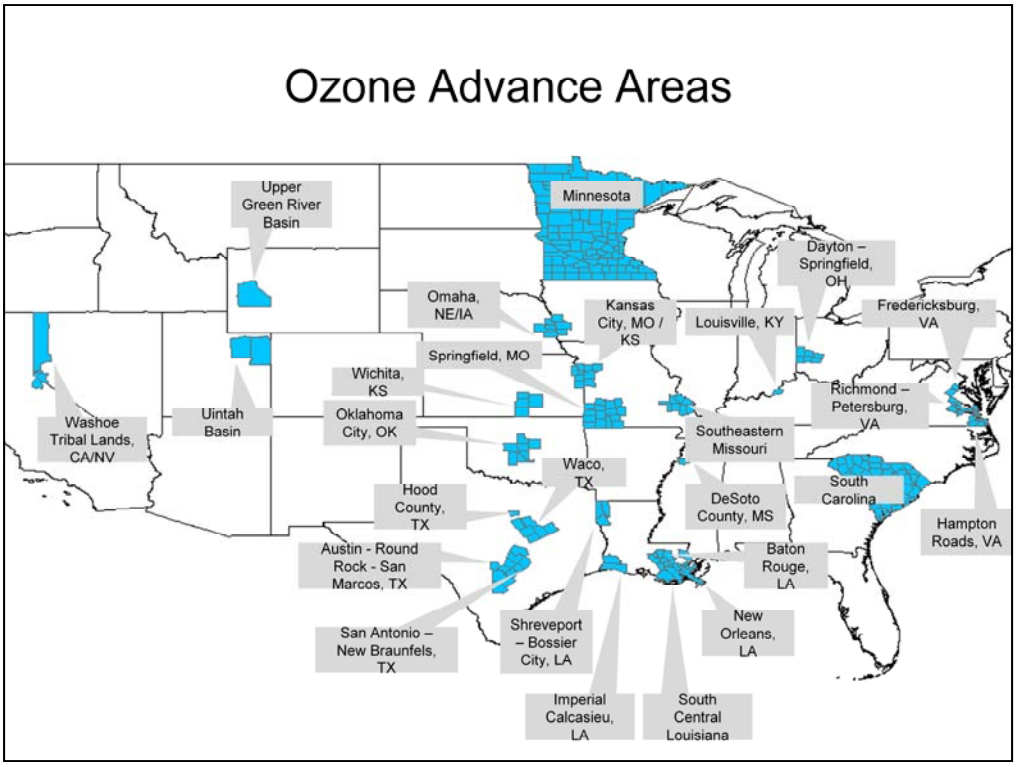
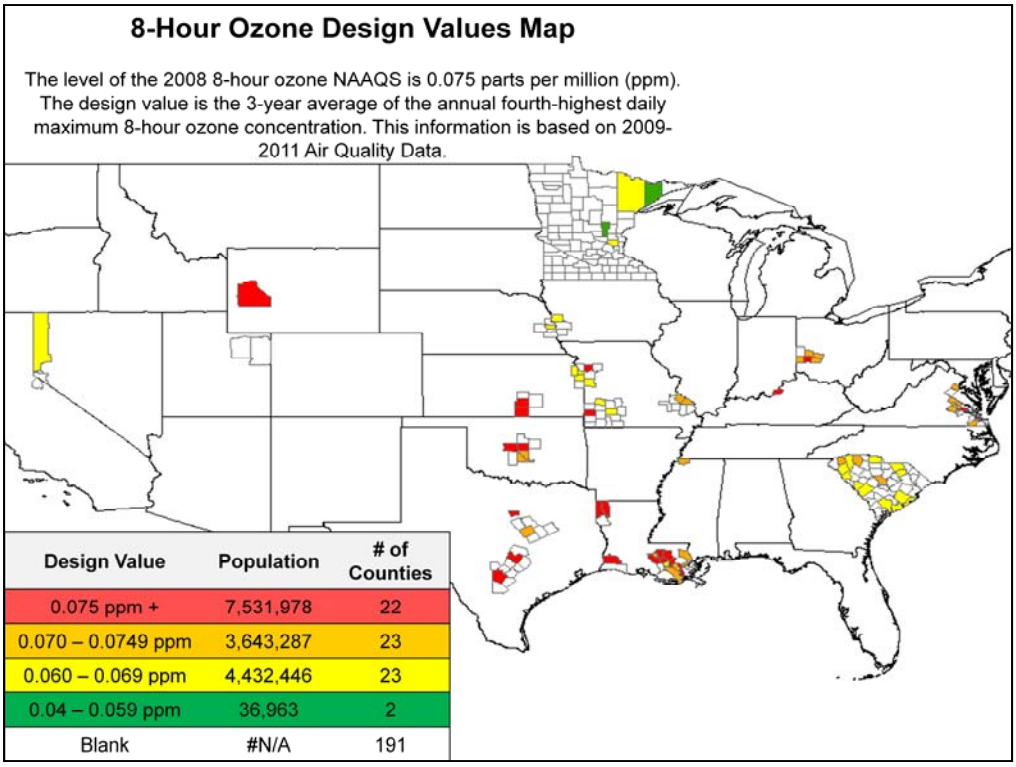
Ozone Advance Counties Maps Directory

1) Ozone Advance Areas
2) 8-Hr Ozone Design Values
   - Source: http://www.epa.gov/airtrends/values.html
3) Mobile Diesel Emissions as a % of Total NOx Emissions (2008)
   - Source: NEI (http://www.epa.gov/ttnchie1/net/2008inventory.html)
4) Tons of Mobile Diesel NOx Emissions (2008)
   - Source: NEI
5) Sources of Mobile Diesel NOx Emissions
   - Source: NEI
6) Census Tract Diesel PM Exposure Levels (µg/m3)
   - Source: NATA (http://www.epa.gov/nata/)



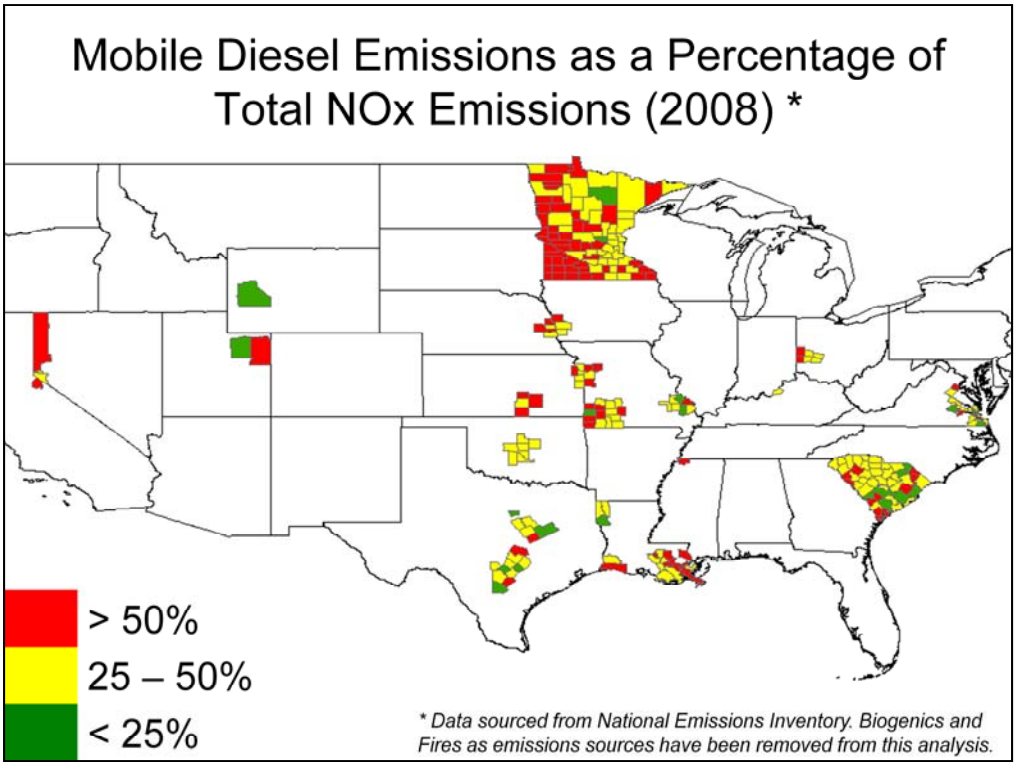
This basic map shows the location and name of the Ozone Advance Areas. Where individual areas may include multiple counties, the group name is displayed (as with Southeastern Missouri).



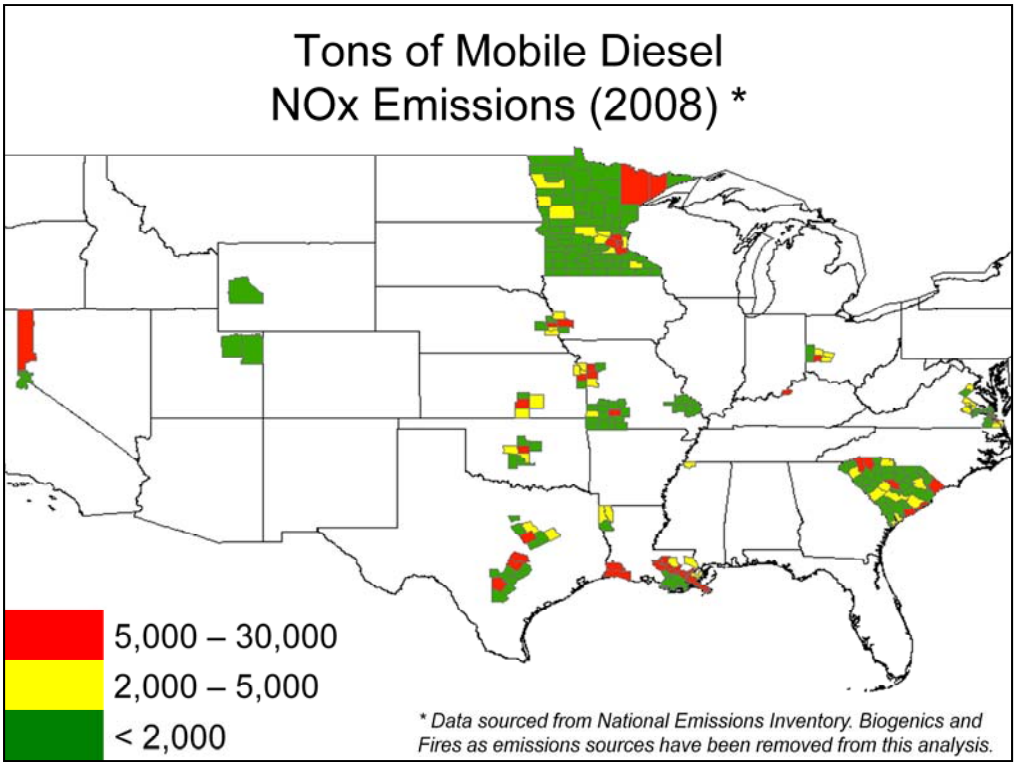
This map displays the 8-Hour Ozone Design Value for the counties within Ozone Advance Areas. For those counties that are blank, there is no design value data available.

The level of the 2008 8-hour ozone NAAQS is 0.075 parts per million (ppm). The design value is the 3-year average of the annual fourth-highest daily maximum 8-hour ozone concentration.

A design value is a statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS). The design values shown here are computed using Federal Reference Method or equivalent data reported by State, Tribal, and Local monitoring agencies to EPA's Air Quality System (AQS) as of July 23, 2012. Concentrations flagged by State, Tribal, or Local monitoring agencies as having been affected by an exceptional event (e.g., wildfire, volcanic eruption) and concurred by the associated EPA Regional Office are not included in these calculations.



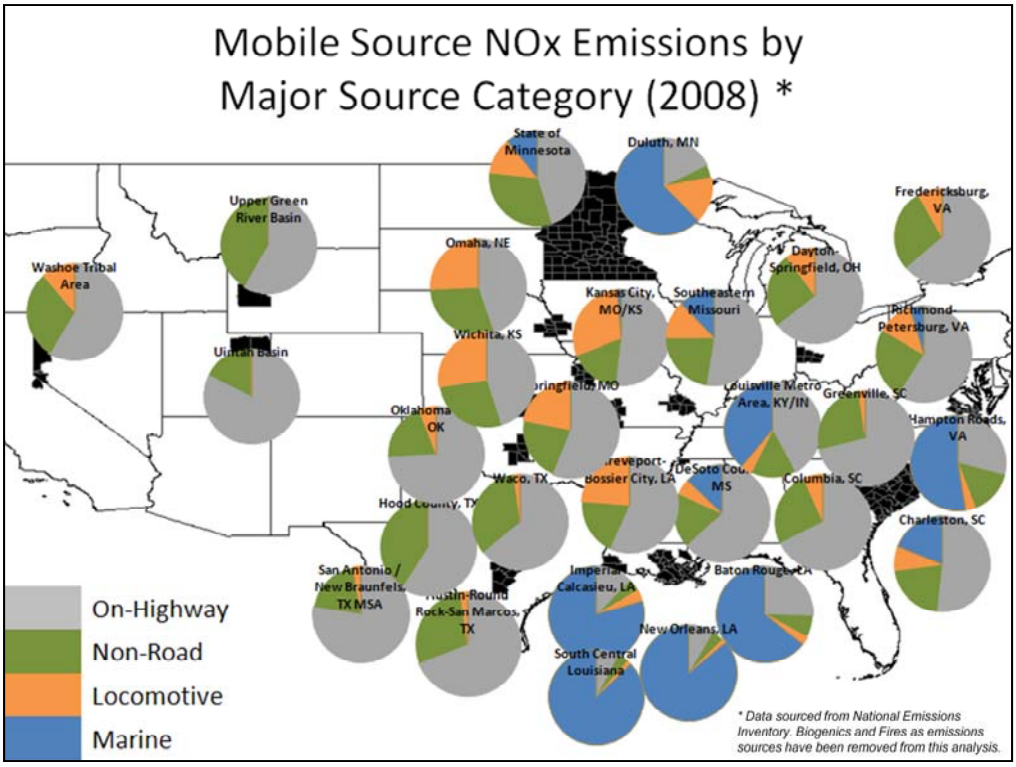
This displays the percentage of annual NOx emissions that come from mobile diesel sources. To calculate the percentage, sum the following NEI data fields (Mobile – Commercial Marine Vessels, Mobile – Locomotives, Mobile – Non-Road Equipment – Diesel, Mobile – On-Road Diesel Heavy Duty Vehicles, and Mobile – On-Road Diesel Light Duty Vehicles) and then divide by the sum of all fields.



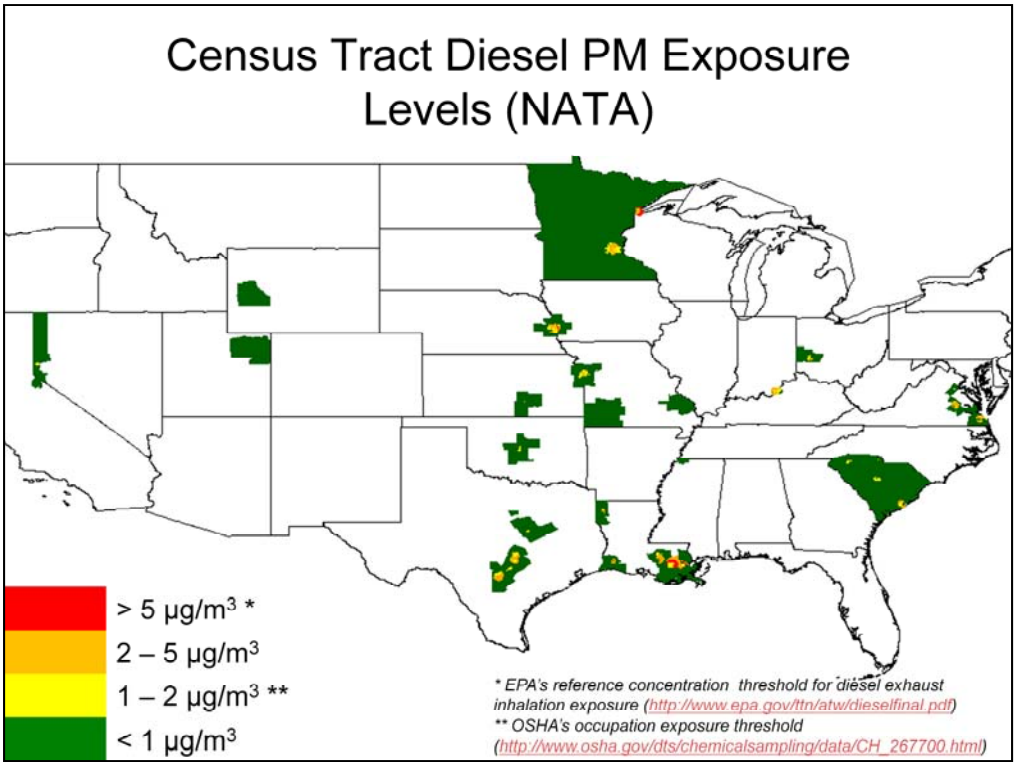
This displays the annual tons of NOx emissions from mobile diesel sources. To calculate the total mobile diesel tons, sum the following NEI data fields: Mobile – Commercial Marine Vessels, Mobile – Locomotives, Mobile – Non-Road Equipment – Diesel, Mobile – On-Road Diesel Heavy Duty Vehicles, and Mobile – On-Road Diesel Light Duty Vehicles.

The NOx emissions tons thresholds were developed by dividing the data set into three approximately equal groups.

From Marc Houyoux (EI Group Lead): "There are no thresholds that I know of that would be meaningful for total NOx emissions. Any groupings will tell some story, though will not tell an area whether diesel NOx is important for their counties. In my opinion, a more useful grouping would be related to the % of total NOx in the counties for diesel vehicles vs. all other sources of emissions."



This displays the annual tons of NOx emissions from 4 categories of mobile diesel sources. It is designed to give the viewer a sense of each sector's contribution to the area's annual NOx emissions. The sectors are On-Highway (Mobile – On-Road Diesel Heavy Duty Vehicles plus Mobile – On-Road Diesel Light Duty Vehicles), Non-Road (Mobile – Non-Road Equipment – Diesel), Locomotive (Mobile – Locomotives), and Marine (Mobile – Commercial Marine Vessels).



Diesel particulate matter (diesel PM) is a mixture of particles that is a component of diesel exhaust (DE). EPA lists DE as a mobile source air toxic due to the cancer and noncancer health effects associated with exposure to whole DE. Diesel PM (expressed as grams diesel PM/m3) has historically been used as a surrogate measure of exposure for whole DE. Although uncertainty exists as to whether diesel PM is the most appropriate parameter to correlate with human health effects, it is considered a reasonable choice until more definitive information about the mechanisms of toxicity or mode(s) of action of DE becomes available. Note that in the risk results presented, diesel PM only presents noncancer results. The non-diesel PM conponent (i.e., the gaseous component with air toxics such as benzene), does provide cancer and noncancer results. For these results, see the Onroad and Nonroad Mobile Cancer Risk files.

NATA data is provided at the census tract level. To enhance visual acuity, all census and county boundary lines have been erased. This map displays the total diesel PM exposure levels, measured in µg/m^3, for the census tracts within Ozone Advance Areas. For aesthetic purposes, the red, orange, and yellow boundaries have been slightly enhanced to provide the user with a better visual.

As noted with asterisks, the 5 µg/m^3 threshold is the same as EPA's reference concentration threshold for diesel exhaust inhalation exposure. The 2 µg/m^3 threshold is OSHA's occupation exposure threshold.

Ozone Advance Area	8-Hour Ozone Design Value	% of Total NOx from Mobile Diesel Sources	Tons of Mobile Diesel NOx Emissions (2008)	NATA
Austin-Round Rock-San Marcos, TX	> 0.075 ppm	25-50%	5,000 – 30,000	2 – 5 µg/m³
Baton Rouge, LA	> 0.075 ppm	25-50%	5,000 – 30,000	> 5 µg/m³
Dayton-Springfield, OH	> 0.075 ppm	25-50%	5,000 – 30,000	2 – 5 µg/m³
DeSoto County, MS	0.070 – 0.0749 ppm	> 50%	2,000 – 5,000	< 1 µg/m³
Fredericksburg, VA	0.070 – 0.0749 ppm	> 50%	2,000 – 5,000	< 1 µg/m³
Hampton Roads, VA	0.070 – 0.0749 ppm	25-50%	5,000 – 30,000	2 – 5 µg/m³
Hood County, TX	> 0.075 ppm	< 25%	< 2,000	< 1 µg/m³
Imperial Calcasieu, LA	> 0.075 ppm	25-50%	5,000 – 30,000	> 5 µg/m³
Kansas City, MO/KS	> 0.075 ppm	25-50%	5,000 – 30,000	2 – 5 µg/m³
Louisville Metro Area, KY/IN	> 0.075 ppm	25-50%	5,000 – 30,000	2 – 5 µg/m³
New Orleans, LA	> 0.075 ppm	> 50%	5,000 – 30,000	> 5 µg/m³
Oklahoma City, OK	> 0.075 ppm	25-50%	5,000 – 30,000	1 – 2 µg/m³
Omaha, NE	0.060 – 0.069 ppm	25-50%	5,000 – 30,000	> 5 µg/m³
Richmond-Petersburg, VA	> 0.075 ppm	< 25%	2,000 – 5,000	2 – 5 µg/m³
San Antonio / New Braunfels, TX MSA	> 0.075 ppm	25-50%	5,000 – 30,000	> 5 µg/m³
Shreveport-Bossier City, LA	> 0.075 ppm	25-50%	2,000 – 5,000	2 – 5 µg/m³
South Central Louisiana	0.070 – 0.0749 ppm	> 50%	5,000 – 30,000	< 1 µg/m³
Southeastern Missouri	0.070 – 0.0749 ppm	25-50%	< 2,000	< 1 µg/m³
Springfield, MO	> 0.075 ppm	25-50%	5,000 – 30,000	< 1 µg/m³
State of Minnesota	0.060 – 0.069 ppm	25-50%	5,000 – 30,000	> 5 µg/m³
State of South Carolina	0.070 – 0.0749 ppm	25-50%	5,000 – 30,000	2 – 5 µg/m³
Uintah Basin	No monitors	25-50%	< 2,000	< 1 µg/m³
Upper Green River Basin	> 0.075 ppm	< 25%	< 2,000	< 1 µg/m³
Waco, TX	0.070 – 0.0749 ppm	< 25%	5,000 – 30,000	1 – 2 µg/m³
Washoe Tribal Area	0.060 – 0.069 ppm	> 50%	5,000 – 30,000	1 – 2 µg/m³
Wichita, KS	> 0.075 ppm	25-50%	5,000 – 30,000	1 – 2 µg/m³

This table lists the individual Ozone Advance areas and its rank for each of the four geospatial analyses. The color is determined by the score's rank as compared to the others in that column – green for low, red for high.

8-Hour Ozone Design Value: Scores were assigned by the occurrence of the highest level of value in the Ozone Advance Area. For instance, in Minnesota, the highest value found is 0.06 – 0.069 ppm.

% of Total NOx from Mobile Diesel Sources: Scores are computed by summing the entire area's worth of counties NOx emissions for both Mobil Diesel and Grand Total, then dividing Mobile Diesel by the Grand Total.

Tons of Mobile Diesel NOx Emissions: Scores were assigned by the occurrence of the highest level of value in the Ozone Advance Area. For instance, in Baton Rouge, the highest value found is 8,501 annual tons NOX from Mobile Diesel sources.

NATA: Scores were assigned by the occurrence of the highest level of value in the Ozone Advance Area. For instance, in Austin, TX, the highest value found is 4.46 ug/m3.

Developing a Mobile Source Inventory

- Good emission inventories are the basis for successful air quality planning
- Because aggregate mobile source emissions cannot be directly measured, computer models are used to estimate these emissions
  - MOVES2010b for on-road mobile sources
  - NONROAD2008a for most nonroad sources
- Models combine emissions data with meteorology, fleet, activity, fuel, and control strategy data to estimate emissions for a specific local area

MOVES2010b

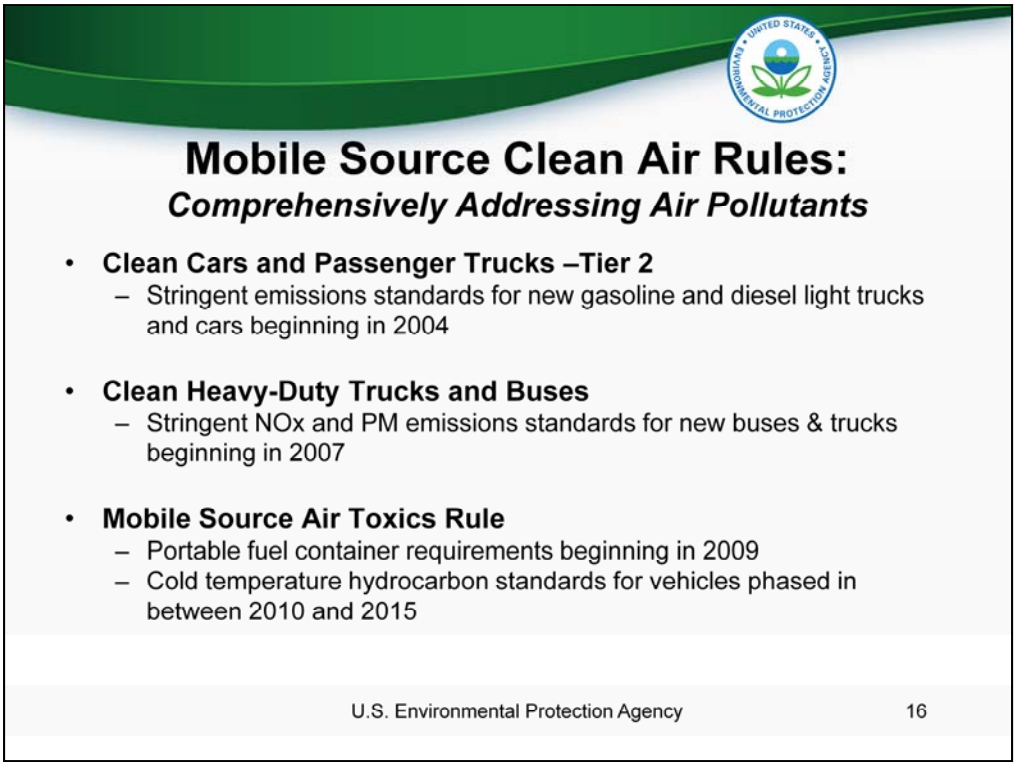
- **Most current version of EPA's official model for on-road vehicles (Released April 2012)**
  - Model, guidance documents and documentation at: www.epa.gov/otaq/models/moves/index.htm
- **Used to estimate emissions from all on-road vehicles**
  - Cars, trucks, buses, motorcycles
  - Gas and diesel (and CNG for buses)
- **Allows user input of local meteorology, VMT, vehicle population, age distribution, road type distribution, speed distribution and local fuel characteristics to estimate a current or projected on-road emissions inventory**

NONROAD2008a

- **Most current version of EPA's official model for nonroad equipment (Released April 2009)**
  - Model, guidance documents and documentation at: www.epa.gov/otaq/nonrdmdl.htm
- **Used to estimate emissions for all categories of nonroad equipment except aircraft, locomotives, and commercial marine engines**
- **NONROAD includes a database of local fleet and activity information, but users can substitute their own local data if available**

National Emission Inventory (NEI)

- **States are required to submit emissions information and EPA is required to compile that data into the National Emissions Inventory every 3 years**
- **For mobile sources, states can submit local modeling inputs and EPA calculates the inventory using MOVES and NONROAD**
- **NEI is a good source of basic inventory information but has limits:**
  - Level of input detail may not meet SIP requirements
  - Some states do not submit local inputs
  - Inventory is limited to NEI years (2008 is most current, 2011 in progress)



Clean Cars and Passenger Trucks –Tier 2 -- National emissions reductions in 2030 of 3 million tons per year (tpy) of NOx and 800,000 tpy of VOCs

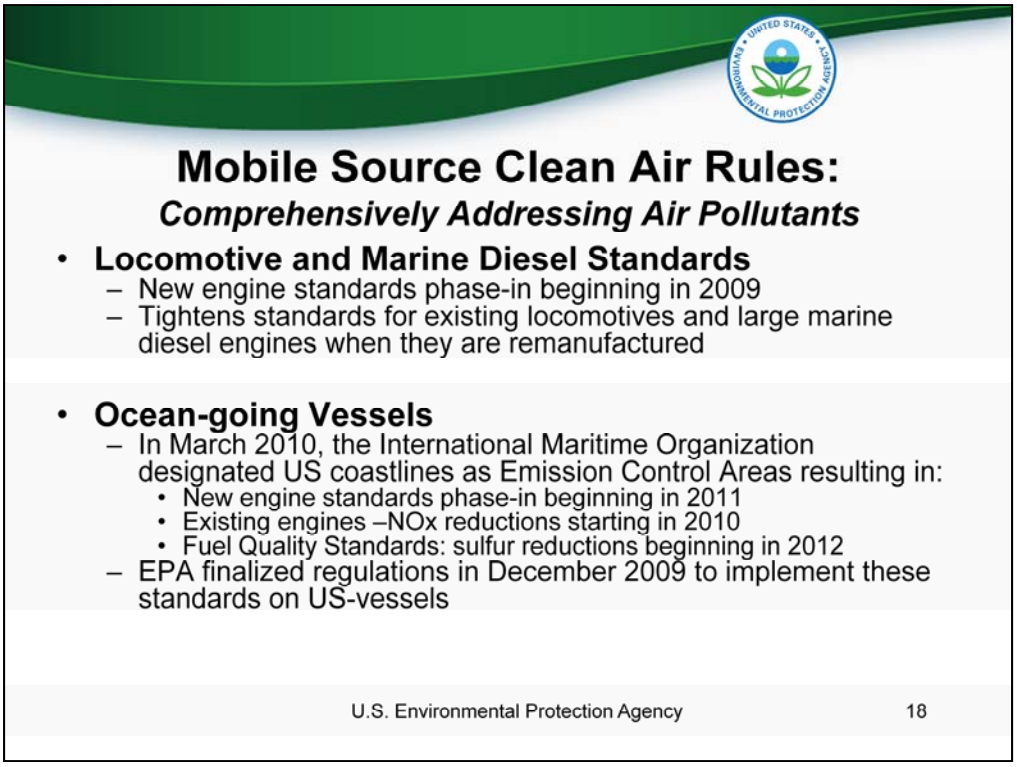
Clean Heavy-Duty Trucks and Buses -- Up to a 90% reduction in NOx and PM emissions

Mobile Source Air Toxics Rule -- National emissions reductions in 2030 of 1 million tpy of VOCs and 19,000 tpy of PM

Clean Non-road Diesel Engines and Equipment -- NOx and PM emissions reductions of more than 90 percent

Small Gasoline and Recreational Marine Standards -- First time ever evaporative emission standards

National emissions reductions in 2030 of 600,000 tpy of VOCs, 130,000 tpy of NOx and 5,500 tpy of PM.

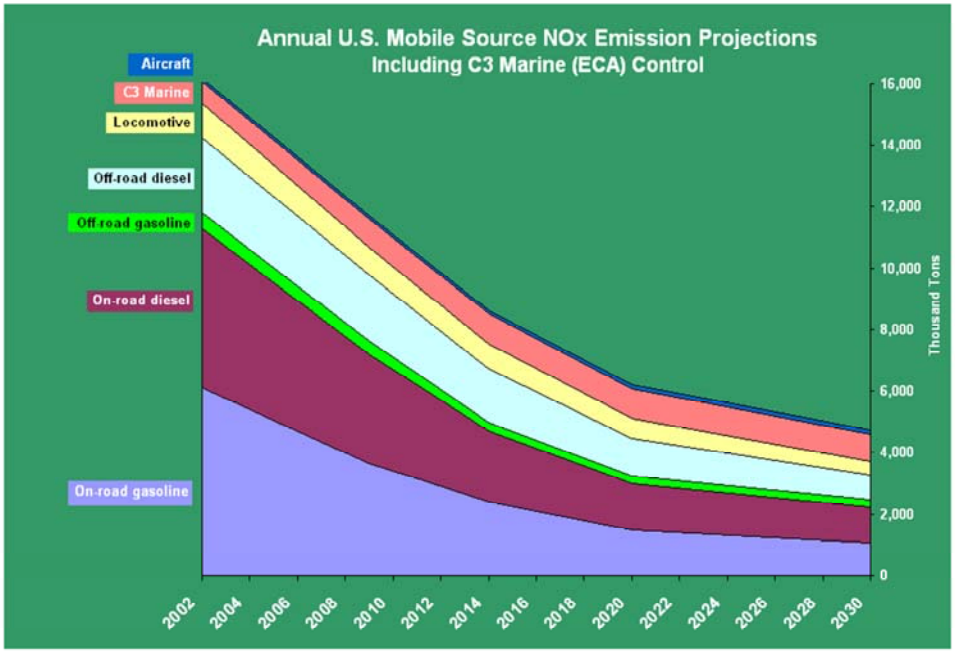


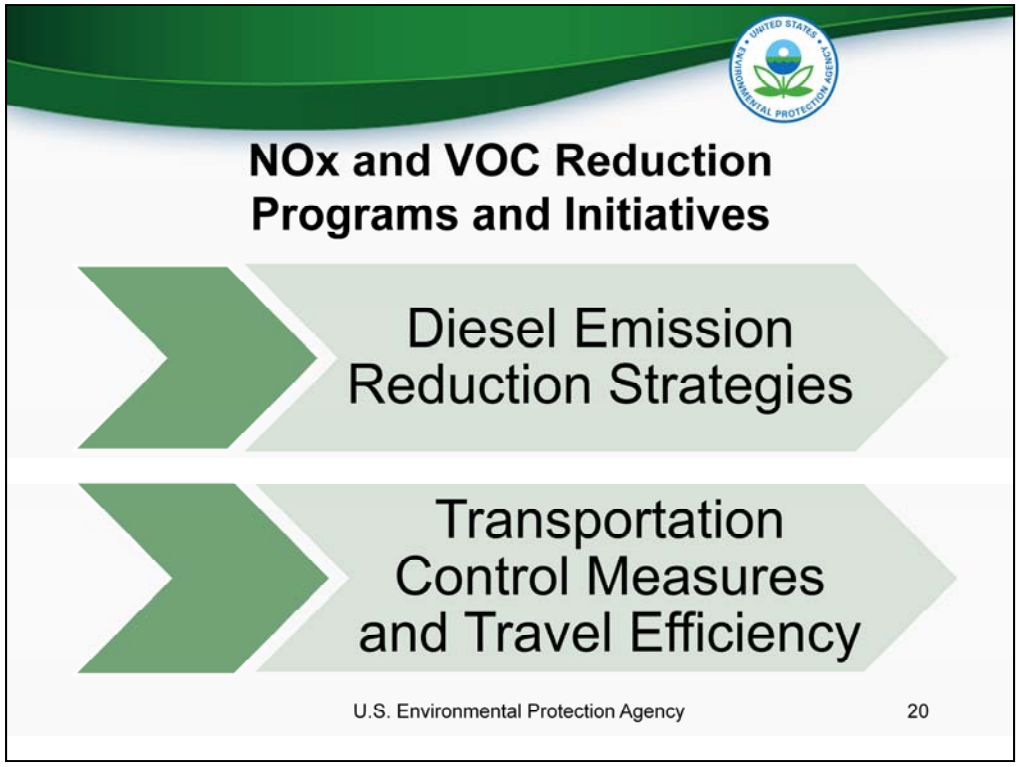
Locomotive and Marine Diesel Standards -- Reduces PM by 90 percent and NOx by 80 percent for newly-built locomotives and marine diesel engines

Ocean-going Vessels -- New engines required to achieve NOx reductions of: 20% in 2011, and 80% in 2016

Existing engines – 15-20% NOx reductions starting in 2010

Fuel Quality Standards: 30% fuel sulfur reduction by 2012 and 97% fuel sulfur reduction by 2015


Annual U.S. Mobile Source NOx Emission Projections
Including C3 Marine (ECA) Control
Aircraft
C3 Marine
Locomotive
Off-road diesel
Off-road gasoline
On-road diesel
On-road gasoline
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Thousand Tons
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
2028
2030


NOx and VOC Reduction Programs and Initiatives
Diesel Emission Reduction Strategies
Transportation Control Measures and Travel Efficiency
U.S. Environmental Protection Agency
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Older construction equipment used for large multi-year public works projects like highways, bridges, hospitals, stadiums, and sewage treatment plants can generate substantial quantities of NOx and $PM_{2.5}$ emissions. State and local officials are increasingly using "contract specifications" to require or encourage the use of cleaner onroad and off-road construction equipment for these projects.

EPA, in collaboration with industry, governmental, and environmental stakeholders, has developed Model Contract Specifications for controlling diesel emissions in construction projects. The Model Contract Specs address:

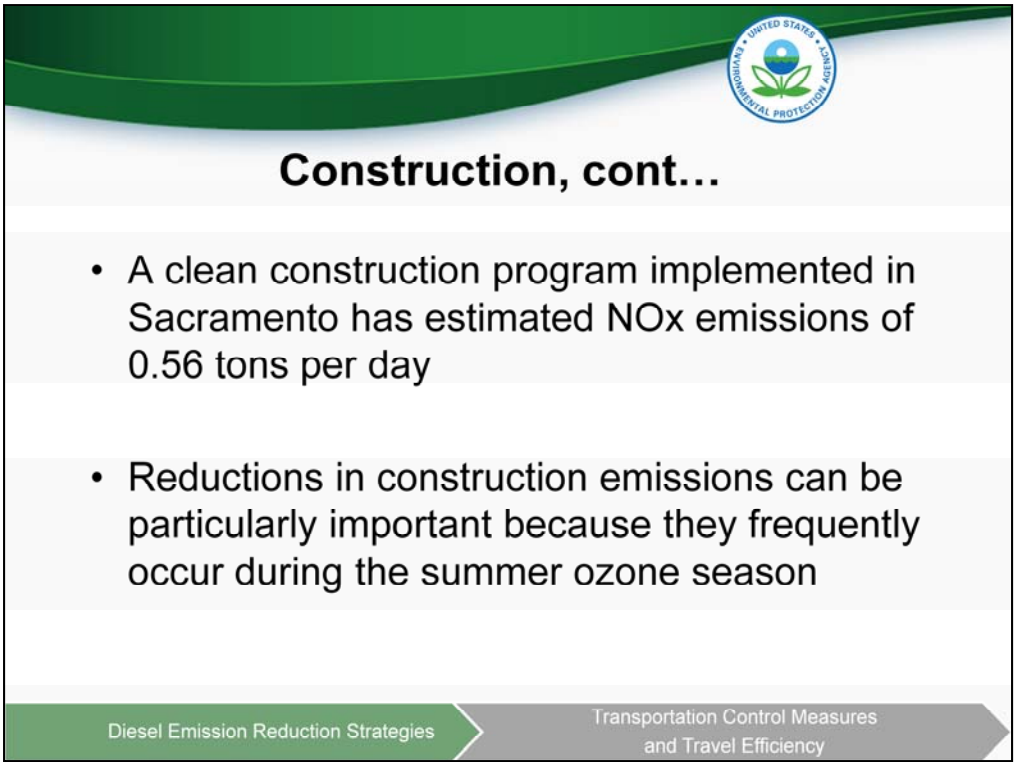
Strategies
- Cleaner construction equipment (newer, repowers, and/or retrofits)
- Idle-reduction policies
- Ultra-low sulfur diesel fuel

Reporting

Compliance

Costs

While idling reduction policies can help reduce construction costs by saving fuel, repowering or buying new construction equipment will increase construction costs. The Model Contract Specifications outlines a number of options for paying these costs (developer v. contractor). EPA Diesel Emission Reduction Program grants, as well as state and local funding, can also help reduce private sector costs.



Contacts

U.S. EPA Clean Diesel Program**:** Connie Ruth, ruth.connie@epa.gov, 734-214-4815.

Boston's Big Dig, MA DOT: Alex Kasprak, alex.kasprak@state.ma.us, 508-721-4403

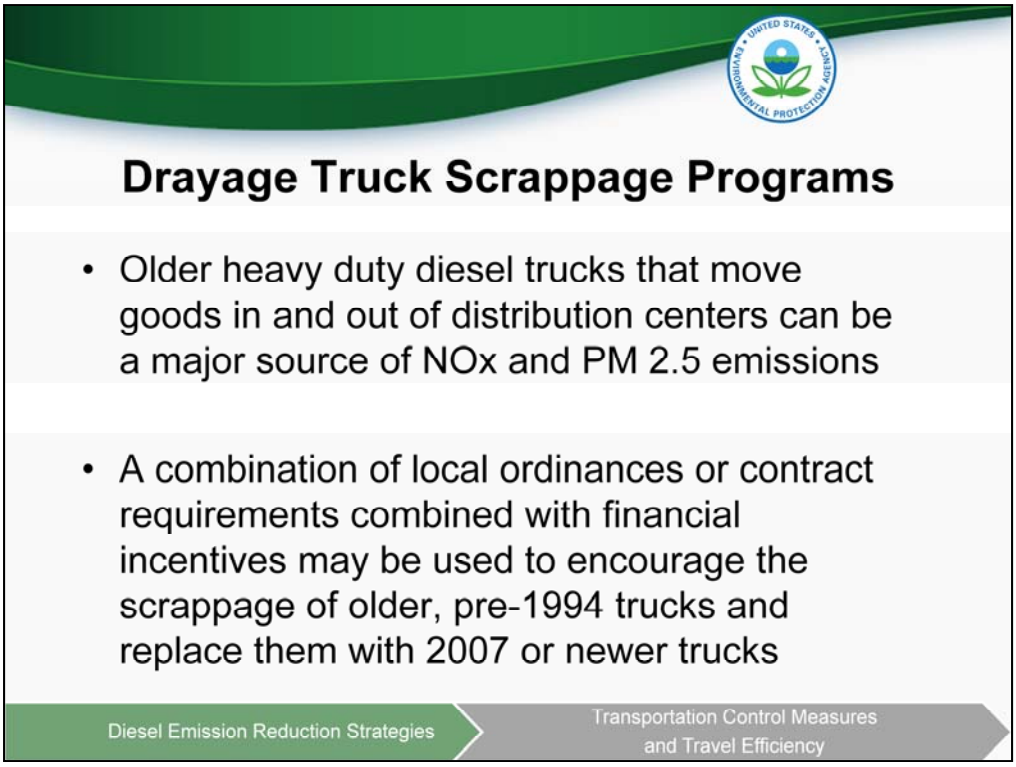
Lower Manhattan Rebuild, FHWA: Paul LeBrun, Paul.LeBrun@dot.gov, 212-668-2502

Web Resources

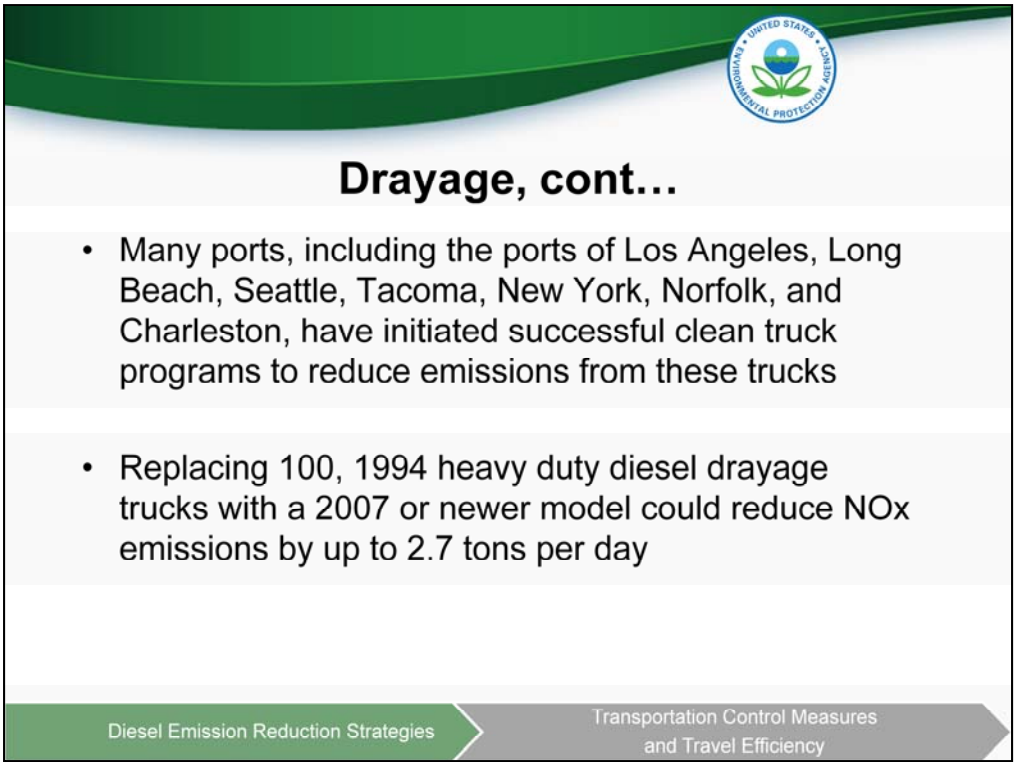
http://www.epa.gov/cleandiesel/documents/cl-nedc-model-2010rev.pdf

http://www.epa.gov/otaq/stateresources/transconf/policy/420b06005.pdf

http://www.epa.gov/diesel/construction/casestudies.htm



Incentive Mechanisms: Ports use a combination of local ordinances or contract requirements combined with assistance grants or low cost loans to scrap older, pre-1994 trucks and replace them with 2007 or newer trucks. The local requirements usually establish a near-term deadline by which 1994 and older trucks are no longer allowed on the terminal, and a later deadline by which only 2007 and newer trucks are allowed. Grants or rebates of approximately $10,000 per truck are used to pay for scrappage of old trucks and provide down payments for the purchase newer cleaner trucks. Diesel particulate filters can also play a role in reducing emissions from these trucks.



Contacts:

U.S. EPA SmartWay Program: Ken Adler, adler.ken@epa.gov, 202-343-9402

Port of Long Beach, Ralph Delgado, Delgado@polb.com, 562-283-7756

Port of New York/New Jersey: Bill Nurthen, wnurthen@panynj.gov, (212) 435-4220

Web Resources

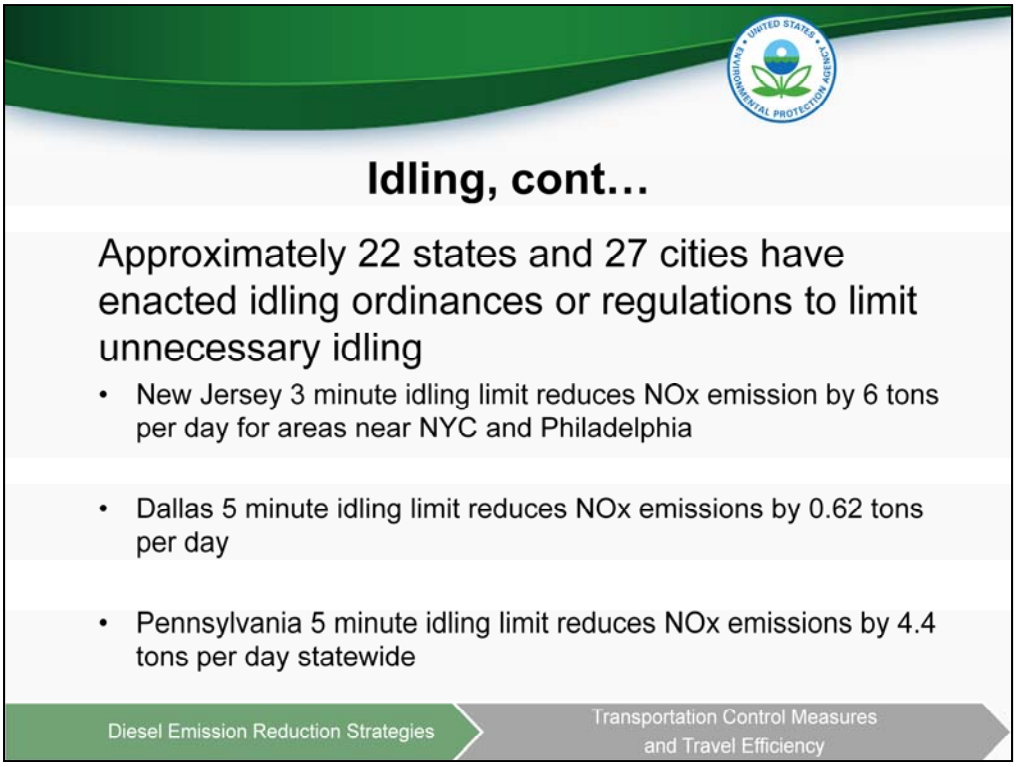
www.panynj.gov/truckers-resources/truck-replacement.html

www.polb.com/environment/cleantrucks/default.asp

www.epa.gov/smartway/partnership/drayage.htm

Long Duration Truck and Bus Idling

- Unnecessary truck and bus idling wastes fuel and increases NOx and PM 2.5 emissions
- Truck stops and rest areas are by far the largest source of idling emissions in most areas
- EPA has issued guidance to take emissions credit for reducing long duration truck and bus idling

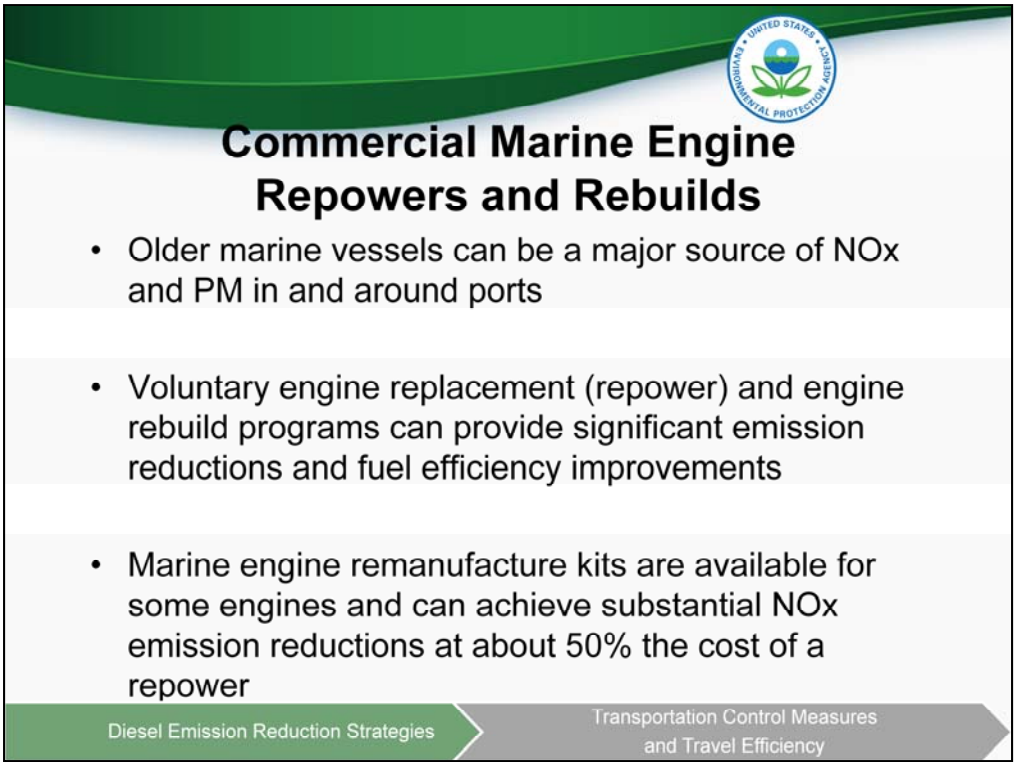


These ordinances limit idling to 3-10 minutes and include a warning, or a fine up to $150, for a first offense. Grants and low-cost loans are available from EPA's National Clean Diesel Campaign and state programs to help truck owners purchase auxiliary power units that can help substantially lower idling emissions.

EPA Contact:
NJ DEP: Ralph Bitter, Ralph.Bitter@DEP.state.nj.us, 609-292-3187
NJ DEP: Amy Hillman, amy.hillman@dep.state.nj.us, 609 292-7953
City of Dallas: Kimberly Mackey, Kimberly.Mackey@DallasCityHall.com, 214-670-6971
PA DEP: Chris Trostle, , 717-772-3926

Resources:

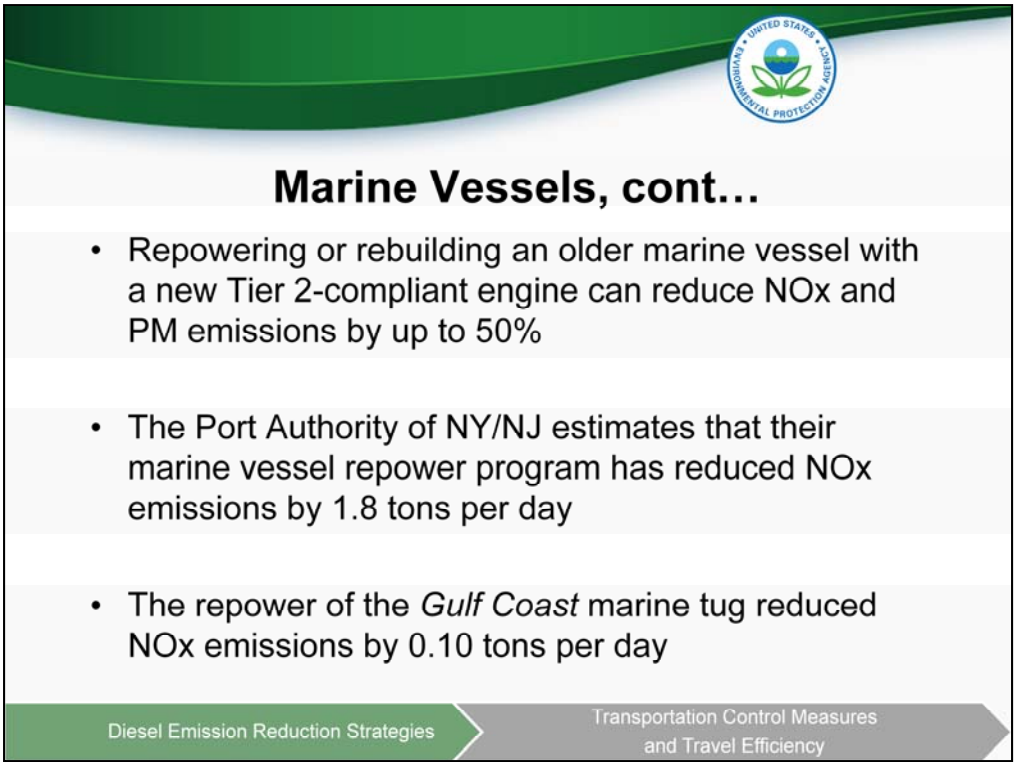
www.epa.gov/cleandiesel/
www.epa.gov/smartway/publications/index.htm#idling
www.epa.gov/smartway/documents/publications/420b04001.pdf
www.4cleanair.org/PM25Menu-Final.pdf
www.engineoffdallas.com
www.atri-online.org/research/idling/ATRI_Idling_Compendium
www.cumminsonan.com/www/pdf/apu/f-1720.pdf
www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&sqi=2&ved=0CEsQFjAB&url=http%3A%2F%2Fwww.portal.state.pa.us%2Fportal%2Fserver.pt%3Fopen%3D18%26objID%3D504144%26mode%3D2&ei=BdUFUNe1GKP30gGeg-jLCA&usg=AFQjCNEyE4C5c80bOW9A4vjbugUrmTuYyg&sig2=e5ofKf4X4k54ujqI6ECsLA



Engine repowers and rebuilds for older marine tug boats, excursion vessels and fishing vessels can provide substantial NOx and PM 2.5 emission reductions, and provide important fuel efficiency improvements.

Engine repowers and rebuilds can be a very cost-effective emission reduction strategy for commercial marine vessels because of their 40 year or more lifespan, high utilization rate and localized operation.

Over the 40 year life of a commercial marine vessel, the main engine may be rebuilt three or more times. In 2008, EPA issued regulations that require owners of certain post-1972 commercial marine diesel engines larger than 600kW to meet new emissions standards when they rebuild their engines. These new requirements are called the Marine Remanufacture Program and they may be able to assist local areas achieve a significant reduction in NOx and PM emissions from marine vessels. Engine manufactures now produce over 35 certified kits for use in marine engine remanufacturing.



Repowering or rebuilding an older marine vessel with a new Tier 2-compliant engine can reduce NOx and PM emissions by up to 50%, while also allowing for larger and more fuel efficient engines.

The Port Authority of NY/NJ funded a $4 million program to replace main and auxiliary engines on 15 commercial vessels at an average cost of $100,000 per engine and $270,000 per vessel. One reason the Port Authority funded the repowers was to offset the increased emissions from a harbor dredging project.

EPA, through the National Clean Diesel Funding Assistance Program, provided $1.55 million to the Chesapeake Bay Foundation and Dan Marine Towing to repower their marine tug boat, the *Gulf Coast*, with four new Tier 2 compliant engines.

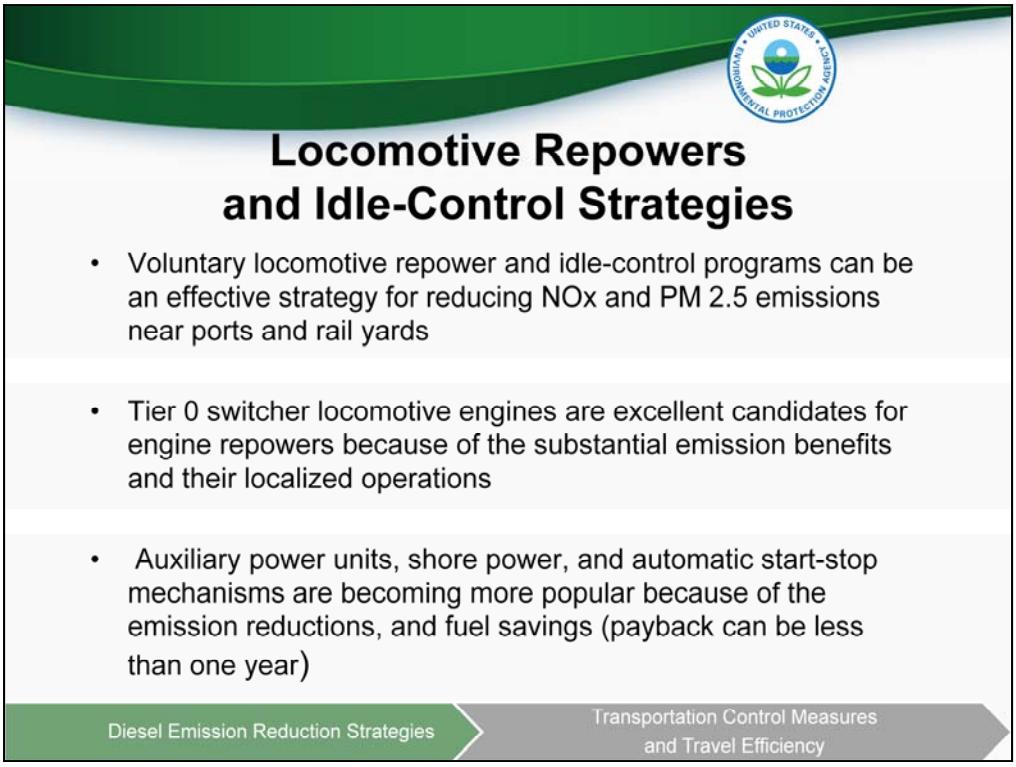
EPA has awarded over $50 million in DERA funds to support marine engine repower and replacement programs.

Contacts:

US EPA, Arman Tanman, Tanman.Arman@epa.gov, 202-343-9326

Port Authority of NY/NJ: Sharon Heller, sheller@panynj.gov, 212-435-4205.

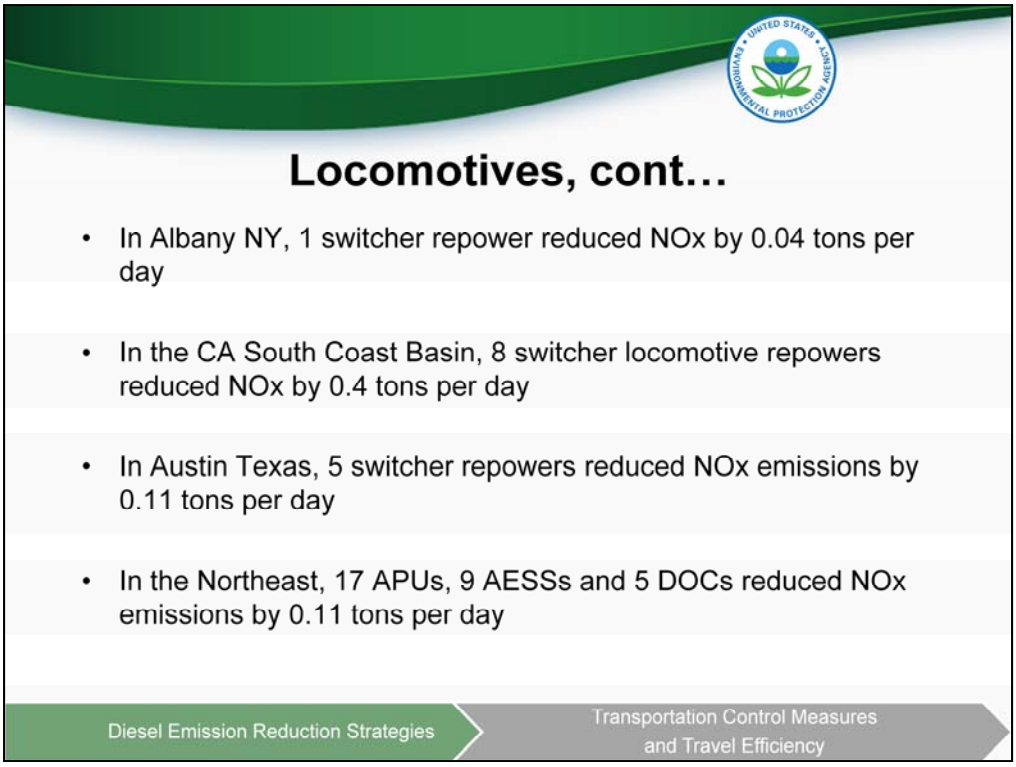
Resources:



Older switcher locomotives with Tier 0 engines are excellent candidates for engine repower projects because of the substantial emission benefits and their localized operations.

One increasingly popular approach is to repower a single Tier 0 switcher engine with three smaller and cleaner genset engines certified to EPA Tier 3 non-road standards. This approach reduces NOx and PM 2.5 emissions, and saves fuel because of the more efficient engine operations.

Idle reduction strategies, including auxiliary power units, shore power, and automatic start-stop mechanisms are becoming more popular because of the emission reductions, and fuel savings. In some cases, the payback for these devices from fuel savings can be less than one year.



Grants from EPA's DERA program have been a major source of funding to help support locomotive repowers.

In Albany New York, 1 switcher locomotive was repowered and it reduced NOx emissions by 0.04 tons per day. EPA DERA funds paid for $1,050,000 of the cost and project participants provided an additional $465,000 for a total project cost of $1,515,000.

In the South Coast Basin of California, 8 switcher locomotives were repowered and it reduced NOx emissions by 0.4 tons per day. EPA DERA funds paid$8,866,000 of the project cost and BNSF supplied $6,864,000 in company funds.

In Austin Texas, 5 switcher locomotives were repowered which reduce NOx emissions by 0.11 tons per day. The Texas Emission Reduction Plan provided a grant of $1,090,000 to pay the project's costs.

A total of 17 auxiliary power units, 9 automatic engine stop/start systems and 5 exhausts DOCs were installed on locomotives operated by the Providence and Worcester Railroad Company. The projects was funded by EPA DERA funds and the MA Department of Environmental Protection at a cost of $886,700 and reduced NOx emissions by 0.11 tons per day.

Contacts:

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NY DOT: Ray Hessinger, 518,457-8075, rhessinger@dot.state.ny.us

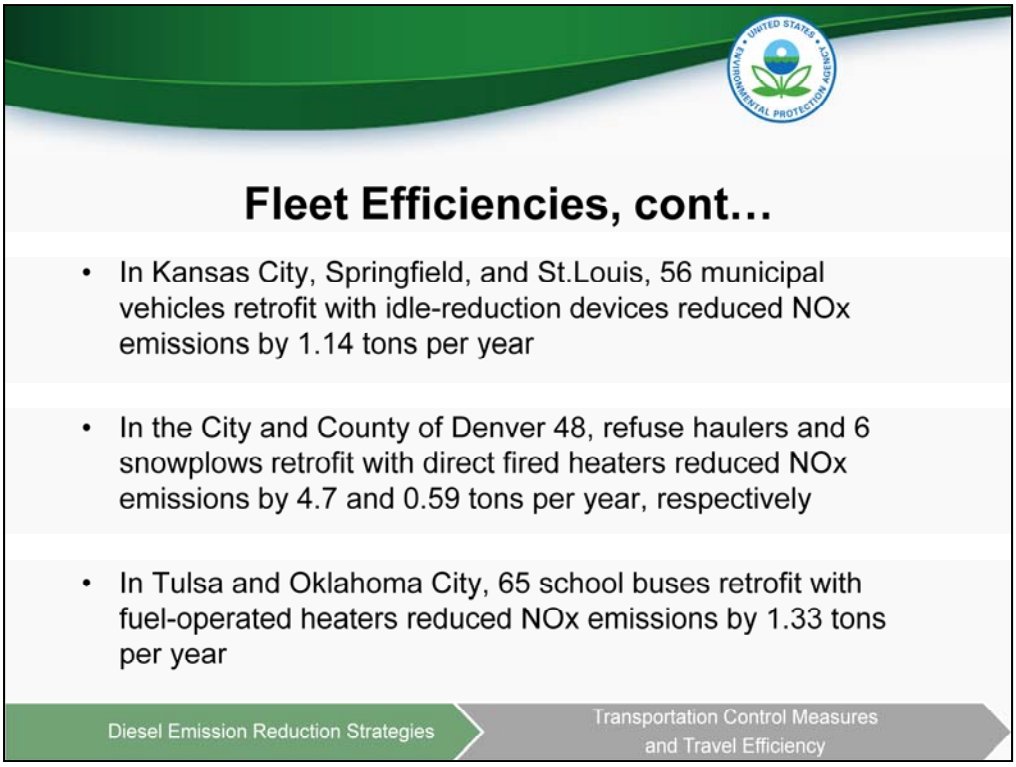
CA Air Resources Board: Harold Holmes, (916) 324-8029, hholmes@arb.ca.gov

Resources:

http://www.epa.gov/cleandiesel/documents/420b09037.pdf

http://pubs.awma.org/gsearch/em/2010/5/cutts.pdf

Computer-assisted routing may result in the elimination or consolidation of routes that can be accommodated by purchasing larger capacity vehicles.



Contacts:

US EPA: Faye Swift, 202-343-9147, swift.faye@epa.gov

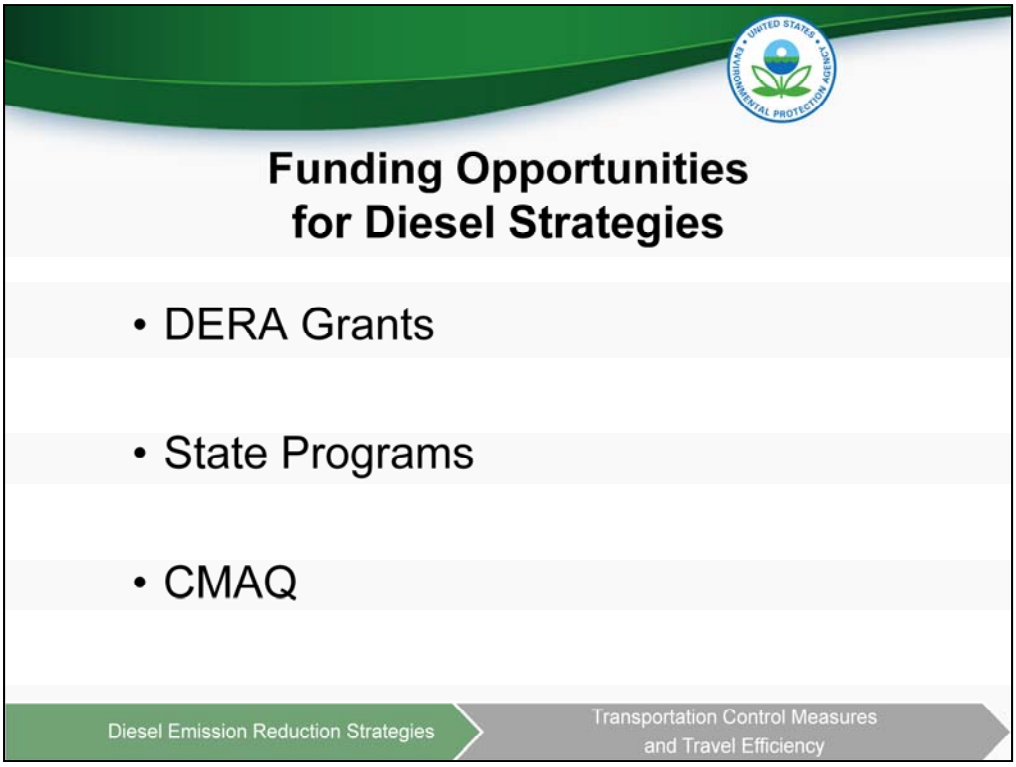
Resources:

http://www.epa.gov/cleandiesel/sector-programs/antiidling.htm

http://www.epa.gov/cleanschoolbus/form.htm

http://www.epa.gov/smartway/technology/idling.htm

http://www.epa.gov/cleandiesel/technologies/operations.htm



DERA funding – competitive grants for retrofit and replacement. Annual.

Many states offer grants other incentive programs for diesel emission reduction projects.

CMAQ may be available in some areas for funding diesel retrofit programs.

Transportation Control Measures and Travel Efficiency

- Refers primarily to the 16 broad categories of strategies listed in Section 108(f)(1)(A) of the CAA, but also includes strategies such as pricing and land use that reduce travel activity.
- Effectiveness of these strategies can be highly variable depending on the existing transportation system in place and the scope of implementation.
- Combinations of travel demand management, transportation alternatives and supporting land use increase effectiveness

Transportation Control Measures and Travel Efficiency

- For example:
  - Public Education and Outreach
  - Workplace Programs
  - Ridesharing
  - Public Transit
  - Pricing (Travel and Parking)
  - Land Use (fundamental building block for other strategies and long term effectiveness)

Public Education and Outreach

- *"It All Adds Up to Cleaner Air"* is a public education and partnership-building initiative developed by several federal agencies for the purpose of informing the public about the impact of their transportation choices on traffic congestion and air quality http://www.italladdsup.gov/
- *It All Adds Up* provides state and local agencies free commercial-quality promotional materials that emphasize four simple, convenient actions people can take to improve air quality and reduce traffic congestion:
  - Trip chain, or combine errands into a single car trip
  - Keep cars properly maintained
  - Refuel in the evening and don't top off the gas tank
  - Choose alternate modes of transportation, such as carpooling, mass transit, biking, or walking

Work Place Programs

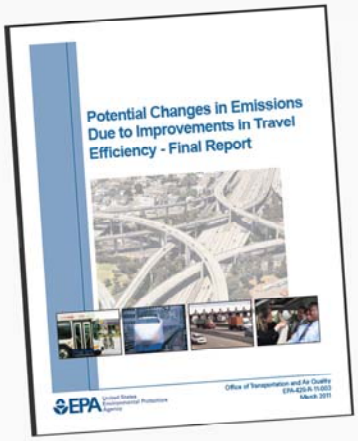
- Learn how to provide employees with a comprehensive package of commuter benefits (e.g. tax-free transit passes, vanpool subsidies, telecommuting options) that can improve air quality
- "Best Workplaces for Commuters" assists participating employers by offering public recognition and promotion, technical assistance, training, Web-based tools, and forums for information exchange
- http://www.bestworkplaces.org/

TCMs: Basic Information and Examples

- Provides information on how local governments have planned and adopted TCMs
- Overview of measures, benefits, costs, sources of funding, examples and case studies

www.epa.gov/otaq/stateresources/policy/430r09040.pdf

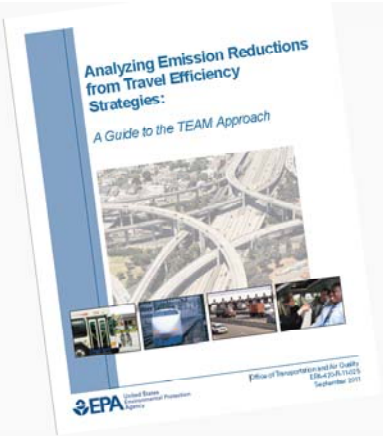
TCMs: Effectiveness and Assessment



- A bottom-up assessment of the potential effectiveness of strategies at the national scale
- Provides information on effectiveness for a range of strategies
- The Travel Efficiency Assessment Method (TEAM) approach utilizes local travel activity data and information along with MOVES emission factors

www.epa.gov/otaq/stateresources/policy/420r11003.pdf

TCMs: Effectiveness and Assessment



- Provides guidance for using the Travel Efficiency Assessment Method (TEAM) approach for local/regional areas

www.epa.gov/otaq/stateresources/policy/420r11025.pdf

OTAQ Web Resources

- Topic-specific guidance documents that outline EPA policies for crediting programs that can help reduce transportation-related air pollution and emissions: http://www.epa.gov/otaq/stateresources/policy/pag_transp.htm
  - Accelerated retirement of Vehicles
  - Airports
  - Commuter Programs
  - Idling
  - Intelligent Transportation Systems Management
  - Land Use
  - Retrofits
  - Transportation Control Measures
  - Transportation Pricing

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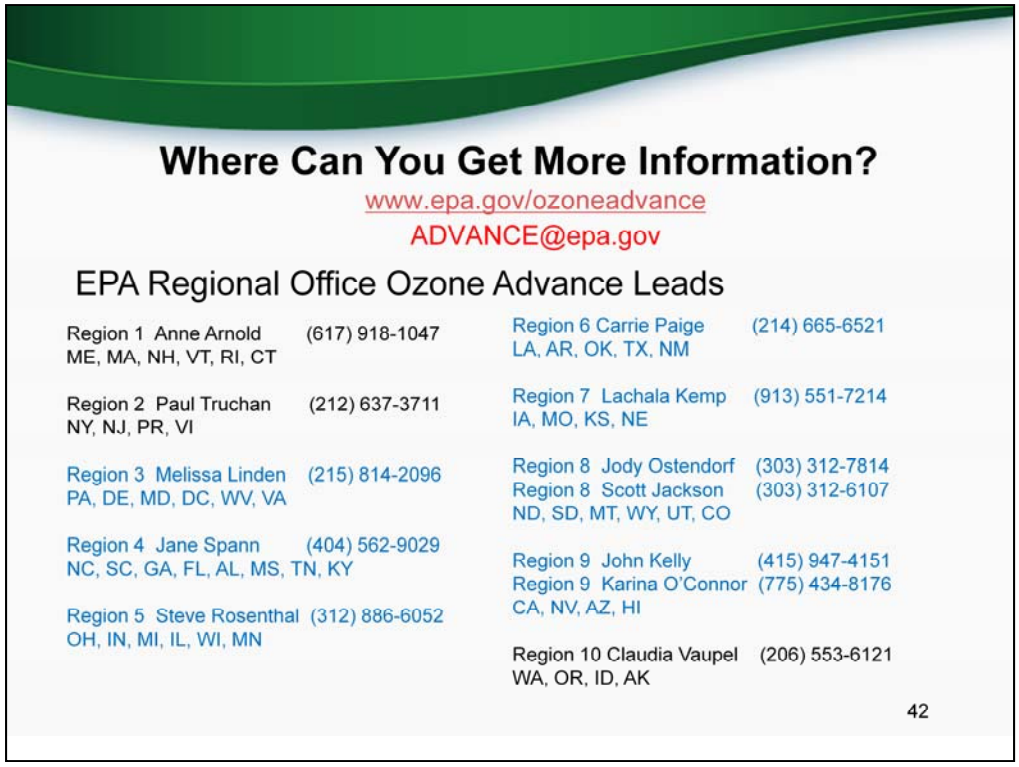

Blue = Regions that currently have Ozone Advance participants