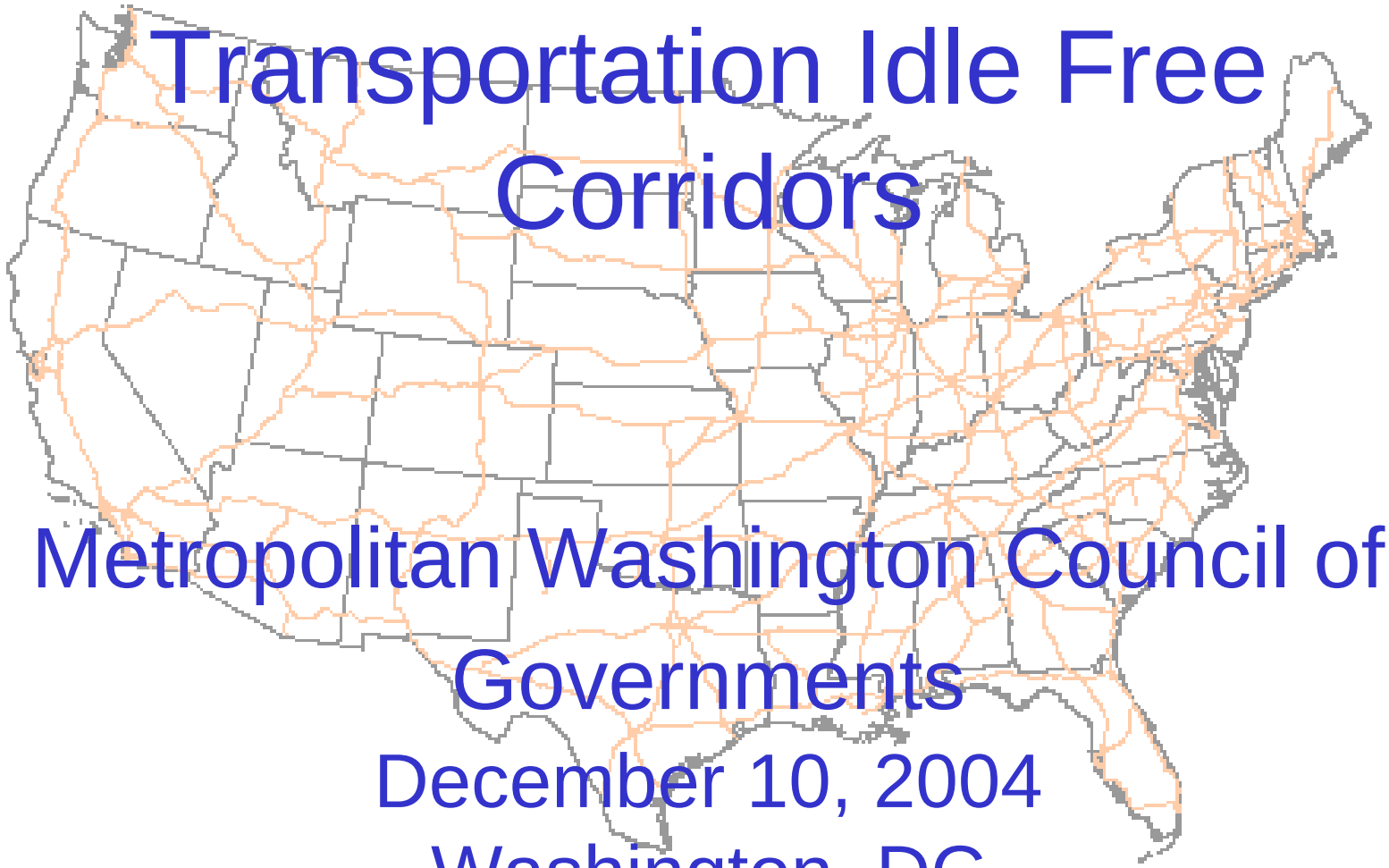
EPA
United States
Environmental Protection
Agency

Transportation Idle Free Corridors



Metropolitan Washington Council of Governments

December 10, 2004

Washington, DC

Objective

- Build idle reduction projects at key locations along major transportation routes
  - Bring together a team to get this done: EPA, DOT, DOE, state/local government, energy provider, technology manufacturer, truck/rail companies, truck stops, community groups, others.

Why Idling?

- Environmental benefits: reductions of NOx, PM, CO, CO2, and air toxics
- Economic benefits: savings on fuel, maintenance, engine life; decreased dependence on oil imports
- Health impacts: drivers and truck stop operators
- Cost/Benefit: $2,500 per NOx ton reduced

Truck/Locomotive Idling

- Truck Top 3 Reasons:
  - Climate Control (AC, heat)
  - Power accessories (e.g., TV)
  - Protect engine in cold weather
- Locomotive Top 3 Reasons
  - Protect engine in cold weather
  - Readily available engine
  - Habit/custom

Idling Emission Impacts

- Long Haul Trucks:
  - NOx: 180,000 tons per year
  - PM: 5,000 tons per year
  - CO2: 11 million tons
  - Fuel: 1 billion gallons
- Switch Yard Locomotives
  - NOx: 13,000 tons per year
  - PM: 430 tons per year
  - CO2: .75 million tons
  - Fuel: 65 million gallons

Other Impacts

- Air toxics (formaldehyde and trace metals)
- Pollutants in environmental justice areas (inner-city rail yards)
- Noise pollution
- Increased maintenance on engines
- Decreased engine life

Alternatives

- Change Behavior/Provide Incentives
  - Difficult to change behavior when idling is necessary to provide heat or air conditioning to rest comfortably
- State Anti-Idling Laws
  - Difficult to enforce; unfair to impose when alternatives are unavailable
- Idle Reduction Technologies
  - Mobile & Stationary devices (see list)

Idle Reduction Technologies (IRTs)

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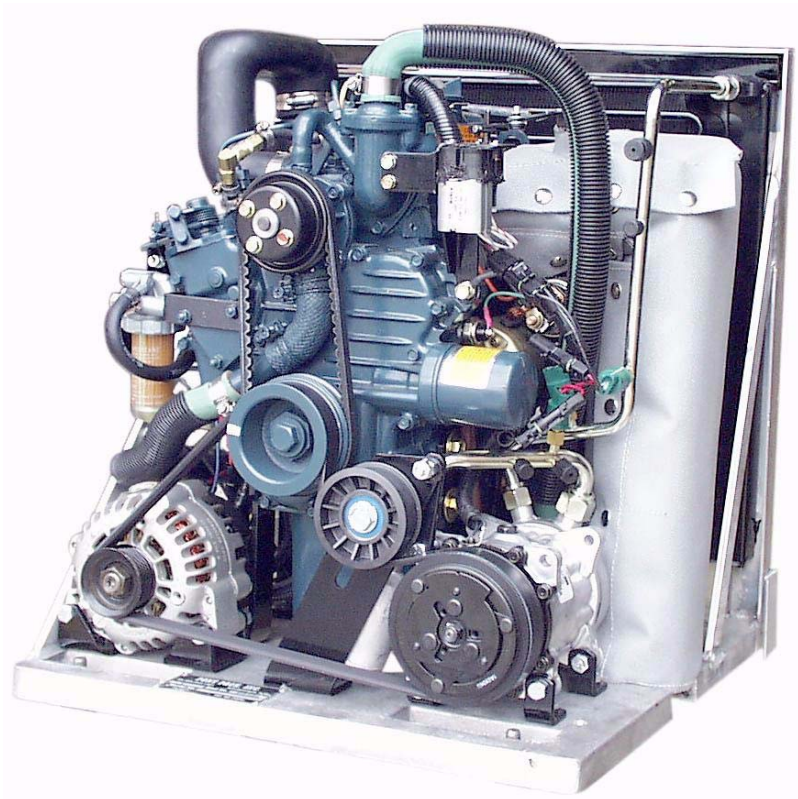
- Automatic engine shut-down systems
- Diesel Fuel Fired Heaters
- Auxiliary Power Units/Generator Sets
- Electrified Parking Spaces (EPS) (on-board + off-board)
- “Advanced” EPS (off-board only)

Auxiliary Power Units

- What is it?
  - Small diesel powered combustion engine, ~10 hp, EPA certified non-road engines
- What does it do?
  - AC, heat and power for auxiliaries
- Cost: $5,000-$7,000
- Issues:
  - Weight, maintenance, extra tax, costly

- Major manufacturers:

include Pony Pack (see picture), Rig Master, and Teleflex



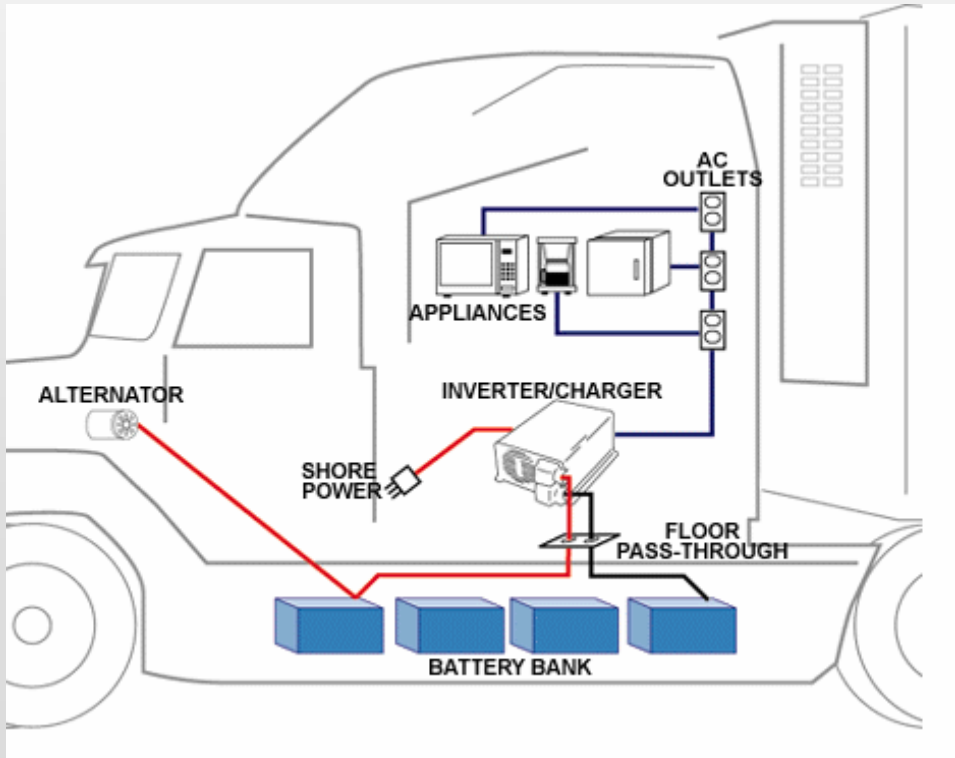
Electrified Parking Spaces (on-board + off-board)

United States Environmental Protection Agency

- What is it?
  - Inverter/charger & electric HVAC; connection to external electrical grid
- What does it do?
  - Provides power for HVAC and auxiliaries
- Cost: Inverter/Charge + electric HVAC ($4,000); external connection ($2,500/space)
- Issues
  - Requires modifications to truck, external connection not readily available

- Major manufacturers:

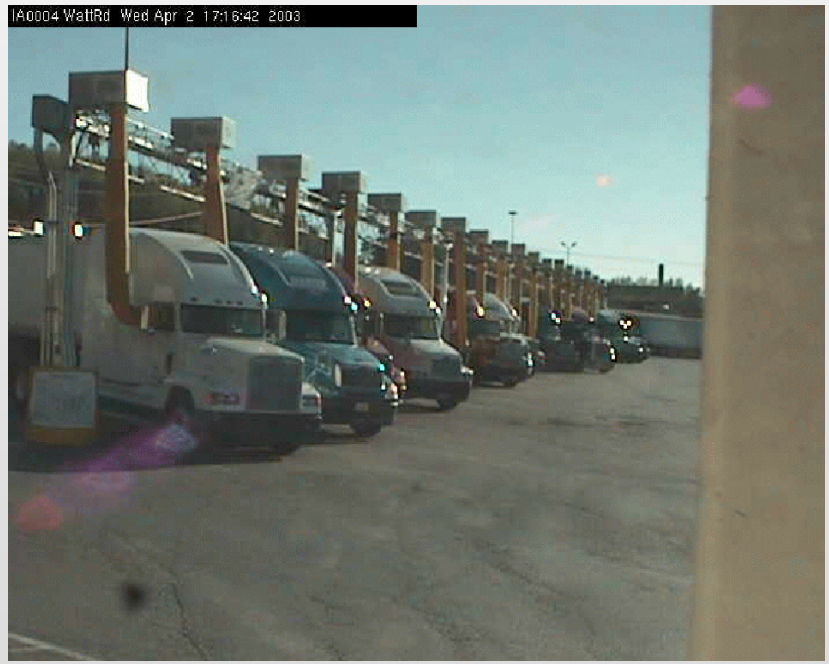
Xantrex (see picture below), Dometic/Cab Comfort, Taylor, Phillips, Antares



Advanced EPS (off-board only)

- What is it?
  - Electric HVAC system suspended above trucks
- What does it do?
  - Provides power for HVAC and auxiliaries; cable, telephone
- Cost: $10,000 per space (50 space min); $1.25-$1.50 hourly charge
- Issues:
  - Costly; available in only a few locations

- Major Manufacturer:
IdleAire Technologies, Inc.



IRTs for Locomotives

- Automatic Shut Down/Start Up System
  - Maintains all vital engine systems by turning engine on and off based on temperature and/or time
  - ZTR Control Systems
  - $7,500-$14,000
- APU
  - Maintains all vital engine systems
  - CSXT
  - $35,000-$40,000
- Diesel Driven Heating System
  - Maintains all vital engine systems
  - Kim Hotstart Manufacturing
  - $27,000-$29,000

Barriers

- Weight of APUs (250-500 lbs)
- Tax on APUs (FET 12%)
- Maintenance of APUs
- APUs too expensive
- EPS not readily available
- EPS too expensive

EPA-DOT-DOE Response

- Weight waiver of 250 lbs in Energy Bill
- TSE projects eligible for CMAQ funds
- Grant program to assist truck fleets in purchase of mobile idle reduction technology
- Demonstration projects for locomotives
- Demonstration projects for EPS ($1 million in awards recently announced)

State Wide Truck Parking

STATE	TOTAL TRUCK PARKING SPACES
Pennsylvania	15,798
Virginia	**8,262 (175 truck stops)**
Maryland	**2,587 (55 truck stops)**
West Virginia	2,222
Delaware	394
Washington, DC	0
TOTAL	29,263

State Wide Truck Impacts

STATE	FUEL (gal/yr)	NOx (tpy)	PM (tpy)
Pennsylvania	18.4 M	3,397	87
Virginia	**9.6 M**	**1,776**	**45**
Maryland	**3 M**	**556**	**14**
West Virginia	2.5 M	478	12
Delaware	460,000	85	2
TOTAL	34 M	6,292	160

State Parking on I-95

STATE	I-95 PARKING SPACES	% PARKING ON I-95
Maryland	**1,771**	**68%**
Virginia	**2,299**	**28%**
Pennsylvania	250	.0158%
Delaware	0	N/A
West Virginia	0	N/A
TOTAL	4,320	

Truck NOx Impact

STATE	EMISSIONS IMPACT IF 50% IDLING AT EACH PARKING SPACE ON I-95
VIRGINIA	**494 tons per year (1149 spaces)**
MARYLAND	**380 tons per year (885 spaces)**
PENNSYLVANIA	54 tons per year (125 spaces)

Truck PM Impact

STATE	EMISSIONS IMPACT IF 50% IDLING AT EACH PARKING SPACE ON I-95
VIRGINIA	**13.5 tons per year**
MARYLAND	**10 tons per year**
PENNSYLVANIA	1.5 tons per year

Railroad Mileage per State

STATE	MILEAGE
Pennsylvania	5,145
Virginia	**3,262**
West Virginia	2,433
Maryland	**760**
Delaware	227
Washington, DC	**25**

East Coast Railroads

RAILROAD	# LOCOMOTIVES
Norfolk Southern	3,455
CSX Transportation	3,360
Canadian National/Illinois Central	296
Canadian National/Grand Trunk Western	109

Switch Yard Locomotives (CSXT Only)

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STATE	# SWITCHERS
Maryland	**57**
West Virginia	50
Pennsylvania	45
Virginia	**34**
Delaware	6
Washington, DC	**5**
TOTAL	197

Switcher NOx Impact

STATE	EMISSIONS IMPACT
Maryland	**148 tpy**
West Virginia	130 tpy
Pennsylvania	117 tpy
Virginia	**88 tpy**
Delaware	16 tpy
Washington, DC	**13 tpy**
TOTAL	512 tpy

Switcher PM Impact

STATE	EMISSIONS IMPACT
Maryland	**5 tpy**
West Virginia	4.3 tpy
Pennsylvania	4 tpy
Virginia	**3 tpy**
Delaware	.5 tpy
Washington, DC	**.43 tpy**
TOTAL	17 tpy

Potential Truck Stop Projects

- Selection Criteria:
  - Site Density: number of other truck stops nearby
  - Usage: current demand/supply ratio
  - Growth: estimated annual % increase in demand
  - Capacity: <25, 25-50, 51-99, 100-199, 200+)
  - Ozone and PM Status: attainment, maintenance, non-attainment
  - Census: population density within 0.5 mile radius
  - Regulation: presence/absence of state or local anti-idling law