



Idle Free Corridors

Implementation Meeting

April 28, 2004

Boston, MA

Why Idling?

- ï Environmental benefits: reductions of NO_x, PM, CO, CO₂, and air toxics
- ï Economic benefits: savings on fuel, maintenance, engine life; decreased dependence on oil imports
- ï Cost/Benefit: \$1,500 (rail) to \$2,500 (truck) per NO_x ton reduced

Truck/Locomotive Idling



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

Idling Emission Impacts



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

Other Impacts



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

Alternatives

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

Truck Idle Reduction Technologies



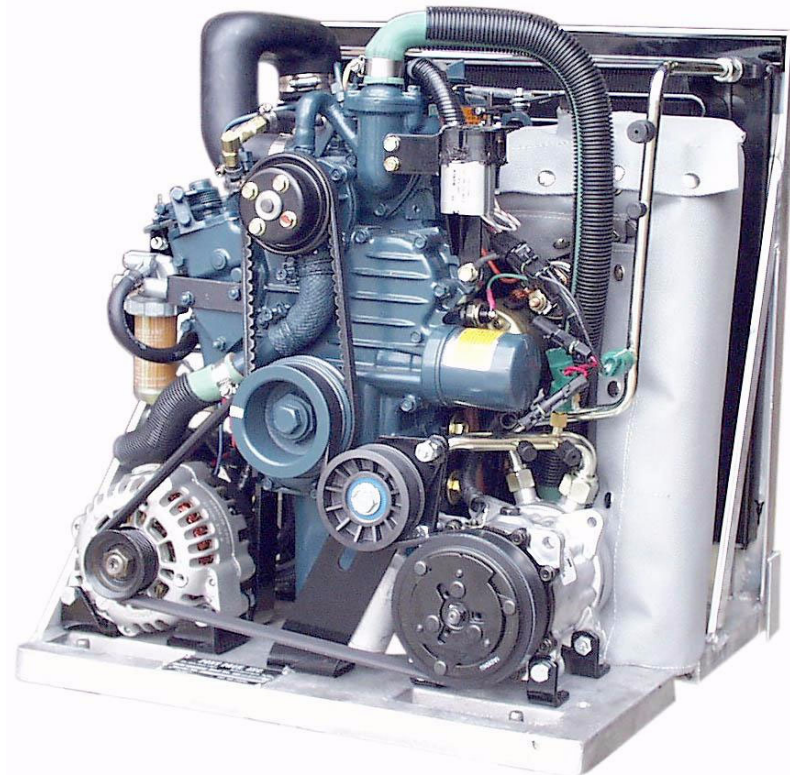
- ï Automatic engine shut-down systems
- ï Diesel Fuel Fired Heaters
- ï Auxiliary Power Units/Generator Sets
- ï Truck Stop Electrification (on-board HVAC + electrical connection)
- ï ìAdvancedî TSE (external unit only)

Auxiliary Power Units



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

- ï Major manufacturers: include Pony Pack (see picture), Rig Master, and Teleflex



Truck Stop Electrification (Shore Power)



ï What is it?

- ñ Inverter/charger & electric HVAC; connection to external electrical grid

ï What does it do?

- ñ Provides power for HVAC and auxiliaries

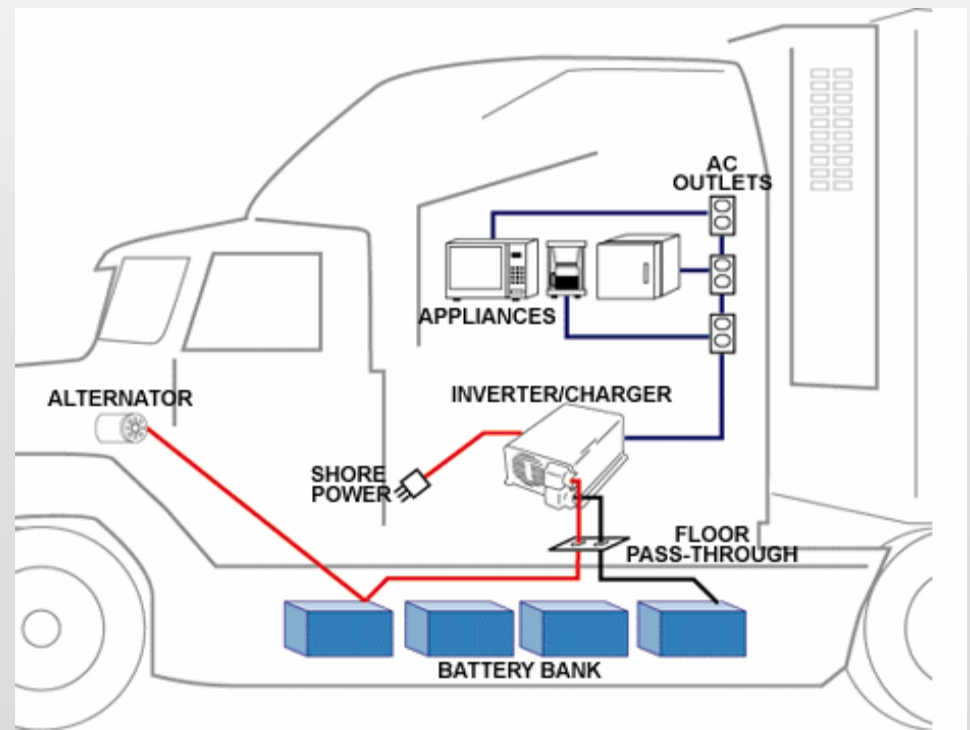
ï Cost: Inverter/Charge + electric HVAC (\$4,000); external connection (\$2,500/space)

ï Issues

- ñ Requires modifications to truck, external connection not readily available

ï Major manufacturers:

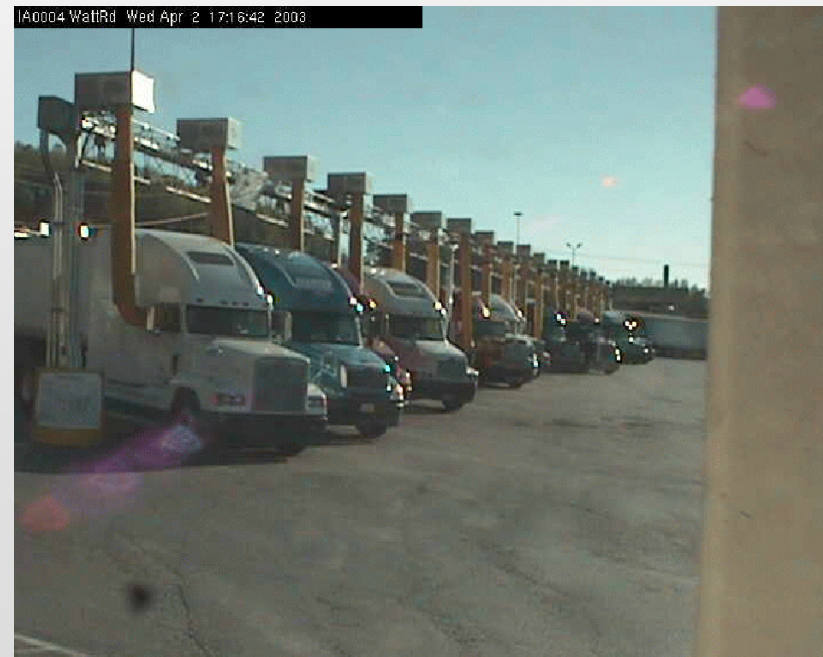
Xantrex (see picture below), Dometic/Cab Comfort, Taylor, Phillips, Antares



Advanced TSE (Rental)

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

- ï Major Manufacturer:
IdleAire Technologies, Inc.



Locomotive Idle Reduction Technologies



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

Barriers

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



EPA-DOT-DOE Response

- ï Weight waiver of 250 lbs in Energy Bill
- ï TSE projects eligible for CMAQ funds
- ï Grant program to assist truck fleets in purchase of mobile idle reduction technology
- ï Demonstration projects for locomotives
- ï Demonstration projects for TSE

State Wide Truck Parking



STATE	TOTAL TRUCK PARKING SPACES (public & private)
Connecticut	1,604
Maine	1,361
Massachusetts	2,056
New Hampshire	783
Rhode Island	687
Vermont	627

State Wide Truck Impacts: Fuel



STATE (if 50% of all parking spaces had idling trucks)	FUEL (gal/yr)
Connecticut	1.9 million
Maine	1.5 million
Massachusetts	2.4 million
New Hampshire	900,000
Rhode Island	800,000
Vermont	730,000

State Wide Truck Impacts: NOx



STATE (if 50% of all parking spaces had idling trucks)	NOx (tpy)
Connecticut	345
Maine	292
Massachusetts	442
New Hampshire	168
Rhode Island	147
Vermont	135

State Wide Truck Impacts: PM



STATE (if 50% of all parking spaces had idling trucks)	PM (tpy)
Connecticut	10
Maine	9
Massachusetts	13
New Hampshire	5
Rhode Island	4
Vermont	4

Railroad Mileage per State



STATE	Mileage
Connecticut	635
Maine	1,202
Massachusetts	1,071
New Hampshire	437
Rhode Island	102
Vermont	600

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)



STATE	# SWITCHERS
Massachusetts	20

Switcher NOx Impact (CSXT Only)



State	Fuel (gal/yr)
Massachusetts	240,000

Switcher NOx Impact (CSXT Only)



STATE	NOx tpy
Massachusetts	52

Switcher PM Impact (CSXT Only)



STATE	PM tpy
Massachusetts	2

Potential Truck Stop Projects



ï Selection Criteria:

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

ï Priority Areas

- ñ See handout in folder

Objective

- ï Build idle reduction projects at key locations along major transportation routes
 - ñ 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.