FREIGHT COMMITTEE
of the
REGIONAL TRANSPORTATION ADVISORY COUNCIL

Summary of February 25, 2009 Meeting

This meeting was held in the MPO Conference Room at the State Transportation Building.

The meeting was called to order at 1:10 PM.

1. Introductions and Chair's Report –Walter Bonin, *Chair and City of Marlborough*
The meeting date of the Freight Committee will be the fourth Wednesday of the month to allow for more time to prepare reports and recommendations for the Regional Transportation Advisory Council (RTAC). The next meeting is scheduled for March 25, 2009.

2. Approval of Meeting Minutes
The minutes of February 11, 2009 were approved unanimously.

3. Meet with MEPA Officials
The discussion with the representative from the Massachusetts Environmental Policy Act Unit (MEPA) is rescheduled to the March meeting as the representative was unable to attend in February. The purpose of the discussion will be to learn about the MEPA process and gain an understanding of whether MEPA and state environmental reviews require the consideration of impacts from the closing of industrial or freight facilities and if so, at what threshold and through what process.

F. DeMasi is concerned about the environmental and air quality impacts of abandoning and relocating the Beacon Yard.

Members raised the following concerns about the future of the freight rail facilities at Beacon Yard:

- There has been no review of the environmental impact of closing the facilities
- Will the rail rights-of-way be lost?
- What will be the regional impacts (traffic, environmental, and infrastructure-related) of relocating the Beacon Yard freight facilities to the MetroWest area?
- How would any such impacts be mitigated?

Abby Swaine, US Environmental Protection Agency, noted that environmental review is required with the closure of a right of way, like those at Beacon Yard.

P. Wolfe noted that environmental reviews quantify environmental impacts and identify ways to avoid, minimize or mitigate them. Typically, there is a specific proposal from which to analyze effects.

Questions that the members hope to get clarified in the meeting with MEPA:
- What are MEPA's guidelines?
- What triggers MEPA's involvement in a project?
- Does MEPA address issues like the relocation of Beacon Yard?

Regarding process, Committee members agreed to follow the following approach – to brief RTAC members on the Freight Committee discussions; to outline and explain any issues and concerns; and to notify RTAC members of upcoming Freight Committee presentations. The Committee will specify to RTAC the issues they plan to discuss with MEPA.

4. Discussion of Final Freight Committee Charter
Members discussed the current draft version of the Freight Committee Charter and suggested that it be condensed and duplicate text and content be eliminated. The statement should be short and concise.

5. Presentation of Freight Diversion
F. DeMasi would like to see work conducted on this topic in addition to the attention it is being given as part of the statewide Freight Rail Study. His goal is to increase diversions of freight from truck to rail. The Freight Committee report to RTAC will include a note that the Committee is interested in identifying a truck to rail freight project for the MPO region in the upcoming FFY 2010 Unified Planning Work Program (UPWP). The timing is good, as the FFY 2010 UPWP development process is just beginning. Freight Committee members will continue to discuss this topic at the next Freight Committee meeting.

6. Diesel Reduction Program
Abby Swain circulated information on EPA's Clean Diesel Campaign and invited Freight Committee members to learn about and promote participation in the program.

7. Adjourn
The meeting adjourned at 3:00 PM.

Attachments: Draft Final Charter

Agencies
Lynn Vikesland, Massport
Abby Swaine, U.S. Environmental Protection Agency

Cities and Towns
Walter Bonin, Marlborough
Frank DeMasi, Wellesley
Steve Olanoff, Westwood

Citizens Groups

Guests and Visitors
Linda Blair
Marilyn MacNab

MPO Staff
Anne McGahan
Sean Pfalzer
Pam Wolfe

Freight Committee Charter:
(Draft Revision for FY 2009)*

Charter:

•Emphasize to MPO the need for a Multimodal Freight Transportation System by providing RTAC with the tools, documents, etc. to support RTAC goals of enhancing the multimodal transportation system (MTS) in the region, reducing dependence on trucking and fossil fuel, and reducing the Green House gas emissions. Consideration of the improvement of the Multi Modal Freight Transportation System (MFTS) should seek to avoid adverse impacts.

•Focus MPO on freight in regional transportation planning and priorities as above and in relation to RTAC, and assist the MPO to integrate the MFTS into the MTS.

• Inform RTAC about FHWA freight planning guidelines and priorities.

• Inform RTAC about State legislative initiatives in regional transportation programs and funding, land use, economic development, and policy programs as they affect freight transportation.

Scope:

•Catalogue, develop, present findings on transportation studies and planning to RTAC.

• Bring to the RTAC issues regarding operations to enhance pipeline, air, truck, rail, intermodal freight, and sea movement of goods.

•Provide information such as non-proprietary strategic and short term plans of rail roads operating in Massachusetts to the RTAC. Coordinate with RTAC to promote such information and its possible impact on our Regional Transportation System.

• Identify to RTAC opportunities for integrated public/private studies, partnerships, freight planning and project funding

•Address congestion and environmental improvements by diversion of freight from truck to intermodal rail and/or Sea (Coastal Shipping). Consideration of improvements should identify opportunities to address congestion and avoid adverse effects.

•Encourage studies to establish land use scenarios for best locations of trans-loading facilities. Consideration of the best locations and designs should avoid adverse affects on our communities in the near term and long term.

•Suggest preservation of freight rail ROW for future freight and passenger use (rail/port/industrial sites). Such preservation should take into account the practicality of preserving or activating rail lines and alternative uses for rights-of-way.

•Assess the need and viability of accommodation for access of modern heavy weight, high, wide, equipment over existing freight and commuter rail lines.

Strategy: In accordance with RTAC Freight Committee Charter and RTAC Bylaw:

•Advocate for freight transportation by review and evaluation of policy, plans, and programs to further existing efforts by the MPO using FHWA guidelines and best practices and reporting results and suggestions to the RTAC for action.

•Advocate the need to emphasize the importance and needs for improved highway and rail freight access to logistics terminals and ports by review and evaluation of policy, plans, and programs to further existing efforts by the MPO using FHWA guidelines and best practices and reporting results and suggestions to the RTAC for action.

•Advocate for inclusion of Freight Mobility and modal choices by review and evaluation of regional policy, plans, and programs to:

- **reduce congestion**
- **manage urban sprawl - effecting land use/smart growth**
- **enhance economic development/job creation**
- **reduce Green House Gas Emissions**
- **conserve energy**
- **otherwise protect the environment**

By reporting results and suggestions to the RTAC for action.

Tactics:

•Initiate action using, "Identification of Massachusetts Freight Issues and Priorities " (Nov 99) - FHWA Freight Planning Guidelines, Boston MPO Freight Study, Regional Transportation Plan, Massachusetts Rail Trends and Opportunities Report (July 2007)

•Meet periodically, on behalf of RTAC, with public and private stakeholders to be informed of freight issues and priorities

•Provide RTAC with necessary information and data to inform MPO on the importance of freight transportation, links to economic development, conservation of energy, environment, infrastructure, and congestion

•Follow approach of Freight Advisory Council established by EOT/MassHighway in advocacy for Freight Issues and Priorities Study outcomes

•Use technical/statistical data, issues of concern to shippers/freight providers to formulate recommendation to the RTAC

•Keep current with industry trends, public policy and legislation regarding freight transportation issues and priorities through monthly meetings

*** The Freight Committee, formed in August 2003 was chartered to emphasize sufficiently the importance of Freight Transportation Systems and the view of some RTAC members that freight issues weren't receiving attention deserved in regional transportation planning/priorities. The committee charter emanated from conclusions reached by a Regional Freight Issues Panel and unanimous vote of the Council at the February 12, 2003 RTAC meeting.**

The mission of the freight committee is to bring issues regarding freight movement and the planning and funding of an intermodal transportation system through the RTAC to the Boston Region MPO. RTAC provides comments to the MPO as part of the 3-C process for the Regional Transportation Plan, Transportation Improvement Plan (TIP), and Unified Planning Work Program.

End

Appendix:

Freight Committee background, guidelines, tools, best practices, Targets/Goals for improvements

FHWA Freight Planning Guidelines

•Freight template for MPOs Defined by FHWA Freight Planning Guide lines
•Used in conjunction with the freight report issues of concern.
•Used to assess freight accessibility, mobility, and safety.
•Applied to MPO goals, objectives, policies, strategies, actions.
•Consistent with statewide plans, corridor plans, airport, seaport plans, relevant policy/planning

MPO/State DOT (EOTPW) roles in freight planning

<u>Many SDOTs and MPOs systematically incorporate freight movement issues into planning activities by</u>

•Define elements of MPO transportation system critical for efficient movement of freight
•Identifying measures of system performance in terms of freight movement
•Developing freight-oriented data collection models to identify problems and potential solutions
•Create freight movement advisory committees to identify bottlenecks in the freight network
<u>Federal legislation promulgates:</u>
•MPO is responsible for freight movement to be considered in the transportation planning process
•
•Statewide/MPO planning processes to specifically include "freight shippers" and "providers of freight transportation services"
•
•Provide reasonable opportunity to participate in the development of plans and programs as well as all stakeholders, the public, and interested parties

Freight mobility

•Freight
□important part of fully-functioning transportation system
•Efficient movement of freight
□critically important to industry, retail, agriculture, international trade, terminal operators
•Metropolitan areas (particularly w/ports) are especially affected by freight movement issues:
□air cargo airports
□intermodal freight yards
□large trucking terminals
□shipyards

Freight Ton-Mile Trends by Mode

•U.S. domestic freight moved in 1980 were 3.4 trillion ton-miles; by 2004, 4.5 trillion ton-miles

•Growth occurred in three modes – air, truck, rail

•Air freight ton-miles grew 3.5 times 1980 despite sharp decline in 2001- 2002

•Truck freight ton-miles grew over 2 times 1980 level

•Rail Freight ton-miles grew over 1.75 times 1980 level

•Water declined in ton-miles since 1980

Traffic Congestion Rising and Costly

Texas Transportation Institute Congestion Statistics:

• 1982 - 29 % peak travel period congested compared to 63 % -2005 - 48% major road systems congested - 2005, compared to 29% in 1982 - number hours of day congestion grew 4.2 hrs to 7.0 hrs

• Cost of congestion, value of extra travel time, extra fuel consumed by vehicles traveling at slower speeds is $I4.60 per person-hour and $77.10 per truck-hour in 05

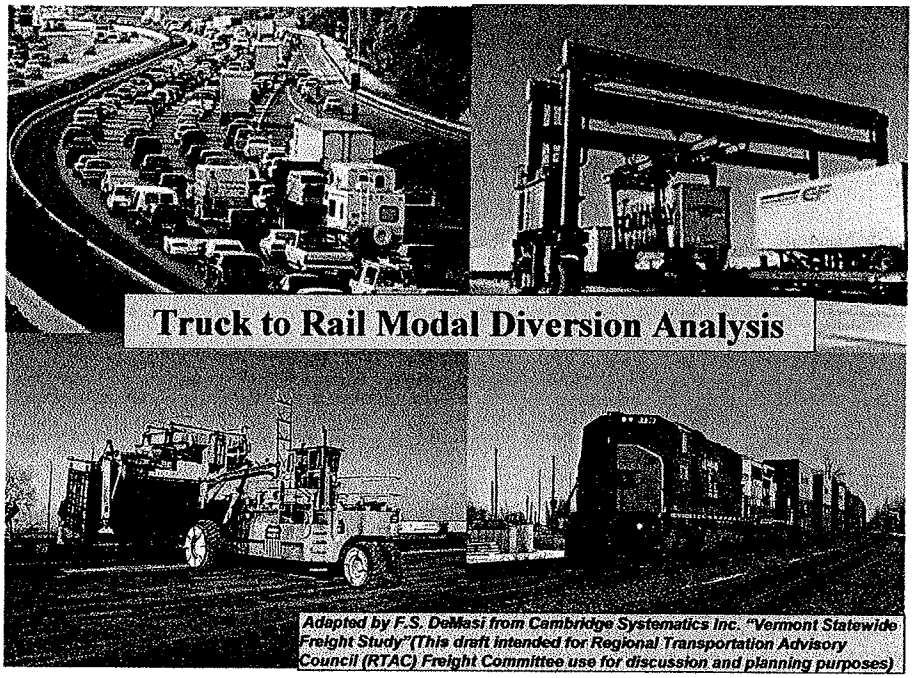
• Congestion results in 4.2 billion lost hours - 2.9 billion gallons of fuel wasted annually - For Boston, Massachusetts, New Hampshire, Rhode Island, 45.1% daily travelers experience congestion, 51% travel congested in peak periods, 29% congested in off-peak periods.

•Multiple strategies for traffic operations, transit, freight Mobility /Modal choices available now can lessen problem

Intermodal Rail Issues/Goals

Goal 1: Improve the Movement of Goods in Eastern Massachusetts
Goal 2: Create a Balanced System for Goods Movement in Eastern Massachusetts
Goal 3: Improve Environmental Quality
Goal 4: Promote Economic Development

Freight transportation provides goods/services the economy depends on and people rely on. Cost of consumables/manufactured goods/raw materials are more expensive in this region



Truck to Rail Modal Diversion Analysis

Adapted by F.S. DeMasi from Cambridge Systematics Inc. "Vermont Statewide Freight Study" (This draft intended for Regional Transportation Advisory Council (RTAC) Freight Committee use for discussion and planning purposes)

Conclusion – Legislative Action

Legislation is needed to create and fund a *Rail Capacity Improvement and Freight Diversion Program* by enjoining public policy to partner with railroads, EOT, MBTA, MassPort, industry, warehousing and logistics providers

This legislation would reduce significantly the adverse impacts of long haul transportation of freight by highway:

- **Reduce traffic congestion on major arterials and interstate highways by increasing rail capacity for both passengers and freight**
- **Increase the competitive advantage of trade for the region, create jobs, and foster economic development opportunities to retain and attract industry**

Creation of public private partnerships to invest in expanding rail capacity, modernize branch rail lines, would reduce the significant burden Truck Freight imposes in the form of additional costs for road repairs, damage to private vehicles from truck damaged highways, damage to air quality/health effects, and from property damage and personal injuries related to accidents.

Truck to Rail Modal Diversion Analysis

It suggested that the Executive Office of Transportation and Public Works EOT perform a truck to rail modal diversion analysis.

Massachusetts has become heavily dependent on freight. The US on average moves over 40% of its freight by rail. Massachusetts' railroads move less than 5 % of its freight.

Rail Freight provides inherent environmental and economic advantages as well as cost avoidances/capital expenditures derived from the use of private ROW in deference to publicly built/maintained ports, roads, and bridges.

Objective:

To outline the basic methodology for constructing a modal diversion model for increasing the amount of freight carried on Massachusetts's railroads and to define the data elements required for conducting the detailed analysis.

The Role of the Executive Office of Transportation and Public Works (EOTPW)

The Executive Office of Transportation and Public Works is the principle architect of transportation planning and development in the Commonwealth.

Chapter 6A of the General Laws describes the scope of EOT's mandate and establishes EOT's role with respect to MassHighway, the MBTA, Massport, the Turnpike Authority, Regional Transportation Authorities (RTAs), and other agencies.

Chapter 161C provides a broad and unambiguous statement of legislative intent with respect to rail transportation and EOT's role in carrying out that intent.

Massachusetts General Law Chapter 161 C, Section 1

"It is hereby declared:

that rail transportation offers economic and environmental advantages with respect to land use, air and noise pollution, energy efficiency, safety and costs per ton mile of movement to the extent that the preservation, development and maintenance of such services is a public purpose and in the public interest;

that essential rail transportation services for the movement of passengers and freight are threatened by the cessation or significant curtailment because of the deterioration or inadequacy of rail rights-of-way either earlier acquired for a public purpose, or because of the insufficiency of inadequacy of rail facilities and related equipment, and because of the inability of private railroad companies to provide such services or facilities without public financial assistance;

that the public convenience and necessity require that . . . adequate and efficient rail services and facilities be provided in the Commonwealth;

that these needs cannot be met without substantial action by the Commonwealth; and

that it is the intent of the General Court to provide for such action through an act which authorizes a public agency to plan for and carry out the steps necessary to acquire, preserve, develop and construct when necessary on lands not formerly owned or used by a railroad, which insures the maintenance and operation of, adequate and efficient rail nghts-of-way, related facilities or equipment, and rail services.

Massachusetts General Law Chapter 161 C, Section 3

The Executive Office [of Transportation and Public Works} shall take such steps as may be necessary to provide for the development, promotion, preservation, and improvement of an adequate, safe, efficient and convenient rail system for the movement of passengers and freight in the Commonwealth.

In carrying out the purposes of this Chapter, the Executive Office shall seek to encourage and develop rail services which promote and maintain the economic well-being of the citizens of the Commonwealth, and which preserve the environment and the Commonwealth's natural resources."

Environmental Advantages of Rail

Every railcar trip removes approximately three truck trips from congested highways

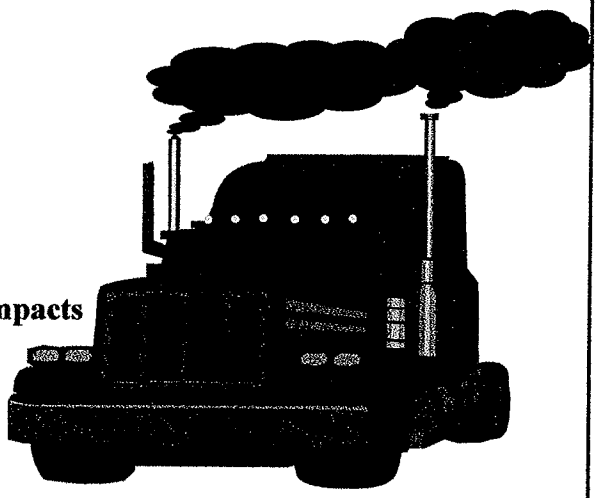
Railroads can move one ton of freight three times as far as 3 trucks on a gallon of fuel

On a per ton-mile basis, railroads emit one-tenth the hydrocarbons and diesel particulates as trucks, and one-third the oxides of nitrogen and carbon

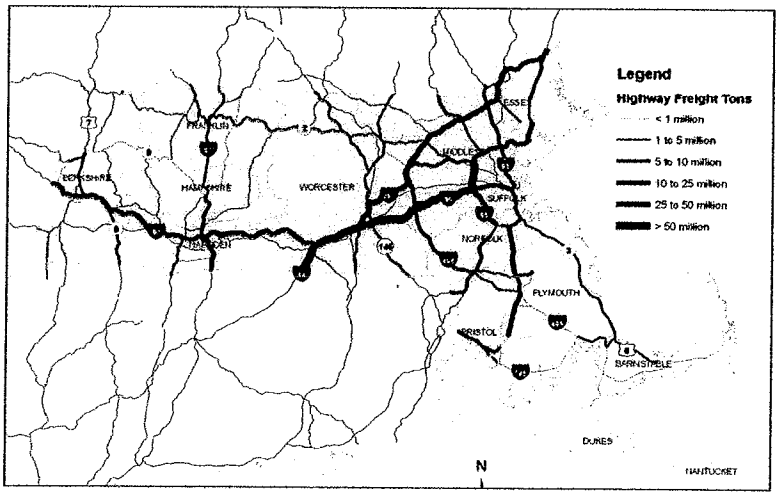
Infrastructure Impacts of Trucks

Hidden Externality costs of long haul trucking are:

- **Pavement wear/tear**
- **Congestion costs**
- **Accident costs**
- **Excess user costs**
- **Air Quality**
- **Noise impacts**
- **Health/environment impacts**



MassHighway Truck Freight Tons



EOT Freight & Rail Plan

Underutilized Rail seen as an Economic and Environmental Opportunity and alternative for Congestion Management

Advantages of Rail Freight:

- **–Rail energy intensity, is 444 Btu/ton mile, and 3,337 Btu/ton mile for trucks**
- **–The EPA estimates trucks emit 6 to 12 times more pollutant/ton mile than Rail**
- **–Freight rail efficiency has improved 72% since 1980, saving 2.8 billion fewer gallons of fuel in 2003**
- **–A single intermodal train can take 280 trucks off our highways**
- **–Studies have estimated cost of highway traffic congestion in the US is $69.5 Billion, representing a cost of 3.5 billion hours of extra travel time and 5.7 billion gallons of fuel wasted sitting in traffic**

Railroads: a component of remedy for Infrastructure, Environmental, Economic Development Deficiencies

To illustrate railroad's advantages versus tractor-trailer truck compare the full cost of moving freight approximately 750 miles*

These costs are of two types:

Direct cost assessed by the freight hauler, rail or truck,
Externality costs imposed by each action.

External costs include:

Congestion imposed on other motorists who suffer additional delay and lost productivity

Accident costs that grow in proportion to travel, much of which is not covered by insurance and environmental damages, both to human health and to the physical environment

*A comparison of the full cost of moving freight by truck compared to moving freight by rail By Brian Ketcham, P.E. July 30,2007

Direct Cost to Move Freight*

There is a savings of approximately 67% to 83% for using railroad services for moving freight long distances

The cost to move freight by rail a distance of 750 miles ranges between $2,000 and $4,000 per rail car depending on the commodity moved

At 100 tons per rail car, this works out to between *$20 and $40 per ton by rail*

This compares to approximately $2,400 for a tractor-trailer truck moving 20 tons of freight 750 miles and returning empty, for a cost of *$120 per ton by truck*

*A comparison of the full cost of moving freight by truck compared to moving freight by rail
By Brian Ketcham, P.E. July 30,2007

A Comparison of Relative Air Pollution Emissions*

COMPARISON OF EMISSIONS FACTORS FOR RAIL AND TRUCK

	EMISSIONS FACTORS (Grams per Vehicle Mile)		EMISSIONS FACTORS (Grains per Revenue Ton-Mile)	
	RAIL	TRUCK	RAIL	TRUCK
Carbon Monoxide (CO)	2.99	3.15	0.030	0.157
Nitrogen Oxides (NOx)	20.24	20.60	0.202	1.030
Volatile Organic Compounds (VOC)	1.10	2.74	0.011	0.137
Particulate Matter (PM)	0.70	1.24	0.007	0.062

Assumes 100 tons per car by rail and 20 tons by tractor-trailer distance of 750 miles.

*A comparison of the full cost of moving freight by truck compared to moving freight by rail
By Brian Ketcham, P.E. July 30,2007

Pollutants Generated by Rail and Truck Freight Movement and Fuel Consumption by Mode*

	EMISSIONS FCTORS (Grams Vehicle Mile)		EMISSIONS FACTORS (Grains Revenue Ton-Mile)	
	RAIL	TRUCK	RAIL	TRUCK
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Assumes 100 tons per car by rail and 20 tons by tractor-trailer.distance of 750 miles.

ENERGY SAVINGS AVAILABLE FROM RAIL VS. TRUCK

	Gallons of Diesel Fuel Per Year		
	Tractor-Trailer	Rail	Saving
Fuel Use at 100 tons rail/20 tons truck	9,915,254	2,854,800	7,060,454
Fuel Use at 64 tons rail/8.9 tons truck	22,033,898	4,453,488	17,580,410

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Truck to Rail Modal Diversion Analysis

Performance measures specifically relevant to freight (e.g., economic development) data sources and measurement methods (e.g., time savings):

- **Congestion mitigation from reduced truck traffic,**
- **Air Quality Improvements,**
- **Reduced Road/Bridge maintenance/replacement costs from trucks**

Effective development/implementation of a modal diversion model requires four key elements:

- **Market definition**
- **Data requirements and collection**
- **Development/application of the diversion model**
- **Application of the model outputs to a network analysis tool**

Data Needs for Truck-to-Rail Modal Diversion Modeling

Definition of Market
- **Origin/destination pairs**
- **Types of commodities**
- **Size of shipment load**

Market
- **Commodity flow data for defined market area**
- **Conversion factors for tons to units calculation (Vehicle Inventory/Use Survey)**

Service Sensitivities
- **Stated-preference survey results for defined market**
- **Consist of data intensive surveys with shippers/receivers that meet market definition**

Alternative Levels of Service
- **Level of service matrices for each defined alternative**
- **Development of new/future service alternatives should be based on private sector expertise, ideally from the transportation service providers**
- **Future alternatives should be based on desired goals/ objectives of transportation policy**

Impacts
- **Truck trip tables for each alternative to model highway impacts and other secondary impacts such as air quality**

Truck to Rail Modal Diversion Analysis
★ Opportunities for modal shift

Top Ten Truck Commodities with an Origin or Destination in MA

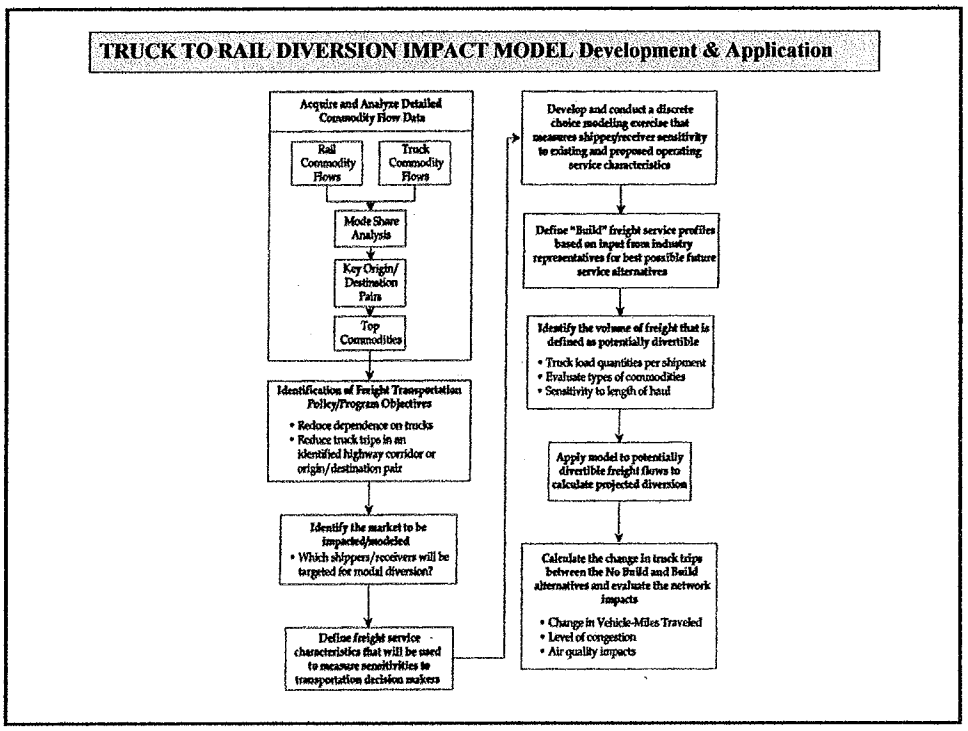
	Commodity - Total O&D	Truck Tons	% Share
	Secondary Traffic	50.87	21%
	Petroleum Or Coal Products	39.52	16%
★	Nonmetallic Minerals	38.28	15%
	Clay, Concrete, Glass Or Stone	35.13	14%
★	Food Or Kindred Products	24.25	10%
★	Chemicals Or Allied Products	20.17	8%
	Primary Metal Products	7.00	3%
	Pulp, Paper Or Allied Products	5.01	2%
★	Lumber Or Wood Products	4.76	2%
	Fabricated Metal Products	4.59	2%
	Total	247.50	93%

Top Ten Rail Commodities with an Origin or Destination in MA

	Commodity - Total O&D	Rail Tons	% Share
	Misc Mixed Shipments	2.15	19%
★	Chemicals Or Allied Products	1.44	13%
★	Food Or Kindred Products	1.33	12%
	Pulp, Paper Or Allie ²roducts	1.21	11%
	Farm Products	0.87	8%
	Waste Or Scrap Materials	0.82	7%
	Transportation Equipment	0.71	6%
★	Nonmetallic Minerals	0.64	6%
	Or Stone	0.58	5%
★	Lumber Or Wood Products	0.53	5%
	Total	11.23	

Note: Though there are 13 million tons of coal traveling on MA rail, 11 million are through and thereby not reflected

Freight & Rail Plan



Truck to Rail Modal Diversion Analysis

The final step/analysis incorporates output data from mode choice model into the travel demand model

Massachusetts truck freight model consisting of truck trip tables is reliable source to assess changes in demand forecasts

The freight model uses the accepted statewide travel demand model developed for all vehicles

This model ensures consistency among planning practices in Mass and facilitating rigorous analyses, such as congestion/air quality impacts

Allows EOTPW to measure impact of the build alternatives as they relate to VMT, levels of congestion (V/C ratios), and secondary impacts such as change in vehicle emissions

EXAMPLES OF RAIL FREIGHT SOLUTIONS

1. ***Enhancement of rail freight capacity and service for intercity corridors*** - e.g., Pennsylvania Double Stack Clearance Project, Virginia I-81 Marketing Project, Netherlands Betuweroute
2. ***Enhancement of rail capacity and service along urban corridors*** - e.g., California Alameda Corridor Project, Kansas City Sheffield Flyover
3. ***Plans to enhance throughput and capacity of regional rail freight system*** — Vancouver MCTS Plan, Chicago Rail Futures Plan
4. ***Enhancement of rail freight options for service to ports/terminals*** - e.g., State rail access programs and Inland Ports.

Truck to Rail Modal Diversion Analysis

Adapted by F.S. DeMasi from Cambridge Systematics Inc. "Vermont Statewide Freight Study" and a study by Bryan, Weisbrod and Martland (This draft intended for Regional Transportation Advisory Council (RTAC) Freight Committee use for discussion and planning purposes)

It suggested that the Executive Office of Transportation and Public Works EOT perform a truck to rail modal diversion analysis.

Data Needs and Methodology for a Modal Diversion Analysis

Massachusetts has become heavily dependent on trucks for the movement of freight. The US on average moves over 40% of its freight by rail. Massachusetts' railroads move less than 5 % of its freight. Freight rail provides inherent environmental and economic advantages as well as cost avoidances and capital expenditures derived from the use of private ROW in deference to publicly built and maintained ports, roads, and bridges. Trucks carry over 94 percent of the tons of freight moved on an annual basis into, out of, and within Massachusetts. This disproportionate use of a single mode of transport provides an opportunity for the Executive Office of Transportation and Public Works (EOTPW), the Executive Office of Housing and Economic Development (EOHED), and the Executive Office of Environmental Affairs (EOEA) to perform a study to evaluate benefits to be derived from a "Modal Diversion Analysis" as part of a state wide Strategic Intermodal System (SIS)*.

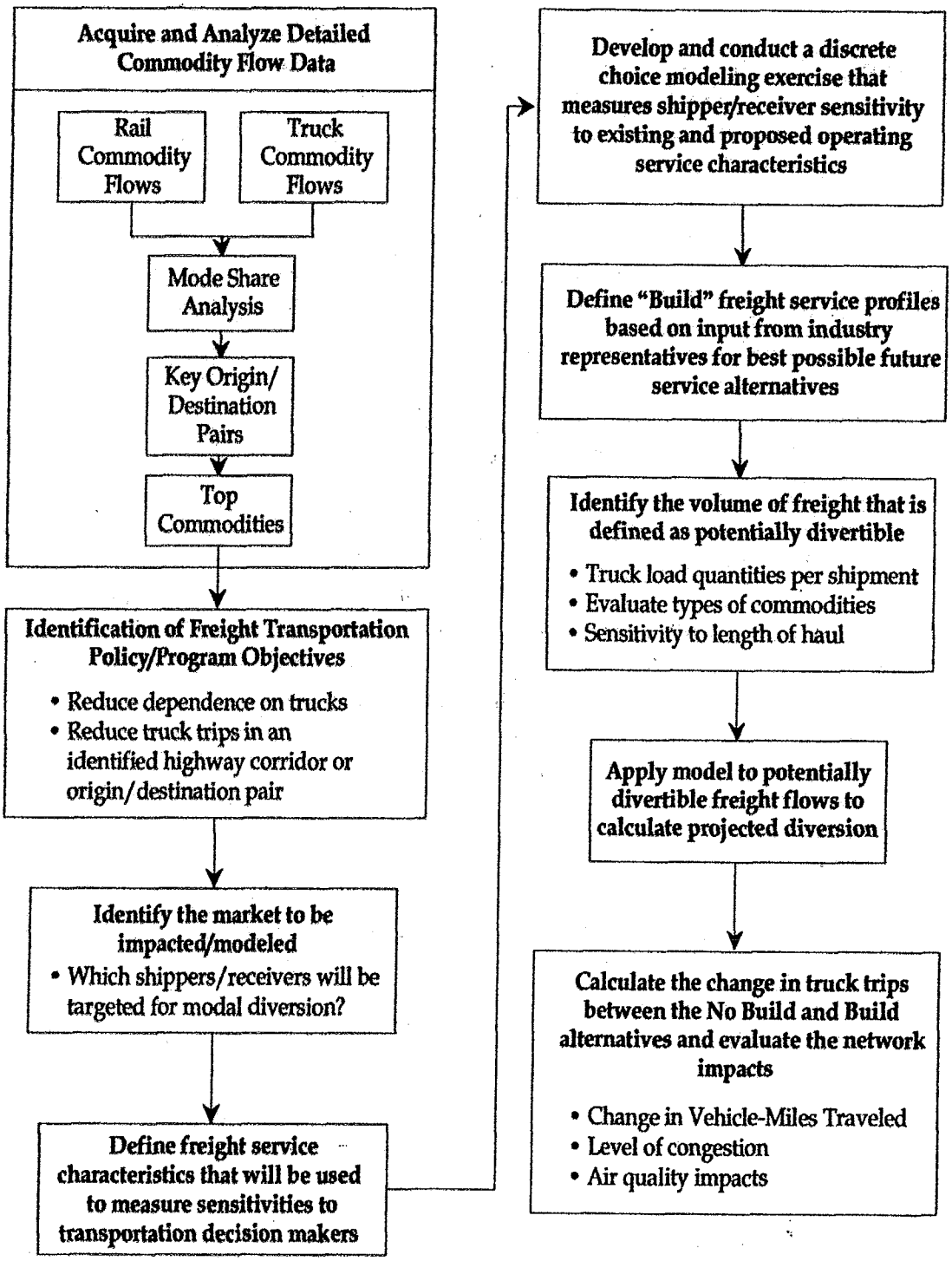
The objective of the study is to outline the basic methodology for constructing a modal diversion model for increasing the amount of freight carried on Massachusetts's railroads and to define the data elements required conducting the detailed analysis.

In most cases, transportation projects will benefit passenger and freight travel to varying degrees. The freight evaluation process is meant to be a generic framework that includes all projects, regardless of their focus. However, performance measures specifically relevant to freight **(e.g., economic development)** as well as appropriate data sources and measurement methods **(e.g., time savings/congestion mitigation from reduced truck traffic, Air Quality Improvements, and reduced Road and Bridge maintenance and replacement costs from trucks)** should be explicitly included. If some types of beneficial projects are systematically overlooked with existing criteria, it may be desirable to revise the selection criteria to consider these projects or to set aside separate funding for these types of projects.

In order to effectively develop and implement a modal diversion model, four key elements must be addressed. They consist of (1) market definition, (2) data requirements and data collection, (3) development and application of the diversion model, and (4) application of the model outputs to a network analysis tool. Although each of these components may separately provide some benefit to the EOTPW/EOEA, it is necessary to address all of them to complete a thorough modal diversion analysis. The Process chart below illustrates the steps in developing and applying a truck-to-rail modal diversion and transportation system impact model. The following describes the sequence of analytical steps that should be employed to complete this type of analysis.

* A Strategic Intermodal System (SIS) is a transportation system including the state's largest and most significant commercial service airports, deepwater seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways and highways and regionally significant facilities and services **(strategic)**, contains all forms of transportation for moving both people and goods, including linkages that provide for smooth and efficient transfers between modes and major facilities **(intermodal)**, integrates individual facilities, services, forms of transportation (modes) and linkages into a single, integrated transportation network **(system)**.

Truck-to-Rail Diversion and Transportation System Impact Model Development and Application



The first step in a modal diversion analysis is to identify a specific corridor or market to be tested. This type of analysis cannot be undertaken in a general, non-specific way. A type of movement/operation must be defined. Data is then collected and analyzed to address the selected scenario. This is critical because the stated-preference survey will be designed to estimate the shippers'/receivers' sensitivities to specific transportation service alternatives.

For example, to measure the potential diversion of commodity shipments from the Port of New York/New Jersey, or Distribution Centers in Eastern Pennsylvania to Boston, Gloucester, Fall River, New Bedford or Providence from truck to rail, the analysis would need to be designed to define existing truck and rail service characteristics in those corridors, identify potential rail improvements (service, infrastructure, etc.), and then identify shippers/receivers currently moving commodities between those points. Users would then be engaged in a stated-preference survey exercise to identify sensitivities to service characteristics. These preferences will populate a stated-preference model. Specific future alternatives then will be developed with service characteristics. The stated-preference model will then be applied to these specific service options and the potential market to calculate diverted freight flows.

The second step of the analysis is to identify the data requirements necessary to build the models and develop a data collection plan to accommodate these needs. Table below provides an overview of the data requirements. The commodity flow data purchased by EOTPW from Reebie Associates would provide base data with future years. These data sets would represent current and future freight flows under anticipated economic and demographic growth forecasts. Thus they would represent "no-build" conditions, as they would not account for any major infrastructure enhancements or modal shifts. Other data components would include detailed transportation service characteristics for no build and build alternatives, conversion factors to go from tons to units, stated-preference survey data, and truck trip tables for use in the statewide travel demand model. The stated-preference survey data would be used to estimate sensitivity to rail/truck level of service and forecast changes in truck market share in response to improvements in travel time, reliability, and cost for freight transportation alternatives. The truck trip tables developed, as part of the truck freight model would be used as the base against which the impact of diverted tons/trips would be analyzed.

The third step of the analysis is to develop a mode choice model. This is developed from the stated-preference survey data and is the core of the modal diversion analysis. The models should be sensitive to all policy-related factors (i.e., time, cost, reliability, etc.) expected to differ between the no-build and build alternatives. The model's level of service defined for both the no build and build alternatives also will need to be produced at the desired level of origin and destination (O-D) detail.

Data Needs for Truck-to-Rail Modal Diversion Modeling

Definition of Market

- Origin/destination pairs

- Types of commodities
- Size of shipment load

Market

- Commodity flow data for defined market area
- Conversion factors for tons to units calculation (i.e., Vehicle Inventory and Use Survey)

Service Sensitivities

- Stated-preference survey results for defined market

- This will consist of data intensive surveys with shippers/receivers that meet the market definition

Alternative Levels of Service

- Level of service matrices for each defined alternative

- Development of new/future service alternatives should be based on private sector expertise, ideally from the transportation service providers

- Future alternatives should be based on desired goals/ objectives of transportation policy

Impacts

- Truck trip tables for each alternative to model highway impacts and other secondary impacts such as air quality

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A choice survey presents respondents with a series of future choices (in this case, the transportation mode they would use to ship their products) in which service attributes such as travel time, cost, and reliability are systematically varied. The results are input to a mathematical model that determines the tradeoff points among the attributes where the respondents will change mode. ***(It is noted many rail corridors operated by some regional and branch line railroads in Massachusetts are in poor condition and the model should also include evaluating impacts of raising all corridors to class 3 condition and 286,000# capacity as a minimum)***

This technique is used to forecast consumer response to products and services that do not presently exist. Typical applications include new public transportation services, such as a rapid transit system in a region with only bus service today, or innovative consumer products such as cellular telephones and paging devices. The advantage of this approach compared to standard survey techniques is that it does not simply rely on what a respondent says they might do, but quantitatively tests these responses against a defined set of service attributes. In these choice surveys, different shipping alternatives would be described in terms of the attributes that describe the alternative - travel time, cost, reliability, frequency of service, delivery window, destination in the defined

Massachusetts region, and any physical changes to the infrastructure impacting route selection. In the choice surveys, the values of each of these attributes are systematically varied, asking the shipping decision-makers to choose an alternative under varying levels of service. This information is then estimated to identify how shipping decision-makers tradeoff the attributes when making their shipping decision. Finally, these models are applied to estimate how shippers would make their decisions for the actual proposed new freight transportation alternatives.

The fourth and final step of the analysis is to incorporate the output data from the mode choice model into the travel demand model. The Massachusetts truck freight model consisting of truck trip tables created, as part of the study is the most reliable source to assess changes in demand forecasts. The freight model uses the accepted statewide travel demand model developed for all vehicles. Using this model ensures consistency among the planning practices in Massachusetts and will facilitate more rigorous analyses, such as congestion and air quality impacts. This will allow EOTPW to measure the impact of the build alternatives as they relate to vehicle-miles of travel, levels of congestion (V/C ratios), and secondary impacts such as the change in vehicle emissions.

Evaluate the Feasibility of Operating Intermodal Facilities

Intermodal transportation is considered an efficient method for moving freight because it maximizes the service strengths of each mode. While extensive intermodal service exists in Massachusetts today, EOTPW should support its expanded use to achieve a better modal balance and to mediate existing truck traffic on Massachusetts' highways. ***Therefore, this study should include an assessment of the feasibility of enhancing rail/truck intermodal services in Massachusetts.*** The study needs to identify specific issues associated with intermodal service, consider the benefits of improved intermodal service, and evaluate the role the state in promoting and implementing new and improved intermodal services. This section describes rail/truck intermodal service and its application to Massachusetts' shippers and receivers, presenting recommendations for new and improved service opportunities.

"Intermodal freight" was first defined as trailers moved on rail flatcars or containers moved on rail flatcars (TOFC/COFC). The study may be limited to the evaluation of TOFC/COFC freight movements of rail cars to and from intermodal terminals and the corresponding pickup and delivery by truck. This is the traditional definition of intermodal, but the study would be more useful to expand the definition to include a full range of rail/truck transfer operations, including transload, warehousing, and bulk transfer facilities. A non-traditional intermodal business also included in an evaluation is the movement of express freight by rail, using existing passenger train service. The decision to expand the definition is based on a cursory overview of traditional intermodal markets, which typically are high-density urbanized areas with large consuming or producing markets. It also is based on interviews with shippers and railroads that report a need for transload facilities throughout the state.

TOFC/COFC Intermodal

TOFC/COFC intermodal service is an important topic for Massachusetts. It represents a combination of rail and truck services primarily in longer-haul markets where the strengths of each mode can be maximized. Existing TOFC/COFC has been carried on 3

Massachusetts rail lines; there were 4 termination/origination of this freight in the state. These shipments primarily included the movement of products from the U.S. Midwest, Ports of NY/NJ and Canada. The principle routes are via the CSX line from Syracuse NY, Pan Am from Halifax Canada (no longer operating), New England Central RR (NECR)** line from its current connection to Canadian National (CN) at East Alburgh, to the Palmer MA. A large portion of this traffic terminated on the Massachusetts Central Railroad (MCER)*** at Palmer from which the containers were unloaded and distributed to the metropolitan areas of New England. Other routes of TOFC/COFC traffic utilize the CSX at East Springfield, Worcester and Boston and Pan Am/Norfolk Southern at Ayer, MA. As such, Massachusetts has functioned as an intermodal gateway for certain markets.

Massachusetts' shippers and receivers use regional terminals to access TOFC/COFC service. The closest ramps are located in Massachusetts, New York, and Quebec. This study would analyze the available data to describe the existing service options and define what Massachusetts should do in the upcoming years to improve the TOFC/COFC service opportunities.

Since intermodal moves are typically long haul, access to the North American intermodal rail system is critical. Massachusetts's railroads have connections to the network at several locations. The sale and division of Conrail to the Norfolk Southern and CSX Corporation railroads has impacted the connections of Massachusetts's railroads with national carriers. The connections to Massachusetts's rail systems are now increased with the ability to directly move traffic to these two national carriers. Prior to the Norfolk Southern and CSX purchase, the connection of Massachusetts's railroads to the national rail system was primarily via the single carrier, Conrail. The benefit of this is increased options for the railroads of Massachusetts to negotiate with the connecting railroads. This always affords an advantage over negotiations with a single carrier.

Massachusetts's rail system also provides multiple rail gateways to the Canadian National and Canadian Pacific systems. These systems connect with the east and west coasts, as well as the major terminal points in the Midwest. The movement of overseas containers through the Canadian ports of Halifax and Vancouver has the potential to provide significant intermodal opportunities for Massachusetts's rail operations.

The market for TOFC/COFC intermodal service has experienced a strong growth trend since its introduction more than three decades ago. This has occurred based on several factors, including: fuel efficiency, convenience and partnerships; improved air quality; the need for reduced highway congestion; innovative technologies such as double-stack; changing patterns in truck delivery; and consolidation of overseas shipping rates.

TOFC/COFC movements in Massachusetts are limited to single-stack operations for domestic containers or mixed double stack using one international container stacked with one domestic container or two international containers limited to under 19'6" vertical clearance restrictions on rail lines in Massachusetts. All of the Massachusetts deep-water ports have both vertical clearance and 286,000# capacity constraints to rail access.

Considering that the majority of TOFC/COFC traffic moves in double-stack configuration this is a major obstacle that needs to be overcome. For instance, the clearance restrictions prevent COFC movement on CN and CP lines to connect to existing intermodal terminals via Massachusetts's rails. Elimination of these restrictions by accelerating a specific program for increasing vertical clearances by bridge rehabilitation and modification over selected double stack rail corridors will provide Massachusetts lines substantial opportunities for movement of TOFC/COFC traffic to terminals in Massachusetts and New England. As such, the establishment and priority by EOTPW of construction of double-stacked clearance routes utilizing Massachusetts rail lines has the potential to divert trucks that currently transport trailers and containers from the Ports New York/New Jersey, Distribution centers in Pennsylvania, Chicago, and Canada. Future coastal shipping opportunities would be enhanced by landside rail connections to our South Coast ports and the Port of Boston as future development of short haul intermodal rail becomes feasible.

From Bryan, Weisbrod and Martland

EXAMPLES OF RAIL FREIGHT SOLUTIONS

Categories of Examples. There are existing examples of built projects and mature plans that enhance and support the growth of rail freight services as an alternative to reliance on congested roads. Projects examined by the study team generally fall into four categories:

1. *Enhancement of rail freight capacity and service for intercity corridors* - e.g., Pennsylvania Double Stack Clearance Project, Virginia 1-81 Marketing Project, Netherlands Betuweroute
2. *Enhancement of rail capacity and service along urban corridors* - e.g., California Alameda Corridor Project, Kansas City Sheffield Flyover
3. *Plans to enhance throughput and capacity of regional rail freight system* — Vancouver MCTS Plan, Chicago Rail Futures Plan
4. *Enhancement of rail freight options for service to ports/terminals* - e.g., State rail access programs and Inland Ports.

Case Study Examples. A short synopsis of selected examples is shown below.

- ***Pennsylvania Double Stack Clearance project*** - Pennsylvania DOT coordinated the work of the railroads and contractors, who "cleared" 163 obstacles so that double stack container trains could serve the Port of Philadelphia. This involved a combination of undercutting rail rights-of-way, raising vertical clearances on railroad bridges and tunnels, as well as highway and township road bridges. The project covered Conrail's east-west route from the Ohio border to the port, and Canadian Pacific's north-south route from the New York border to the port. In addition, the project improved horizontal clearances in order to accommodate dimensional movements from Wilkes-Barre to the Port of Philadelphia. The project benefits were: (a) reduced shipping cost and improved service for the region's shippers, (b) some newly viable competitive rail alternatives where none had previously existed, (c) gain of dimensional traffic for the port and gain of

intermodal traffic for the railroads, and (d) a dramatic increase of trucking and warehousing employment in the area.

- ***Virginia Interstate 81 Marketing Study*** - The Virginia Department of Rail and Public Transportation studied the potential for new railroad freight services to attract truck traffic from Commonwealth highways, for the alleviation of roadway congestion and improvement of safety. The project employed market research, competitive and operational analysis, diversion modeling with traffic data, and cooperative planning with railroad officials to establish the product features and attendant costs and investments that would be required to shift varying levels of highway volume to rail. Earlier studies had determined that the direct benefits of freight modal diversion along 1-81 were significant, and included improvements in highway user, safety, and pavement maintenance costs, as well as in air quality. The project identified public investment needed to upgrade right of way and expand or develop terminals to allow the introduction of new intermodal trains, raise then- performance characteristics, and reduce their cost of operation to the point where it would shift the competitive modal balance.

- ***Betuweroute Freight Line*** - The Netherlands Ministry of Transport and the NS Railinfrabeheer Railroad partnered to develop a 160 km, US $5 billion freight-only rail line from the Port of Rotterdam to the German border, linking with the German rail network. It included five tunnels with a total length of 18km and 130 bridges and viaducts with a total length of 12 km, all electrified and built to accommodate double stack trains operating at a speed of 120km/h, with up to ten trains per hour in each direction. The nearly completed project was designed to expand freight rail capacity and protect the competitive trade position of the Netherlands and its major port. It is one of the 14 priority infrastructure projects supported by the European Commission as part of its effort to discourage road haulage in favor of rail freight across Europe. As such, the Betuweroute is expected to reduce roadway congestion and yield environmental benefits.

- ***Alameda Corridor*** - The State of California and Los Angeles County MTA provided major support for a new freight rail expressway, connecting on-dock and terminal rail facilities at the Los Angeles and Long Beach ports to inland terminals and the continental rail network. The current corridor consists of 20 miles of public, multi-track rail line, half of it grade separated in a sub-street trench. The $2.4 billion project consolidates access to the country's top international container port by its two serving Class I railroads, with capacity for one hundred trams per day at speeds of 40 miles per hour, in an urban environment. As part of the project, two hundred grade crossings were eliminated by rebuilding the right of way and by redirection of traffic to a consolidated route. This was estimated to remove 15,000 daily hours of vehicle delay from Los Angeles roads. At the same time, the street parallel to the rail corridor was widened and improved as part of the right of way reconstruction, leading to better traffic flow. The corridor is expected to substantially reduce the growth in truck trips associated with port container activity expansion.

- ***Kansas City Sheffield Flyover*** -A public/private partnership of railroads and Missouri DOT funded development of three miles of elevated tracks in Kansas City to increase the

capacity and improved the performance of a major bottleneck in the rail network. At-grade crossing of high-density rail routes had not only led to train backups, but also caused extensive delays to highway traffic when trams blocked local streets. The resulting delays were especially difficult for trucks seeking to enter or exit a major industrial area hemmed in between the main lines. By double-tracking the flyover and keeping the existing tracks, it was possible to greatly increase the capacity of the intersection, improving flow of through trains and allowing better service to local rail customers. The project eliminated rail and highway delays associated with train interference at the rail crossovers.

- ***The Major Commercial Transportation System*** (MCTS) for the Vancouver region of British Columbia is a system of key transportation facilities and routes planned to improve both rail and highway connections to the region's to external gateways and major commercial activity centers. The MCTS planning process identified a set of surface transportation projects designed to support a balanced flow of rail and truck movements. They were intended to minimize local traffic congestion, while maximizing the economic health of the region's international gateway function - which is the flow of people and cargo to and from marine port, airport and international border crossing facilities. The "Current and Planned Infrastructure List" makes the case for 17 major new investments, comprising highway upgrades, rail links, new road and rail river crossings, a new rapid transit line and an additional harbor crossing, with a cost of CANS 6 to $7 billion.

- ***Chicago Freight Rail Futures*** - Chicago's undeniable stature as the nation's rail freight hub has immersed that city in the issues of multi-modal policy development. At present, nearly 60% of all US rail intermodal traffic and one-third of all US rail traffic flow through the Chicago region. As overall rail traffic volumes have grown and mergers have concentrated volumes on fewer and fewer traffic corridors, the region has faced a growing rail congestion problem. Although trains can make the trip from the West Coast to Chicago in a truck-competitive two days, once they get to Chicago they can take three more days just to move across town by truck. This adds to urban congestion, especially with 600 at-grade rail crossings in Chicago. The City of Chicago DOT, along with the Chicago Metropolis 2020 organization and the Chicago Coordinating Committee of the railroads have each studied needs for improving freight service and movement through the city. The proposed $1.5 billion CREATE (Chicago Regional Environmental And Transportation Efficiency) Project, envisioned as a public-private partnership, would maximize the use of five rail corridors, create grade separations at 25 road-rail crossings, and create six rail-to-rail "flyovers" -overpasses separating passenger trains from freight trains. The project has not yet been developed, as public funding is still pending.

- ***State Rail Access Programs*** - Many states have local transportation grant programs designed to help fund local rail and/or highway projects that are needed to help attract and expand industry in the state. Several of these states operate separate rail grant funding programs that are specifically focused on supporting local projects that address these economic development objectives. Maine's Industrial Rail Access Program and Ohio's Rail Economic Development Program are particularly interesting examples of rail economic development programs, since programs in those states have documented how

then- projects have explicitly served to reduce highway demand and associated needs for highway-related investment. In both states, most projects are new or rehabilitated rail sidings and spur lines, although the eligible projects can include transload facilities, bridges, rail/roadway crossings, track interchanges and rail yards.

- ***Inland Ports*** - A true "Inland Port" is a remote freight processing facility and connecting infrastructure that provides advanced logistics for ground, rail and marine cargo movements outside of the normal boundaries of marine ports. In effect, it extends a marine port to an off-site, inland location by providing a remote, inland multimodal distribution center for marine/rail and marine/truck transfers, with a direct rail or barge shuttle that moves cargo between ocean-going vessels at the main port and the intermodal transfer site on a frequent basis. By relocating the truck and rail distribution facilities away from the main port site, the inland port facility can reduce congestion from truck traffic in the area of the main port, reduce rail/roadway intersection delays, and remove constraints on port expansion that are attributable to truck capacity limitations. Examples include the Virginia Inland Port (VIP), the European Container Terminal (ECT) in the Netherlands, Nilai Inland Port (NIP) in Malaysia, and New York's Port Inland Distribution Network (PIDN).

** **The Massachusetts Central Railroad Corporation (Mass Central)** was established in 1975 to provide railroad transportation services between Palmer and South Barre, MA. In 1976 Mass Central was formed by a group of local businessmen and railroad enthusiasts, who recognized the need for freight service between Palmer and South Barre. Mass Central began operating along the 25-mile track in 1979.

In 1984 Mass Central established the first "inland port" facility in Palmer, MA for the handling of international intermodal container traffic and the ability to receive and ship trailers and containers via CN, CSXT, CPRS or NECR. Mass Central is a U.S. Customs Bonded facility so containers and trailers can be received from throughout the world without having to go through customs until unloading in Palmer. Mass Central has two bulk terminal yards that can provide 165 accessible car spots for transloading from railcars. Mass Central maintains a state-of-the-art networked computer system and can EDI to any railroad or shipper with the same capabilities.

*** **NEW ENGLAND CENTRAL RAILROAD (NECR)** operates 327 miles of railroad between the Vermont and Quebec border just south of Montreal on the north and tidewater at the Port of New London, CT on the south. NECR features seven days per week service to all major interchange points with 4 Class 1 railroads; Canadian National at East Alburgh, VT, Canadian Pacific at Bellows Falls, VT, Norfolk Southern at Bellows Falls, VT and CSXT at Palmer, MA. Other rail partners include the Vermont Railway at Burlington, the WACR, CCRR, ST, GMRC, MCER and PW interchanges at various points in Vermont, Massachusetts and Connecticut.

NECR provides service of mixed (import and domestic) double stack COFC container clearances from Canadian border to PW at Willimantic, CT to/from intermodal terminal in Worcester, MA. NECR also provide on-dock transatlantic steamship access at Port of New London, CT. There is availability for railcar storage and on-line public warehouse and transfer yard facilities for rail/truck, truck/tail and rail/ocean service. Major commodities featured for movement on the NECR include lumber, panels & plywood, poles, newsprint, printing paper, compressed gas, chemicals, fuel oils, road salt, ferrous and non-ferrous metals, fabricated metals, resins, TOFC/COFC, finished vehicles, feed mill ingredients, machinery & equipment, recyclables, ash, construction debris, foodstuffs and non-metallic minerals.

National Clean Diesel Campaign Clean Diesel Programs

FY09 Clean Diesel Program Overview

National Clean Diesel Campaign

The Good News

- Cost-effective solutions are available now
- Funding is available for a second year (Fiscal Year 2009) 300M
  - An estimated ~~$49.2M~~ is available in FY 09
  - Appropriations can vary from year to year however so watch EPA's web site for any updates (current estimate: $300M)
  - Final budget amount → TBD

www.epa.gov/cleandiesel

2

National Clean Diesel Program
$49.2 Million for 2009 [estimated]

National $34.4 Million (70%)	**State** $14.8 Million (30%)
National Clean Diesel Funding Assistance Program $27.6 M	State Clean Diesel Grant Program $14.8 M: State Base / Matching Bonus
Clean Diesel Emerging Technologies Program ~$3.4 M	
SmartWay Clean Diesel Finance Program ~$3.4 M	

National Clean Diesel Campaign
$49.2 Million for 2009 [estimated]

National Component
$34.4 Million
(70%)

Competitive equipment grant process managed through EPA regions

National Clean Diesel Funding Assistance Program ~~$27.6 M~~ 158M – ~9M in New England

SmartWay Clean Diesel Finance Program ~~$3.4~~ 30M

Clean Diesel Emerging Technologies Program ~~$3.4 M~~ 20M

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Regional Collaboratives

- Northeast Diesel Collaborative (Regions 1, 2)
  - http://www.northeastdiesel.org/
- Mid-Atlantic Diesel Collaborative (Region 3)
  - http://www.dieselmidatlantic.org/diesel/index.htm
- Southeast Diesel Collaborative (Region 4)
  - http://www.southeastdiesel.org/
- Midwest Clean Diesel Initiative (Region 5)
  - http://www.epa.gov/midwestcleandiesel/
- Blue Skyways Collaborative (Regions 6, 7 plus Minnesota)
  - http://www.blueskyways.org/
- Rocky Mountain Clean Diesel Collaborative (Region 8)
  - http://www.epa.gov/region8/air/rmcdc.html
- West Coast Collaborative (Regions 9, 10)
  - http://westcoastcollaborative.org/

5

National Clean Diesel Funding Assistance Program: Eligible Entities

- Regional, state, local, tribal or port agency with jurisdiction over transportation or air quality; and
- Nonprofit organization or institution which
  - Represents or provides pollution reduction or educational services to persons or organizations that operate diesel fleets; or
  - Has, as its principle purpose, the promotion of transportation or air quality

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National Clean Diesel Funding Assistance Program: Public Fleets

At least 50% of funding is dedicated for the benefit of public fleets

- Includes private fleets contracted or leased for public purpose, such as private school buses or refuse haulers
- Only eligible entities can apply directly for funds (i.e., school district applies on behalf of private school bus contractor; non-profit organization applies on behalf of truckers)

7

National Clean Diesel Funding Assistance Program: Use of Funds

- Cannot fund the cost of emissions reductions mandated under Federal, State or Local law
  - Early compliance can be funded
- Grants are not for emissions testing
- Grants are not for cleaner-fuels infrastructure, such as tanks, fueling stations, etc.

8

National Clean Diesel Funding Assistance Program: Use of Funds

- Technologies and engines must be verified and/or certified by USEPA or CARB www.epa.gov/cleandiesel (select *Verified Technology List*)
- Incremental cost of engine replacement (sent to be remanufactured or scrapped), engine repower, engine rebuild

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National Clean Diesel Funding Assistance Program: Use of Funds

- Idle Reduction Technologies (EPA verified)
  - Electrified Parking Spaces (truck stop electrification)
  - Shore Connections Systems and Alternative Maritime Power
  - Auxiliary Power Units and Generator Sets
  - Fuel Operated Heaters
  - Battery Heating and Air Conditioning Systems
  - Thermal Storage Systems

http://www.epa.gov/cleandiesel
select *Idle Reduction* for updates

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Hybrids (diesel/electric) eligible

National Clean Diesel Funding Assistance Program: Use of funds

- Cleaner fuels
  - Covers incremental costs of cleaner fuel versus conventional diesel fuel
- Innovative Finance Projects
  - Regional or state -specific programs (for vehicles or engines operating exclusively within a State, Territory or Tribal Land)
  - Should offer improvement on rates, FICO scores, availability, etc.

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National Clean Diesel Funding Assistance Program: Eligible Fleets and Equipment

- Buses
- Medium or heavy duty trucks
- Marine engines
- Locomotives

- Nonroad engine, stationary engine or vehicle used for:
  - Construction
  - Handling of cargo (including at a port or airport)
  - Agriculture
  - Mining
  - Energy production

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National Clean Diesel Funding Assistance Program: Priority Projects

Project proposals that align with these priorities will rank higher in the evaluation process:

- Maximize public health benefits
- Are the most cost-effective
- Are in areas with high population, air quality issues, and air toxic concerns
- Are in areas that receive a disproportionate quantity of air pollution (i.e. truck stops, ports)
- Maximize the useful life of the engine
- Conserve diesel fuel and utilize ULSD (early introduction of ULSD for nonroad projects)

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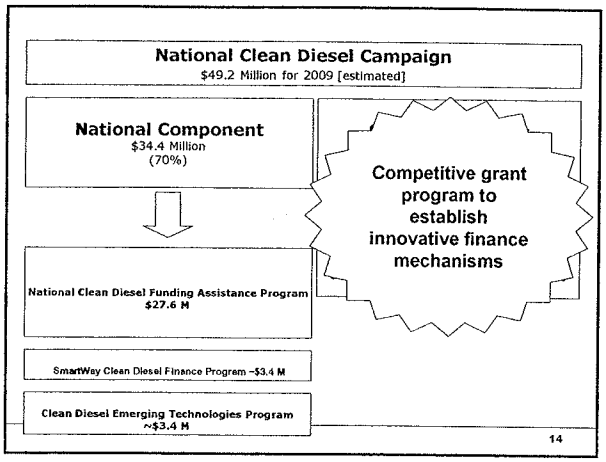

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SmartWay Clean Diesel Finance Program: Overview

- Two distinct funding opportunities for innovative financing:
  - Apply to Regional request for proposals if: the application establishes an innovative finance program limited to eligible vehicle or equipment owners that reside within the Region (s) providing the request for proposals. (Not all Regions may include financing so check the RFP)
    - Note, there is no requirement that the eligible vehicles or equipment operate exclusively within the Region (s) providing the request for proposals
  - Apply to the National Smartway Clean Diesel Financing request for proposals if: the proposal establishes an innovative finance program for eligible vehicle or equipment owners that reside within multiple collaboratives or provide opportunities on a National scale.
- Everything else is the same:
  - Same eligible entities
  - Same eligible vehicles & equipment
  - Same priority projects

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SmartWay Clean Diesel Finance Program: Use of Funds

- Finance Program grants are used to establish innovative financing projects. The projects must:
  - Result in lower loan interest rates for the buyer of clean vehicles or equipment; and/or
  - Result in greater loan approvability rate for the buyer of clean vehicles or equipment; and/or
  - Result in an increased financial incentive for buying clean vehicles or equipment when compared to similar vehicles or equipment without the clean technology

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Examples of Innovative Finance Projects

- **Loan guarantee**
  - Grant funds are used to guarantee repayment of loans made by a lender
  - In case of default, the lender uses funds to reimburse the lender
- **Equity investment**
  - Uses grant funds to leverage additional funds from a lending institution.
  - The lower interest rate comes from blending of grant funds and borrowed funds.
- **Tax-exempt or taxable bonds**
  - The finance program may be used to underwrite the cost of issuing a bond which is then used to create innovative loans to support eligible activities.
  - Bond allows a public or private entity to raise capital by promising to pay a certain interest rate over a predetermined period of time.
- **Revolving loan fund**
  - Grant funds are used to make direct loans.
  - As borrowers pay the loans back, the returned money is re-loaned to support eligible activities.

See www.epa.gov/cleandiesel for more information

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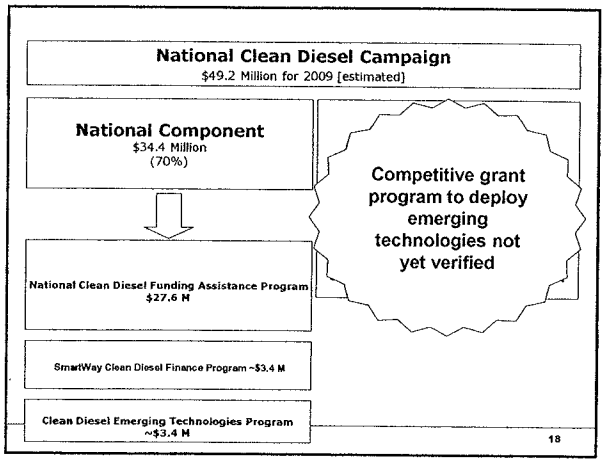

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Clean Diesel Emerging Technologies Program: Overview

~$3.4 million in FY09

- Separate grant competition from the national funding assistance program
- Program is designed to establish projects that will use technologies not yet verified and/or commercialized but on EPA's emerging technology list (see www.epa.gov/cleandiesel *emerging technologies*)
- Program does not pay for research and development
- Only eligible entities can apply

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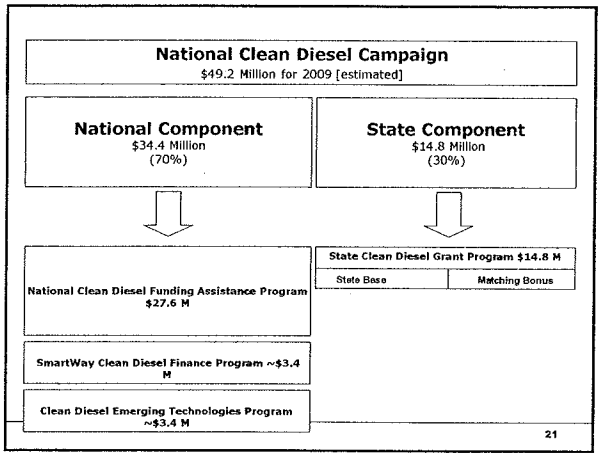
Clean Diesel Emerging Technologies Program: Manufacturers

- Manufacturers should partner with an eligible entity
- Manufacturers must be on EPA's emerging technologies list prior to closing date of RFP
  - To get on this list, manufacturers must work with EPA to apply for verification and develop a test plan for evaluating their technology

www.epa.gov/cleandiesel
select *Emerging Technologies*

20



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State Clean Diesel Grant Program: Use of Funds

- States shall use funds to develop and implement grant and low-cost revolving loan programs as appropriate to meet State needs and goals relating to the reduction of diesel emissions
  - 15% cap on administrative costs
- Grants or loans provided by States may be used for projects related to certified engine configurations, verified technology (including idle reduction) or emerging technologies
  - States can subgrant funds

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Clean Diesel Programs: Wrap-Up

- Are you an eligible entity?
- Which program applies to you?
- Could you partner with an eligible entity?
- When are applications due?
- What is the best technology for your fleet?

Need more info? www.epa.gov/cleandiesel

National Clean Diesel Campaign

Resources

National Clean Diesel Campaign
http://epa.gov/cleandiesel

- State & local government tools and resources
- Diesel retrofit technology verification list
- Idle reduction technologies
- Cost-effectiveness of retrofit technologies
- Sample proposal on web site
- FY 08 awarded grants listed on web site

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RFAs out First week of March ; closing mid/late April (≤ 40 days)
Spend $ by Sept 2010

The call tomorrow is one of several. It is specifically about the "SmartWay Finance" pool of funds, through which applicants can set up programs to lend money to fleets to upgrade vehicles with "EPA verified" technologies, including idle reduction technologies. There will be other calls about other pools of funds. One is the "Emerging Technologies" pool, through which technologies that have not yet been verified can become so. Another is the "Funding Assistance" pool, which is actually divided up among the regions to award; this money goes to eligible entities to buy verified equipment & vehicles themselves, or sub-grant or sub-contract (with other eligible or non-eligible entities) to do so. This is the website where I'm told you'll find all the Q&A conference calls for all the categories of funding, and all the regions, posted:

http://www.epa.gov/otaq/diesel/grantfund.htm

We will also post the 2 Q&A sessions we'll host for the "Funding Assistance" $ we'll compete in New England on this regional website:

http://www.northeastdiesel.org/funding.htm

You may want to check other regional diesel collaborative websites for EPA staff contacts, Q&A call notices, etc; here's a portal to those:

http://www.epa.gov/otaq/diesel/whereyoulive.htm

On one or more of these calls, which will be attended by plenty of eligible parties, you could speak up and say "we've got this technology, we know who (specifically, or categorically) can use it, we're looking for a nonprofit or public agency partner to apply, and we'll help you put the meat in the application."

I can't do that much to help you find the right users for your technology. My realm of acquaintance is mainly SmartWay partners, only some of whom are suitable. If you go to the SmartWay "where you work" page http://www.epa.gov/smartway/transport/where-you-work/index.htm you can see which partners are HQ'ed where, and the regional EPA contacts who may know more about them.

The other step is to find an eligible applicant who is willing to come forward and apply on behalf of the user and your technology. I have been doing my best to urge SmartWay partners and technology vendors to reach out to those parties to say "hey I've got an idea, pay attention to me!." But some of them have many projects in mind, some don't like to fill out long grant applications, some don't have the staff or expertise to manage grants, etc. So either the user you want to partner with, or you directly, needs to capture the interest of:
-- a state agency with some purview over transportation or air quality
-- a municipality
-- a metropolitan planning organization (MPO) or regional planning agency
-- a publicly-funded state university
-- a port authority
-- a not-for-profit organization or institution
or a tribe.

So a lot still depends on your marketing, I'm afraid. If you can find interested users in New England, I can tell interested users some of the eligible applicants in their area that they could approach, and I can let

the eligible party know that a fleet might approach them...

from FY08 RFP

viii. Utilize ultra low sulfur diesel fuel (15 parts per million of sulfur content) ahead of EPA's mandate (for nonroad projects).

NOTE: New emission standards in the highway sector took affect in 2007 and will affect future model year highway heavy-duty vehicles and engines. For nonroad engines, new EPA standards will be phased in starting in 2008. Emission reductions from retrofits of post-2007 and post-2008 vehicles, engines and equipment will be considered, if the technologies, devices or systems proposed in the proposal package will achieve emissions reductions beyond that required by EPA regulations at the time of engine certification.

Diesel Emissions Reduction Solution Proposal Areas:

Retrofit Technologies: A "retrofit" project is defined broadly to include any technology, device, fuel or system that when applied to an existing diesel engine achieves emission reductions beyond that currently required by EPA regulations at the time of the engine's certification. Retrofit technologies may include, but are not limited to, the following: EPA verified emission control technologies (for example, those installed in the exhaust system like oxidation catalysts and particulate matter filters or systems that include crankcase control, like a closed crankcase filtration system, and engine re-calibrations), and California Air Resources Board (CARB) verified emission control technologies. This funding may cover up to 100% of the costs for these emission reduction technologies. A list of EPA verified technologies is available at http://www.epa.gov/otaq/retrofit/verif-list.htm. A list of CARB verified technologies is available at http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm.

Idle Reduction Technologies (EPAct 2005, Section 792(d)(1)(B)): An idle reduction project is defined as the installation of a technology or device that (1) is installed in one or more of the following vehicle(s) or equipment: a bus; a medium-duty or heavy-duty truck; a marine engine; a locomotive; or a nonroad engine or vehicle used in construction, handling of cargo (including at a port or airport), agriculture, mining, or energy production, or is installed in the ground and (2) is designed to provide services (such as heat, air conditioning, and/or electricity) to vehicles and equipment that would otherwise require the operation of the main drive engine while the vehicle is temporarily parked or remains stationary, and (3) reduces unnecessary idling of such vehicles or equipment. The reduction in idling must also lower emissions. EPA has verified four categories of idle reduction technologies: (1) auxiliary power units and generator sets; (2) battery air conditioning systems and thermal storage systems; (3) electrified parking spaces (truck stop electrification); and (4) fuel operated heaters. To determine if a particular technology fits under one of these categories please see http://www.epa.gov/otaq/diesel/idle-ncdc.htm.

Cleaner Fuel Use: Cleaner fuels include, but are not limited to, ultra-low sulfur diesel fuel (for non-road vehicles/engines prior to EPA's mandate), biodiesel, compressed natural gas, liquefied natural gas, propane, and emulsions or additives verified by EPA or CARB. Funding available under this program may be used to cover the cost differential between the cleaner fuel and conventional diesel fuel.

Engine Repowers: Repower refers to the removal of an existing engine and its replacement with a newer or cleaner engine that meets a more stringent set of engine emissions standards. Repowers may include engine replacement for use with a cleaner fuel such as compressed natural gas, re-

calibrations, and/or other components and/or the addition of newer, cleaner technologies to reduce the emissions from the engines. EPA is particularly interested in engine repowers that include combined verified improvements which will further reduce emissions, e.g., through the addition of verified retrofit technologies such as a diesel particulate filter, diesel oxidation catalyst or crankcase emission control. This funding will cover up to 50% of the cost of an engine repower. Please see the note below regarding repower and replacement proposals for additional eligibility requirements, such as original engine disposal requirements. 75%
Includes Gen Sets.

Engine Upgrades: Some engines may be able to be upgraded to reduce their emissions by applying manufacturer recommended upgrades or kits to certified or verified configurations. This funding will cover up to 100% of the cost of an engine upgrade. (Please note that the upgrade must be with a manufacturer's kit listed in CARB or EPA's verified lists, or an EPA certified configuration.) NOTE: this funding cannot be applied to the entire cost of an engine rebuild, but only the emissions-reducing upgrade kit.

Vehicle and Equipment Financing: This proposal area applies to low-cost financing for the purchase of vehicles or equipment retrofitted with EPA or CARB verified emission control technologies. This proposal area includes up to 100% financing for used pre-2007 model year on-highway vehicles (e.g., heavy-duty trucks) with verified emission control technologies or up to 100% financing for new or used pieces of equipment (e.g., bulldozer) with verified emission control technologies. These funds can be used to finance the purchase of the entire vehicle or equipment. The purchase of a newer, cleaner vehicle or piece of equipment that has not been retrofitted with a verified emission control technology is not eligible for this proposal area. For these types of projects see the section below on "Vehicle and Equipment Replacement."

Vehicle and Equipment Replacements: Nonroad and highway diesel vehicles and equipment can be replaced under this program with newer, cleaner vehicles and equipment that operate on diesel or alternative fuels and meet a more stringent set of engine emissions standards. Replacement projects can include the replacement of diesel vehicles and equipment with newer, cleaner diesel or hybrid or alternative fuel vehicles/equipment. These projects can also include the replacement of nonroad vehicles/equipment with highway models if the engine's operating cycles make the replacement technically feasible. EPA encourages the replacement of older vehicles and equipment containing engines that were manufactured prior to the implementation of emissions standards. As with engine replacements, proposals must specify how the vehicles/equipment will be disposed. This funding covers the incremental costs of new vehicles and equipment. Incremental costs are defined as up to 25% of the cost of the new vehicle or equipment (except for school buses—see provision below). Please see the note below regarding repower and replacement proposals for additional eligibility requirements, such as original engine/vehicle/equipment disposal requirements.

Replacements for School Buses: Funding levels will cover up to 25% or 50% of the cost of a replacement school bus, depending on the engine emission certification levels.

1) Twenty-five percent Level: This funding will cover up to 25% for school buses with engines manufactured in model years 2007, 2008 or 2009 that are particulate filter equipped in the case of diesel engines or catalyst equipped in the case of CNG engines and satisfy regulatory requirements for school bus engines manufactured in that model year and do not

exceed the limits of particulate matter (PM) at 0.01, nitrogen oxides (NOx) at 2.0, and nonmethane hydrocarbons (NMHC) at 0.40 (expressed in grams per brake horsepower hour, g/BHP-hr).

2) Fifty percent Level: This funding will cover up to 50% of the cost of a replacement school bus with engines manufactured in model year 2007, 2008, or 2009 that satisfy 2010 model year regulatory limits for emissions of PM, NOx and NMHC. The model year 2010 regulatory requirements are: PM at 0.01 grams per brake horsepower hour, NOx at 0.20 and NMHC at 0.14.

Repower and Replacement Proposals are eligible for funding on the condition that the following criteria are satisfied:

- The vehicle, engine, or equipment being replaced will be scrapped, or the replaced engine would be returned to the original engine manufacturer for remanufacturing to a cleaner standard;
- The replacement vehicle, engine, or equipment will perform the same function as the vehicle, engine, or equipment that is being replaced (e.g., an excavator used to dig pipelines would be replaced by an excavator that continues to dig pipelines); and
- The replacement vehicle, engine, or equipment will be of the same type and similar gross vehicle weight rating or horsepower as the vehicle, engine, or equipment being replaced (e.g., a 300 horsepower bulldozer is replaced by a bulldozer of similar horsepower).

NOTE for Repower and Replacement Proposals: This program funds the early replacement of vehicles, engines and/or equipment. Emission reductions that result from vehicle, engine, or equipment replacements that would have occurred through normal attrition are considered to be the result of normal fleet turnover and are not eligible for funding under this program. The purchase of new vehicles or equipment to expand a fleet is not covered by this program. To be considered a replacement, the purchase of new vehicles, engines, and equipment must be accompanied by the scrappage or remanufacturing of old vehicles, engines and equipment. Furthermore, for engine repowers, EPA requires that the engine being replaced must be scrapped, remanufactured by an original engine manufacturer to a cleaner emission standard or rendered permanently disabled. Drilling a hole in the engine block and manifold while retaining possession of the engine is an acceptable scrapping method. Other methods may be considered. Evidence of appropriate disposal is required in a final assistance agreement report submitted to EPA.

Innovative Finance Projects

Applicants may submit proposals to establish a Regional innovative financing program that results in diesel emissions reduction activities such as those described in the "*Diesel Emissions Reduction Solution Proposal Areas.*" In order to support the EPA Regional focus of this RFP, the proposal must be for the establishment of an innovative finance program limited to eligible vehicle or equipment owners that reside within Regions 1 and/or 2 States, Territories, and Tribal Lands. **NOTE:** there is no requirement that the eligible vehicles or equipment operate exclusively within the Region's States, Territories or Tribal Lands. Proposed innovative financing may include, but is not limited to, the following: issuance of loan guarantees, equity investments that leverage additional funds, revolving loan funds, or issuance of tax exempt or taxable bonds.