



National Clean Diesel Campaign

Mid-Atlantic  
Diesel Collaborative

on the route to cleaner air 

## **Mid-Atlantic Dray Truck Replacement Program**

### **Final Report**

**EPA Grant # DE 83477601**

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Mid-Atlantic Regional Air Management Association

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The Mid-Atlantic Regional Air Management Association, Inc. (MARAMA) is a cooperative association of ten state and local air pollution control agencies. In collaboration with Region 3 of the U.S. Environmental Protection Agency, MARAMA supports the Mid-Atlantic Diesel Collaborative, seeking to reduce diesel emissions in order to improve public health protection in the Mid-Atlantic Region.

With assistance from the University of Maryland Environmental Finance Center, MARAMA operated the Mid-Atlantic Dray Truck Replacement Program from 2010 to 2014. The program supported the replacement of 213 drayage trucks serving ports in the Mid-Atlantic Region with newer trucks, thereby reducing emissions of diesel particulate matter, nitrogen oxides, hydrocarbons, and carbon monoxide.

Program support was provided primarily by a grant from the U.S. Environmental Protection Agency with significant additional funding from the Virginia Port Authority, the Maryland Port Administration. Additional financial support was provided by three program sponsors, and significant in-kind assistance was provided by numerous program partners. It should be noted that most of the cost for replacing the 213 drayage trucks was borne by the truck owners.

MARAMA expresses sincere appreciation to the following program funders, sponsors, and partners:

U.S. Environmental Protection Agency  
University of Maryland Environmental Finance Center  
Virginia Port Authority  
Maryland Port Administration  
California Cartage  
Champion Truck Lines  
Sunoco  
Philadelphia Air Management Services  
Maryland Department of the Environment  
Maryland Motor Truck Association  
Philadelphia Clean Air Council  
Philadelphia Regional Port Authority  
Port of Wilmington, Delaware

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## I. Introduction

### A. *Overview of Program Purpose and Design*

The purpose of the Mid-Atlantic Dray Truck Replacement Program was to provide down payments to make the voluntary replacement of drayage trucks affordable and help owners obtain loans to finance the cost of the replacement trucks.

To be eligible, the model year of the truck engine to be replaced had to be 2003 or older. Preference was given to trucks with 1997 and older engines. Applicants had to show that the old truck was operational and street legal, that they had owned the truck for at least one year, and that they regularly served one of four participating ports.

Areas served included the Port of Virginia, the Port of Baltimore, the Port of Philadelphia, and the Port of Wilmington, Delaware. Each of these ports is located in areas with poor air quality for ozone and fine particulates.

A program website was established with information about eligibility requirements, application materials, sponsorship opportunities, and outreach tools. Program partners – including ports, trucking associations, and truck vendors – helped publicize the program.

Program funding was provided by a cooperative agreement from the U.S. Environmental Protection Agency (EPA) to the Mid-Atlantic Regional Air Management Association, Inc. (MARAMA). MARAMA established a subaward to the University of Maryland Environmental Finance Center (UMD EFC) and worked cooperatively with the UMD EFC to administer the program.

The UMD EFC reviewed applications completed by truck owners to ensure that all requirements were met. Documentation required with the application included a copy of the title and registration, proof of insurance, and proof of port service. Owners were also required to submit a photograph of the old truck with the license plate clearly visible.

For applicants meeting all requirements, MARAMA issued Certificates of acceptance into the program, giving participants 45 days to complete the process of finding a truck and obtaining financing. In order to receive payment, MARAMA required clear evidence that the old vehicle had been scrapped along with a purchase agreement for a newer truck meeting program requirements.

Throughout the process, the UMD EFC and MARAMA maintained communication with truck centers, finance agencies, participants, and scrap yards to ensure a thorough understanding of the process.

A significant aspect of program design was the need to minimize the time between scrapping the old truck and acquiring the newer truck. This was accomplished by requiring the participant to obtain approval from MARAMA before scrapping, educating scrap yard operators on how to properly document scrapping, and waiting to issue approval for scrapping until the participant had found a replacement truck and obtained financing. MARAMA program staff and accounting staff closely coordinated the dates when checks were to be issued.

Applicants were given the freedom to purchase their replacement vehicle from any one of several participating dealers pre-screened by MARAMA and/or the UMD EFC. The approved vendor list evolved throughout the project period as dealers were added or dropped based on the geographic focus of the program and dealer performance. Pre-screening was also used to identify lenders willing to issue loans to replace trucks and to provide a range of lending approaches to participants. Similarly, scrap yards were screened and identified.

MARAMA structured the Mid-Atlantic Dray Truck Replacement Program to open first in one port area and then expand to other Mid-Atlantic ports once procedures were in place. In developing its application for the grant, MARAMA chose to begin the program with trucks serving the Port of Virginia.

The EPA grant provided approximately \$3.3 million to support pass-through grants for dray truck replacements at four ports. Despite this substantial funding, the demand for support was much greater than could be satisfied by the grant. In allocating funds among the three areas, MARAMA provided incentives for partners and sponsors to provide voluntary additional funding. To encourage additional investment in the program, MARAMA allocated more grant funds to port areas in which sponsors and partners voluntarily provided additional funding from other sources. This was an informal process and did not stem from any requirement to match grant funds. External funding helped to increase the effectiveness of the program whether or not the funding flowed through MARAMA.

## ***B. Background***

### **1. EPA cooperative agreement supported the program**

The U.S. Environmental Protection Agency (EPA) awarded the Mid-Atlantic Regional Air Management Association (MARAMA) a \$3.9 million cooperative agreement to implement the Program between July 1, 2010, and June 30, 2014.

EPA initiated the competitive process that resulted in this grant in October 2009 via a Request for Proposals (EPA-OAR-OTAQ-09-13) issued by EPA's Clean Diesel Emerging Technologies Funding Assistance Program. The RFP solicited proposals nationwide for projects aimed at achieving significant reductions in diesel emissions (tons of pollution produced and diesel emissions exposure), particularly from fleets operating in areas designated by the EPA Administrator as poor air quality areas. EPA stated that reducing emissions from diesel engines was one of the most important air quality challenges facing the country. The Diesel Emissions Reduction National Program (DERA) authorized by Title VII, Subtitle G (Sections 791 to 797) of the Energy Policy Act of 2005 (EPA Act 2005) enabled EPA to offer funding assistance to eligible entities on a competitive basis.

Funding for the project was in the form of a cooperative agreement. The anticipated Federal involvement for this project included technical assistance, development of outputs, and oversight. Specifically, EPA involvement included monitoring the project within the approved timeline, participation and collaboration in program content, review of project progress, and quantification and reporting of results.



## 2. Program served areas with poor air quality

The Mid-Atlantic Region faces some of the most significant air quality problems in the nation. The Baltimore area is designated as a serious ozone nonattainment area with respect to the 8-hr ozone standard adopted by EPA in 1997. Philadelphia and Wilmington are designated moderate ozone nonattainment areas. These three areas are also designated nonattainment for fine particulate matter (PM<sub>2.5</sub>). The Norfolk Hampton Roads area where the Port of Virginia is located in a former ozone nonattainment area, and the Port's Green Operator program supported by this grant is a part of the area's Ozone Advance program designed to help maintain compliance with the ozone standard. Air quality is improving throughout the region, and since air quality has met the standards for PM<sub>2.5</sub>, states have submitted requests for redesignation to attainment status for PM<sub>2.5</sub>. In addition to improving air quality in nonattainment areas, it is important to continue to maintain good air quality once health standards are met.

Areas surrounding ports are adversely affected by diesel emissions. There are no ambient air quality standards specifically for diesel pollutants, but in the Mid-Atlantic Region and across the country, there is growing concern about pollution from diesel engines. We are all too familiar with the sight and smell of black soot that comes from some of our nation's trucks. Diesel exhaust is not just a nuisance, it threatens public health. Numerous scientific studies indicate that exposure to pollution from diesel vehicles can cause cancer and other serious health problems. Diesel trucks also emit significant amounts of nitrogen oxides, particulate matter (PM), and hydrocarbons (HC) that contribute to acid rain, ground level ozone, and reduced visibility.

## 3. Program focused on drayage trucks



Ground transportation of goods is a significant source of air pollutant emissions. Drayage trucks, which transport cargo to and from sea port terminals, represent a key sector of the intermodal transportation industry. In its 2009 report on truck drayage practices, the National Cooperative Freight Research Program described drayage trucks as the "critical link between marine container terminals and customers, railroads, and other facilities."<sup>1</sup>

Drayage trucks, whether operating as part of a company fleet or independently owned and operated, are often old, inexpensive vehicles with high emission rates. Furthermore, drayage truck drivers routinely spend significant amounts of time waiting to enter port terminals and pick up or drop off cargo. The vehicle idling that inevitably accompanies this wait time exacerbates air pollution problems in and around port areas.

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<sup>1</sup> Tioga Group, "Project 14 – Truck Drayage Practices," *National Cooperative Freight Research Program* (March 2, 2009): 3-4.

While reducing harmful emissions from drayage trucks is critical to improving air quality, making significant improvements in this sector has proven to be challenging, as many carriers (in particular independent owner-operators) have difficulty saving or borrowing the money needed to purchase a newer, cleaner truck.

Drayage trucks may operate at least part of the time doing work not related to serving ports. EPA indicated the following in their Questions and Answers document during the process of reviewing proposals for this grant:

*“The percent of time a DERA funded drayage truck should operate at a port will depend on a number of variables. Where the demand for drayage trucks is relatively constant over the year, DERA -funded drayage trucks should operate a larger percent of time at the port. In areas where the demand fluctuates, it would be reasonable to expect the DERA -funded drayage trucks to operate a greater number of trips at non-port venues. Grant applicants are encouraged to develop proposals that maximize truck operations at the ports, while taking into consideration local variables. A range of 60 to 100 percent could be considered reasonable.”*

#### 4. Program served three port areas

**Table 1. Container Market Share Among U.S. East Coast Ports**

Location	Percentage of Share
New York/New Jersey	33%
Savannah	18%
Hampton Roads (VA)	13%
Charleston	9%
Port Everglades	6%
Jacksonville	6%
Miami	6%
Baltimore	4%
Wilmington (NC)	2%
Philadelphia	2%

This Program served four Mid-Atlantic ports: Hampton Roads, Virginia; Baltimore, Maryland; Philadelphia, Pennsylvania; and Wilmington, Delaware. Philadelphia and Wilmington were treated as one combined area for purposes of allocating program resources.

Table 1 lists the container market percentage share of the top ten U.S. East Coast ports. Hampton Roads, Baltimore, and Philadelphia are already among the most active container ports on the U.S. East Coast. In addition, Hampton Roads and Baltimore have the deep channels

and larger equipment needed to handle the new larger ships that will be able to transit the widened Panama Canal. This means these ports are likely to see increased truck and rail traffic serving them in future years as cargo is moved to and from inland markets.

The following information briefly describes each port.

##### a) Port of Virginia

The Virginia Port Authority (VPA), together with Virginia International Terminals, LLC, owns and operates three cargo terminals located in the Hampton Roads metropolitan area. The terminals are

Newport News Marine Terminal, Norfolk International Terminal, and Portsmouth Marine Terminal. VPA's website reports they handled 15.6 metric tons of container cargo in 2012.

The Mid-Atlantic Dray Truck Replacement Program operated in coordination with VPA's active environmental program. One element of that environmental program, VPA's Green Operators (GO) Program, was formally launched in 2009 after the United States Department of Energy and The Virginia Department of Environmental Quality provided funding for owner-operators and trucking firms to retrofit or replace their older model trucks.



The Virginia Port trucking community was familiar with voluntary replacement programs due to the ongoing GO Program. Through separate EPA grant funding, MARAMA was already helping the Virginia Department of Environmental Quality support voluntary retrofits of dray trucks through the GO program. As a result, an important program piece was already in place in Virginia—the Port of Virginia was on board and quick to obligate additional state funds for the Mid-Atlantic Dray Truck Replacement Program, increasing the number of trucks that could be replaced.

Virginia was selected to be the first port for the Mid-Atlantic Dray Truck Replacement Program. MARAMA issued its first three certificates to owner operators in June 2011. The supportive relationship with the Port of Virginia continued into 2012 and 2014. This program readiness and early program launch explain why more trucks serving the Port of Virginia were replaced under this program than in the other two port areas.

#### **b) Port of Baltimore**



The Maryland Port Administration (MPA) reports that the Port of Baltimore's public marine terminals handled more than 6.3 million tons of containerized products in 2012. With a 50-foot-deep container berth and four super-post-Panamax cranes, Baltimore is one of two U.S. East Coast ports able to handle the world's largest ships.

Through its GreenPort initiative, the MPA works to implement sustainability practices ranging from clean-diesel equipment to wildlife habitat

and community greening.<sup>2</sup> As part of the GreenPort initiative, the MPA implemented the Port of Baltimore Clean Diesel Program in 2009. This two-year program funded by the American Recovery and Reinvestment Act aimed to reduce emissions at the Port of Baltimore through a cost-sharing grants program to retrofit, repower, or replace vehicles at the Port including drayage trucks, harbor craft, locomotives, and cargo-handling equipment. The MPA expanded upon the successes achieved through its Port of Baltimore Clean Diesel Program by participating in MARAMA's program.

The Mid-Atlantic Dray Truck Replacement Program expanded to include the Port of Baltimore in March 2012. The Program benefitted from additional funding from the MPA. In addition, the Maryland Department of the Environment obtained an independent companion grant to replace additional dray trucks. The MPA provided in-kind assistance to verify port service and other application criteria. As in Virginia, this extended the dollars available for the area and increased the number of trucks replaced in Maryland.

### c) Ports of Philadelphia and Wilmington

The Philadelphia Regional Port Authority (PRPA) handled 2.4 million metric tons of containerized cargo in 2013, an increase of 22 percent over 2012. Containers are primarily handled at PRPA's Packer Avenue Marine Terminal, which is operated by Holt Logistics.

Located at the confluence of the Delaware and Christina Rivers, 65 miles from the Atlantic Ocean, the Port of Wilmington, Delaware, is owned and operated by the Diamond State Port Corporation (DSPC), a corporate entity of the State of Delaware. The Port is a full-service deepwater port and marine terminal handling about 400 vessels annually, with an annual import/export cargo tonnage of more than five million tons. In 2012 the port handled approximately 1.9 million short tons of containerized cargo. Delaware's port is the smallest port to participate in the Mid-Atlantic Dray Truck Replacement Program.

MARAMA extended the Mid-Atlantic Dray Truck Replacement Program to the ports of Philadelphia and Wilmington, Delaware, in July 2012, continuing through March 2013. The Philadelphia Clean Air Council (CAC) operated a sister program replacing seventeen trucks using separate DERA grant funding prior to this Program's initial operation in Philadelphia. The CAC's efforts provided some initial momentum for the Mid-Atlantic Program.



<sup>2</sup> <http://mpa.maryland.gov/greenport/index.php>

Results in the combined Philadelphia and Wilmington area did not match the success of the other two port areas. While the response from the trucking community and area vendors was good, MARAMA found it difficult to find additional funding for trucks serving Philadelphia and Wilmington. Port officials supported the Program's goals, but funding was not available. Also support from the local port partners to verify port service and other application criteria was not as easily obtained for trucks serving the ports of Philadelphia and Wilmington.

### **C. Project Administrators**

MARAMA and the UMD EFC worked collaboratively to implement the Mid-Atlantic Dray Truck Replacement Program. Weekly project management calls were held between the organizations to review program structure and details and to facilitate clear communication and collaborative problem solving. Descriptions of each organization are provided below.

MARAMA is a voluntary, non-profit association of ten state and local air pollution control agencies. Founded in 1990, MARAMA's mission is to strengthen the skills and capabilities of member agencies and to help them work together to prevent and reduce air pollution impacts in the Mid-Atlantic region. MARAMA provides cost-effective approaches to regional collaboration by pooling resources to develop and analyze data, share ideas, and train staff to implement common requirements.

Since 2005 MARAMA has supported the Mid-Atlantic Diesel Collaborative, whose goal is to reduce diesel emissions to protect public health throughout the Mid-Atlantic Region. The Collaborative is a partnership between leaders from federal, state, and local government, the private sector, and environmental groups in Delaware, Maryland, Virginia, Pennsylvania, West Virginia, and the District of Columbia. MARAMA has successfully undertaken numerous EPA-funded grants to support diesel emission reduction projects serving ports in Norfolk, Baltimore, Philadelphia, and Wilmington on behalf of the Collaborative.

Key MARAMA staff members for this program included Deborah Thomas (Project Manager), Susan Stephenson (Diesel Collaborative Manager 2009 through mid-2011), and Susan Wierman (MARAMA Executive Director).

The Environmental Finance Center at the University of Maryland, College Park (UMD EFC) is a regional center that has worked on environmental challenges throughout the Mid-Atlantic Region for two decades. The UMD EFC serves the five states of EPA's Region 3: Maryland, Virginia, Delaware, Pennsylvania, and West Virginia, as well as the District of Columbia. The primary purpose of the UMD EFC is to assist local governments, communities, watershed organizations, and other stakeholders in fulfilling their roles in effectively and responsibly managing natural resources. In particular, the UMD EFC works to help communities identify sustainable ways of paying for resource protection efforts by providing training, technical assistance, and investigating and facilitating the broader use of innovative financing techniques and emerging markets. One of the UMD EFC's core strengths is its ability to bring together a diverse array of individuals, agencies, and organizations to develop solutions for a wide variety of environmental protection problems.

The UMD EFC's air quality work began in 2009 with the Port of Baltimore Clean Diesel Program. Funded by an American Recovery and Reinvestment Act (ARRA) grant, the project reduced emissions at

the Port of Baltimore through a cost-sharing grants program to retrofit, repower, or replace vehicles serving the Port.

Key UMD EFC staff members for this program included Megan Hughes (Program Manager, December 2010-September 2011), Medessa Burian (Program Manager, September 2011-project end), and Joanne Throwe (UMD EFC Director).

## II. Program Description

### A. Key Events in Program Timeline

It took more than a year to get the program underway. MARAMA applied for the SmartWay grant in early December 2009 and, after preliminary approval and minor modification of the proposal, EPA awarded a cooperative agreement in August 2010. MARAMA conducted a competitive procurement process resulting in a subgrant award to the University of Maryland Environmental Finance Center (UMD EFC) to assist with program administration and outreach beginning in December 2010. Initial activities involved developing a detailed program design and developing relationships with stakeholders. Beginning with trucks serving the Port of Virginia, the Program gradually expanded to include the Port of Baltimore and then the Ports of Philadelphia and Wilmington, Delaware. Adjustments were made throughout the program to ensure effective management of applications and awards. Outreach activities are discussed in “Program Results and Outcomes” and are not included in the following Key Events Timeline. Please refer to Appendix A for a full project timeline.

December 2009	MARAMA applies for SmartWay funding in a national competitive process
August 2010	EPA awards Cooperative Agreement
December 2010	Following a competitive procurement process, MARAMA awards a subgrant to the University of Maryland Environmental Finance Center  An initial kick-off meeting is held with EPA and stakeholders to refine program design
January 2011	MARAMA project manager is hired
March 2011	Program website is launched
September 2011	First truck is replaced at the Port of Virginia
January 2012	Maryland Department of Transportation/Maryland Port Administration awards MARAMA \$300,000 to replace 15 additional trucks serving the Port of Baltimore  Program opens to applicants serving the Port of Baltimore
April 2012	California Cartage becomes the Program’s first sponsor
May 2012	Virginia Port Authority awards \$45,000 to MARAMA in support of the Program and commits \$300,000 for direct down payments for replacement trucks at the Port of Virginia
August 2012	Program requires applicants to pre-screen for loans
September 2012	Program opens to applicants serving the Ports of Philadelphia and Wilmington
January 2013	Champion Truck Lines becomes the Program’s second sponsor

October 2013 Virginia Port Authority awards \$30,000 to MARAMA in support of the Program and commits \$200,000 for direct down payments for replacement trucks at the Port of Virginia

May 2014 Program makes final down payment for truck replacements

\* \* \*

## **B. Developing Options for Financing**

MARAMA's work plan goals with respect to financing were as follows:

*The financing for the replacement program will be coordinated with a select group of financing institutions. Any applicant who receives funding through this program may be required to work with participating lenders in order to receive funding. The reason for this is to simplify the administrative process, ensure scrappage requirements are met, more easily track repayment of loan and rate of default, and allow for better servicing of the loan through participating lenders. Additional lenders may be added to the participating list as the program evolves.*

One of the barriers to the successful implementation of a truck replacement program is the high interest rate offered to owner-operators seeking to purchase a new vehicle. The targeted sector is also at higher risk for loan default, making it more challenging for applicants to receive affordable loans.

Setting up systems for financing was a crucial component to program implementation as the Program's ultimate success depended on applicants being able to secure affordable loans. Applicants unable to secure loans had no other option but to withdraw from the Program.

### **1. Reducing withdrawals from program**

Participants who withdrew after applying and being approved for the Program cited various reasons for doing so. Financial reasons, whether being unable to obtain credit or being unable to find affordable terms were the most frequently cited reasons for withdrawal. Participants with poor credit often became discouraged with the terms of the loan and cost of monthly truck payments. In some cases, program staff encouraged participant withdrawal due to poor terms and high interest rates (over 20 percent). Early in the program development stage in 2010, the poor U.S. economy created a challenging credit environment. Program staff quickly learned that the economy made it difficult for many applicants to obtain reasonable credit terms or any credit at all. Port drivers were viewed as a significant risk by most financial institutions, particularly by banks who typically offered the best interest rates. Therefore, other types of financial companies were brought into the program to offer reasonable credit for higher-risk participants.

Both MARAMA and the UMD EFC agreed that marketing the program to port drivers should include alerting them to potential credit challenges. While participants were not required to use a program approved lender, staff worked closely with participating financial institutions to ensure that loan terms and interest rates were reasonable.



As the program progressed, credit became easier to obtain in early 2012. The improving economic conditions, coupled with requiring applicants to seek financial pre-approval before finalizing their applications, resulted in fewer program withdrawals.

## **2. Identifying options for participants**

While applicants were permitted to secure loans with the personal bank or financial institution of their choosing, including in-house financing provided by vehicle vendors, program administrators believed it was important to provide a range of options to applicants for financing the remaining cost of their replacement vehicles not covered by the grant award. Therefore, staff worked to identify a select group of participating lenders.

Program staff spent considerable effort identifying and building relationships with a variety of lending institutions including banks, brokers, and lenders specializing in the trucking industry. Partnering with the program was attractive to many financial institutions due to the substantial down payments offered (that could cover up to half the cost of the replacement vehicle) as well as the community and environmental goodwill factor presented by the program.

It was important to partner with financial institutions that could offer competitive rates and terms to both applicants with good credit histories as well as applicants with more challenging financial backgrounds who entailed a higher level of risk. In general, it was found that banks offered more competitive interest rates and terms to fleet owners and applicants with high credit scores. The stringent underwriting standards required by many banks were often not an ideal option for applicants with lower credit scores. Engaging lenders that specialized in the trucking industry and considered factors other than credit scores to make their credit decisions e.g., length of time in the trucking industry) was critical to allowing the more credit-challenged owner-operators to secure financing.

Before partnering with financial institutions, program staff worked to help ensure that lenders would be a good fit to the program. The screening process included a check on the organizations' business practices through the Better Business Bureau. If lenders received an acceptable rating with no concerning complaints, conference calls or in-person meetings were held to discuss program details and obtain specific proposals on the financing terms each institution could offer to program applicants. Lending institutions that could provide competitive rates and terms as well as quick turnaround times on closing were prioritized. Other factors considered included lenders' willingness to waive up-front and document processing fees, repossession rates, and other attractive services they could offer. For example, a few lenders had prior experience working with similar truck programs in other states enabling them to pass along valuable knowledge to applicants and program staff regarding reliable engine makes/models and emissions equipment maintenance. Others helped applicants locate eligible vehicles while others used the make and mileage of applicants' chosen vehicles to ensure they were not overpriced.

## **3. Participating lenders**

In the first year of the program, program staff contacted nearly 50 lending institutions. Following a series of informational calls and meetings, the list was quickly narrowed down to four interested and appropriate lenders. The program's participating lender list evolved during the course of the

program as financial institutions were added or dropped based on program needs and lender performance. The financial institutions that partnered with the program throughout the course of the project period are listed below. Lenders still participating with the program at the end of the grant are noted with an asterisk (\*).

- Accion USA
- BB&T Bank\*
- Bulldog Asset Management
- Business Capital Solutions\*
- CAG Truck Capital
- Capital Pacific Funding
- Cascade Sierra Solutions
- Crossroads Equipment Lease and Finance\*
- M&T Bank\*
- Meadowbrook Environmental Funding
- SJK Capital Funding
- Wheaten Financial, Inc.\*

MARAMA ultimately decided to allow applicants to work with a lending institution of their choice in order to secure the best rates and terms for their loans. MARAMA did not want to limit applicants' choices. As described above, program staff coordinated a select group of financing institutions to allow program applicants a variety of options in securing a loan.

#### **4. Assessing financial readiness**

Program staff worked with participating lenders to gain an understanding of the factors they look for in a loan application in order to develop financial readiness considerations for applicants. These financial readiness considerations were summarized and included as part of the truck replacement application. Understanding the red flags of financing helped interested parties decide if they should proceed through the application process or first work on improving their financial readiness.

Even though applicants were encouraged to consider their financial history before proceeding, a significant number of approved applicants withdrew from the program after locating a vehicle and finding that they did not qualify for financing or that the terms of the loan were unaffordable. In addition, applicants required more time to complete the process due to difficulties experienced with financing. The 45-day timeframe allotted for approved applicants to find a truck, secure financing, and scrap their old vehicles was increased to 50 days to accommodate challenges with securing a loan. Participating truck vendors also expressed frustration as a result of working with applicants to locate new trucks only to discover that they were unable to obtain financing.

Cascade Sierra Solutions, a non-profit organization dedicated to fuel and emission reduction from heavy-duty diesel engines, offered an affordable, low-interest lending option to applicants. Cascade Sierra was particularly helpful in financing the program's more credit challenged applicants, offering program participants denied by other lenders a second chance to complete the program. MARAMA

obtained written assurances that none of the participants funded by Cascade Sierra were supported by Cascade Sierra's separate federal grant.

Cascade Sierra ultimately switched their focus to West Coast programs and was no longer able to fund applicants of the Mid-Atlantic program. The withdrawal of this financial partner significantly affected the ability of participants with poor credit to obtain loans. For several quarters, no other financial institution could match the loan terms and approval rate of Cascade Sierra resulting in a participant drop-out rate of nearly 50 percent. This issue increased the administrative time program staff spent working with participants who ultimately withdrew from the program.

To address this financial readiness challenge, a new criterion for participation was implemented, requiring applicants to prove their financial readiness prior to receiving acceptance into the program. Program staff worked with participating lenders to set up a process to determine if applicants would be likely to qualify for a loan should they receive program funds. Effective August 1, 2012, as part of the application process, applicants were required to obtain a financial screening and submit proof that they could qualify for a vehicle loan of \$30,000 or more (the estimated remaining balance of a 2008 or newer replacement vehicle). Alternatively, applicants paying cash for the balance could submit a qualifying letter from their own bank or provide a copy of their bank statement. If approved for program funds, screened applicants could then secure a loan with the financial institution that provided the financial screening or work with another financial institution of their choosing. Applicants were encouraged by program staff to solicit bids from at least two different lenders to compare rates and terms. Applicants had to be wary of how many credit checks they pursued, however, as too many requests could damage their credit score. This financial screening process helped program staff better predict applicants' ultimate success in completing the program.

Implementation of the prequalification requirement not only had a positive impact on the amount of staff time needed to work with applicants who were financially unready but also on the amount of time needed for approved applicants to complete the process. With much of the financing work already underway or complete, most certificate holders were able to locate a new truck, secure a loan, scrap the old vehicle, and complete the grant process in less than 45 days.

## **5. Revolving loan fund considered but rejected**

In early 2011 the concept of using a Revolving Loan Fund (RLF) as a financing option was explored. The RLF was first introduced by then participating lender Meadowbrook Environmental Funding. Meadowbrook proposed building an RLF for the Mid-Atlantic program with significant financial contribution from Community Development Transportation Lending Services (CDTLS). The proposal aimed to ensure the viability of the program beyond the life of the SmartWay grant. Meadowbrook and CDTLS proposed to leverage the EPA grant and sponsorship money by allowing the program to receive an income which would be turned back into new loans for future applicants. Meadowbrook's RLF concept proposed to lower interest rates, extend payment terms, allow for more flexible credit criteria to increase approvals, and decrease total costs of ownership for program applicants. It was proposed that ports could also make loans to the RLF and receive most of the investment back in the future. Meadowbrook proposed waiving all standard management fees on all charges if the program chose to utilize the RLF concept.

The UMD EFC drafted a memo describing the RLF concept and facilitated a meeting between MARAMA program staff and the Environmental Finance Advisory Board for a more in-depth discussion. Program staff also participated in a conference call with EPA to discuss the proposal. After further exploration and consideration of the risks involved and staff resources needed to manage a RLF, MARAMA's Board of Directors determined not to pursue this option and directed staff to continue developing the program as it existed under the current grant agreement.

### ***C. Developing Relationships with Key Stakeholders***

As the Program began, a heavy emphasis was placed on identifying and contacting key stakeholders who could potentially play a significant role in both program design and implementation. Involving key stakeholders was integral to program success.

Each participating port was determined to have particular stakeholders who were important to the ultimate success of the program. Key stakeholders included 1) program partners, 2) used truck vendors, 3) scrap yards, and 4) carrier companies. A description of each stakeholder group as well as a summary of project activities associated with each group is provided below.

#### **1. Program partners**

Although the EPA cooperative agreement provided substantial funding for truck replacements, MARAMA recognized that a much greater demand existed than the grant funding could meet. It was also understood that support and guidance from key partners within each state would be critical to designing the program, identifying best practices, conducting outreach, and garnering buy-in from the local trucking community. Key organizations connected to the participating ports in each state and/or with regional clean air agendas were, therefore, approached in early 2011 to provide additional program funding, planning guidance, and implementation support.

The Mid-Atlantic program offered several attractive features to program partners. First, the program afforded an innovative way for the private sector to engage in an environmental initiative while simultaneously supporting the drayage truck industry. The voluntary nature of the program was also an attractive feature, in contrast to the clean truck mandates being implemented at larger ports (i.e., New York/New Jersey and Los Angeles/Long Beach).

To further incentivize partner participation, MARAMA allocated funding among the three port areas in proportion to the funds provided by program partners and sponsors in each area. Capitalizing on these incentives, program partners in Virginia and Maryland provided additional leveraged funding of over \$100,000 each. In addition, other EPA grants were independently used to replace additional dray trucks to enhance effectiveness in all three port areas. The additional funding greatly extended the scope and effectiveness of the program in each state by enabling the replacement of more vehicles. (Note: Activities under other grants are not reported here and not counted in totals of trucks replaced or funds expended. They reflected the commitment of partners in each port area to the goals of this Program and helped target the allocation of funds under this cooperative agreement among the three port areas.)

In addition to their financial support, program partners also provided valuable advice for defining the rules, requirements, and best practices for the program, allowing criteria to be established to reflect the unique nature of each state. Importantly, partners provided vital marketing and outreach support in publicizing the program to attract eligible applicants. This collaborative approach of working with partners in each state strengthened the regional approach to the project, assuring uniformity and transparency between the areas, while at the same time allowing the flexibility to adapt to the characteristics of each port community.

Program partners included port authorities/administrations, state agencies, transportation related associations, and environmental non-profit organizations. In order to build relationships and facilitate communication, the UMD EFC and MARAMA coordinated multiple in-person meetings, conference calls, and site visits with program partners throughout the course of the project period. A brief description of key program partners and their contributions to the program is provided below. Please refer to the Project Timeline in Appendix A for a list of key meetings with program partners.

**a) Virginia Port Authority**

The Virginia Port Authority (VPA) was a key partner through both its financial contributions and generous in-kind support. The VPA provided \$500,000 in down payments directly to truck owners at the Port of Virginia and \$75,000 in administrative funding to support MARAMA's costs in implementing the program. The VPA provided ongoing support and guidance in developing the program's structure and criteria for participation, establishing best practices based on lessons learned through the Virginia Green Operators (GO) Program, engaging sponsors and vehicle vendors, and procuring eligible vehicles for grantees. The VPA promoted the Mid-Atlantic program on their Port of Virginia and GO Program websites, issued frequent press releases about the program's progress, and conducted outreach to local fleets and shippers about the benefits of truck replacement on air quality.

Regular meetings and communication with the VPA throughout the course of the project to strategize and provide updates on the program's progress helped to ensure smooth implementation of the program at the Port of Virginia.

**b) Maryland Port Administration**

Forming a partnership with the Mid-Atlantic program allowed the Maryland Port Administration (MPA) to initiate a second phase of its Clean Diesel Program. The MPA played a key role in the success of the Mid-Atlantic Dray Truck Replacement Program through both financial contributions and in-kind support. The MPA provided \$300,000 to support the replacement of 15 drayage trucks at the Port of Baltimore. In addition to their financial backing, the MPA provided substantial support and guidance in creating program rules and eligibility requirements, developing program materials, engaging additional Maryland stakeholders, verifying applicants' port service, and performing outreach to attract eligible participants to the program.

Program staff were in close communication with the MPA throughout the course of the project, submitting monthly progress reports and participating in monthly conference calls with MPA staff and other Baltimore partners to provide updates on the Program's progress and ongoing outreach activities. In the absence of an ongoing dray truck replacement program, more outreach was needed

to expand interest at the Port of Baltimore. Specific outreach activities conducted by the MPA included stocking program business cards at marine terminal customer service centers; broadcasting regular program updates through the Port's eModal system; distributing program flyers; issuing press releases; and promoting the Program through the Port's Twitter account, website, and Port of Baltimore magazine.

**c) Maryland Department of the Environment**

The Maryland Department of the Environment (MDE) is a member of MARAMA's Board of Directors and the Steering Committee of the Mid-Atlantic Diesel Collaborative. MDE has been an active participant and supporter of diesel emissions reductions efforts at the Port of Baltimore and was an active supporter of the Mid-Atlantic Dray Truck Replacement Program. MDE worked with program staff, offering valuable guidance in the program design phase and continued in-kind technical support for the duration of the program. MDE participated in monthly conference calls with Port of Baltimore program partners to keep abreast of the program's progress and offer guidance on challenges faced by program staff. In addition, MDE obtained additional DERA and ARRA grants that independently replaced additional dray trucks not included in this report.

**d) Maryland Motor Truck Association**

The Maryland Motor Truck Association (MMTA) serves and represents the motor carrier industry in the state of Maryland.<sup>3</sup> Due to the organization's insight and connection with the trucking industry through both its membership services and Intermodal Council representing companies and drivers operating at the Port, the MMTA was an ideal partner for the Mid-Atlantic program. MMTA was an avid supporter of the Baltimore program providing in-kind assistance in program design and throughout the implementation phase. The MMTA participated in several in-person meetings as well as monthly conference calls with program staff and other Baltimore partners. The MMTA recommended reputable truck vendors, local recycling companies, and conducted a range of outreach activities to attract eligible applicants to the program including promoting the program on their website and in their monthly newsletters, sharing outreach materials with their intermodal trucking constituents, and allowing program staff to present and share materials at Intermodal Council meetings and an annual fundraising event.

**e) Philadelphia Clean Air Council**

Headquartered in Philadelphia, Pennsylvania, with a satellite office in Wilmington, Delaware, the Clean Air Council (CAC) is a non-profit environmental organization focused on improving air quality in the Mid-Atlantic region.<sup>4</sup> The CAC was engaged as a program partner in early 2011 participating in several strategy calls and in-person meetings to provide input and guidance on program design, program materials, sponsorship development, and outreach for the combined Philadelphia/Wilmington program. The CAC also helped engage other Pennsylvania and Delaware stakeholders by facilitating

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<sup>3</sup> <http://www.mmtanet.com/>

<sup>4</sup> <http://www.cleanair.org/>

stakeholder conference calls and co-hosting a luncheon in May 2011 with the UMD EFC and over 15 carrier and port industry representatives to share program information, gather feedback, and build support for the program. The CAC also coordinated their outreach efforts with area trucking companies, the Delaware Department of Natural Resources and Environmental Control, Delaware Clean Cities, and Philadelphia Clean Cities and worked with program staff to develop promotional materials.

The CAC obtained independent DERA funding to support truck replacements at the Ports of Philadelphia and Wilmington. The CAC used its DERA funding to manage its own truck replacement program in 2012. With the additional sponsorship support of two trucking companies – Trinity Distribution Services<sup>5</sup> and TriState Intermodal – the CAC’s program resulted in the replacement of 17 trucks at the Ports of Philadelphia and Wilmington by the end of 2012. Funds used by the CAC to implement their truck replacement program were recognized by MARAMA in allocating funds from this grant to open the Mid-Atlantic program at the Ports of Philadelphia and Wilmington.

**f) Philadelphia Regional Port Authority**

Port officials at the Philadelphia Regional Port Authority (PRPA) were engaged in early 2011 to discuss developing a truck replacement program at the Port of Philadelphia. While unable to provide financial support, the PRPA offered guidance in developing eligibility requirements and provided outreach by promoting the program to eligible port drivers on their website and through the Port’s Traffic Club.

**g) Philadelphia Air Management Services**

Philadelphia Air Management Services (AMS) is part of the Philadelphia Department of Health and is a member of MARAMA’s Board of Directors and participates on the Steering Committee for the Mid-Atlantic Diesel Collaborative. AMS is actively involved in promoting diesel emissions reduction strategies in Philadelphia through the Philadelphia Diesel Difference. The Philadelphia Diesel Difference Working Group was formed to help build a coalition of diverse partners with a mutual interest in reducing air pollution from diesel engines in the greater Philadelphia area through voluntary programs and the use of innovative strategies including market-based approaches.

In addition to general in-kind support for the Mid-Atlantic Dray Truck Replacement Program, in 2012, AMS negotiated a settlement of an alleged violation of air pollution control regulations with SUNOCO. As a part of the settlement, to benefit air quality in Philadelphia, SUNOCO provided \$50,000 of Supplemental Environmental Project (SEP) funds to support this Program.

**h) Port of Wilmington**

Officials at the Port of Wilmington, Delaware, were engaged in early 2011 to discuss developing a truck replacement program at their Port. While unable to provide financial support, the Port of Wilmington

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<sup>5</sup> Trinity Distribution Services also provided noteworthy contributions to the Mid-Atlantic program replacing multiple company and owner-operator trucks through the program and recommending reputable truck vendors, lenders, and recyclers in the Philadelphia/Wilmington area.

offered guidance in developing eligibility requirements and other program parameters.

## 2. Truck vendors

MARAMA's work plan goals with respect to truck purchase coordination were as follows:

*MARAMA will not be actually purchasing the trucks, but working to coordinate purchases. The reason for this approach is twofold. First, this will expedite the process of the applicant selecting and securing a new truck on his/her own, and second, it will create efficiencies that result in lower per truck cost which in turn reduces the loan-to-value ratio per applicant. Acquisition of replacement trucks will focus on engine model years 2004 through 2007 or later, but it is expected there will be some variation among available trucks enabling the applicant to decide what make, model, and specifications they prefer within the range of available trucks.*

Significant time was spent researching potential truck retailers who could supply quality, eligible trucks and customer service to program applicants. Several stakeholders including the Virginia Port Authority, the Maryland Motor Truck Association, and Evans Trucking provided names of candidate truck dealerships. Trucking companies in each of the participating states (Virginia, Maryland, Pennsylvania, and Delaware) were contacted to inquire about their used truck inventory, terms, and conditions.

While a list of reputable truck dealers was shared, applicants were permitted to purchase an eligible replacement vehicle from any dealership of their choosing during the first year of the Program. After experiencing several problems with product reliability, poor customer service, lack of warranties, and difficulty receiving the required paperwork, program staff opted to maintain a closed vendor network in year two of the Program. Applicants were then required to purchase a vehicle from a list of approximately 20 vetted vendors, many with multiple locations. Program administrators were cognizant that the vendor network needed to be large enough in each state to ensure competition among the dealers (to minimize the potential inflation of truck prices) but at the same time small enough to thwart the problems encountered with the open vendor network.

After the closed vendor network policy was implemented, new vendors were required to go through a screening process which began with a check on their business practices through the Better Business Bureau. If vendors received an acceptable rating with no documented concerns, program staff researched their company websites for eligible inventory and conducted a detailed interview process regarding the dealership's locations, inventory, cost estimates for MY 2008 and 2009 vehicles, warranties, customer service policies, and ability to submit the required program paperwork. On some occasions, in-person site visits were also made to view available inventory and meet the sales representatives.

The requirements of the grant program necessitated that the vendor provide several documents (e.g., invoice, photo of engine tag, photo of VIN plate, copy of new title and registration, etc.) to program staff before down payment requests could be processed, so it was critical that participating vendors thoroughly understood the process and met the paperwork responsibilities in a timely manner so as to not delay the closing process. Participating vendors were also asked to educate program applicants about the care and maintenance of the 2007 or newer EPA certified emissions equipment and to clean the DPF filter as part of their road-ready service. Finally, participating dealerships were asked to assign



a single sales representative to work with the program so as to better facilitate communication and a thorough understanding of program requirements.

Maintaining a smaller network of vendors and implementing a single sales representative policy at each location had several advantages. First, it enabled program staff to develop better relationships with the dealers and, consequently, better ensure more reliable equipment and good customer service. If an applicant experienced a mechanical problem with a new truck, program staff contacted the dealership and could be more confident that the salesperson would stand behind the equipment and support the applicant in fixing the problem if it fell within a reasonable time period after purchase. In contrast, many challenges were involved when working with a dealership that had no prior relationship with the program and no confidence of future business from program applicants.

Approved vendors could also supply promotional materials (i.e. sales flyers) that program staff included in applicants' acceptance packages. The prospect of regular business generated by the program also prompted some vendors to decrease their prices for Mid-Atlantic applicants. Preselecting vendors enabled program staff to better support the use of local businesses. Establishing relationships with dealers in close proximity to the ports helped to make the process more convenient to applicants, allowing customers to more easily visit the dealership to test drive their chosen vehicle and return to the dealership for service or repairs if needed.

Program staff corresponded with participating vendors on a regular basis to provide updates on programmatic details and changes, to gather application materials for new applicants, and to provide updates on applicants' funding status. Vendors were informed of newly approved groups of applicants and received their contact information in order to facilitate communication about available inventory. The approved vendor list with the assigned sales representative and links to dealer websites showcasing their inventory was distributed to all approved applicants. It should be noted that a programmatic change was implemented in year two: as some approved applicants felt overwhelmed with the number of phone calls they were receiving, program staff began soliciting grantees' permission before releasing their contact information to vendors.

The program's approved vendor list evolved throughout the course of the program as truck dealers were added or dropped based on program needs. Dealers were removed from the program's vendor network for a variety of reasons including lack of eligible inventory, selling very high mileage trucks, performing little or no maintenance on trucks, not offering warranties, poor customer service, failure to follow program parameters, and lack of participation. The truck vendors that partnered with the program during the project period are listed below. Although many vendors had several locations from which eligible inventory could be obtained, the locations listed below served as the primary point-of-contact for program applicants. Vendors still participating with the program at the end of the grant period are denoted with an asterisk (\*).

#### Virginia Area Vendors

- Truck Enterprises, Inc. – Chesapeake, Virginia\*
- Norfolk Truck Center – Norfolk, Virginia\*
- Rush Truck Center – Suffolk, Virginia\*
- Advantage Truck Center – Rocky Mount, North Carolina\*

- Ryder – Chesapeake, Virginia\*
- Virginia Truck Center – Virginia Beach, Virginia\*
- TMI Truck & Equipment, Inc. – Chesapeake, Virginia\*

#### Maryland Vendors

- Beltway Companies – Baltimore and Elkton, Maryland\*
- Peterbilt of Baltimore – Baltimore, Maryland\*
- Bare Truck Center, Inc. – Westminster, Maryland\*
- Truck Enterprise of Hagerstown, Inc. – Hagerstown, Maryland\*
- K.Neal International Truck Center, Inc. – Hyattsville, Maryland\*
- Baltimore Freightliner – Baltimore, Maryland\*
- Baltimore International Used Truck Centers – Baltimore, Maryland\*

#### Pennsylvania-Delaware Area Vendors

- SelecTrucks of the Mid-Atlantic – New Castle, Delaware\*
- Arrow Truck Sales – Elizabeth, New Jersey\*
- International Used Truck Center – Philadelphia, Pennsylvania\*

#### Out of Area Dealers

- AmeriQuest Remarketing – Port Orange, Florida\*
- Bulldog Truck Sales – Cumming, Georgia
- SelecTrucks of Houston – Houston, Texas
- SelecTrucks of Charlotte – Charlotte, North Carolina

### **3. Scrap yards**

Requiring old vehicles to be scrapped was a key element in ensuring that program funding was not used to expand a fleet. MARAMA's cooperative agreement required the engine and vehicle being replaced to be scrapped or rendered permanently disabled. Disabling the engine could be completed by drilling a hole in the engine block (the part of the engine containing the cylinders) or other acceptable scrappage methods approved by EPA. Disabling the vehicle could be demonstrated by permanently disabling the chassis or other methods approved by EPA. Vehicle/equipment components that were not part of the engine or chassis could be salvaged from the unit being replaced.

Scrapping was the final step in the program. Truck owners only earn income when they are able to use their trucks, so it was essential that the Program minimize the time between scrapping the old vehicle and providing funds for the down payment on the new vehicle. Therefore, considerable effort went into making this a smooth step, allowing the truck owner to complete the transaction seamlessly and receive his or her down payment quickly. Achieving this seamlessness involved creating ongoing relationships with several scrap yards in the Maryland, Virginia, and Pennsylvania areas.

MARAMA worked to recruit, screen, and educate scrap yard operators for the program. While many scrap yards were approached about participation, several declined involvement citing the time and

tools needed to perform the EPA approved methods of scrapping. Participating scrap yards were asked to do more than they normally would for a customer, including providing photographs of the truck engine and chassis pre- and post-scrapping. Working with experienced scrap yards that knew how to handle the process correctly and swiftly was important to the Program's success, as it was critical for participants to feel at ease about this final step.

The scrapping process can be an anxiety-producing experience particularly for the owner operator whose livelihood may depend on the use of that one truck. Applicants placed their trust in program staff to help them through this process, so it was critical that staff earn that trust by paying close attention to the final details of the scrapping and closing process. Ensuring that the timing of the down payment check was closely synchronized with the scrapping process was important in minimizing out of work time for the applicant. After scrapping, the goal was to have the truck owner in their new truck within five business days.

On scrap day, the owner was required to obtain and submit photographs of the truck destruction in order to document that the old truck would never be on the road again. Photographs provided an extra level of quality control to the final step of the program. Because program staff could not be on hand for scrapping, a thorough document was developed to explain the requirements and each step in the scrapping process. The scrapping guideline (Appendix B) was shared with participants accepted into the program to ensure that scrapping was done correctly. The handout included sample pictures of a properly scrapped truck with the engine destroyed and the chassis cut and stressed the EPA guidelines that "the vehicle engine needs to be *permanently disabled* and rendered no longer usable."

In addition to the handout, program staff contacted each participant by phone and described the process in detail. Participants were instructed to wait until receiving approval from MARAMA before scrapping their trucks. Truck sales representatives were also educated about these requirements. In most cases, the sales person was very involved in the scrapping process, assuring a good outcome. The scrap procedure was reinforced several times throughout the program process in order to minimize the time between scrapping and receipt of the down payment check as well as to eliminate any possibility of receiving incomplete scrapping documentation. Since the scrapped vehicle is disposed of quickly by the scrap yard, participants only had one chance to get the documentation right.

A slightly different set of instructions was developed for the scrap yards. This document was needed to educate the scrap yard contacts about the process and identify needed documentation. Not all scrap yards would take the scrap photographs, citing too much responsibility if something went wrong. Therefore, for those participants, program staff either worked closely with the truck sales person or spent time training the participant on how to get the needed photos and receipts from the scrap yard. Working with the different scenarios per participant made it even more important to establish the idea that no one should go to the scrap yard without first obtaining approval from MARAMA.

The program utilized two types of scrap yards: metal disposal yards (scrapers) and recyclers. Recyclers provided the clearest destruction of the engine as their equipment chewed through the engine rather than boring holes in the engine block, which was the method utilized by scrapers. (Please see Appendix C for examples of the scrapping crushing and drilling methods.) Before towing the truck to the yard, scrap yards required participants to drain and dispose of all truck fluids, such as oil, gas, air

conditioning and power steering fluids, and remove the tires. Alternatively, certain scrap yards offered this service for a fee, which was frequently the option chosen by participants.

Truck owners were compensated by the scrap yard for the value of the scrap metal in the old vehicle—usually between \$1,000 and \$2,000. Documentation (e.g., a copy of the check) was required. In order to claim their down payment check, owners were also required to sign a notarized statement that they had properly disposed of their old vehicle.

#### **4. Carrier companies**

The original financing strategy for the Program involved obtaining commitments from carrier companies to provide funds in addition to the down payment provided by the grant. Owner operators were expected to sign a contract to work for the participating carrier company in return for the financial support. However, after consulting with stakeholders, MARAMA determined that many owner operators are reluctant to take loans from carriers that bind them to their service, believing that their ability to repay the loan could be compromised if they are not assigned enough work, causing them to lose their vehicle. In addition, carriers are concerned about maintaining a contractual rather than employee relationship with independent owner operators and do not want to enter into financial arrangements that might blur that distinction.

The Evans Network of Companies was an early supporter of the Mid-Atlantic Program, offering guidance in program development, assistance in locating reputable truck vendors and lenders, and assistance in attracting eligible owner-operators to the program. The Evans Network is comprised of nine affiliated companies providing truck transportation services in the 48 contiguous states. Evans' primary business focus is on the international container drayage transportation business serving all major East Coast marine ports and major railroad facilities.<sup>6</sup> Evans' support for the program continued to be in-kind rather than providing direct funding to the Program.

In addition to working with Evans, MARAMA and the UMD EFC worked to encourage other carriers to extend the program's scope and reach in Virginia, Maryland, Pennsylvania, and Delaware. Potential program sponsors were identified through recommendations from participating ports and through program staff reaching out to companies that submitted multiple trucks to the program (either fleet vehicles or vehicles owned by owner operators under contract by the companies).

Gold, Silver, and Bronze level sponsorships were available to small carriers, large carriers, shippers, retailers, non-profit organizations, and others connected to participating ports. Recognition for sponsors included highlighting them on program outreach materials and inviting them to submit trucks for priority consideration in the program. To receive priority consideration, sponsors' vehicles were required to meet all of the Program's eligibility requirements. A summary of sponsorship benefits is presented below in Table 2. The Program's sponsorship package can be found in Appendix D.

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<sup>6</sup> <http://www.evansdelivery.com/>

**Table 2. Sponsorship Benefits**

	2011 - 2012	2013 - 2014
<b>Gold Sponsor \$30,000</b>	<ul style="list-style-type: none"> <li>• Priority consideration for 10 truck replacements*</li> <li>• Company logo on Program website for 1 year</li> </ul>	<ul style="list-style-type: none"> <li>• Priority consideration for 6 truck replacements*</li> <li>• Company logo on outreach materials and Program website for 1 year</li> </ul>
<b>Silver Sponsor \$15,000</b>	<ul style="list-style-type: none"> <li>• Priority consideration for 5 truck replacements*</li> <li>• Company logo on Program website for 1 year</li> </ul>	<ul style="list-style-type: none"> <li>• Priority consideration for 3 truck replacements*</li> <li>• Company logo on outreach materials and Program website for 1 year</li> </ul>
<b>Bronze Sponsor \$5,000</b>	<ul style="list-style-type: none"> <li>• Priority consideration for 2 truck replacements*</li> <li>• Company logo on Program website</li> </ul>	Not available
*Priority consideration in accordance with set eligibility requirements		

Two carrier companies ultimately became program sponsors, contributing funds to support the Program:

- **California Cartage** became the Mid-Atlantic program’s first corporate sponsor in April 2012 with a Gold level sponsorship. California Cartage’s sponsorship resulted in the replacement of eight owner-operators’ vehicles who were leased to the company. Two additional California Cartage vehicles were processed, but the owner-operators ultimately withdrew from the program.
- The program welcomed **Champion Trucklines** as a Silver level sponsor in January 2013. Champion subsequently replaced three fleet vehicles through the Mid-Atlantic program.

#### ***D. Application Management***

The success of the program depended on the ability of program staff and stakeholders to effectively enlist eligible drayage truck owner operators and fleet owners to participate in the Program. The UMD EFC reviewed applications and assisted applicants through the application process. After verifying that truck owners met all eligibility requirements and qualified for financing, the UMD EFC recommended eligible applicants to MARAMA for funding. Recommended applications and supporting documents were scanned and placed on a shared website to facilitate MARAMA’s access to the records. MARAMA then completed a final review of each application and approved participants for Program funding. Participating truck vendors and lenders were notified of approved applicants in order to facilitate the

truck acquisition and financing processes. MARAMA then assisted applicants in finding their new trucks, securing financing, scrapping their old vehicles, and ultimately processing the grant payment. Each step in the application management process is described in more detail below. The section concludes with application statistics.

## 1. Application Assistance

Truck owners were required to complete, sign, and date a program application acknowledging that the information provided was true, accurate, and complete to the best of their knowledge. The application contained eligibility requirements, financial readiness considerations, application instructions, and a checklist of all required supporting documentation. Supporting documentation included a valid driver's license, vehicle title, up-to-date registration, proof of insurance, proof of port service, and a photograph of the truck to be replaced with the license plate clearly visible. Please refer to Appendix E for a sample program application.

The UMD EFC staff worked closely with applicants to ensure a thorough understanding of the program and that all application information and documentation was accurate and complete. Although a Frequently Asked Questions (FAQ) document was created to help applicants better understand the program and complete the application (Appendix F), program staff often had to make multiple phone calls to obtain complete application packages. In many cases, applicants needed one-on-one assistance, which resulted in frequent and lengthy phone conversations. Records (notes) of conversations with both applicants and prospective applicants were maintained to enhance customer service.

## 2. Eligibility Requirements

### a) Eligible Applicants

In order to be approved for program funds, vehicle owners had to meet a strict set of eligibility requirements. Both independent owner operators and fleet owners with model year engines 2003 or older could apply for funding. Applicants had to demonstrate that the truck was operational, street legal, that they had owned the truck for at least one year, and that they currently used the truck to transport cargo to/from one of the four participating ports.

EPA established the following criteria regarding the required frequency of eligible trucks' port service:

*"The percent of time a DERA funded drayage truck should operate at a port will depend on a number of variables. Where the demand for drayage trucks is relatively constant over the year, DERA -funded drayage trucks should operate a larger percent of time at the port. In areas where the demand fluctuates, it would be reasonable to expect the DERA -funded drayage trucks to operate a greater number of trips at non-port venues. Grant applicants are encouraged to develop proposals that maximize truck operations at the ports, while taking into consideration local variables. A range of 60 to 100 percent could be considered reasonable."*

Because each port authorizes entry differently, a variety of methods were used to verify applicants' port service. All applicants were required to provide a current Transportation Worker Identification

Credential (TWIC) and indicate their frequency of service on the application. In addition, Virginia applicants supplied a valid Virginia Port ID card, essential for all workers to enter the Port of Virginia. Baltimore applicants' service to the Port's public terminals was verified by the Maryland Port Administration through their eModal drayage truck registry system. Service to the Port of Baltimore's private terminals was verified by the terminals' operation staff on a case-by-case basis. In the absence of Port identification cards or port-wide electronic verification systems, Philadelphia and Wilmington applicants provided both Terminal and Equipment Interchange Receipts and carrier company letters to verify their service.

b) Eligible Trucks

As described above, MARAMA and the UMD EFC worked with truck centers in each state to coordinate the purchase of eligible vehicles. EPA established the following criteria for replacement drayage trucks purchased under this program:

“Eligible replacement drayage trucks must meet EPA’s 2007 or newer emissions levels for heavy-duty highway vehicles. While there is no specific model year limit for the vehicle being replaced, replacements due to normal attrition are not allowed.”

“EPA will fund up to 50% of the cost of an eligible drayage truck with a 2004 to 2006 model year engine equipped with a diesel particulate filter that produces at least an 85% reduction in particulate matter. For project proposals to fund 2004-2006 model year engines, the applicant should include information in their proposal to address the viability of the diesel particulate filter to operate satisfactorily in a drayage setting. This information should include datalogging, exhaust temperature operating requirements, previous history of use, etc. Also, if active filters are to be used to address operational requirements, the applicant should address the operational requirements and associated costs.”

Engine years precede the model year of trucks by one year (e.g. MY 2004 trucks are equipped with 2003 engines). Since it is the engine that is of concern with respect to emissions, work plan amendments for this Program specified that “only trucks with engines that are MY 2003 or older will be eligible for replacement.” All “Tractor Program Conditions” from the work plan were met, as described in the following table.

**Table 3. Tractor Program Conditions Were Met**

From Work Plan or Grant Award	Actual Accomplishments
Tractors must be purchased from an entity approved by MARAMA.	All tractors were purchased from truck dealerships approved by MARAMA. Beginning in year two, more stringent conditions were placed on dealerships participating in the program.
All maintenance records should be available. The balance of any remaining warranty should also be included.	If warranties remained on the trucks, they were passed on to the next owner. Maintenance records were shared as requested by the buyer. Truck centers used a meter that provided read outs concerning any maintenance performed on the truck. These reports were available from the truck center if requested by the customer. MARAMA encouraged participants to request this documentation.
Tractors may be equipped with a GPS tracking device in order to locate the vehicle in the event that it becomes necessary. This will not be required by MARAMA but may be required by the financial institution providing the loan.	MARAMA found that most lending institutions required GPS tracking. As this was not a requirement of MARAMA, GPS tracking was not formally monitored.
Where necessary, tractors shall be equipped with the appropriate emission reduction devices such as Diesel Oxidation Catalysts or Diesel Particulate Filters. Cooperative agreement funds can be used to purchase or finance eligible used pre-2007 highway vehicles, used engines, and used pieces of equipment, so long as verified emission control technologies have been installed. (Programmatic Condition #4k)	Three trucks with model year 2006 engines (MY 2007 trucks) were sold to participants with DOCs installed. The remaining trucks purchased through the Program were equipped with 2007 or newer engines. MARAMA provided information about maintenance required for Diesel Particulate Filters on newer trucks.
Only certified engine configurations and/or verified technologies are eligible for purchase or financing using cooperative agreement funds. (Programmatic Condition #2)	Photographs of the VIN plate of the new engine were required and checked to ensure that the new engine was a 2007 or newer model meeting EPA requirements.

### 3. Certificates Issued

Applicants were recommended to MARAMA for funding by the UMD EFC in groups of eight to 10. Moving groups of applicants through the same steps of finding a new truck, securing financing, and preparing them for scrapping saved administrative time and effort. Furthermore, working with small groups allowed program staff to better track participants' progress and provide in-depth assistance to those falling behind.

For applicants meeting all program requirements, MARAMA issued Certificates of Acceptance (see Appendix G), allowing participants 45 days to complete the process of finding a truck, obtaining financing, and scrapping the old vehicle. Program participants were notified of approval through a phone call from MARAMA where program requirements were reiterated and next steps were



discussed. Acceptance packages containing the Certificates of Approval, participating vendor-lender information, DPF maintenance information, scrappage details, and instructions regarding next steps were also mailed to each approved applicant.

Regular follow-up calls helped the program run smoothly by ensuring that participants were moving forward. On occasion, the 45 day agreement period was extended due to unforeseeable events beyond the applicant's control such as the new truck needing repairs or financing taking longer than expected. Most extensions were for 2 to 3 weeks maximum with most owners able to finish within the 45 day time frame.

Participants were encouraged by program staff to obtain more than one bid to locate the optimal financing option. Most participants lacked experience in financing big purchases and needed substantial support to find the best deal. Although answering questions was time consuming, it was necessary to keep the process moving forward.

#### **4. Scrappage, Documentation, and Payment**

As participants moved through the different stages of the program, certain documents were collected and filed alphabetically by owner name. Documents relating to the truck purchase such as the invoice, model year, new truck title, and the truck registration application were received from the truck vendor. The truck vendor also provided two photographs of the new truck – one of the exterior and another of the VIN plate. This documentation made it possible to follow the VIN number to establish the authenticity of the truck purchase while the file was under review.

The truck owner provided two additional documents for MARAMA. One authorized MARAMA to send the down payment to a named payee. The second was a notarized scrappage warranty from the participant verifying proper disposal of the old vehicle.

Lastly, documentation from the scrap yard was needed to prove that old trucks were scrapped according to EPA requirements. Required scrappage documentation included before and after photographs of the engine and chassis, a scrapping receipt with the date and truck VIN number, and a copy of the scrappage check showing the amount owners received for the scrap metal. Documentation for each applicant was compiled in a package which was then reviewed by the project manager, the program manager, and MARAMA's Executive Director. Upon approval, down payment checks were written and either sent to the truck center or picked up by the participant.

The final document checklist for certificate holders, truck vendors, and scrap yards as well as the checklist used by MARAMA to process down payments can be found in Appendices H and I respectively.

#### **5. Application Statistics**

##### **a) Number of Applications Received and Approved for Funding**

Table 4 shows the number of Program applications approved for funding among all applications received before the close of the program. Program-wide 76 percent of the applications received were

approved for funding. The approval rate was highest among Port of Virginia applicants (81 percent) and lowest among Port of Philadelphia/Wilmington applicants (60 percent). Applications not approved for funding were incomplete, did not meet the eligibility criteria, or were withdrawn from the program prior to approval. Not included here are applications received after the program closed to new applicants.

**Table 4. Applications Approved for Funding**

	Total No. Applications Received	Applications Approved for Funding	
		No.	Percent
Port of Virginia	195	157	81%
Port of Baltimore	112	81	72%
Port of Philadelphia/Wilmington	35	21	60%
<b>PROGRAM WIDE</b>	<b>342</b>	<b>259</b>	<b>76%</b>

b) Number of Trucks Replaced

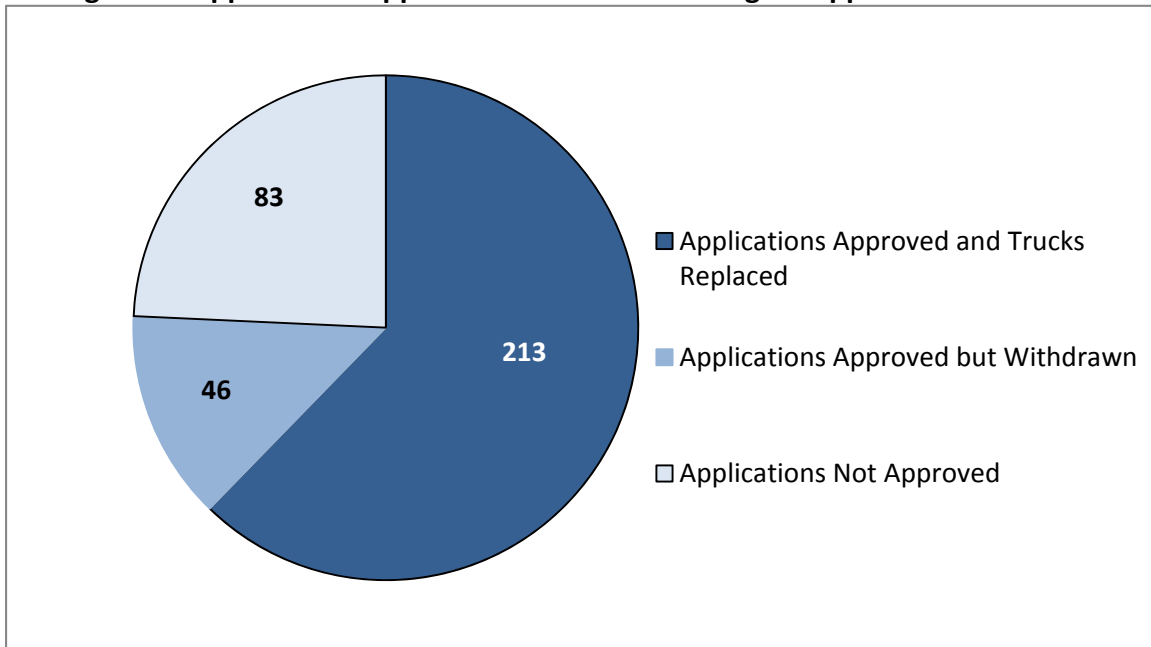
Table 5 shows the number of trucks replaced among those applications approved for Program funding. Program-wide approximately 82 percent of approved applications resulted in truck replacement. The truck replacement rate was similar among individual port programs: 86% among Philadelphia/Wilmington applicants, 83% among Virginia applicants, and 79% among Baltimore applicants. Approved applicants who dropped out of the Program withdrew for a variety of reasons including financing issues and not being able to locate an affordable truck.

**Table 5. Trucks Replaced**

	No. Applications Approved for Funding	Trucks Replaced		Withdrawals	
		No.	Percent	No.	Percent
Port of Virginia	157	131	83%	26	17%
Port of Baltimore	81	64	79%	17	21%
Port of Philadelphia/Wilmington	21	18	86%	3	14%
<b>PROGRAM WIDE</b>	<b>259</b>	<b>213</b>	<b>82%</b>	<b>46</b>	<b>18%</b>

Figure 1 below further illustrates the above data. Among all applications received (342), 62 percent (213) resulted in successful truck replacement. Thirteen percent (46) of applications received were approved for Program funding but ultimately withdrew. Twenty-four percent (83) of applications were never approved for Program funds as they were incomplete, ineligible, or dropped out of the Program prior to approval.

**Figure 1. Applications Approved and Funded Among All Applications Received**



c) Grantee Demographics

Table 6 shows that program wide, 80 percent (170) of grantees were owner operators and 20 percent (43) were licensed motor carriers. Port of Baltimore grantees had the greatest percentage of owner-operators (84 percent) followed by Port of Virginia (79 percent) and Port of Philadelphia/Wilmington (72 percent) grantees.

**Table 6. Owner-Operators vs. Licensed Motor Carriers by Port Area**

	No. Trucks Replaced	Owner-Operators		Licensed Motor Carriers	
		No.	Percent	No.	Percent
Port of Virginia	131	103	79%	28	21%
Port of Baltimore	64	54	84%	10	16%
Port of Philadelphia/ Wilmington	18	13	72%	5	28%
<b>PROGRAM WIDE</b>	<b>213</b>	<b>170</b>	<b>80%</b>	<b>43</b>	<b>20%</b>

### III. Program Results and Outcomes

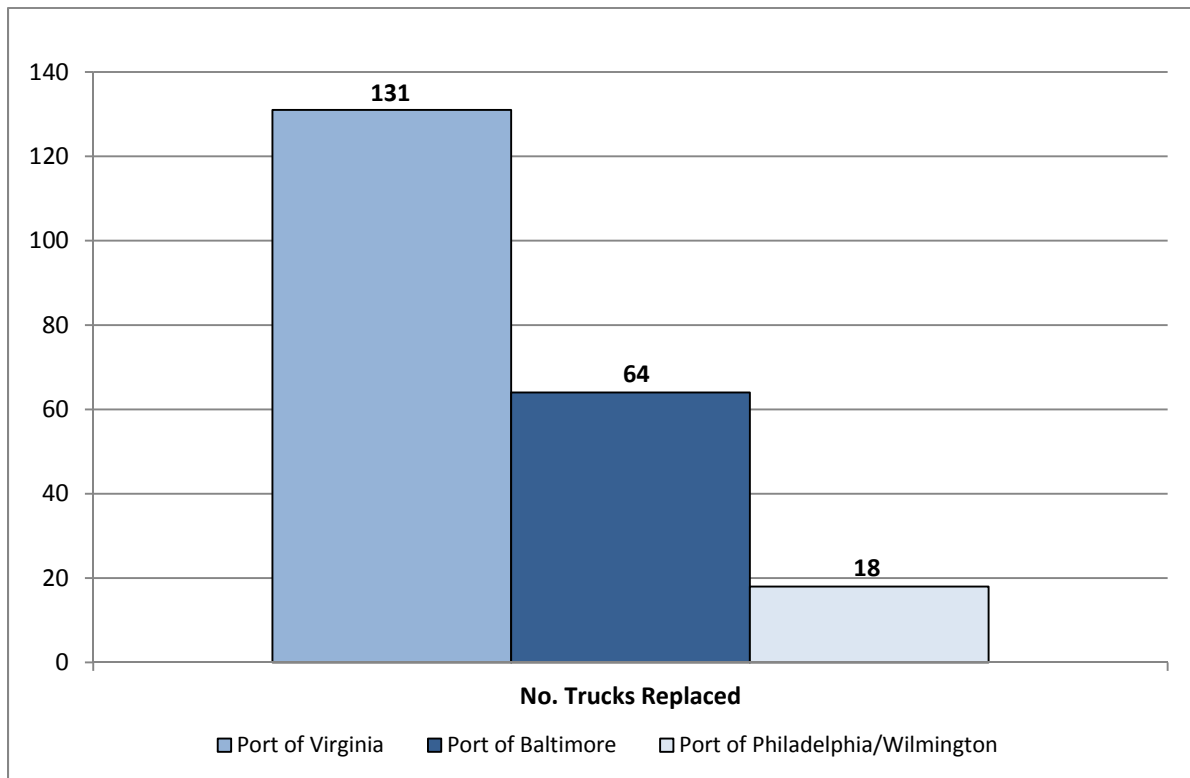
#### A. Vehicles Participating in the Program

##### 1. Number of Trucks Replaced

Overall, the Mid-Atlantic Dray Truck Replacement Program supported the replacement of 213 older drayage trucks serving ports in Virginia, Maryland, Pennsylvania, and Delaware. As shown in Figure 2, the replacements included:

- 131 dray trucks serving the Port of Virginia,
- 64 dray trucks serving the Port of Baltimore, and
- 18 dray trucks serving the Ports of Philadelphia and/or Wilmington.

**Figure 2. Number of Trucks Replaced by Port Area**



## 2. Characteristics of Trucks Replaced and Replacement Trucks



*Oldest truck replaced in Program: 1984 Kenworth W900*

Table 7 presents characteristics of the old trucks replaced in the Program and characteristics of the newer, replacement trucks. Program wide, 213 older drayage trucks were scrapped and replaced. Old trucks replaced ranged in age from model year 1984 to 2003 with an average model year of 1996. Old trucks traveled an average of 68,432 miles per year and idled an average of 1064 hours per year.

Replacement trucks were required to be model year 2008 or newer. Replacement vehicles ranged in age from model year 2006 to 2013 with an average of model year 2009 – on average, 13 years newer than the trucks being replaced. The oldest replacement vehicles were three model year 2007 trucks with added diesel oxidation catalysts. The newest replacement vehicles included 24 model year 2010 trucks, seven model year 2011 trucks, one model year 2012 truck, and one model year 2013 truck.



*One of newest trucks purchased: 2011 Volvo VNL 64T*

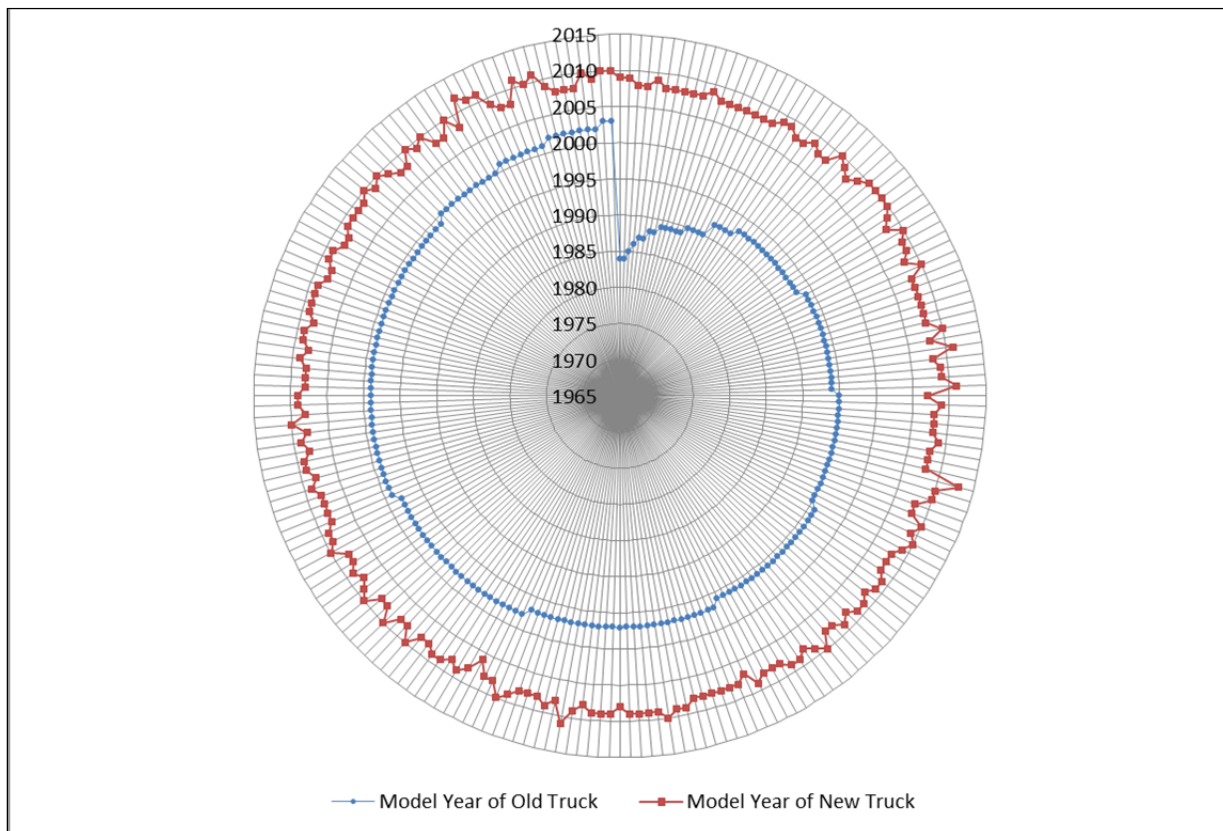
Truck mileage had a major influence on the price of the replacement truck. Replacement trucks ranged in price from \$33,000 for a high mileage (700,000) 2008 tractor to \$102,500 for a low mileage (under 200,000 miles) 2011 vehicle. The average cost was \$51,781. There was very little difference between the cost of 2008 and 2009 model year trucks, and the mileage on the vehicles was also similar. Most of the replacement trucks purchased by program participants had already been driven 400,000 to 500,000 miles regardless of model year.

**Table 7. Characteristics of Trucks Replaced and Replacement Trucks**

	Old Trucks Replaced				Newer Replacement Trucks	
	Number of trucks replaced	Average MY of old truck	Average miles traveled per year	Average idling hours per year	Average MY of replacement truck	Average cost of replacement truck
Port of Virginia	131	1996	70,093	1278	2009	\$51,706
Port of Baltimore	64	1996	53,447	1051	2009	\$51,373
Port of Philadelphia/Wilmington	18	1996	81,756	864	2009	\$53,781
<b>PROGRAM WIDE</b>	<b>213</b>	<b>1996</b>	<b>68,432</b>	<b>1064</b>	<b>2009</b>	<b>\$51,781</b>

Figure 3 shows the model year differences between the old and replacement trucks, further illustrating the impact of the Program in encouraging early replacement of older drayage trucks with newer, lower emitting trucks.

**Figure 3. Comparing the Model Year of Old and Replacement Trucks**



The program Fleet Sheet provides additional details about the trucks replaced as well as the replacement vehicles purchased by program participants.

### ***B. Methods for Quantifying Emissions Reductions and Cost Effectiveness***

EPA's Diesel Emissions Quantifier (DEQ) is an interactive tool that evaluates clean diesel projects and options for medium- and heavy-duty diesel engines by estimating emission reductions, cost effectiveness, and health benefits. The current version of the DEQ is based on data generated using EPA's Motor Vehicle Emission Simulator (MOVES) 2010 model. EPA's website indicates that the DEQ cannot be used in developing State Implementation Plans or conformity determinations because DEQ estimates use default values and are not precise enough for these applications.

MARAMA used the DEQ to provide estimates of emission reductions due to scrapping old trucks and purchasing replacement vehicles. The DEQ was also used to estimate the cost effectiveness of the program. Following the steps outlined on the DEQ Frequently Asked Questions document from the Office of Transportation and Air Quality (EPA-420-F-13-008, April, 2013), MARAMA created an Excel spreadsheet with information on the scrapped trucks. Scrapped trucks were grouped together according to the port served. For each port area calculations were done using old truck information as listed below, to create averages for each port area. The averages for each port area were then input into the DEQ to provide emission reduction numbers. For each port area, the following data was input into the DEQ in order to calculate the emission reductions:

#### Old Truck Information

- Model year
- Year replaced,
- Annual fuel consumed,
- Average annual idling time, and
- Average annual mileage.

#### New Truck Information

- Model year,
- Identification as an "engine" replacement, and
- Cost of the new vehicle.

The resulting DEQ calculation of emissions reductions assumes a 30-year lifetime for each truck replaced. Thus, a 1996 truck is expected to be on-road through 2026. The quantifier estimates tons of pollutants reduced annually and over the remaining lifetime of the old truck. The estimated lifetime emissions reductions represent the benefits of early replacement of the old vehicle and terminate after the old vehicle would have reached the end of its expected useful life.

The program results were obtained using the Summary of Emission Results report page of the DEQ. The DEQ also provided a detailed report in an Excel file format that shows all inputs for each truck group. MARAMA used both documents to check the inputs. For quality control, another MARAMA staff member reviewed the emission results in comparison to the proposed results specified in the grant work plan.

### C. Estimated Emissions Reductions

Table 8 shows the estimated annual and lifetime emissions reductions for the overall Program. Overall, the greatest emissions reductions were seen in NOx and CO with estimated annual reductions of 322 and 85 tons per year respectively and estimated lifetime reductions of 3908 and 1028 tons respectively. Tables 9 and 10 show estimated annual and lifetime emissions reductions by port area.

**Table 8. Estimated Emissions Reductions Achieved**

Pollutant	Annual emissions reductions (tons/yr)	Lifetime emissions reductions (tons)
NOx	323	3908
PM <sub>2.5</sub>	16	194
HC	13	153
CO	85	1028

The DEQ uses a variety of state- and county-specific characteristics such as climate, geography, roads, and population. These factors can affect emissions calculations, causing variation between states or counties. Emissions reduction variation between port areas may reflect differences in the number of miles driven annually, amount of fuel used, idling time, and the remaining lifetime of the old truck based on a 30 year lifetime. For example, as noted in Table 7 above, the average truck scrapped in Baltimore was driven fewer miles per year compared to the other two port areas (53,447 miles per year compared to 70,093 miles per year in Virginia and 81,756 miles per year in Philadelphia/Wilmington). Furthermore, the remaining lifetime of very old, more polluting trucks (i.e. model year 1984-1987 trucks) is 3 years or less; hence, a port area replacing a greater number of old trucks may show lower lifetime emission reductions as compared to a port area replacing fewer old trucks. Please refer to Appendix J for a more detailed description of emissions reductions by port area. Values were rounded for this presentation and may not sum exactly to totals above.

**Table 9. Estimated Annual Emissions Reductions by Port Area**

Pollutant	Philadelphia & Wilmington (tons/yr)	Baltimore (tons/yr)	Virginia (tons/yr)
NOx	34	84	205
PM <sub>2.5</sub>	1.7	3.9	10.4
HC	1.5	2.8	8.4
CO	9.5	19.4	56

**Table 10. Estimated Lifetime Emissions Reductions by Port Area**

Pollutant	Philadelphia & Wilmington (tons)	Baltimore (tons)	Virginia (tons)
NOx	439	1012	2457
PM <sub>2.5</sub>	23	46	125
HC	19	34	101
CO	124	233	672



**D. Estimated Total Project Cost Effectiveness**

MARAMA calculated cost effectiveness by dividing the cost of replacement vehicles by the estimated emissions reductions. Total project cost effectiveness is defined as *the dollar per ton of pollutant reduced for the entire project*. This does not include program administration costs.

Table 11 shows the total project cost effectiveness of the Program. Program wide total project cost effectiveness was \$2,822 for NOx, \$45,906 for PM<sub>2.5</sub>, \$71,876 for HC, and \$10,725 for CO. To arrive at these figures MARAMA included EPA funds, contributions from each port area, sponsorship dollars, SEP funds, and funds owner operators committed to truck purchases.

Table 11 also shows cost effectiveness by port area. Variation in cost effectiveness between ports is due in part to the age of the old trucks serving the ports and the cost of the replacement trucks. Older trucks with shorter remaining lifetimes result in less lifetime emissions reduced. Newer replacement trucks cost more, which increases the overall cost. Replacement trucks with 2010 or later engines also have lower emissions, which tends to increase the emissions reductions achieved.

Replacement trucks serving the ports of Philadelphia and Wilmington were more expensive on average than the replacement trucks serving the Baltimore and Virginia ports. However, trucks serving the Port of Baltimore were driven fewer miles on average than the trucks replaced in the other areas. This would result in lower lifetime emissions and a higher cost per ton. Because most trucks replaced were in Virginia, the cost effectiveness for the total program is more similar to the results for Virginia.

**Table 11. Total Project Cost Effectiveness (Dollars per Ton)**

	NOx	PM <sub>2.5</sub>	HC	CO
Port of Virginia	\$2,757	\$54,166	\$67,320	\$10,082
Port of Baltimore	\$3,249	\$71,093	\$97,146	\$14,123
Port of Philadelphia/ Wilmington	\$2,203	\$42,988	\$50,979	\$7,825
<b>Program Wide</b>	<b>\$2,822</b>	<b>\$56,906</b>	<b>\$71,876</b>	<b>\$10,725</b>

**E. Outreach Activities**

MARAMA’s work plan goals with respect to the promotion of the Program were as follows:

*MARAMA will promote the finance project through the Mid-Atlantic Diesel Collaborative website and periodic news releases and partners...MARAMA will also coordinate program activities with existing dray truck programs particularly in the Mid-Atlantic region. Coordination of activities could include conference calls and meetings to discuss items such as program design, best practices, and marketing.*

As described below, all work plan goals related to the promotion of the project were met.

A central component to the success of the Mid-Atlantic Dray Truck Replacement Program was public outreach and engagement. Outreach activities were integral in recruiting participants, educating the public about the harmful air pollution associated with the transport of goods to and from participating ports, and communicating program accomplishments. Outreach was ongoing throughout the course of the Program beginning with branding and continuing with the development of promotional materials, public presentations, website promotion, and press coverage. Program partners, truck vendors, and participants provided valuable assistance in successfully promoting the Program to the public. A summary of outreach activities is provided below.

## 1. Branding

In early 2011, the UMD EFC worked with the University of Maryland Design Services to modify the previously existing Virginia Green Operators (GO) Program logo to create a generic Mid-Atlantic GO Program logo that included all four ports. The logo was used on program materials as a way to connect the four ports under the regional program. The design was, with permission from the Port of Virginia, very similar to the Virginia GO Program logo. Green Operators in Virginia already identified with the symbol and the goal was to reflect the success of Virginia’s program in the other states.



At the request of the Maryland Port Administration, an additional logo was utilized for the Baltimore program. Previously developed for the Port of Baltimore Clean Diesel Program in 2009, this logo and its accompanying slogan “Another Clean, Green Diesel Machine” were used to build upon the success and familiarity that had already been established among port operators in Baltimore through the Port’s previous emission-reduction program. The logo was also used for large decals that were distributed to Baltimore grantees for display in their program-funded replacement trucks.

## 2. Promotional Materials

Program flyers and informational business cards (Appendix K), available in both English and Spanish, were developed and modified for use in all three port programs. In addition, large sticker decals were distributed to grant recipients to place on their new trucks as a promotional tool.



*Baltimore grantee with new truck and "Another CLEAN, GREEN Diesel Machine" decal*

### **3. Word-of-Mouth**

While the more traditional outreach methods described in this section were critical to the successful promotion of the Program, the power of word-of-mouth proved vital. In speaking with interested parties, program staff quickly realized the importance of referrals from peers who had already participated in the Program and the credibility that the "peer experience" provided. To better facilitate peer referrals, program staff distributed program business cards and truck decals to newly funded applicants. Grant recipients were encouraged to share the cards with their friends and co-workers interested in truck replacement.

### **4. Role of Truck Vendors in Outreach**

Truck vendors played a key role in promoting the program to drayage truck owners. Program staff worked to ensure that truck vendors were thoroughly educated about the details of the program so that they could be a knowledgeable source for potential applicants. It was helpful for each vendor location to assign a single sales representative to work with program applicants and staff to ensure consistent education and communication. The most successful vendors (those that sold the most trucks to program participants) had program flyers, business cards, and applications materials on hand to share with eligible customers. Many also assisted their customers in completing the application, gathering supporting documentation (e.g., taking photos of old trucks), and submitting complete applications directly to program staff.

### **5. Websites**

The Mid-Atlantic Dray Truck Replacement Program website was launched on March 1, 2011, and hosted on the UMD EFC website. Program information, eligibility requirements, press coverage, applications and other program materials were posted to the site. The Program was also promoted on a variety of other websites. Although web links are provided below, please note that information may no longer appear on the organizational websites after the Program's conclusion. Please refer to Appendix L for screen shots of the UMD EFC and Mid-Atlantic Diesel Collaborative websites.

- University of Maryland Environmental Finance Center (<http://efc.umd.edu/cleandiesel.html#.U5cJbnJdU9Z>)
- Mid-Atlantic Regional Air Management Association, Inc. ([www.marama.org](http://www.marama.org))
- Mid-Atlantic Diesel Collaborative ([www.dieselmideatlantic.org](http://www.dieselmideatlantic.org))
- The Port of Virginia (<http://www.portofvirginia.com/environment/green-operator.aspx>)
- Virginia Clean Cities (<http://www.greenoperator.org/>)
- Maryland Port Administration (<http://mpa.maryland.gov/greenport/clean-diesel-program.php>)
- Maryland Motor Truck Association (<http://www.mmtanet.com/>)
- Philadelphia Regional Port Authority (<http://www.philaport.com/green.htm>)
- Clean Air Council (<http://www.cleanair.org/>)
- Evans Delivery Company ([www.evansdelivery.com](http://www.evansdelivery.com))

## 6. Help Line

Websites and promotional materials also provided the phone number for the Truck help line. Trained students and staff at the University of Maryland Environmental Finance Center (UMD EFC) provided program information and application guidance via the help line. As applicants progressed, assistance from staff at both the UMD EFC and MARAMA via phone conversations was important to expedite completion of the replacement process. Truck owners often preferred phone contact as driving made it difficult to use e-mail or access the Internet. The help line was also used to provide assistance to truck vendors, lending institutions, and scrap yards.

## 7. Public Presentations and Outreach Events

MARAMA and the UMD EFC made numerous presentations about the Program. Key public presentations are listed below.

- May 3, 2011: A presentation about the Baltimore program was given to over 60 members of the Maryland Motor Truck Association's Intermodal Council promoting the program to both truck owner operators and carrier companies.
- May 16, 2011: UMD EFC and the Philadelphia Clean Air Council hosted a luncheon for Pennsylvania/Delaware stakeholders attended by approximately 15 carrier and port industry representatives. A presentation was given, and stakeholders voiced concerns and provided feedback on how to build and strengthen the Program.
- July 13, 2011: A presentation was given to the Delaware Valley Goods Movement Task Force in Philadelphia, Pennsylvania.
- January 25, 2012: The EFC Director presented a program overview to the Mid-Atlantic Diesel Collaborative Steering Committee.
- February 23, 2012: A program booth at the Maryland Motor Truck Association's annual fundraising event provided program information and application materials to prospective applicants and recruited local truck vendors

- May 17, 2012: The program was presented, operational questions and concerns were addressed, and materials were distributed to local trucking company representatives at the Maryland Motor Trucking Association Intermodal Council meeting in Baltimore, Maryland.
- January 29, 2013: MARAMA and UMD EFC leaders presented a program overview at the Workshop on Green Financing Mechanisms to Reduce Emissions from Heavy-Duty Vehicles, which was sponsored by the U.S. EPA and Environment Canada.
- February 27, 2014: The UMD EFC Director presented a program overview including estimated total program lifetime emissions reductions at the EPA National Estuaries Program conference in Washington, DC.
- April 8, 2014: The MARAMA Executive Director presented an overview of the program and outcomes at the National Port Stakeholder Summit in Baltimore, Maryland.
- June 25, 2014: The MARAMA Executive Director presented a paper describing lessons learned from the program at the Air and Waste Management Association’s Annual Conference and Exhibition in Long Beach, California.

## 8. Press Coverage

At least a dozen news articles have been published about the Program, with the most frequent coverage occurring the Program’s first year (2011). Table 12 below lists the known press coverage and provides links if available.

**Table 12. Press Coverage**

<p><a href="#"><u>Transport Topics: “East Coast Port Sets Grants to Purchase Newer Trucks”</u></a>          June 6, 2011          This Transport Topics article by Rip Watson highlights the Mid-Atlantic Dray Truck Replacement Program.</p>
<p><a href="#"><u>Environment News Service: “Cleaner Short Haul Coming to US Ports”</u></a>          June 28, 2011          This ENS article highlights the Mid-Atlantic Program and other SmartWay initiatives to improve air quality and community health by reducing harmful diesel emissions from short haul diesel drayage trucks.</p>
<p><a href="#"><u>New Mid-Atlantic Program Helps To Improve Port Communities</u></a>          June 28, 2011          A press release announcing the Mid-Atlantic Dray Truck Replacement Program was released to coincide with a US EPA SmartWay and Coalition for Responsible Transportation joint press conference held in Charleston, South Carolina.</p>
<p><a href="#"><u>Mid-Atlantic Drayage Truck Replacement Program</u></a>          June 29, 2011          This interview with Land Line Now on XM Sirius Satellite radio was rebroadcast throughout the day.</p>

**[Fleet Owner Magazine: "Mid-Atlantic states float plan to dump dirtiest trucks"](#)**

July 5, 2011

This article by David Cullen highlights the Mid-Atlantic Program and its goal of bringing together four states to offer one of the nation's most generous programs aimed at replacing old, highly polluting trucks by focusing on drayage vehicles that shuttle freight from four ports in the region to both warehouses and local stores.

**[Baltimore Sun: "Dirty trucks in port targeted"](#)**

July 17, 2011

This article by Timothy Wheeler describes the Mid-Atlantic Dray Truck Replacement Program and how it is reducing pollution from older dray trucks through grants to help truck owners replace older vehicles.

**[USA Today: "Clean-air program offers cash to get old trucks off the road"](#)**

November 15, 2011

This USA Today article by Ron Barnett cites the Port of Virginia truck replacement program and other similar programs across the United States.

**[Maryland Port Authority Press Release: "New Program to Improve Air Quality at Port of Baltimore"](#)**

January 31, 2012

This press release announces the opening of the Baltimore program and its efforts to reduce air pollution at the port and surrounding communities.

**[Transport Topics: "EPA Funds Available for Drayage Retrofits at Port of Baltimore"](#)**

February 7, 2012

Transport Topics reporter Eric Miller highlights the Mid-Atlantic Dray Truck Replacement Program.

**[Land Line: "Grants available for Mid-Atlantic port truck replacements"](#)**

July 26, 2012

This Land Line Mag.com article by Charlie Morasch describes the Mid-Atlantic Program and the availability of grant funding to truck companies and individuals who service one of four participating ports. Land Line Now Radio also advertised the program at news time and ran PSA spots over a period of several days.

**[Port of Baltimore Magazine: "Out with the Old, In with the New"](#)**

July/August 2012

This Port of Baltimore magazine article features the Mid-Atlantic Dray Truck Replacement Program and its first Maryland grant recipient, pages 14-15.

**[Port of Baltimore Magazine: "Solid Steps towards Sustainability"](#)**

March/April 2013

The Mid-Atlantic Dray Truck Replacement Program was featured in the March/April 2013 Sustainability issue of the Port of Baltimore Magazine, pages 18-26.

**[Port of Baltimore Magazine: "Power Over Pollution: Efforts Made to Keep Dray Truck Program Running"](#)**

March/April 2014

The Mid-Atlantic Dray Truck Replacement Program was featured in the March/April 2014 special Green issue of the Port of Baltimore Magazine, pages 24-25.

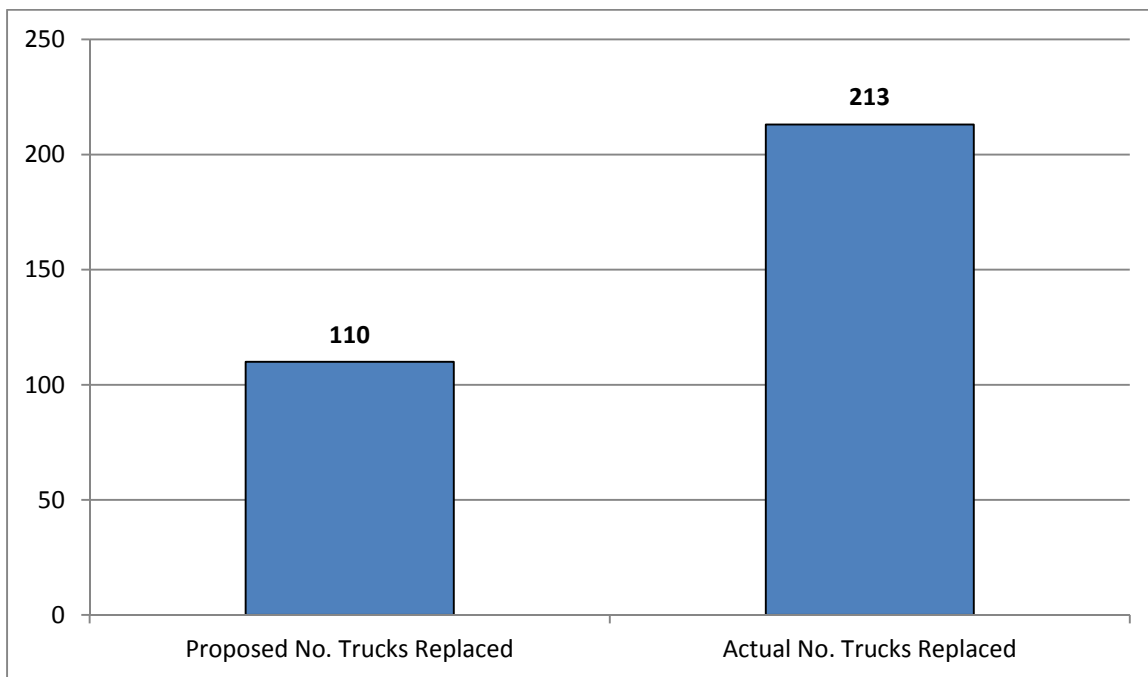
## IV. Comparison of Actual Results with Proposed Outputs and Outcomes

### A. Truck Replacements

#### 1. The Number of Trucks Replaced Exceeded Work Plan Goals

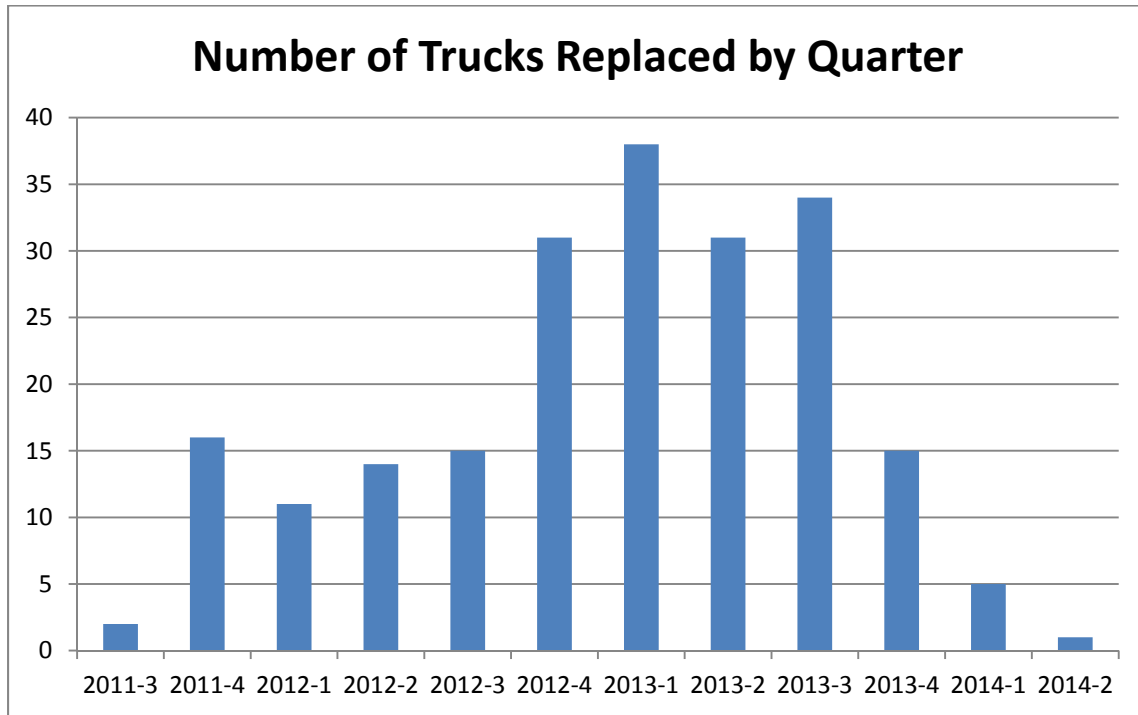
The anticipated program output as described in the Work Plan was to replace approximately 110 model year 1997 or older drayage trucks. As shown in Figure 4 the number of trucks replaced with program support was 213, exceeding the goal of 110 by 103 trucks.

**Figure 4. Proposed vs. Actual Number Trucks Replaced**



All truck replacements were expected to be completed within the approved project period: July 1, 2010 to June 30, 2014. The originally projected number of replacements (110) was reached during the 1<sup>st</sup> quarter of 2013. In total, 212 truck replacements were completed by the end of the first quarter of 2014, and one final truck was replaced in May 2014, exceeding anticipated deliverables well in advance of the project end date. While truck replacements were slow in the early part of the program, Figure 5 shows that replacements significantly increased in late 2012 and 2013 after the program was well established and open in all three port areas.

Figure 5. Number of Trucks Replaced by Calendar Quarter



### B. Emissions Reductions

The intended outcomes of this project as facilitated by the replacement of older drayage trucks included reductions in nitrogen oxide (NOx), particulate matter (PM), hydrocarbon (HC), and carbon monoxide (CO). MARAMA used two scenarios to bracket the anticipated emissions reductions:

- Scenario 1 was that all replacements would be model year 2007 and that the scrapped vehicles would include 75 MY 1994-1997, 17 MY 1991-1994, and 17 MY 1984-1990 trucks. This scenario assumed that 110 trucks would be replaced with 2007 or later vehicles at an estimated purchase price of \$65,000.
- Scenario 2 was that all replacements would be MY 2004 and scrapped vehicles would include 82 MY 1994-1997, 41 MY 1991-1994, and 41 MY 1984-1990 trucks. This scenario assumed that 164 vehicles could be replaced because the replacement trucks would cost less—it was assumed that 2004 trucks would cost \$40,000.

Table 13 summarizes the range of annual and lifetime emissions reductions anticipated from the two truck replacement scenarios described above. The first number in the range represents estimated reductions achieved by Scenario 1, and the second number in the range represents estimated reductions achieved by Scenario 2. The larger number of trucks replaced in Scenario 2 resulted in greater emissions reductions of NOx and PM, but the older replacement trucks had higher emissions as evidenced in the lower reductions of HC and CO as compared to Scenario 1.



**Table 13. Proposed Outcomes**

Pollutant	Range of estimated annual emissions reductions (tons/yr)	Range of estimated lifetime emissions reductions (tons)
NOx	137.95 – 139.21	1637.95 – 1755.85
PM	2.53 – 3.14	28.76 – 37.57
HC	2.47 – 2.35	28.87 – 28.75
CO	18.86 – 12.76	221.515 – 156.66

**1. Emissions Reductions Achieved were Greater than Predicted**

The estimated emissions reductions achieved exceeded the goals established in the Work Plan for NOx, PM<sub>2.5</sub>, HC, and CO. Contributing factors to the greater than predicted emissions reductions include the larger number of trucks replaced (213 vs 110 in Scenario 1 and 164 in Scenario 2) and that replacement trucks were newer than predicted (average age of MY 2009 versus anticipated age of MY 2007 in Scenario 1 and MY 2004 in Scenario 2). In addition, changes in the emissions quantifier also contributed to the results.

At the time the grant application was submitted, estimates of program effectiveness used EPA’s Diesel Emissions Quantifier, which used emissions factors developed using the MOBILE6 model. The current version of the Quantifier uses emissions factors developed using the MOVES 2010 model. The MOVES 2010 model incorporates EPA’s latest research, which indicates that emissions reductions will be greater than previously estimated.

The Diesel Emissions Quantifier provides estimates of both annual and lifetime emissions. Table 14 compares the Work Plan predictions with the current estimate of reductions achieved for both annual and lifetime periods. Lifetime emissions represent emissions during the remaining life of the scrapped vehicle, assuming a 30-year lifetime.

**Table 14. Comparison of Emissions Reductions to Program Goals**

Pollutant	Range of predicted annual emissions reductions (tons/yr)	Actual annual emissions reductions (tons/yr)	Range of predicted lifetime emissions reductions (tons)	Actual lifetime emissions reductions (tons)
NOx	137.95 – 139.21	322.84	1637.95 – 1755.85	3,907.87
PM	2.53 – 3.14	16.01	28.76 – 37.57	193.82
HC	2.47 – 2.35	12.66	28.87 – 28.75	153.45
CO	18.86 – 12.76	84.90	221.515 – 156.66	1028.35

## 2. Several factors influenced the age of trucks chosen by participants

The program initially offered a down payment of \$15,000 to purchase model year 2004-2007 trucks as long as a diesel particulate filter (DPF) was installed as part of the purchase. Three (3) program trucks model year 2007 were purchased under this grant provision. Unfortunately, the DPF installation time included a 6 to 8 week wait for parts to be delivered to the truck center plus an additional 2 weeks' time for installation. Truck mechanics at the time were unfamiliar with installing the DPF equipment, making proper installation somewhat risky. Due to these factors and the timeframe to complete the sale and DPF installation on the 2004-2007 trucks, a program decision was made requiring the purchase of only 2008 or newer trucks.

When the program launched in 2011, 2008 trucks were more scarce than anticipated due to economic conditions. Two major economic impacts caused the scarcity. First, the number of diesel trucks manufactured in 2008 had been greatly reduced. Second, large national trucking companies that typically turn over truck fleets every three years, making class 8 used trucks available, instead held onto their trucks longer.

Program staff worked on these early issues of supply and price by encouraging truck vendors to search nationally and purchase more 2008 trucks for their inventory. Generally, the Program's approved vendors stocked pre-2008 trucks as their drayage truck customers traditionally purchased older trucks in the \$20,000 range rather than the newer 2008 trucks in the \$50,000 range that the program required. As the program matured, it became easier for the participants to purchase later model year trucks.

## V. Recommendations and Lessons Learned

### A. Recommendations for Future Programs

- **Build on the success of similar programs when possible.** Part of the Mid-Atlantic program's success can be attributed to the excellent work previously accomplished in both the Virginia Green Operators (GO) and Port of Baltimore Clean Diesel Programs. The Virginia Port Authority (VPA)'s GO program was formally launched in 2009 to reduce the amount of air pollution from drayage trucks in the state of Virginia. The VPA was an integral program partner to the Mid-Atlantic effort offering a wealth of support and guidance in developing program rules and requirements, sharing program materials, providing outreach support through their website and press releases, engaging additional stakeholders such as trusted truck vendors and potential sponsors, and devoting direct financial support to the program. Mid-Atlantic program staff also built upon the success of the 2009-2010 Port of Baltimore Clean Diesel Program by capitalizing on lessons learned and engaging program partners associated with the Clean Diesel program who provided ongoing support and guidance in developing program rules and requirements; developing program materials; providing outreach support through their website, port publications, eModal communication system, and press releases; verifying applicants' port service; engaging trusted truck vendors; and providing direct financial support to the program. Building upon the successes and relationships initiated by these previous programs was critical to the ultimate success of the Mid-Atlantic program
- **Leverage local stakeholders.** Working with teams in each participating state strengthened the regional approach, assuring uniformity and transparency between the three port programs. Program partners and other local stakeholders provided valuable input and guidance in developing the overall program design, allowing selections and criteria to be established that reflected the unique nature of each state. Outreach efforts and building support for the Program among the port drayage truck population were also greatly extended with the help of local stakeholders.
- **Gain the support of the local Port Authority.** Gaining the support of and building good working relationships with the local Port Authorities/Administrations was key to the success of the Mid-Atlantic program. The financial support of the Port Authorities in both Virginia and Baltimore enabled the program to greatly expand its scope and reach, replacing more trucks than would have been possible with grant funds alone. In addition, the Ports' credibility helped to attract both participants and other key stakeholders. Furthermore, the local Port Authorities' top-down support facilitated processes such as port service verification and ensured outreach efforts were adequately sustained.
- **Educate and build relationships with local truck vendors.** Establishing good relationships with reputable truck vendors proved critical to smooth project implementation and to the ultimate success of the program. Establishing relationships with dealerships in close proximity to the ports helped to make the process more convenient to applicants. Program staff also found it easier to build relationships and communicate more effectively with vendors if a single sales representative was assigned to the program. Thoroughly educating vendors about the details

of the program was important as they played a critical role in recruiting applicants and educating them about the care and maintenance of the emissions equipment. Relationship building and communication was also critical to the timely submission of required paperwork, ensuring that DPF filters were cleaned as part of vendors' road-ready service, and working through any mechanical problems to offer maintenance support and, in some cases, loaner trucks if grantees experienced problems with their new vehicles in the first few weeks after purchase.

- **Provide a variety of lending options to program applicants.** It was important for program staff to identify and build relationships with a variety of lending institutions in order to increase applicants' chances of securing an affordable loan and, consequently, successfully completing the program. Financial institutions were needed that could offer competitive rates and terms to both applicants with good credit histories as well as applicants with more challenging financial backgrounds who entailed a higher level of risk. Program staff engaged a variety of lending institutions including banks, brokers, and lenders specializing in the trucking industry. Including lenders experienced in the trucking industry that considered factors other than credit scores to make their credit decisions (i.e. length of time in the trucking industry) was critical to allowing the more credit-challenged owner operator to secure financing. The finance departments of participating truck centers were also crucial in offering viable financing options to applicants. Program staff often referred applicants to their truck center of choice to explore the lending options available in-house.
- **Educate and build relationships with reputable scrappage companies.** Establishing good relationships with reliable scrappage companies was a critical component of the program. Scrappage companies must thoroughly understand the program, the importance of scrapping the vehicles in a timely manner, and the documentation requirements. If the scrappage company does not fully understand the program, a truck may sit for days before being destroyed. Since down payment checks could not be issued until scrappage documents were received and reviewed, delays in scrapping resulted in lost work days for the driver. In addition, clear before and after photographs of the scrapped vehicle validating that the truck was adequately destroyed was a necessary step in the grant process. Program staff developed a detailed scrappage document with sample photographs to help guide both applicants and scrappage companies through the process. Because they demolish the engine, chassis, and truck, recyclers proved to be the best resource in providing the photos and documentation required by the Mid-Atlantic program.

## ***B. Lessons Learned***

- **Word-of-mouth was a powerful outreach tool.** In speaking with interested parties, program staff quickly realized the importance of referrals from peers who had already participated in the program. To better facilitate peer referrals, program staff distributed outreach materials including program business cards and truck decals to newly funded applicants. Grant recipients were encouraged to share the cards with their friends and co-workers interested in truck replacement.
- **Program participation was not for everyone.** The substantial grant sum offered by the program was a big incentive for participation. Participating in the program, however, was a big commitment and not for everyone. Even if eligible and deemed “financially ready,” some owner operators felt uncomfortable with various aspects of the program. Be it the vendor network requirement, vehicle prices, financing terms and conditions, or the false assumption that the program was being pushed by future clean air mandates at the participating ports, program staff took great care in communicating about the voluntary nature of the program and the risks and uncertainties that accompany the purchase of used vehicles. Despite the lure of the grant award, to participate applicants had to be comfortable with assuming all potential risks involved.
- **Application assistance was highly involved but ultimately worthwhile.** Program staffing had to be reconsidered to accommodate the time needed to obtain complete application packages. Significant staff time was needed to thoroughly explain the purpose of the program and the truck replacement process to each applicant. Several applicants needed one-on-one assistance in completing the application form, resulting in frequent and often lengthy phone conversations. While Virginia Clean Cities and some truck vendors offered application assistance, the vast majority of this support fell to program staff. Furthermore, most applications were received with incomplete information and/or supporting documentation (e.g., updated registration, proof of insurance, photograph of truck). Several follow-up phone calls were often necessary to obtain complete application packages.
- **Mobile phones were the preferred source of communication among program applicants.** As the majority of applicants were operating their vehicles during the work day, speaking with applicants on their mobile devices proved to be the most effective and commonly used method of communication.
- **Dedicated communications equipment increased staff efficiencies and improved customer service.** During the application process, frequent calls were received from applicants inquiring about the status of their application, their position on the waitlist, and the timing in which they would be able to purchase a new truck. An automated phone line dedicated to this program helped to streamline these calls allowing for increased staff efficiencies and improved customer service as staff covering the “Truck line” were well trained and prepared with current databases and call logs. In addition, faxing proved to be the most popular method for applicants to submit missing documentation. The purchase of a new fax machine dedicated to the program also

helped to create efficiencies and minimize misplaced documents which can be common when sharing a fax machine with other office staff.

- **Utilizing a database may have increased program efficiencies.** Program staff used a variety of Excel spreadsheets to track applicant and fleet information. Purchasing and utilizing a database may have been a more effective method to track and analyze program information.
- **Ensuring applicants' financial readiness prior to program approval reduced staff administrative time and enabled grantees to complete the program more quickly.** Despite the variety of lending options available and the encouragement by program staff for interested parties to consider their financial readiness prior to entering the program, several owner operators still withdrew from the program after discovering they did not qualify for financing or that the terms of the loan were unaffordable. In addition, the timeframe given to approved applicants to complete the process (find a truck, secure a loan, and scrap their old vehicle) had to be extended in several cases to allow applicants extra time to secure financing. The increased administrative time needed to work with these applicants, combined with the disappointment of applicants and the frustration of truck vendors who located eligible vehicles only to discover that applicants were unable to secure financing, led program staff to implement a new criterion for participation. The new policy implemented in year two of the program required applicants to prove their financial readiness prior to receiving acceptance in the program. Applicants worked with a participating lender(s) (or a financial institution of their choosing) to obtain a financial screening. To be eligible for program funds, applicants were required to qualify for a vehicle loan of \$30,000 or more (the estimated remaining balance of a 2008 or newer replacement vehicle). Alternatively, applicants could submit a copy of their bank statement if paying cash for the balance. This financial screening helped program staff determine applicants' ability to secure a loan if approved for program funds and to better predict their ultimate success in completing the program. The prequalification requirement reduced staff administrative time and decreased the amount of time needed for certificate holders to complete the process.
- **Implementing more stringent lending requirements helped reduce the number of loan defaults and repossessions.** Throughout the course of the program some lenders chose to implement more stringent lending criteria for Mid-Atlantic applicants due to late payments and repossessions – many of which resulted from mechanical problems experienced with the new vehicles purchased. Some lenders required applicants to complete a more thorough interview process to ensure that grantees had a cash reserve should they experience a break down or encounter other maintenance or repair costs. Several financial institutions also became more stringent regarding the new equipment they were willing to finance, implementing mileage restrictions or requiring applicants to secure a warranty if purchasing a vehicle with over 700,000 miles.

- **Maintaining a preselected set of truck vendors enabled the program to deliver a higher level of customer service.** During the first year of the program, applicants were able to purchase an eligible replacement vehicle from a vendor of their choice. After experiencing several problems with product reliability, customer service, lack of warranties, and difficulty receiving required paperwork, program staff implemented a closed vendor network in year two of the program. New vendors were screened for program compatibility. Better Business Bureau business reviews were obtained for each vendor and a detailed interview process included an assessment of each vendor's inventory, warranties, customer service policies, and willingness to meet the paperwork and other program requirements. In addition, participating vendors were required to designate a single sales representative to work with the program in order to ensure better communication with both program staff and applicants. The closed vendor network and single sales representative policy allowed program staff to develop better-quality relationships with the sales representatives which, in turn, facilitated better customer service. For example, if an applicant experienced a mechanical problem with a new truck, program staff contacted the dealership and could be more confident that the salesperson would stand behind the vehicle and support the applicant in fixing the problem. Furthermore, vendors were less likely to inflate the price of the vehicles in order to take advantage of applicants and the maximum grant award. (Grant funds could only cover the cost of half the vehicle with a maximum payout of \$20,000.) Finally, the closed vendor network better supported the use of local businesses in close proximity to participating ports, allowing customers to more easily visit the dealership to test drive their chosen vehicle.
- **The most successful vendors promoted the program to eligible customers and assisted them through the application process.** The program's most successful vendors (those who made the most sales in the program) provided exceptional customer service. These vendors had program flyers and application materials on hand and continually evaluated their customer population for eligible applicants. These vendors also provided assistance to applicants in completing the program application, gathering supporting documentation, and even submitted completed applications to program staff on the applicants' behalf. As some applicants lacked access to cameras to take photographs of their vehicle or lacked e-mailing capabilities to instantly submit their application materials, this assistance from vendors made applying to the program more convenient and proved very valuable in increasing the number of submitted applications.
- **Consider a more formal relationship with truck centers.** As discussed throughout this report, forming relationships with quality truck centers was key to the Program's success. Future programs should consider requiring truck centers to sign a basic program agreement that outlines program expectations such as fair truck pricing, mandatory 30 day warranty, a mileage cap on trucks sold, complete machine cleaning of the DPF prior to the customer taking the vehicle, and customer DPF maintenance training.

As the program developed, program staff recognized a need to establish clear expectations with participating truck centers with respect to good customer relations and fair pricing. The need to establish these expectations was particularly evident in the nearly 30 cases in which

grantees experienced mechanical issues soon after purchasing their replacement vehicles. In order for a truck replacement program to be reputable and continue to attract new applicants, participants should have some level of confidence that they are purchasing a truck in good working condition. Truck vendors should stand behind their equipment and offer support if customers encounter a mechanical problem within 30 days of purchase. In some cases, when truck vendors were unwilling to help the grantee, program staff found little recourse other than dropping the truck center from the participating vendor network. While potentially helping future participants, cutting ties with the truck center provided little solace for grantees who already purchased a problem truck. While mechanical problems were an ongoing issue for program participants, particularly with the DPF equipment, most participants found the newer trucks to be an improvement over their older vehicles.

- **Policies regarding the release of applicants' information were reconsidered.** Early in the program, as a benefit of partnership, participating vendors received newly approved applicants' contact information so that they could communicate with applicants about available inventory. After receiving feedback that applicants were overwhelmed with the number of phone calls they were receiving, program staff began asking permission and better explaining the process before releasing applicants' contact information to vendors. Some applicants wanted to receive phone calls from vendors while others only wanted to be contacted by e-mail or not at all.
- **Post-approval follow-up was highly involved but ultimately worthwhile.** After certificates of approval were issued, applicants were allowed 45 days to locate an eligible truck, secure a loan, scrap their old vehicle, and complete the truck replacement process. Program staff found it important to work closely with applicants during this time to ensure that the necessary steps were followed to keep the process on schedule.
- **Appraising new vehicles may help to alleviate applicants' concerns.** A common grievance among program applicants was the perception that vendors were elevating the prices of eligible vehicles due to the grant program. While program staff felt that the closed vendor network helped to address this issue due to the relationships developed, new vehicle prices were still assessed from time to time through trusted sources. Future programs should consider purchasing a subscription to the National Automobile Dealers Association (NADA) or similar organization that provides market reflective vehicle pricing and information based on vehicle specifications. Utilizing a printed guidebook or service to appraise vehicles may help to alleviate applicants' concern about being overcharged.
- **Providing education on the care and maintenance of the DPF increased grantees' efficacy and improved vehicle care.** Many owner-operators pride themselves on knowing their equipment well and making their own vehicle repairs. The 2007 and newer EPA certified emission equipment, however, was often new technology for the drayage truck population who often operate much older equipment. As the program progressed and grantees reported problems with this new technology, program staff strongly encouraged applicants to educate themselves on the special care required for the diesel particulate filters (DPFs). Program staff began



including educational materials on how to care for the new equipment in the acceptance packages and also encouraged participating vendors to provide further education to grantees on the care and maintenance of the emissions equipment. Program staff and applicants also asked vendors to clean the DPF as part of their road-ready service. Fostering this education not only respected the owner-operator's relationship with their vehicle but also helped to extend the lifetime of the equipment, ultimately contributing to program effectiveness and the owner's bottom line.

- **Stress purchasing extended warranties to program participants.** To help deal with unforeseen "problem trucks," participants should be encouraged to purchase an additional warranty contract from the truck center to provide extra protection during the first year of truck ownership. This need was identified as the program progressed and it became clear that many participants had stretched themselves financially in order to purchase a newer model year truck. If major mechanical issues occurred in the first few months of ownership, it was a big financial obstacle to overcome. Participants were already paying large monthly truck payments (often leaving no extra cash for truck emergencies), and major truck repairs can take a week or longer to complete. Being without a truck for extended periods of time means loss of income which was exacerbated by the added cost of the repair bills. In the worst scenarios, if the mechanical issues were frequent and major enough and significant time was lost from work, participants gave up and walked away from their trucks. While the program wasn't equipped to monitor the participants' trucks after the down payment was made, warranties could be one way to help ensure that cleaner trucks continue to serve participating ports.
- **Administrative funding was needed for additional leveraged resources.** It is important to consider the administrative time needed to process additional truck replacements made possible by additional leveraged income. EPA required that no more than 15 percent of grant funds could be used for administrative costs. To accommodate the staff time needed to process the additional truck replacements funded by program partners or sponsors, all leveraged resources secured in year two included funds to help cover administrative costs.
- **Establish organizational policies regarding leveraged resources.** In order to seek and accept additional leveraged resources, it is important for the program organization to maintain required state approvals to solicit contributions as well as internal policies regarding authorization to accept and acknowledge contributions.
- **Sponsorship packages need achievable benefits and timeframes.** Sponsorship packages were reworked to strike a better balance between providing worthwhile incentives to sponsors and being reasonable given the timeframes and staff effort. The Mid-Atlantic program's original sponsorship package offered priority consideration for 10 truck replacements to gold level sponsors (\$30,000), five truck replacements to silver level sponsors (\$15,000), and two truck replacements to bronze level sponsors (\$5000). Sponsorship benefits also included placing the sponsor's company logo on the program website and on outreach materials. After the program's first gold level sponsor signed on, program staff quickly realized the difficulty in fulfilling this sponsorship commitment. The initial sponsorship package offered to give priority to too many trucks and was difficult to fulfill even within a one and a half year timeframe. With

this in mind, MARAMA reduced the priority consideration for truck replacements to a more manageable number. The promotional benefits remained unchanged. Additionally, it was clear that a set time period to receive sponsorship benefits was needed so that priority truck replacements could be handled quickly, leaving time for additional sponsors to take advantage of the opportunity. Ultimately the sponsorship package was reduced with the gold level (\$30,000) receiving priority consideration for six trucks and the silver level (\$15,000) receiving priority consideration for five. The Bronze level was eliminated.

- **The time and skill required for obtaining sponsors should be considered in the planning stages of the program.** Obtaining sponsors is a special skill that requires time and experience. Securing trucking company sponsorships proved to be a challenge for the Mid-Atlantic program, and only two carriers sponsored the program. Similar programs may consider dedicating a staff person skilled in this area who is able to travel and make in-person presentations to potential sponsors. In addition to carrier companies, large truck and engine manufacturers could also be considered as potential sponsors of future programs.
- **Consider a cap on the number of trucks a company is allowed to replace with program funds.** In some cases, trucking companies submitted a dozen applications when numerous single owner operators were on the waiting list. Placing a limit on the number of truck replacements permitted for a single owner would allow more owner operators to take advantage of the program. However, processing several replacements for a single owner can reduce administrative costs.
- **An adaptive management approach allowed staff to improve the program as new lessons were learned.** One of the biggest lessons learned was that program administrators must be amenable to change. Program materials, policies, stakeholders, and outreach strategies evolved throughout the project period based on the needs of applicants and lessons learned along the way. Application forms were updated on several occasions after discovering the need to collect additional information. Policies regarding the release of applicant information to vendors and applicants' financial readiness had to be changed during the program's second year. Furthermore, despite the screening processes utilized by program staff to acquire new vendors and lenders, several had to be removed and replaced after discovering that they were not a good fit for the program. Outreach strategies were also continually revisited by Baltimore program partners in order to better promote and encourage program participation.

## **VI. Program Income, Cost Share, and Additional Leveraged Resources**

### ***A. Program Income***

Program income is gross income received by the grantee or sub-grantee directly generated by a grant supported activity, or earned only as a result of the grant agreement during the grant period.

MARAMA's grant award identifies income from scrappage as program income.

Scrappage income is not reported as program income to MARAMA because the scrappage amount, generally \$1,000 to \$2,000, was received by the truck owner who was directed to use it for expenses associated with purchasing the new vehicle. In some cases, the scrap yard charged the owner for scrapping the vehicle and provided no program income. The highest amount documented was \$3,500. A full list of scrappage amounts reported by truck owners can be found in the program Fleet Sheet .

The total amount of scrappage income received by truck owners during this program was \$304,879, an average of \$1,438 per vehicle scrapped.

### ***B. Cost Share***

Leveraging and cost-sharing were not required as a condition of eligibility for this grant, and no cost share or leveraged funds were required in this award. However, EPA evaluated proposals based on the extent and quality to which applicants proposed to maximize the environmental and economic benefits of proposed projects through the use of the federal funds requested and/or by leveraging additional funds/resources, including voluntary cost-shares. As discussed below, the project generated significant additional leveraged resources.

### ***C. Additional Leveraged Resources***

MARAMA's grant provided substantial funding, but a much greater demand existed than the grant could meet. Therefore, MARAMA encouraged program partners and sponsors to provide similar funding, either independently or through MARAMA. As an incentive to encourage participation by partners and sponsors, MARAMA allocated grant funding among the three port areas in proportion to the funds provided by program partners and sponsors. This allocation method was intended to create incentives for additional leveraged funding to extend the scope and effectiveness of the program.

In each of the three port areas first year in the program, MARAMA allocated up to \$500,000 of grant funds to the area to match the support provided by program partners and sponsors. MARAMA allocated grant funds equal to the amount of non-federal funds from partners and sponsors plus half the amount of any other federal grant funds independently spent by program partners and sponsors to support replacement of dray trucks for the area. (Funds from separate grants and vehicles replaced under those grants are not included in the fleet sheet for this grant nor included in any program statistics.) Also during its first year in the program, each area's program was allocated an additional \$100,000 in MARAMA grant funds if multiple partners or sponsors actively participated in the program.

In the second year of program participation for an area, funding from partners and sponsors was leveraged by MARAMA at a rate of 2:1 for non-federal funds and 1:1 for federal funds up to a total amount of grant funding determined by MARAMA within the available resources.

Beginning in 2014, the remaining grant funds were allocated among applicants from all ports on a first-come, first-served basis (including those on the waiting list after the program stopped seeking applications in Baltimore and Philadelphia/Wilmington). All grant funds budgeted for replacements were spent by early 2014.

Sources of additional leveraged resources are discussed in the following three categories: 1) truck payments by owners, 2) payments by program partners, and 3) sponsorships.

## **1. Truck payments by owners**

MARAMA's grant application estimated that the incentive provided by the grant's down payment would result in additional leveraged resources, primarily truck payments made by program participants. For an estimated 110 trucks, MARAMA's Work Plan anticipated the owners' costs for the new trucks in addition to the down payment provided by the grant would be \$4,614,720, an average of \$41,952 per vehicle.

The actual total amount of additional leveraged resources paid by truck owners was calculated as replacement vehicle cost minus grant award. The total owner payments were \$6,795,757, an average of \$31,905 per vehicle. The total amount paid for replacement vehicles significantly exceeded the estimate in the original application because more trucks were replaced than originally anticipated, even though the per-vehicle average was lower than anticipated.

Data for each vehicle is included in the Fleet Sheet, including the amount of grant funds or other resources paid, the cost of the replacement vehicle, and the owner's contribution.

## **2. Payments by program partners**

As shown in Table 15, program partners provided significant support to the program. The Virginia Port Authority and the Maryland Port Administration were program partners who provided funds directly to MARAMA as well as using non-federal funds independently to help implement the program. The Maryland Port Administration provided \$300,000 to MARAMA for down payments to replace 15 trucks. The Virginia Port Authority provided \$45,000 in spring 2012 plus \$30,000 in fall 2013 to help cover program administration and, in addition, directly funded \$500,000 in down payments for the replacement of 25 vehicles.

MARAMA also received a \$50,000 contribution from SUNOCO that was directed to support the program as part of a Supplemental Environmental Program (SEP) agreement negotiated with the City of Philadelphia in settlement of an alleged violation of air pollution control requirements. Of this amount \$44,000 was used to provide downpayments on replacement vehicles.

**Table 15. Program Funding Received from Partners**

Source of Funds: Partner	Amount	Use of Funds
Maryland Port Administration	\$300,000	15 down payments
Virginia Port Authority	\$500,000	25 down payments paid directly to owners by VPA
Virginia Port Authority	\$75,000	Program administration
SEP Contribution from SUNOCO	\$50,000	Down payments (\$44,000) and program administration (\$6,000)
<b>TOTAL</b>	<b>\$925,000</b>	

Other program partners who independently supported dray truck replacements through separate federal grants included the Maryland Department of the Environment, the Virginia Department of Environmental Quality, and the Philadelphia Clean Air Council. These partners were helpful in coordinating with the Mid-Atlantic Regional Dray Truck Replacement Program, and their activities were recognized via the allocation of program funding for additional replacements in their areas. (These separate grants are not included as leveraged funds, and the trucks replaced through these efforts are not included in the totals reported for this program.)

### 3. Payments by program sponsors

MARAMA also sought additional leveraged resources from program sponsors. Program sponsors were carrier companies that hired drayage truck owners to haul freight. Potential sponsors were offered priority consideration for participation in the program and placement of their company logo on program materials. Table 16 below shows contributions from program sponsors.

**Table 16. Program Funding Received from Sponsors**

Source of funds: Sponsor	Amount	Use of Funds
California Cartage Express, LLC	\$30,000	Down payments
Champion Truck Lines	\$15,000	Down payment
<b>TOTAL</b>	<b>\$45,000</b>	

## VII. Evidence of Early Replacement

Because this program provided down payments to replace drayage trucks, the EPA agreement included special conditions related to early replacement. A note following Programmatic Condition #4k of MARAMA’s cooperative agreement states, “Cooperative agreement funds can be used to purchase or finance eligible used pre-2007 highway vehicles, used engines, and used pieces of equipment, so long as verified emission control technologies have been installed. The purchase or financing of eligible used pre-2007 highway vehicles, used engines, and used equipment that have been retrofitted are not subject to the “Normal Attrition” nor the “Fleet Expansion” restrictions listed above.”

In addition, Programmatic Condition #4j of the agreement applies to newer highway vehicles (model year 2007 and newer) and requires that the replacement vehicle i) perform the same function as the vehicle being replaced, ii) be of the same type and similar gross vehicle weight rating. It also requires that the engine being replaced will be scrapped, and the vehicle being replaced will be scrapped.

### A. *Scrapped Trucks were Newer than Anticipated, Indicating Early Replacement*

EPA’s Diesel Emissions Quantifier (DEQ) assumes a 30-year lifetime for each truck replaced. Thus, a 1994 truck is expected to be on-road through 2024. When MARAMA applied for this grant, it was anticipated that 50 percent or more of the scrapped trucks would fall into the 1994-1997 model year range. As shown in Table 17 below, 75 percent of trucks replaced in the program were 1994 or newer, with 43 percent falling in the 1998-2003 model year range. Based on the DEQ 30-year average lifetime assumption, even the oldest truck replaced through the program (MY 1984) still had useful life remaining at the time of replacement.

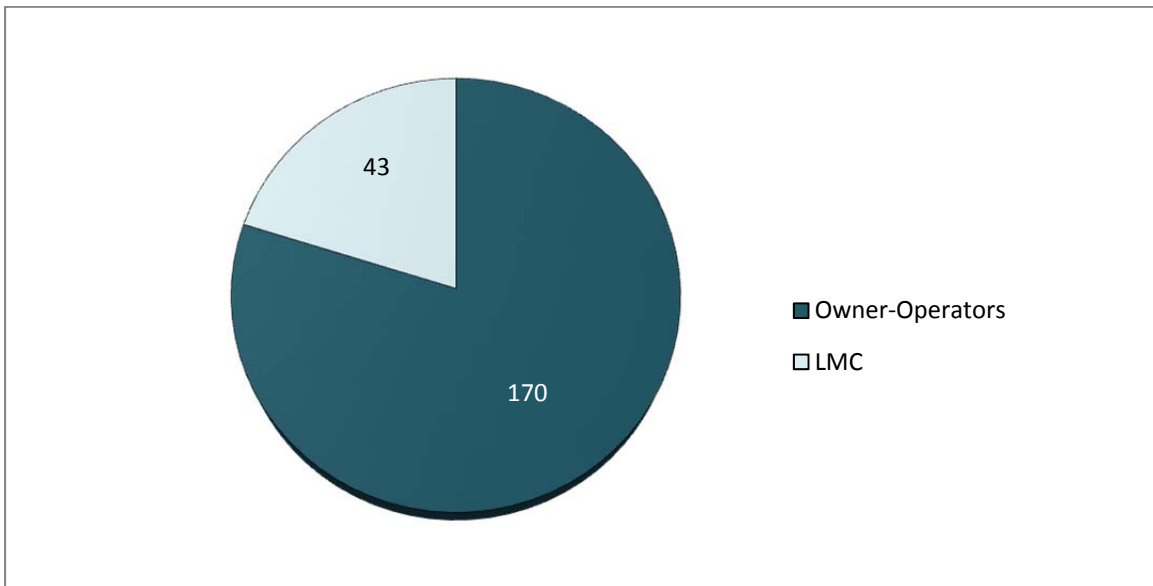
**Table 17. Trucks Scrapped by Model Year – Work Plan vs. Actual**

Truck Model Years	Anticipated Number of Trucks to be Scrapped (Work Plan)				Actual Number of Trucks Scrapped	
	Scenario #1		Scenario #2		n	%
	n	%	n	%		
1998-2003	0	0%	0	0%	91	43%
1994-1997	75	68%	82	50%	68	32%
1991-1993	18	16%	41	25%	36	17%
1984-1990	17	15%	41	25%	18	8%
<b>TOTAL</b>	<b>110</b>	<b>100%</b>	<b>164</b>	<b>100%</b>	<b>213</b>	<b>100%</b>

### ***B. The Majority of Grantees were Owner Operators***

As shown in Figure 6 below, out of the 213 participants, 80 percent (170) were owner operators. Twenty percent (43) were licensed motor carriers. Owner operators are much less likely than licensed motor carriers to own a fleet of trucks with a retirement schedule.

**Figure 6. Owner-Operators Vs. Licensed Motor Carriers**



Program staff worked with each applicant to ensure they were an appropriate fit for the program, carefully monitoring application materials such as current vehicle registrations and insurance documents to ensure vehicles were operational and currently in use. Additional questions regarding fleets were asked of licensed motor carriers. Grantees with multiple trucks were port fleet businesses, which are not known to use a replacement schedule.

Furthermore, port fleets do not routinely purchase replacement vehicles with late model engines, often choosing pre- 2007 or older trucks instead. Participating businesses saw the Program as an opportunity to purchase trucks with tighter emissions standards citing that this grant made it possible for them to upgrade.

## VIII. Evidence of Scrappage

Condition #4j in MARAMA’s cooperative agreement states in part: “Disabling the engine may be completed by drilling a hole in the engine block. Permanently disabling the chassis and the engine while retaining possession of the vehicle is an acceptable scrappage method. Disabling the chassis may be completed by cutting the chassis in half...Other acceptable scrappage methods may be considered and will require prior EPA approval. Vehicle components that are not part of the engine or chassis may be salvaged from the unit being replaced.”

The specific requirements for scrappage require rendering the truck no longer useable. “Before” and “after” photographs were taken of the old truck to establish that the truck was satisfactorily scrapped. “Before” photos included a front and side view showing the intact chassis of the old truck prior to scrapping to help ensure that the appropriate truck was scrapped. “Before” photos were also taken of the truck engine to ensure that it was intact and that engine parts were not removed prior to scrapping. “After” photos showed the engine destroyed and the chassis cut with some truck color showing to help verify that the appropriate engine was destroyed. A receipt from the scrapyard was also required with the scrap yard name and address, the participant name, and the VIN of the old truck. Scrappage documentation was e-mailed to program staff either by the scrap yard, the truck salesman, or the participant. Photographic documents were included in the final package of information used to approve participants for down payment funding. Please see Appendices B and C for complete scrappage guidelines and an example of scrappage methods.

## IX. Evidence that Emissions Reductions were not Mandated

Neither the vehicles nor the areas included in the Mid-Atlantic Dray Truck Replacement Program are affected by Federal, State, or local law mandating early replacement of drayage trucks. The ports served by this program do not have requirements that exclude drayage trucks older than a particular model year.