Comprehensive Environmental Management: NWSA Clean Truck Program

1. Program Summary

The Northwest Seaport Alliance (NWSA) is an operating partnership of the ports of Seattle and Tacoma. Combined, the ports are the fourth-largest container gateway in North America. Regional marine cargo facilities also are a major center for bulk, breakbulk, project/heavy-lift cargoes, automobiles and trucks.

The NWSA Clean Truck Program is one initiative resulting from the groundbreaking Northwest Ports Clean Air Strategy. The original Northwest Ports Clean Air Strategy (NWPCAS) was published in 2008 in collaboration between Port Metro Vancouver (PMV), the Port of Seattle (POS), and the Port of Tacoma (POT) with the aim of reducing air emissions from maritime and port-related activities, such as vessels, trains, trucks and terminal equipment, that affect air quality and contribute to climate change in the Puget Sound-Georgia Basin air shed. Several government agencies worked in partnership with the ports to support implementation, including the US Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), the Puget Sound Clean Air Agency (PSCAA), Environment Canada, and Metro Vancouver.

Under the original NWPCAS, the ports of Seattle, Tacoma, and Vancouver, BC, collectively set a goal in 2008 of having 2007 or newer engine year trucks exclusively serving the international container terminals by January 2018 as part of the NWPCAS. Upon formation of the NWSA in 2015, the ports of Seattle and Tacoma combined their Clean Truck Programs into one NWSA Clean Truck Program. The Clean Truck Program was originally set to go into effect Jan. 1, 2018, but as the date approached only 53% of trucks were compliant. In early 2018, the NWSA Managing Members voted to extend the deadline through the end of the year. Throughout 2018 efforts ramped up to help truckers prepare for the new 2019 deadline.

The implementation of the Clean Truck Program deadline was a success. Cargo is moving smoothly through the gateway, with very few interruptions due to turning trucks at the gate. All trucks entering the international container terminals now have a 2007 engine or newer, or have an equivalent emission control system. The implementation of the program has decreased diesel particulate matter (DPM) emissions from trucks serving the international terminals, reducing the pollutant load on our neighboring communities by 33.4 tons of DPM per year. Clean trucks not only reduce DPM – additional benefits include a simultaneous reduction in other air toxics by newer truck engines and emission controls. NOx emissions are considerably lower from newer engines, with the Clean Truck fleet now emitting 78% less NOx than our original fleet – a reduction of 567 tons a year.

2. Goals and Objectives

The two overall goals of the NWSA Clean Truck Program are:

Goal 1: To reduce emissions of harmful diesel particulate matter (DPM), especially in near-port communities in Seattle and Tacoma

Goal 2: To improve efficiency of cargo moving through the gateway

To support these two overarching goals of the Program, the following objectives were established:

- Use the best and most effective technology to improve the efficiency of the gateway, working with the trucking community and terminal operators
- Work with our partner agencies to provide support to the trucking community to meet the Clean Truck standard
- Accelerate the adoption of newer, cleaner truck technology
- Collaborate and communicate effectively with all stakeholders

3. Discussion

(a) Project Background

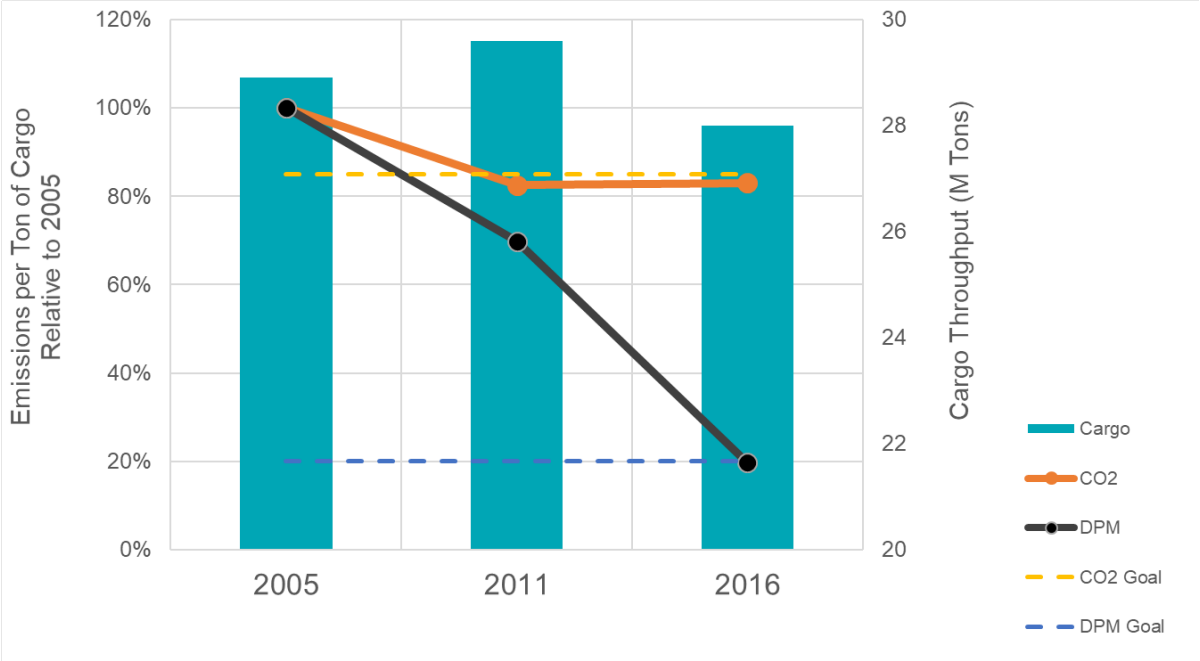
The Northwest Seaport Alliance (NWSA) has been successfully working towards reducing harmful air pollutants and greenhouse gas emissions related to port operations through the Northwest Ports Clean Air Strategy (NWPCAS) for the past decade. The NWPCAS is an international collaborative effort between the NWSA, Port of Seattle, Port of Tacoma, and the Port of Vancouver B.C. to reduce the impacts of seaport activity on regional air pollution and climate. Regarded for our commitment to reducing emissions above and beyond legislation, the NWSA met the 2020 NWPCAS emission reduction targets four years ahead of schedule. Programs under the NWPCAS achieved (per ton of cargo relative to our 2005 baseline) the following emission reductions:

Diesel Particulate Matter (DPM)

- Target: 80%
- Achieved: 80%

GHG (reported as CO2 equivalents, CO2e)

- Target: 15%
- Achieved: 19%



These emission reductions can be attributed to a breadth of voluntary programs implemented in collaboration with industry, community, and government agency partners, and speak to the foresight and aggressiveness of the port's dedication to cleaner air. The original NWPCAS established a goal that 100% of the drayage trucks serving container terminals would have cleaner diesel technology that meets the 2007 EPA engine emission standard, or an approved equivalent by Jan. 1, 2018. To meet this goal, the NWSA Clean Truck Program was established

Diesel emissions increase the risk of asthma, cancer and heart disease. Newer engines emit 90% less diesel particulate matter than those manufactured before 2007. While the Clean Truck Program was a voluntary initiative to reduce port-related diesel emissions, it also brought on complex challenges.

In February 2018, the Managing Members took the following action:

- Effective April 1, 2018, all trucks entering NWSA international container terminals must have a 2007 engine or newer or equivalent emissions control retrofits to be considered compliant ("2007 Emission Standard"). To continue to access the terminals after April 1, 2018, a driver with a non-compliant truck may apply for a Temporary Access Pass.
- Effective January 1, 2019, all non-compliant trucks will be turned away from NWSA international container terminals.

- Trucks meeting the 2007 Emission Standard will be able to serve the gateway until at least 2025. This provides certainty to drivers in the process of upgrading that the standard will not change in the immediate future.
- Authorization for the NWSA to spend $1 million to develop a Clean Truck Fund Program and to partner with certified Community Development Financial Institutions (CDFI) to ensure all drivers have access to fair and affordable financing.

Throughout 2018, the NWSA provided additional support and outreach to the trucking community, to help prepare for the Dec. 31, 2018 deadline. The implementation of the NWSA Clean Truck deadline has been a success, cargo is moving smoothly through the gateway, with very few interruptions due to turning trucks at the gate. All trucks entering the international container terminals now have a 2007 engine or newer, or have an equivalent emission control system, with no significant impact on the overall number of trucks entering the gateway.

(b) Objectives and Methodology

Overall the Clean Truck Program had three main objectives:

- Improve air quality for the Puget Sound region
- Support the trucking community to meet the Clean Truck standard
- Use technology within the Program to improve the efficiency of the gateway

The implementation of the Program was a whole port, multidisciplinary effort, and was a collaboration with a range of state agencies (i.e. Puget Sound Clean Air Agency; EPA Region 10 office; WA State Department of Ecology; African Chamber of Commerce of the Pacific Northwest; City of Seattle; Washington Trucking Association). The internal Clean Truck Program team identified three key streams of work: Outreach & Communication; Trucker Support; and Technology Installation.

- <u>Outreach and Communication</u>

  The NWSA Clean Truck Program was multidisciplinary, with multiple moving parts (2007 engine requirement; retrofits; RFID technology infrastructure; different trucker support resources; workshops, loan program, scrap bonuses), requiring clear and concise communication, tailored for different audiences.

  To better understand the drayage community serving the gateway, the NWSA included optional questions for drivers applying for a Temporary Access Pass to provide background information: 46% identified as non-white, 29% white, and 25% declined to answer; predominant languages, other than English, include

Amharic, Tigrinya, Russian, Ukrainian, Spanish, and Punjabi. As a result, the NWSA worked with the African Chamber of Commerce to provide translation and support at our summer 2018 workshops. This partnership was especially vital when discussing financial resources and DPF/truck maintenance. The Program also provided support and directed drivers to the Puget Sound Clean Air Agency's online DPF maintenance training videos that were available in seven languages.

Communication was conducted through various channels – online(the NWSA website, direct emails and social media channels used as the main hub of information for the trucking community); physically through banners and flyers at terminal gates; and through evening and weekend workshops throughout 2018.

- Trucker Support

  The NWSA and home ports managed a number of successful truck scrapping programs over the lifetime of the program, providing financial incentives to truck owners to scrap their old truck, and purchase a new replacement truck. During 2018 this financial assistance expanded to include the Clean Truck Fund, where the NWSA provided a loan loss reserve to Community Development Financial Institutions (CDFIs) to administer high-risk loans to truck owners to purchase a new replacement truck or install an equivalent emission control device on their truck.

  The NWSA implemented a large-scale effort to improve outreach and education on trucking issues in the gateway. The Port of Seattle and PSCAA held outreach events at the ScRAPS program's Terminal 5 offices, including an event with potential replacement trucks from participating dealers onsite, as well as at a trucker safety forum in Tacoma. Evening and weekend hours were expanded throughout the program to provide services after drayage operations ceased each day.

  Additionally, the NWSA and the Port of Seattle partnered with the African Chamber of Commerce to host workshops around the Clean Truck Program, such as DPF maintenance, safety and financing workshops. Videos of these workshops have been uploaded to our website where available.

  Port staff have sought cost-effective ways for drivers to update their trucks and presented findings at the Trucker's Outreach Forum (TOF), a public forum for drivers that began in January 2017. The Trucker Outreach Forum is run by the trucking companies serving the gateway and has regular attendance of 30-50 companies, that represent over 1,200 drivers. The TOF has featured presentations on solutions for upgrading or retrofitting equipment, including a presentation by Business Impacts Northwest, a non-profit community development financial institution (CDFI), on its Green Trucking Loan program, used LNG/CNG truck demonstrations and other retrofit products.

- RFID Technology Installation

The NWSA Clean Drayage System involved the installation of RFID infrastructure at in- and out-gates at international container terminals included in the CTP (T-18; T-30; T-46; PCT; WUT; Husky; TCT), providing in-gate information on whether a truck is compliant with the Program, and providing on-terminal turn times. Previously, green stickers were used for a visual compliance check in Tacoma, this gatewide RFID technology has provided an active enforcement mechanism, where non-compliant trucks receive a red light at the in-gate, and are not able to access the terminal.

The Clean Drayage System was installed during 2018, with a soft launch rolled out at the start of December 2018 – RFID data was switched on in the South Harbor, so staff could work with the software (Advent) and hardware (Kalmar) providers to troubleshoot issues before the go-live date of Jan. 1, 2019. Significant software upgrades were required during 2018 to ensure the data could be processed, that drivers could easily register their truck, and that the enforcement of the program could be tied to the RFID tag. The tags collect data that terminal operators may be able to use to make operations more efficient, eventually leading to faster turn times and potentially more revenue for drivers.

© Award Criteria (6)

1. Level & nature of env benefits

The NWSA Clean Truck Program is one element of the Northwest Ports Clean Air Strategy, and has contributed significantly towards meeting the NWPCAS 2020 goals ahead of schedule.

In EPA's 2011 National Air Toxics Assessment (NATA), both King and Pierce counties were identified as areas where all or part of the population is exposed to more than 2.0µg/m3 of DPM emissions and both counties are on the EPA 2018 National Priority Area list. A Puget Sound Clean Air Agency study estimates that 70% of the potential cancer risk in the Puget Sound area from air toxics stems from highly toxic diesel fine particles. Those cancer risks are 10 to 100 times higher than the EPA's acceptable cancer risk values. The NWSA Clean Truck Program has considerably reduced the annual emissions of DPM contributed to this cancer risk and should contribute to positive health benefits for all who live near our port facilities and work at the ports.

The NWSA Clean Truck Program is one element of the Northwest Ports Clean Air Strategy that will have a profound impact on port-related emissions of diesel particulate matter. Drayage trucks with 1993 or older model-year engines emit over twice the diesel particulate matter (DPM) as 1994 engines. EPA's on-road diesel engine emissions standards for DPM remained constant for engine model-years 1994-2006 at 0.10 g/bhp-hr and were lowered to 0.01 g/bhp-hr for 2007 model-year engines. By raising the minimum engine year requirement to 2007, the Clean Truck Program can effectively reduce drayage truck DPM emissions by

over 90%. The implementation of the program has decreased diesel particulate matter (DPM) emissions from trucks serving the international terminals, reducing the pollutant load on our neighboring communities by 33.4 tons of DPM per year.

2. Level of independent effort by port

   The NWSA was responsible for the on-the-ground implementation of the Program, ensuring the whole community was aware of the requirements, and making sure non-compliant trucks were turned away at the gates following the deadline. The NWSA conducted outreach events (barbeques, resource fairs) and evening and weekend workshops throughout 2018 to make sure the whole trucking community was aware of the deadline, and what options were available.

   The success of the Program was largely down to the selection, installation and implementation of the best truck and gate technology – RFID infrastructure at both the in- and out-gates at all international container terminals. Installation and troubleshooting the software during the soft launch in December 2018 ensured that the technology could be relied upon to physically identify compliant trucks and allow them entry to the terminals. The NWSA was responsible for ensuring the technology used met all our needs and would ensure a gateway-wide approach.

   To ensure that RFID technology would be used, and non-compliant trucks would be denied entry to the terminals, the NWSA renegotiated all the international container terminal leases in spring 2018. All new leases were reviewed and approved by NWSA Managing Members.

3. Creativity of program

   The NWSA Clean Truck Program is an example of the gateway's innovative approach to implementation and creativity to meet certain challenges encountered throughout the Program. Traditionally, the home ports and the NWSA were unable to directly fund truck scrapping programs using port funds due to Washington state law that specifically prohibited Washington state port funds from being spent on air pollution control devices (i.e. new trucks). As a result, the ports were only able to fund other trucker support programs, such as outreach events, technical and project management support, and administrative facilities for grant funded scrapping programs such as ScRAPS. In 2017 the NWSA Managing Members directed staff to seek a technical correction to existing state law clarifying the statutory authority for public ports to invest in air quality improvement equipment, fuels, and other methods that provide emission reductions for engines, vehicles and vessels.

   In 2007, the Legislature passed a law intended to allow ports to use tax revenue to support this type of investment (E2SHB 1303). Unfortunately, the language adopted had the opposite effect of disallowing these

types of investments. To provide legislative clarity and clarity of authority for ports, the NWSA requested a technical amendment to clarify state law and fulfill the original intent of the 2007 law, the 1966 amendment to Washington, Article 8, Section 8 constitutional amendment, and RCW 53.08.041, adopted in 1975. Senators Guy Palumbo and Shelly Short sponsored Senate Bill 6207, clarifying the authority of port districts to offer programs relating to air quality improvement equipment and fuel programs that provide emission reductions for engines, vehicles, and vessels, successfully passed in the 2018 legislative session.

The passing of the senate bill granted the NWSA the authority to establish and contribute to the Clean Truck Fund, an innovative way to support the trucking community in the run-up to the Dec. 31 2018 deadline. Providing financial backing to lenders to issue riskier loans to truck drivers was identified as a key mechanism to assist non-compliant drivers at a workshop with stakeholders in April 2019, to help drivers avoid predatory lending practices in the run up to the CTP deadline. As part of a package of support for drivers to meet the Clean Truck deadline, Managing Members approved the establishment of the Clean Truck Fund at their June 5, 2018 meeting. The Clean Truck Fund (CTF) was opened in September 2018, providing a level of loan loss security to qualified lenders to ensure market rate loans were provided to truck owners serving marine terminals so that those owners could replace their older trucks and purchase trucks with 2007 and newer engines. The CTF backed 10% of the total loan value issued by the two CDFIs in case of default and provided $6,000 scrap bonuses to drivers who also agreed to scrap their old trucks and use the bonus towards the down payment on their new truck, in conjunction with a CTF-backed loan.

Typically, ports remain far removed from the financing of equipment and technology from port tenants and users. However, there were significant concerns about the possibility that truck drivers would become prey to predatory lending practices, especially truck owners trying to finance and purchase new trucks close to the Clean Truck deadline. The NWSA was able to establish the CTF to help protect truck owners from this danger. Contracting with the two Community Development Financial Institutions to back these risky loans had never been done by the Port Contracts department, and required a great deal of creative thinking from the whole team.

The NWSA turned over every stone to find ways to further support the trucking community in meeting the deadline. The NWSA partnered with PSCAA and South Coast Air Quality Management District (SCAQMD) in California to administer SCAQMD’s DERA grant in 2018, a first of its kind grant.

In 2017, the California South Coast Air Quality Management District (SCAQMD), in partnership with the Puget Sound Clean Air Agency and Oregon Department of Environmental Quality (DEQ), successfully

applied for a DERA grant for scrapping and replacing drayage trucks. Since the project was awarded, Oregon DEQ backed out of the agreement, cutting the available funding in half.

The state of California and the San Pedro Bay ports have more aggressive truck requirements than the NWSA's 2007 engine standard – moving to a 2014 model year (MY) last year and near zero standard by 2023. Several drayage companies in California had recently upgraded trucks to 2012 MY or newer and were reluctant to scrap what was still a useable and valuable truck. SCAQMD received a $1 million DERA grant in 2017 which reimbursed Southern California fleet owners $100,000 for purchasing a low NOx emission truck. As NWSA stepped in to replace Oregon DEQ, NWSA drivers were able to purchase the Californian trucks at a capped price, and they in turn scrapped their non-compliant pre-2007 truck in the Pacific Northwest. The Californian 2012 MY truck was sold in Washington to NWSA drivers to replace a pre-2007 truck and the pre-2007 truck was scrapped. The Washington truck purchaser paid the SoCal fleet owner up to $30,000 for the sale of the 2012-compliant truck.

PSCAA was originally going to administer this program in Washington, but in summer 2018 was no longer able to and approached NWSA to take over the project. The NWSA was responsible for identifying 10 NWSA non-compliant truck owners, to be matched up with the Southern Californian fleet owners, to negotiate a price (capped at $30,000). This program resulted in eight new compliant trucks entering the NWSA.

4. Whether results are apparent

The implementation of the Clean Truck Program deadline was a success. Cargo is moving smoothly through the gateway, with very few interruptions due to turning trucks at the gate. All trucks entering the international container terminals now have a 2007 engine or newer, or have an equivalent emission control system, with no significant impact on the overall number of trucks entering the gateway.

The implementation of the program has decreased diesel particulate matter (DPM) emissions from trucks serving the international terminals, reducing the pollutant load on our neighboring communities by 33.4 tons of DPM per year. Clean trucks not only reduce DPM – additional benefits include a simultaneous reduction in other air toxics by newer truck engines and emission controls. NOx emissions are considerably lower from newer engines, with the Clean Truck fleet now emitting 78% less NOx than our original fleet – a reduction of 567 tons a year.

In EPA's 2011 National Air Toxics Assessment (NATA), both King and Pierce counties (where the North and South Harbors are located) were identified as areas where all or part of the population is exposed to more than 2.0µg/m3 of DPM emissions and both counties are on the EPA 2018 National Priority Area list. A Puget

Sound Clean Air Agency study estimates that 70% of the potential cancer risk in the Puget Sound area from air toxics stems from highly toxic diesel fine particles. Those cancer risks are 10 to 100 times higher than the EPA's acceptable cancer risk values. The NWSA Clean Truck Program has considerably reduced the annual emissions of DPM contributed to this cancer risk and should contribute to positive health benefits for all who live near our port facilities and work at the ports.

Operationally, the NWSA Clean Truck Program has not had any negative impacts on physical movement of cargo through the gates. The total number of trucks entering NWSA international container terminals after the implementation of the deadline has not changed significantly compared to before the deadline – the 2019 fleet is similar in overall size as the 2018 fleet. In March 2019, approximately 3,700 clean trucks entered NWSA terminals – for comparison, in May 2018, approximately 3,800 trucks entered NWSA terminals. Overall, the fleet size is the same – the only difference is the age of the fleet, as the 2019 fleet is fully compliant with the model year requirement of the Clean Truck Program.

5. Cost effectiveness of program

The ports have been very successful over the years of the Program in managing grant funding from a number of partners to help drivers purchase new, compliant trucks, to be able to continue working and entering NWSA terminals.

The Clean Truck Fund trucker support package was established with $2.8 million using port funds and supporting agency funds (WA Department of Ecology, Puget Sound Clean Air Agency, City of Seattle) to bring down the risk for CDFIs to issue truck loans and provide scrapping bonuses to drivers willing to scrap their non-compliant trucks. A total of $668,668.47 of loan funding was issued by CDFIs enrolled in the Fund to truck owners - $66,866.85 of which was contributed by the Clean Truck to back the loans. An additional total of $102,000 was issued as scrap bonuses to truck owners who scrapped their non-compliant trucks during 2018.

Prior to the additional time in 2018 to meet the deadline, both the home ports of Seattle and Tacoma operated their own trucker support programs. The Port of Tacoma partnered with the City of Tacoma and the Puget Sound Clean Air Agency (PSCAA) on a ScRAPS program supported by a $2.5 million CMAQ grant and scrapped 75, 1998 engine year and older trucks as part of the first round of the Clean Truck program. Launched on November 18, 2009, and concluded on January 31, 2011, the first round of ScRAPS was a partnership between Port of Seattle and the Puget Sound Clean Air Agency. successfully removed 280 pre-1994 model year drayage trucks (27 in 2009; 253 in 2010). The ScRAPS 2 program ran from May 2014 through June 2017 using additional grant funding from EPA, Department of Ecology, WSDOT and

PSRC. In total the ScRAPS2 program scrapped and replaced 413 drayage trucks, offering drivers $20,000 - $27,000 towards the purchase of new, compliant truck.

The NWSA reviewed available technology to aid the program and determined RFID tags and gate infrastructure were the most beneficial, and helped us meet the goals of the Program. The NWSA Clean Drayage System involved the installation of RFID infrastructure at in and out gates at international container terminals included in the Clean Truck Program (T-18; T-30; T-46; PCT; WUT; Husky; TCT), providing in-gate information on whether a truck is compliant with the program, and providing on-terminal turn times. All international container terminal leases were updated in spring 2018 to reflect the updated Clean Truck Program tariff. The on-the-ground enforcement of turning trucks has been implemented by terminal operators consistently across the gateway. Previously, green stickers were used for a visual compliance check in Tacoma, this gatewide RFID technology has provided an active enforcement mechanism, where non-compliant trucks receive a red light at the in-gate, and are not able to access the terminal. The installation of RFID infrastructure at international container terminals for the North Harbor in Seattle was budgeted at $945,000 and actual expenditure was $525,000, whereas the South Harbor in Tacoma was budgeted at $1,654,000 and actual expenditure was $824,000. In both Seattle and Tacoma the cost of installing the infrastructure for the Clean Truck Program came in considerably under budget, providing efficiency and air quality benefits to the port, communities and terminal operators.

6. Transferability to port industry

The NWSA is the one of the only U.S. ports to successfully implement a voluntary Clean Truck Program such as this, above and beyond state and federal requirements. The success of the implementation of this Program relied on several key initiatives, that could be incorporated and replicated by other ports. The key takeaway lessons are that the program was a success due to clear messaging; a unified port Commission; the provision of a package of support for truckers to comply with the deadline; the importance of good data and technology to plan and implement such a program; and collaboration across different stakeholder groups.

Much of the successful implementation of the Clean Truck Program was a direct result of the clear and consistent message from the NWSA Managing Members, Executives and staff that the deadline was real and would not be extended. This core message was communicated online (emails, social media, NWSA website); physically across the gateway (flyers, banners at the gates), at public meetings, and in person with trucking companies and truck drivers. This message was reinforced by Managing Members attending our trucker workshops during 2018, and reinforcing the message in person.

As the Clean Truck Program was a whole port team effort (Operations, Environmental, IT, Engineering, Government Affairs, Communications), an internal Clean Truck Steering Committee, chaired by CEO John Wolfe, with representatives from all departments, met regularly to ensure any updates or changes in project scope and schedule were also widely communicated internally.

With other voluntary port environmental programs, especially for landlord ports, where the port itself does not own the equipment being upgraded, the importance of a financial and education support package for truck owners was key to the success of the program. Over the years, the ports of Seattle, Tacoma and the NWSA have used different sources of grant funding (e.g. DERA, CMAQ, Clean Diesel funding) to provide different lump sums to drivers willing to scrap their old, non-compliant truck and purchase a new, 2007 engine or newer truck. Even when purchasing second-hand vehicles or equipment, newer and cleaner technology can be expensive, and the owner can need financial assistance.