

**THE NORTHWEST SEAPORT ALLIANCE**  
**MEMORANDUM**

Staff recommends providing a 90-day grace period extended from the original January 1, 2018, deadline established in the Clean Truck Program

**MANAGING MEMBERS**  
**ACTION ITEM**

<b>Item No.</b>	4D
<b>Date of Meeting</b>	February 6, 2018

**DATE:** January 24, 2018

**TO:** Managing Members, The Northwest Seaport Alliance

**FROM:** John Wolfe, Chief Executive Officer

**Sponsor:** Jason Jordan, Director, Environmental and Planning Services

**Project Manager:** Sara Cederberg, Environmental Senior Project Manager

**SUBJECT:** Clean Truck Program – Policy Motion

**A. ACTION REQUESTED**

1. To adopt the NWSA Clean Truck Program, which will:
  - Contractually obligate the NWSA international marine terminal operators to limit truck entries to trucks with engines 2007 or newer, or trucks with equivalent emission controls certified by the US EPA or the California Air Resources Board;
  - And do so by the end of grace period date of April 1, 2018, as extended from the January 1, 2018 deadline, and;
  - With additional provisions to allow a temporary deferral program (limited to December 31, 2018).
2. To authorize the CEO or his delegate to negotiate and enter into lease amendments with the four listed international marine terminal operators to carry out the Clean Truck Program requirements. The specific Leases subject to this amendment are: ITS (Husky), Ports America (TCT), Everport (PCT), and Washington United Terminals (WUT).

**B. SYNOPSIS**

**CLEAN AIR STRATEGY**

The original Northwest Ports Clean Air Strategy (NWPCAS) was developed in 2007 and 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. The Clean Truck Program is one segment within the broader NWPCAS.

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.

During the initial NWPCAS development in 2007, there were 7 Commission briefings on the Clean Truck Program and more than 60 meetings with industry, community, labor, environmental, and agency stakeholders.

The over-arching 2007 clean air strategy goals for all segments of the strategy are:

- Goal 1: Reduce diesel particulate matter (DPM) emissions per ton of cargo by 75% by 2015 and by 80% by 2020, relative to 2005.
  - The preliminary 2016 data for NWSA shows an 80.4% reduction in DPM emissions per ton of cargo within the Puget Sound airshed – surpassing the 2020 goal four years ahead of schedule.
- Goal 2: Reduce greenhouse gas emissions (GHG emissions) per ton of cargo by 10% by 2015 and by 15% by 2020, relative to 2005.
  - The preliminary 2016 data for NWSA shows an 19.3% reduction in GHG emissions per ton of cargo within the Puget Sound airshed – surpassing the 2020 goal four years ahead of schedule.

#### CLEAN TRUCK PROGRAM:

The Ports of Seattle, Tacoma and Vancouver established the same Clean Truck Targets but utilized different implementation plans.

Clean Truck Targets:

- By 2010: 1994 or newer heavy-duty truck engine model year, or equivalent. (achieved)
- By 2015: 80% of heavy-duty drayage trucks meet or surpass EPA emission standards for model year 2007 (this target was later deemed not measurable and the NWPCAS partners agreed to remove it in the 2013 update)
- By 2018: 100% of heavy-duty drayage trucks meet or surpass EPA emission standards for model year 2007

Given the number of trucks serving the gateway, both programs have always relied heavily on the market to upgrade equipment and have historically used grants to support truck conversion for drivers with the highest need. In terms of drayage truck operations, the Seattle marine terminals rely more on drayage to nearby railyards than Tacoma marine terminals, but ultimately both harbors are served by the overall combined drayage fleet.

During the development of the NWPCAS, the international MTOs and other stakeholders suffered significant losses during the economic downturn in 2008. In response, both ports implemented customer support packages that could creatively assist various stakeholders while advancing certain initiatives, including the environment.

The Port of Seattle package included amending existing international container leases whereby the port committed to various terminal improvements or concessions in exchange for their participation in the Clean Truck Program, including investing in RFID technology to monitor progress. The Port of Tacoma package included a commitment to support the Port's NWPCAS via voluntary compliance and deployment of additional technology. As has been noted by some stakeholders, the Seattle approach (RFID registry and lease commitments) used a clear requirement for the goal's deadline and the Tacoma approach (sticker program and registry) used strong promotion to reach the goal's deadline.

Although the approach taken was different, in Seattle and Tacoma, the outcome has been similar. At the end of August 2017 (the last time data was tracked separately for the two harbors), 51% of trucks were compliant in Tacoma and 50% in Seattle.

Over the past ten years, the home ports and the NWSA have published a progress report on all targets within the Northwest Ports Clean Air Strategy. Commissioners/Managing Members have been briefed and reports published on the NWSA/homeport websites. Throughout this timeframe, staff have regularly engaged in trucker outreach to assist in truck conversion, truck safety and bike safety workshops. Further, staff has sought over time to connect the trucking community with the larger network of dealers, lenders and other small business resources, as well as work with community organizations such as the African Chamber of Commerce to enhance outreach effectiveness. Lastly, each homeport, and now NWSA, have sought direct grant assistance for truck conversion which has provided \$12.2 million in 5 grant rounds toward truck purchases. During each round of funding, the trucking community and larger supply chain network has been actively notified of the related Clean Truck deadlines. (See pages 14-15)

### **RECOMMENDATION**

- External stakeholders across the full spectrum of commenters are urging a final date be selected now, as certainty in a date is vital to their business.
- Staff recommends providing a 90-day grace period extended from the original January 1, 2018, deadline established in the Clean Truck Program.
- Staff will negotiate lease amendments with international container terminal operators and users to contractually obligate them to only allow drayage trucks with 2007 or newer model year engines, or trucks with equivalent emission controls certified by the US EPA or the California Air Resources Board, onto their cargo terminals after April 1, 2018. South Harbor leases will be amended first, as North Harbor leases meet current program requirements. If the Clean Truck Program standards change in the future, the North Harbor Leases will be updated at that later date. Lease amendment and tariff language in Attachment A.
- For drivers who are in the process of procuring a compliant truck, staff will work with our stakeholders and develop a Clean Truck Pass program to provide terminal access until December 31, 2018 to those drivers. This gives operators additional, sufficient time to procure financing and secure an appropriate compliant truck. (See pages 13-14.)

### **OVER-ARCHING FACTS**

- Achieving the 2007 or newer truck program milestone anytime in approximately the next year inherently involves some short-term gate congestion during the initial implementation (estimated 2-4 weeks).
- This can lead cargo diversion from the gateway and is an example of why other ports have chosen to extend their program deadlines.
- Staff will continue to engage supply chain stakeholders, especially Beneficial Cargo Owners (BCOs), to help ensure compliant truck arrangements are in place but some will still likely scramble to adjust which could negatively affect cargo volumes.
- Some stakeholders' comments predict both a shortage and a surplus of trucks. Staff analysis of these comments and other supply chain experts is that the Puget Sound generally has more drayage trucks compared to similar container gateways.
- As pre-2007 trucks are turned from NWSA terminals, some may be scrapped as drivers upgrade or retire but a sizeable fleet segment is likely to find other freight-hauling opportunities within the Puget Sound, or develop shuttle operations where non-compliant trucks exchange the load with compliant trucks for the final run to the marine terminals.
- Post-2007 trucks, especially model years 2007-2010, have operating challenges and high maintenance costs due to the duty-profile of drayage that affects proper Diesel Particulate Filter (DPF) function. This has improved in later year designs and can also be mitigated by training on how to operate and clean the DPFs. Challenges remain and NWSA staff, industry and agency partners must continue to support operation training and any technological after-market improvements that help lower or avoid maintenance costs and ensure proper functioning to achieve expected emission reductions.

### **RECOMMENDATION BENEFITS**

- Reduced Diesel Particulate Matter (DPM) emissions within the ports and in neighboring communities by mid-2018
- Less congestion may lead to quicker turn times and assist both cargo flow and trucker income
- Supports drivers who made the investment to comply with NWSA's objectives on time
- Improved reduction of cost-differential in drayage contract bids between compliant and non-compliant trucks
- Supported by the Puget Sound Clean Air Agency

### **RECOMMENDATION RISKS**

- May increase drayage cost if there is a shortage of trucks.
- Potential work stoppage by non-compliant drivers.
- Has some greater risk of cargo diversion.
- Perceived compressed timeframe for non-complaint drivers to make necessary acquisition, despite 10-year notice.

- Truck costs may increase due to increased demand, although staff are working with dealer and truck manufacturers to minimize this issue.
- Manual truck sticker review at two terminals prior to deployment of gateway-wide technology yields additional cost of \$8,000/month per terminal, approximately \$96,000 total for April-September.
- Less time for other CARB-certified filter technologies to emerge as alternatives to new truck purchase.

## C. BACKGROUND

Staff most recently briefed the Managing Members on the Clean Truck Program at the November 7, 2017, and January 16, 2018, meetings. The memos from those meetings can be found in Attachment B and Attachment C. The Managing Members decided a formal action is necessary to provide certainty to the market. Staff is providing additional supporting information to better inform this action:

1. Background on the Northwest Ports Clean Air Strategy (page 5)
2. Preliminary results from the 2016 Puget Sound Emissions Inventory (page 7)
3. NWSA Operational Improvements -- How clean truck & operations strategies inter-relate (page 10)
4. Clean Truck Pass Process – How in-process drivers qualify for additional time to procure a compliant truck (page 13)
5. Truck Driver Outreach (page 14)
6. Heavy Duty Truck Emission Controls and Drayage (page 17)
7. Domestic Terminals (page 21)
8. Legislative update (page 21)

Note that additional information on the proposed Clean Truck Fund, Volkswagen mitigation funding and 2018 Diesel Emission Reduction Act grants (DERA grants) can be found in the memo for the Clean Truck Fund presentation.

### **1. Northwest Ports Clean Air Strategy**

The ports have successfully implemented the Northwest Ports Clean Air Strategy (NWPCAS) to surpass the overarching 2020 goals four years ahead of schedule.

The goals of the strategy are:

- Goal 1: Reduce diesel particulate matter (DPM) emissions per ton of cargo by 75% by 2015 and by 80% by 2020, relative to 2005.
  - The preliminary 2016 data for NWSA shows an **80.4%** reduction in DPM emissions per ton of cargo within the Puget Sound airshed.

- Goal 2: Reduce greenhouse gas emissions (GHG emissions) per ton of cargo by 10% by 2015 and by 15% by 2020, relative to 2005.
  - The preliminary 2016 data for NWSA shows an **19.3%** reduction in GHG emissions per ton of cargo within the Puget Sound airshed.

The Northwest Ports Clean Air Strategy (NWPCAS) was developed in 2007 and 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 that affect air quality and contribute to climate change in the Puget Sound-Georgia Basin air shed.

The NWPCAS encompasses goals across the whole scope of port operations: ocean-going vessels, harbor vessels, trucks, cargo-handling equipment, locomotives and fleet vehicles. 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. The strategy guides decision-making to reduce diesel and greenhouse gas emissions in advance of, and complementary to, applicable regulations.

The NWPCAS demonstrates leadership by proactively reducing port-related emissions. A key goal of the joint strategy is to stay in attainment of ambient air quality standards and objectives. In addition to concerns about ambient air quality, reducing risk from exposure to diesel particulate is also a primary goal of the strategy.

The Northwest Seaport Alliance became a full partner to the strategy upon its formation in 2015. The home ports of Seattle and Tacoma remain partners in the strategy, as they produce their own port-related air emissions under operations outside of the alliance (e.g. cruise ships, fishing vessels and harbor craft). The strategy is updated periodically to reflect changes in legislation, and to update the goals and performance targets. The most recent update, the second, was in 2013. The next update, the third, will begin in 2018 to set goals and targets for 2020-2025.

#### Clean Truck Program Milestones

The initial NWPCAS published in 2008 outlined the targets for the current Clean Truck Program:

- By 2010: Reach the equivalent PM emissions level of 1994 or newer heavy-duty truck engine model year through vehicle purchase or by using approved retrofit packages.
- By 2015: 80% of heavy-duty drayage trucks will reach the equivalent PM emissions level of 2007 or newer engine model year through vehicle purchase or by using approved retrofit packages. This was an interim objective on the way to the goal of 100% of heavy-duty drayage trucks by 2017. All gates will have an automated system using best available technology to reduce truck waiting times.

These targets were updated by the partners in the 2013 strategy. At the time of adoption, approximately 25% of the trucks met the 2007 engine requirement. The 2013 strategy outlines

targets for 2015 and 2020 for all sectors, trucks are unique that the target is 2017. The targets are:

- 2015 & 2020: 100% of trucks meet or surpass EPA emission standards for model year 2007, by end of 2017
- 2015: Ports have fuel-efficiency plans for trucks
- 2020: Ports, terminals, and 50% of trucks have fuel-efficiency plans

To better understand the drayage truck fleet serving the ports and determine the scope and effort needed to reduce truck diesel particulate emissions, studies were performed in 2008 to determine the local drayage fleet age. The study by the Port of Tacoma found that more than 86% of the drayage truck fleet was newer than model year 1994 and therefore already complying with the port's 2010 goals. Port of Seattle analyzed the fleet to find 25% of fleet were older than 1994. The two ports successfully met the initial target in 2010 using sticker programs for MTO's to identify trucks. The current goal of 100% of trucks having a 2007 engine or newer by the end of 2017, assumed the majority of trucks would turnover following a standard 10-year fleet turnover rate.

#### NWPCAS 2018 Update

The original NWPCAS was published in 2008, and was updated in 2013. Using the updated Puget Sound Maritime Inventory and the NWSA greenhouse gas inventory as a basis, the NWPCAS partners plan to update the NWPCAS' 2020 and 2025 targets during the course of 2018. Staff will present an interlocal agreement for that effort to the Managing Members in the first quarter of 2018, including community and stakeholder outreach and input opportunities.

#### **2. Preliminary results from the 2016 Puget Sound Emissions Inventory**

Every five years the ports, government agencies, and private business partners in the Puget Sound conduct an activity-based air emissions inventory. The 2016 Puget Sound Maritime Emissions Inventory quantifies maritime-related emissions for calendar year 2016, and compares the data emissions and activity against previous inventories conducted in 2005 and 2011. By conducting regular updates, inventory partners can track progress made in reducing emissions as a result of individual or collaborative emission reduction efforts. The full report is on schedule to be released in mid-February 2018. The inventory tracks the six criteria pollutants, as defined by the US EPA in the Clean Air Act as well as greenhouse gases. These six are carbon monoxide (CO), lead, nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM), ozone, and sulfur oxides. A description of the contaminants and their impacts is included in Appendix A.

Particulate Matter (PM) refers to a wide range of airborne particles and includes everything from dust, to pollen to soot and smoke. Airborne PM can result from direct emissions of particles (primary PM) or from condensation of certain gases that have themselves been directly emitted or chemically transformed in the atmosphere (secondary PM). PM is often classified by size. For reference, a single grain of fine sand is roughly 90 microns in diameter.

PM1: Also known as "ultrafine" particulate matter, PM1 refers to the fraction of PM in a sample that is 0.02-2 microns in diameter or less.

PM2.5: Also known as “fine” particulate matter, PM2.5 refers to the fraction of PM in a sample that is 2.5 microns in diameter or less. This size of PM is commonly associated with combustion and secondary PM.

PM10: Also known as “coarse” particulate matter, PM10 refers to the fraction of PM in a sample that is 10 microns in diameter or less.

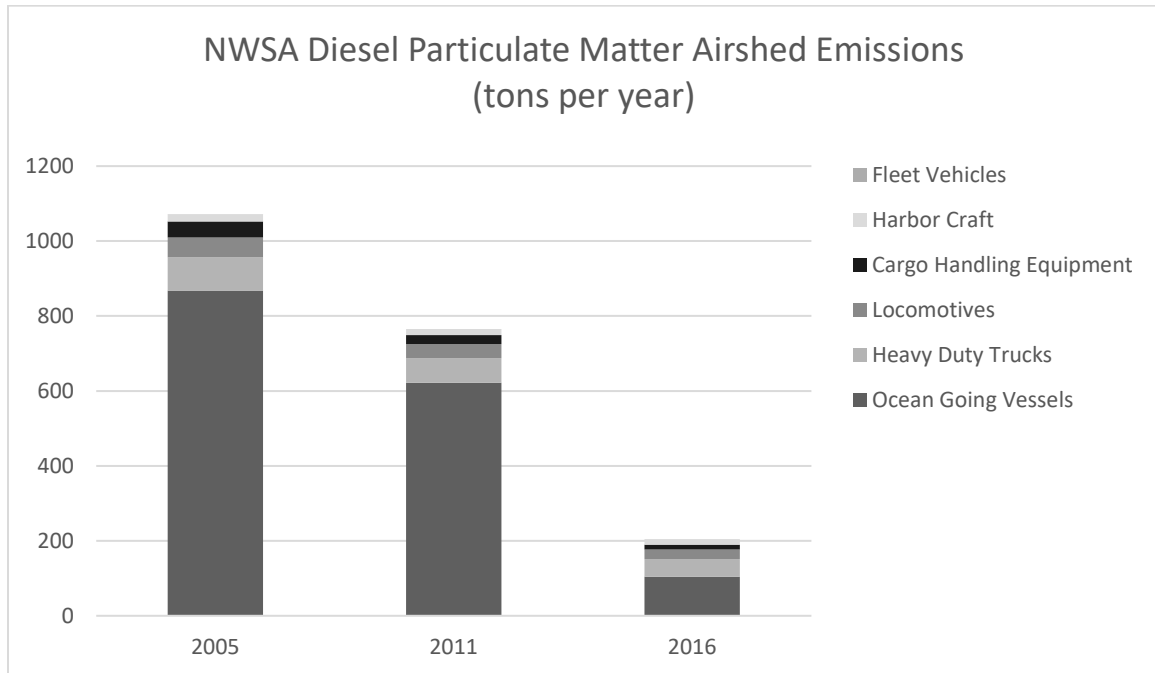
Diesel Particulate Matter (DPM) refers to particulate components of combustion products that are directly emitted from diesel engines. Diesel exhaust was classified as carcinogenic to humans by the International Agency for Research on Cancer (IARC, a division of the World Health Organization) in 2012 and is estimated by the California Air Resources Board to be responsible for 70% of the total cancer risk from air pollution. Truck drivers, railroad workers, heavy-equipment operators, and other workers have higher exposure to diesel exhaust and these workers have been found to be associated with lung cancer risks 40% higher, on average, than in the population at large. Other non-cancer health effects include exacerbated chronic heart and lung disease, including asthma, increased respiratory symptoms, and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies.

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 98%.

Black carbon (BC): is a component of PM2.5 and it stays in the atmosphere for only several days to weeks, as opposed to CO2 that has an atmospheric lifetime of more than 100 years. Black carbon is formed through the incomplete combustion of fossil fuels, biofuel and biomass.

Preliminary Diesel Particulate Matter (DPM) and greenhouse gas (GHG) emissions associated with NWSA operations have decreased substantially since 2005. Preliminary results from the 2016 Puget Sound Maritime Air Emissions Inventory (PSEI) indicate an 80.4% reduction in DPM emissions and a 19.3% reduction in greenhouse gas emissions per ton of cargo since 2005 on the airshed scale. These emission reductions surpass the 80% DPM and 15% carbon dioxide equivalent (CO2e) goals to be achieved by 2020 set forth in the Northwest Ports Clean Air Strategy (NWPCAS).





\* Emissions inventory data is preliminary and subject to change  
\*\* Includes emissions from NWSA throughout the Puget Sound Airshed

Reductions in DPM emissions were primarily driven by switching to lower sulfur fuels, fleet turnover, emissions control technology retrofits, and idling reduction strategies. The largest driver of emission reductions was implementation of the North American Emissions Control Area (ECA), requiring ocean-going vessels to burn fuel containing a maximum of 0.1% sulfur by weight within 200 miles of shore rather than bunker fuel, which must only conform to the 3.5% global sulfur cap. Reducing the sulfur content of fuels is well known to significantly reduce DPM emissions. The International Maritime Organization (IMO) is the body who governs international maritime fuel standards. IMO established in October 2016 the deadline for the new global sulfur limit, 0.50% sulfur by weight, beginning January 1, 2020.

Fuel switching drove emission reductions in other sectors as well, with 2014 EPA standards requiring both on-road (trucks) and non-road (cargo handling equipment, generators, locomotives, harbor craft) engines to use ultra-low sulfur diesel (ULSD). ULSD has a maximum sulfur content of 15 parts per million (ppm) or 0.0015%. Highway diesel fuel was regulated to 500 ppm (0.05%) sulfur before 2010, when all highway engines were required to use ULSD. Nonroad diesel was unregulated before 2007 and had a 500 ppm (0.05%) sulfur limit from 2007 to 2014.

Stricter emission standards and fleet turnover have also driven significant DPM emission reductions. For example, the federal particulate matter (PM) emission standards for heavy duty diesel vehicles referenced in the Clean Truck Program decreased by 90% between model years 2007 and 2008. In addition, emission standards for nonroad engines decreased by greater than 90% between tier 3 and tier 4. Tier 4 nonroad engines are generally model year 2013 and newer. As older vehicles and equipment are replaced, fleet emissions decrease

significantly. Given that there are limited fuel sulfur content improvements left to be made, fleet turnover is likely the most effective remaining emissions reduction strategy for DPM.

Greenhouse gas emission reductions are driven by energy efficiency. Since the carbon in combusted fuel is emitted primarily as CO<sub>2</sub> and there is no way to remove CO<sub>2</sub> from exhaust, the only way to reduce CO<sub>2</sub> emissions is to reduce the amount of fuel burned. Reductions in CO<sub>2</sub> emissions were greatest from ocean going vessels. Reductions in ocean going vessel CO<sub>2</sub> emissions were primarily due to a reduction in vessel movements in 2016 compared with 2005, without a substantial decrease in the tonnage of cargo handled. The reduction in vessel movements was because vessels calling NWSA Ports in 2016 were larger on average than in 2005, allowing cargo to be transported more efficiently and by fewer ships. Additional greenhouse gas reductions were achieved in cargo handling equipment and locomotives. Reductions were due to decreases in intermodal lifts, increases in fuel efficiency, and anti-idling efforts. Notably, greenhouse gas emissions from trucks were up by 9% in 2016 compared with 2005, reflecting increased volumes and little change in fuel economy.

Total emission reductions have been mostly driven by ocean going vessels; DPM associated with vessels in the Puget Sound airshed decreased by 88% from 2005 to 2016 whereas DPM emissions from trucks have decreased by 47%. These measurements include the entire airshed, including vessels transiting in Puget Sound. The relative importance of trucks to total NWSA DPM emissions has grown substantially and contributes 23% of the DPM emissions associated with the NWSA. Those emissions are also occurring along highways and streets where there is greater human exposure.

### **3. NWSA Operational Improvements**

One of the key missions of the NWSA is to be, “the gateway that is the easiest to do business with” by providing best in class service delivery. In addition, Goal 1.B of the Alliance’s Strategic Business Plan is to enhance its competitive position through improving the efficiency and cost competitiveness of the supply chain.

As this strategy evolves, it provides opportunities for advancements in four focus areas, all of which yield inter-related benefits:

- 1) Cargo Velocity: Efficient cargo flow, promotes an increase of cargo velocity. Attractive to stakeholders (terminal operators, truckers, labor, warehouse workers etc.) across the gateway with great economic value.
- 2) Improve Operational Visibility and Communication: As technology deployment continues, these operations can be integrated with other local and regional transportation networks to benefit visibility and communication for regional traffic flow and cargo movement.
- 3) Reduce Congestion and Improve Service Levels: Cargo movement efficiencies reflects well on port operations, thus yielding faster turnaround times for truck drivers, reducing congestion, improving service levels and financial sustainability.
- 4) Environmental Sustainability: Efficiency at our terminals and throughout the supply chain, reduces emissions and fuel consumption, continuing our focus on environmental sustainability. Reduction of emissions, fuel consumption by truck idling at gate queues and equipment idling when terminals are congested.

Supply Chain Context:

From the 1980s until roughly 2005, the gateway's main mode of land transportation to-and-from marine terminals was via rail. In fact, 70% of the international containerized cargo moved via rail during this timeframe. Most of the terminals in the gateway were designed and constructed with a focus on intermodal cargo. In the late 2000s, this trend started to change in ports across the country, especially the Puget Sound. The effect is increased truck activity at our international cargo facilities which strains service levels and often increases gate congestion.

A main driver of this transition was the economics of transloading. The ability for a shipper to load more cargo into a domestic 53' container coupled with relatively inexpensive domestic rail rates led more cargo to be transloaded and moved via this mode. This is reflected by our current cargo mix which has increased the percentage of cargo moving via truck from 30% prior to 2005 to just over 50% today. Additionally, the South Intermodal Yard (SIM) was established as a domestic rail ramp and warehousing businesses along Highway 167 have increased significantly.

Over time the Puget Sound area has developed the second largest warehouse and distribution complex in the country, creating jobs and improving our region's economic vitality. Further, in April 2017 the new global Ocean Carrier Shipping Alliances were launched. With the formation of the new Alliances the gateway has experienced increased service delivery issues at the truck gates. Supply chain participants have expressed their concerns with the perceived service degradation and further apprehension that this trend will continue. The Beneficial Cargo Owners (BCOs) make cargo routing decisions based on price, transit time and service levels. The service quality to their drayage segment is a cornerstone of their logistic product and a key driver in their routing options.

During both routine customer visits and the other supply chain stakeholder engagement described below, the BCOs have appealed for improved service levels at the gates. Specifically, they have requested that additional service hours be provided to improve overall fluidity to the supply chain during the peak season. The supply chain community regards the extended service program as a positive move. Here is feedback from a large customer of the Alliance.

*"...the perception we created with the customer is, this is a port that wants their business and is willing to cover them when an emergency arises for perishable fruit. It will not always fall upon the port funding; the customer will understand in the future it is also up to them to cover the costs as mutual partners."*

NWSA Operations Service Center & Executive Advisory Council:

To support and drive the NWSA operating strategy, the Operations Service Center (OSC) was established. Since its inception, the OSC has been focused on both day-to-day operations and working on strategic improvement initiatives to improve and sustain service delivery through the gateway.

The Executive Advisory Council (EAC) was formed shortly after the OSC to structure the NWSA's engagement with the supply chain stakeholders. Key metrics and initiatives were

established through the EAC to measure and improve service for all three modes of transport; vessel, truck and rail.

Over 15 separate initiatives have either been implemented or are in development, with 70% of the initiatives focused on improving service delivery to the truck segment to assist in delivering an average total truck turn time of 60 minutes or less. Examples of a few key improvement initiatives are:

- Enhanced visibility tools: cargo and equipment movement across the Port.
- Mobile notifications: gateway service levels, congestion points for improved dispatch decisions.
- Continuous operations: to improve productivity both for vessel and gate operations at the terminal.
- Virtual empty street turns: Exploring virtual methods for drivers to coordinate empty container exchanges outside of the terminal to alleviate congestion within the gateway.
- Port Community System: Design a system to enable the supply chain participants to exchange data over a common platform and better manage system flow.
- Extend gate service hours: to provide expanded capacity to the drayage sector and help shift truck movement to time periods outside regional commuting peaks.

#### Operational Improvements: Drayage Trucks:

Staff has researched other US ports and their related clean truck and operations initiatives:

- The Ports of Los Angeles, Long Beach, and Oakland all required a 2007 or newer engine January 1, 2012. LA/LB will require a 2014 model year in mid-2018.
- Port of Vancouver, BC has yet to announce when they will require the 2007 model year engine requirement, though a decision is expected this year. Port of Vancouver, BC has federal authority and thus has been able to develop a licensing program for trucks serving the port. Vancouver also requires every truck supply GPS data. Using this data, the port was able to calculate the number of trucks needed to serve their capacity and increase the number of turns for drayage drivers per day. They have capped their fleet at 1,700 trucks with roughly the equivalent TEU throughput as the NWSA.
- The Marine Terminal Operators (MTOs) in the Ports of LA/LGB and one (1) MTO in the Port of Oakland all charge some type of per container gate fees, have created off-dock yards and have fully implemented RFID technology.

To advance the NWSA clean truck and operations initiatives, in 2016-17 staff piloted a system to track queue times called DrayQ; this pilot represents a key step in the establishment of a larger Port Community System. The DrayQ technology solution was designed to determine real-time street wait times to enter a container terminal yard, specific terminal turn-times calculated from entry to exit, as well as the combined aggregate wait time and trend of the wait time.

This solution deployed a separate smartphone application called DrayLink that leveraged the power of mobile cellular GPS technology as a commercial service to capture data for the

solution, and required driver interaction with an active smartphone to extract data for the DrayLink application. The technology was not reliable and several bugs could not be resolved. The pilot did provide valuable lessons and to build on these staff engaged a consultant, Taso Zagrofas, in late 2017 to evaluate new options that would satisfy the requirements of the Clean Truck Program as well as support operational KPIs.

In addition to the DrayQ pilot, staff have researched other technologies, such as leveraging the Washington State Department of Transportation *Good To Go!* pass, that serve both the clean truck program and the operations initiatives. This work will yield future advances to the port community system and environmental programs, but these technology options cannot be deployed quickly enough to support the current clean truck deadline. As such, staff are recommending the deployment of an older but proven technology.

The Kalmar Smartlane technology solution empowers RFID technology implemented at multiple locations in a terminal yard to determine when a truck is present at a yard location, such as entry and exit gates to calculate terminal turn-times. This solution deploys an active RFID tag attached to each truck, which is then activated by an exciter and read by an RFID reader at pre-determined terminal yard location. The active RFID technology is not controlled by the driver after the RFID tag has been properly mounted to a truck. This technology is also scalable to be integrated into the MTO's terminal operating system.

Once this technology is installed at the entry and exit pedestals gateway-wide, NWSA will be better able to track and communicate turn times at each of the international terminals. This is the first phase toward developing a more robust Port Community System. As currently envisioned, a fully functioning Port Community System would be able to provide drivers, BCO's and others real time information regarding turn times, traffic congestion, emergency response and other factors that might impact the flow of cargo. Once operational, this system would support the entire supply chain and improve our overall velocity of cargo moved through our gateway.

Staff are commissioning a study to examine the relationship between container throughput, terminal operations, and the number of trucks needed to meet current demand as well as projected growth. This study will assess the operational impacts of improvements like extended gates, pre-arrival systems, peel off piles, and truck staging lots as well as the associated air quality benefits from reducing idling and faster turn times.

#### **4. Proposed Extension Process**

For companies and drivers who are making an earnest effort to upgrade trucks but may not have every truck upgraded by April 1, a flexible and reasonable extension process will be put in place. Staff surveyed six local dealerships in January 2018, and found approximately 700 compliant used trucks available and in stock. The number of trucks needed is likely higher than 700 and therefore, staff have developed the following process to provide additional time to drivers waiting for compliant trucks.

The process below outlines how a driver can demonstrate he/she is in the process of procuring a truck, for example, a down payment has been made but the truck has not yet arrived. A similar procedure already exists for drivers who are waiting for their registration from the Department of Licensing, and therefore do not have a permanent license plate. Using this

procedure as a basis for a Clean Truck Pass will minimize confusion. The driver will be given until December 31, 2018. This same language can be found in the Frequently Asked Questions (FAQs for Truckers) section of our Clean Truck website: <https://www.nwseaportalliance.com/trucks>

Subject to stakeholder input the process may include the following: Milestones

Step 1: Truck owner must provide supporting documents

Owners must meet all of the following in a timely process to be determined:

1. Owner must have existing non-compliant truck(s) in either Port of Seattle Drayage Truck Registry or Port of Tacoma Drayage Truck Registry.
  - a. Owner to provide details for identifying existing truck(s) in Seattle and/or Tacoma (in Seattle – RFID number. In Tacoma – license plate).
2. Owner must be able to prove information that they are in the process of securing access to sufficient funds for the truck(s).
  - a. For example, an owner could provide a confirmation of a loan application has been received by a financial institution, application to the Clean Truck (Loan Loss) fund (subject to Managing Member approval), confirmation letter from their lender that they have approval for financing. NWSA to retain a copy of financing confirmation letter on file.
3. Owner must have identified a new compliant truck(s) to purchase for the program.
  - a. Owner to provide a letter from the truck dealership confirming imminent purchase of new compliant truck. NWSA to retain a copy of confirmation letter on file.
  - b. Demonstrate that the truck will be in possession and operational by January 1, 2019

Step 2: Compliance Review

On behalf of MTOs, staff will review whether a driver meets requirements 1, 2, and 3. Supporting materials must be delivered in person to the Port of Tacoma Administration Building, or Port of Seattle Pier 69, or emailed to [trucks@nwseaportalliance.com](mailto:trucks@nwseaportalliance.com). Review of supporting materials will take up to 3 business days. Driver will be informed whether they meet the requirements for a Clean Truck Pass.

Step 3: NWSA Issue Clean Truck Pass

Upon confirmation that a driver is in the process of purchasing a compliant truck (i.e., meets requirements 1, 2 and 3), a Clean Truck Pass will be issued. This can be mailed to the driver or can be picked up in person at the Port of Tacoma Administration Building, or Port of Seattle Pier 69, following notification that the requirements have been met.

Step 4: Use of Clean Truck Pass

Once approved, the driver will receive a Clean Truck Pass that will allow him/her temporary access to NWSA international container terminals in their existing, non-compliant truck. The

driver will present the gate guard with their Pass, which will expire no later than December 31, 2018. When used in the South Harbor, guards should be familiar with manually checking stickers and temporary passes. In the North Harbor, staff, on behalf of MTOs, will work with eModal to have the non-compliant RFID tag unbanned until no later than January 1, 2019. RFID activity will be monitored during this time.

#### Step 5: Expiration of Clean Truck Pass

The driver is expected to use the additional time to secure financing and purchase a compliant truck, and to register his/her new truck with a new green Clean Truck sticker in the South Harbor, and update the RFID tag information in emodal.com. [Once RFID technology has been installed in the South Harbor in Fall 2018, the truck will no longer use a green sticker, it will need an RFID tag in both harbors.] If the driver tries to use the Clean Truck Exception Pass after the expiration date, and enters NWSA international container terminals in a non-compliant truck, they will be denied entry. Any potential extensions will be reviewed on a case-by-case basis.

#### **5. Truck Driver Outreach**

Over the past decade, staff have consistently informed drivers and commercial customers of the Clean Truck Program.

Port of Tacoma staff met quarterly from 2013 through 2015 with a trucker advisory group who discussed truck conversion, terminal congestion and best available technology. The Port also partnered with the City of Tacoma and the 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.

Information on the Clean Truck Program has been included in the presentations made to Beneficial Cargo Owners (BCOs) for the past several years.

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 POS Clean Truck Advisory Group, composed of supply chain stakeholders including drayage trucking companies, importers, exporters, railroads, and container terminal operators, held two meetings, one in September and one in November 2012, attended by a dozen supply chain stakeholders. Additionally, a (POS) Port Trucker Meeting aimed at independent owners/operators, was held on November 28, 2012.

The ScRAPs 2 program ran from May 2014 through June 2017 and most of the participants were individual owner-operators. A fleet owner was initially capped at two truck replacements, but during a slow-down in enrollments that cap was increased to four trucks. Truck owners had 60 days to replace their truck once they'd been approved by the program; owners that qualified as small or minority-owned businesses had 75 days to ensure they had time to identify financing for their replacement truck. POS used their trucker outreach email broadcast system to send program promotion and updates countless times over the 3-year span of the program. They also maintained a program web page on their website.

In addition, POS 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.

PSCAA also conducted outreach about the program. Several times over the course of the 3-year program, staff prepared program fliers and distributed them to the terminal operators so that they could hand them out to truckers as they entered the gates. In addition, staff visited motor carrier offices multiple times to hand out program fliers and explain the program to motor carrier management. Applicants that had signed up but not completed the program were sent emails or called directly to encourage them to replace their trucks while funding was available. And the program office maintained evening hours one day per week throughout the program to provide services after drayage operations ceased each day.

Additionally, Port of Seattle partnered with the African Chamber of Commerce to host a number of workshops in 2014 on many things related to drayage, including the Clean Truck Program.

More recently, 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, who represent over 1,200 drivers. Staff have presented Clean Truck Updates at the February, April, June, July, August, October, and November meetings. Additionally, 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.

On June 19, 2017, staff held meetings with a self-selected subset of the TOF, a group of 35 trucking companies, ranging in size, to provide a recommendation to commission and again on July 27 and August 30 for further brainstorming and feedback.

Staff presented the Clean Truck Program to the NWSA Executive Advisory Council at their July 13 meeting. September 16, NWSA sponsored a drayage driver workshop organized by the African Chamber of Commerce at South Seattle Community College which included an overview and update on the Clean Truck Program. Approximately 95 drivers were in attendance.

Staff have also developed procedures for engine repowers and diesel particulate filter (DPF) retrofits, in partnership with PSCAA, to provide more solutions to drivers. These are discussed in further detail in the *Equivalent Emission Control Technologies* section.

Staff distributed 800 fliers in the truck queues across the gateway at the end of November 2017 informing drivers the January 1, 2018, date was under review and that the Managing Members would vote on the new implementation date. These fliers are also handed out with every new truck sticker issued in the South Harbor. The NWSA website was updated at the same time, with more background and with a list of FAQs (<https://www.nwseaportalliance.com/trucks>). Eight sandwich boards were installed at the



gates for truckers to see as they were queuing. Staff fields at least 5 calls a day from drivers call to inquire on the timeline.

*Current and Future Trucker Outreach:*

Staff has developed an extensive communication and outreach strategy to ensure truck drivers are aware of the upcoming changes and have every opportunity to become compliant before April 1, 2018.

As outlined above, proactive communications have been a consistent focus of the project team. These efforts will be redoubled in the upcoming weeks. Staff will utilize our trucker listserv, containing over 3,300 members, to inform drivers and stakeholders of information and engagement opportunities.

Our NWSA webpage regarding the Clean Truck Program is being updated in phases; first to reflect the staff recommendation, pertinent information, and Managing Member action. After the February 6 meeting, the webpage will focus on tools and steps drivers need to know before the April 1 enforcement date.

In addition to a previously scheduled trucker outreach meeting on January 31, staff is planning two trucker open houses (one in Seattle and one in Tacoma) on February 3. These events will bring together NWSA staff and commissioners, truck dealerships, retrofit options and financing partners to ensure truckers are aware of rationale for the staff recommendation and tools available to assist them in becoming compliant.

The plan also calls for a combination of social media, emails, communication through trucking companies, fliers and potentially contracting with NGOs, specifically the African Chamber of Commerce Pacific Northwest, to ensure coverage within communities most likely to be affected.

The main channel for communications is the NWSA trucker listserv. That listserv has almost 4,000 contact emails, and text numbers to allow for us to communicate with a good portion of the trucker fleet. Trucking companies and the pier trucker Facebook group have passed our weekly emails along to truckers.

Staff has developed a list of interested parties with whom we will communicate throughout the implementation period.

**6. Heavy Duty Truck Emission Controls and Drayage**

Several comments have been made about the appropriateness of trucks with diesel particulate filters (DPFs) and drayage duty cycles. Ports with similar programs have studied the effectiveness of this emission control technology and shown that is it effective when maintained and used correctly, significantly reducing DPM, black carbon and NOx emissions. As the State of Washington does not have its own vehicle emission standards and testing laboratories, the program relies on the results and standards set by the EPA and the California Air Resources Board (CARB). CARB and other ports often commission academic institutions to conduct third-party academic research into the effectiveness of emission control technologies.

The CARB certification process for diesel particulate filters and other emission control retrofits is much more rigorous and comprehensive than the Washington State emissions testing program; CARB often serves as the standard-setting entity for other states and recently the Port of Vancouver, BC. The Washington State program only requires testing of smoke opacity (smoke density) for diesel engines older than 2007 every two years. The measurement of smoke opacity is simply the extinction of a light beam passing through diesel exhaust and has been used as a proxy for particulate matter concentrations in older, dirtier engines. However, smoke opacity measurements do not have the resolution to measure the lower concentrations that exist in the tailpipes of diesel engines equipped with particulate filters. In addition, opacity measurements are complicated by interferences from nitrogen dioxide in the exhaust and are not sensitive to smaller particles commonly found in diesel exhaust. By contrast, the CARB procedure measures particulate matter using more robust filter based methods that have higher sensitivity, fewer interferences, and can therefore effectively measure lower concentrations.

In addition to providing a more sophisticated method for measuring PM emissions, the CARB procedure addresses technical concerns associated with operating the retrofit devices and assesses the device's performance as it ages. Areas addressed in the CARB procedure include: compatibility with the engine, effects on engine back pressure, effect on fuel consumption, effect on oil consumption, compatibility with expected duty cycle, laboratory emissions reduction testing, durability testing, and field verification. These tests are designed to not only ensure that emission reductions targets are met, but also to reduce risk to the owners and operators by certifying that retrofit devices are functional, will do no harm to their engines, and by providing guidelines for their installation and use. The Washington State emissions testing program was not designed to measure emissions from DPF equipped vehicles, nor to assess the functionality of new technologies and therefore should not be considered as an alternative to CARB verification.

#### Suitability to drayage/idling

In 2014, CARB commissioned a study of drayage truck emissions at the Port of Oakland by UC Berkeley<sup>1</sup>. The study measured emissions of black carbon (BC), oxides of nitrogen (NOx) and ultrafine particles associated with an individual truck. The study found that trucks with DPFs (both retrofit or original equipment from the truck manufacturer (OEM)) emit  $74 \pm 30\%$  less black carbon than trucks without DPFs. Trucks with OEM DPFs and Selective Catalytic Control (SCR) systems (in 2010 and newer engines) emit  $92 \pm 32\%$  less black carbon than trucks without DPFs. The study concluded that DPFs do work to reduce emissions, especially black carbon. Many monitoring studies measure emissions in motion, not while idling in a drayage environment. A study on drayage idling emissions in Southern California<sup>2</sup> confirmed that PM emissions were reduced even while in a stop-start idling duty cycle.

Operating newer trucks, which are compliant with the requirements of the NWSA Clean Truck Program, require very different maintenance and usage than older trucks. However, studies confirm that emissions are reduced when the trucks are correctly maintained and the emission control technologies are used and maintained correctly.

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<sup>1</sup> <https://www.arb.ca.gov/research/apr/past/09-340.pdf>

<sup>2</sup> <http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=1721025>

### Maintenance

Based on feedback from the trucking community in California, CARB has conducted extensive research on maintenance of 2007 and newer trucks, and DPFs, through consultation with retrofit installers, truck dealers and truck drivers, alongside physical inspections of trucks and reviewing testing data<sup>3</sup>.

Typically, engine malfunctions and poor maintenance were the likely causes of most DPF filter concerns. Many engine failures were initially wrongly diagnosed as DPF issues. If a driver continued operation of a truck with malfunctioning engine components and triggered malfunction indicator lights without proper maintenance, the DPF filter core could be damaged. Inspections found that engine component malfunctions often resulted in excess PM generated by the engine, causing additional loading on the filter. If the engine is not repaired promptly, the filter will respond through more frequent regeneration and will require more frequent cleaning. If ignored, the DPF may become irreparably damaged. CARB found that fleets that conducted regular preventive maintenance did not experience the same level of engine issues as fleets that did not, and concluded that fleets could combat many DPF and engine issues by conducting regular preventive maintenance. However, follow-up surveys of truck drivers revealed that many were not fully trained on proper maintenance of engine or DPFs.

Analysis of engine warranty claims to CARB supports the importance of maintenance of DPFs and engine components. There were more warranty claims on 2007 trucks, compared to warranty claims on 2010 and newer engines, which had significantly better durability performance and fewer warranty claims. Further examination of warranty claims suggests upstream engine components could be the root cause of DPF problems, as almost all claims for DPF issues also had reported claims for another engine-related component. DPFs in a drayage environment are subject to considerable vibration and impact damage and therefore need to be inspected regularly for damage and/or cracking.

### Impacts on NOx

The Clean Truck Program at the NWSA and other North American ports were established to focus on reducing emissions of DPM from older trucks, a known carcinogen. The changes in 2007 engines reduced these DPM emissions, and later regulations affecting 2010 engines reduced NOx emissions. Testing data collected on drayage trucks in a stop-start idling environment confirmed that engine temperatures struggled to reach high temperatures whilst idling, so NOx reductions were lower than in longer, regional duty cycles. Many studies have found that while PM emissions are significantly reduced, NOx emissions can often increase, or have small decreases. Correct maintenance of the SCR system is critical to achieve NOx reductions in a drayage environment.

### Agency Guidance

Operating newer trucks, which are compliant with the requirements of the NWSA Clean Truck Program, require very different maintenance and usage than older trucks. Newer trucks will not function the same as older trucks, and drivers need to take that into account in their work. One of the primary maintenance issues with a DPF is that the duty cycle of a drayage truck

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<sup>3</sup> <https://www.arb.ca.gov/msprog/onrdiesel/documents/DPFEval.pdf>

means it struggles to run long enough to generate enough heat to regenerate the filter passively. Active regeneration can help in these stop-start duty cycles, but other products of combustion can still build up and clog the filter, leading to further maintenance issues. Drivers must adapt to the requirements of these DPFs – active regeneration systems need the required regeneration time, so the soot can be removed from the filter. In a passive regeneration system, the engine exhaust temperature needs to get hot enough to prompt regeneration. Drivers need to ensure they use the correct lube oil, pay attention to the DPF Monitoring System warnings and clean the filter correctly and regularly.

CARB has used their extensive research to develop guidelines for how to operate and maintain trucks with a DPF, which is available at: [https://www.arb.ca.gov/msprog/truckstop/pdfs/dpf\\_handbook.pdf](https://www.arb.ca.gov/msprog/truckstop/pdfs/dpf_handbook.pdf). The Puget Sound Clean Air Agency has received grant funding to develop a series of training modules on DPF maintenance, specifically in the drayage environment. They have conducted hours of interviews with former ScRAPs recipients and motor carriers. The English version of the videos are scheduled to be released in Spring 2018, further translations of the videos are also being developed. A summary of their upcoming guidance can be seen in Appendix B Common themes and suggested best practices from the interviews are summarized below.

1. Many had to change their operations and/or business model. They typically do longer trips at least twice a week that include freeway driving at speeds over 50 mph for longer than 20 minutes each way.
2. Drivers have to understand their engines and stay on top of their maintenance.
  - a. Understanding the engines helps them stay on top of small problems before they turn into big problems.
  - b. It also helps to understand the truck's engine when take your truck to the dealer for repairs or DPF cleanings. Many drivers don't have the tools they need to work with dealers when things go wrong. This is exacerbated when English is a second language. Understanding the truck engine is an important tool to have.

#### Alternatives to DPFs

Any emission control technology verified by CARB and/or the US EPA can be used to satisfy the requirements of the Clean Truck Program. CARB maintains a list of Level 3 retrofits on their website: <https://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>

Alternatively fueled vehicles, such as LNG or CNG trucks, also satisfy the requirements. Natural gas powered trucks are classified as near zero emission vehicles when evaluating DPM emissions.

Staff does not recommend approving the use of retrofits that have not been verified by CARB or EPA to be effective. The Port of Vancouver, BC, Washington State Department of Ecology and the Puget Sound Clean Air Agency, partners in the Northwest Ports Clean Air Strategy, all agree that CARB or EPA verification is a requirement of the program.

Staff have communicated with Peter Barton, the Head of Engineering for the Emissions Research and Measurement Section of Environment Canada to review the results of their

testing of retrofits that inject hydrogen into induction air to improve the efficiency of combustion in the engine. Environment Canada tested several products that utilized a similar operational premise. Results from the Environment Canada tests do not show any statistically significant decrease in emissions for any pollutants nor any statistically significant increase in fuel economy. Emissions are a function of combustion efficiency, which is a measure of the fraction of energy released when compared with optimal combustion. This is directly related to the fraction of carbon molecules fully oxidized to CO<sub>2</sub> rather than undesirable products such as DPM, CO, and VOCs. Combustion efficiency for diesel engines in the Environment Canada tests (all pre-2007 engines) not equipped with hydrogen injection systems was typically 99.5% or higher, leaving little room for improvements in combustion efficiency. Furthermore, combustion efficiency in hydrogen injection system equipped engines showed no significant improvement, suggesting that the underlying process that produces undesirable emissions in the engines was unchanged. Based on these test results, there is no reason to believe that these hydrogen injection systems are equivalent technologies that would satisfy the clean truck program emission requirements. More recently, at least one hydrogen injection system has been announced that claims to inject hydrogen to the intake valves of the individual cylinders rather than simply into the intake air and uses a on board control unit to time the injection. While there are claims of significant emission reductions, there has been no reputable data supplied to verify these claims and the technology has not obtained CARB certification.

If one of these products or similar device was able to demonstrate equivalent emission reductions and receive CARB or EPA verification, the NWSA would allow the use of that technology to satisfy the Clean Truck Program Requirements.

### ***7. Domestic Terminals***

The Clean Truck Program currently applies to international container terminals (see Table 1 above). As part of the next NWPCAS update, staff recommends extending the program to domestic terminals, but to phase in the program at a date yet to be determined, pending further analysis of the truck population entering these terminals. While there is overlap with the trucks serving the international terminals, there is a population of trucks with whom the NWSA has not had any prior communication or outreach through the Clean Truck Program.

Staff is analyzing extending the program to the domestic container terminals listed in Table 2, which excludes tug and barge operations. Information on the model years of trucks entering the terminals was obtained through the cameras that record license plate information at the terminal pedestal.

Table 2. Domestic Terminal Truck Data

<b>Location, Terminal Name</b>	<b>2017 Truck Fleet</b>	<b>Trucks Currently in CT System</b>	<b>Trucks Meeting CT Requirements</b>
South Harbor, TOTE	344 (Sept-Oct)	200	198 (58%)
South Harbor, West Sitcum Terminal*	584 (July-Aug)	404	310 (53%)
North Harbor, Terminal 25	No data	No data	No data

\*SSA took over operations at West Sitcum during 2017. APM previously operated the terminal and provided truck data to the port for monitoring. Further data from West Sitcum will be available in early 2018.

### **8. Legislative Update**

Representative Jake Fey has introduced HB 2601. The bill requires all trucks calling on NWSA (not just its international container facilities) to have 2007 model-year engines or newer by January 1, 2019. The bill also requires all trucks calling on the NWSA to be zero-emission by 2035.

NWSA staff testified against the bill based on commission direction over the last ten years to favor a voluntary port-led clean air strategy in lieu of a state mandate. Specifically, staff presented the below rationale:

- The Northwest Ports Clean Air Strategy was entered voluntarily and proactively by the ports; passing a retaliatory bill in response to missing a voluntary goal sends the wrong signal to others that might consider voluntary action.
- The bill is not needed considering the staff recommendation for international container trucks being considered by the Managing Members.
- The bill is unworkable for domestic and breakbulk facilities; while international container terminals have had ten years to prepare, the domestic and breakbulk terminals would be given only months.
- Preliminary data from the Puget Sound Marine Air Inventory shows that the current Strategy is working.
- The bill disrupts the feedback loops established by the Northwest Ports Clean Air Strategy where we 1) measure 2) develop an emissions reduction strategy 3) execute 4) measure 5) recalibrate and update strategy etc. While action steps around zero emission vehicles or domestic terminals might make sense, they ought to be addressed by the Managing Members as part of the Strategy once we have the most current data coming out of the Puget Sound Maritime Emissions Inventory.

Customers and supply chain partners, supportive of the port-led Strategy, oppose the bill. Additionally, there is strong legal concern that, the legislation would likely be preempted by federal law (46 USC 14501(c)(1)):

a State, political subdivision of a State, ...may not enact or enforce a law, regulation, or other provision having the force and effect of law related to a price, route, or service

of any motor carrier ...or any motor private carrier, broker, or freight forwarder with respect to the transportation of property.

The bill was voted out of committee on a party line vote Jan. 25. The bill will now sit in rules awaiting a pull to the floor. Staff have been told by the sponsor and committee chair they await action by the Managing Members before deciding what to do next.

#### Clean Truck Legislation

At the November 7, 2017 meeting, the 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 is requesting 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 have sponsored the bill (SB 6207) in the Senate, while Representatives Mary McBride and Dan Griffey have sponsored it (HB 2540) in the House of Representatives. The House Local Government Committee heard and passed HB 2540 on January 24. The Senate Local Government Committee took similar action on SB 6207 on January 18. Both bills are now pending a Rules Committee vote in their respective chambers.

Establishing a Clean Truck Fund is contingent upon the legislature's adoption of either SB 6207 or HB 2540. Listed below is the remaining timeline for this legislative session:

<b>Date (2018)</b>	<b>Action</b>
February 14	House of origin cut-off
February 23	Committee cut-off—opposite chamber
March 2	Opposite chamber cut-off
March 7	If the bill passes by March 2, last day for the Governor to sign the bill
June 5	The law will go into effect (90 days after signing)
<b>OR</b>	
March 8	Last day allowed for regular session under state constitution.
March 28	If the bill passes after March 2, last day for the Governor to sign the bill
June 26	The law will go into effect (90 days after signing)

#### **D. FINANCIAL IMPLICATIONS**

The costs associated with the design and construction of the gate technology will be included in the March project authorization memo and presentation. This project authorization will cover the design, procurement and construction associated with installing RFID readers at the

entry and exit gates in both the north and south harbors. To be able to track trucks for the Clean Truck program, readers at the entry pedestals are needed. To capture gateway-wide pedestal to pedestal turn time, readers at the exit gates are required.

A full site survey has not yet been completed to verify the amount of infrastructure work needed. Therefore, the cost estimates below are at approximately a 10% level of design and carry a large contingency. Project delivery staff continue to finalize the design and cost estimate and will bring a more detailed analysis to the March Managing Member meeting.

	<b>Costs for Clean Truck Monitoring</b>	<b>Estimated Costs for Tracking Turn Times</b>	<b>Total</b>
North Harbor	\$0	\$1,500,000	\$1,500,000
South Harbor	\$1,825,000	\$675,000	\$2,500,000
<b>Total Estimated Costs:</b>			<b>\$4,000,000</b>

Ongoing costs for maintaining the Drayage Truck Registry are captured in the program budget below.

The Capital Investment Plan accounts for costs associated with truck technology reviews, the ongoing contract to support the RFID registry, the sticker program, the Clean Truck Fund and staff time. These costs are expensed as incurred.

**Source of Funds**

The current Capital Investment Plan allocates \$1,380,000 for this program in 2018. The CIP allocates \$800,000 for the Clean Truck Compliance and tracking project identified above. Staff will evaluate the overall CIP prior to the request for project authorization in March to determine if funds can be reallocated from other projects to support this project. See Table 3 for detail.

Table 3. NWSA Clean Truck Program 2018 Budget

<b>NWSA Clean Truck Program</b>	<b>MID 201050.01</b>
RFID contract	\$ 150,000.00
Truck stickers	\$ 15,000.00
Outreach materials and events (space rental, food)	\$ 20,000.00
Meeting facilitation	\$ 15,000.00
Truck technology review	\$ 50,000.00
Clean Truck Fund	\$ 1,000,000.00
<b>Sum of outside services</b>	<b>\$ 1,250,000.00</b>
Staff time	\$ 130,000.00
<b>Grand Total</b>	<b>\$ 1,380,000.00</b>

Staff expects the manual sticker program to cost approximately \$2,000 per week per terminal until the technology can be deployed. Two terminals will require this additional support.



**E. ALTERNATIVES CONSIDERED AND THEIR IMPLICATIONS**

Alternative 1: Provide a 90-day grace period from the original date of January 1, 2018, making the Clean Truck requirements effective April 1, 2018 (Recommended).

Alternative 2: Extend the deadline to January 1, 2019.

**F. ATTACHMENTS TO THIS REQUEST**

- Attachment A: Proposed Tariff and Lease Amendment Language
- Attachment B: November 7, 2017 memo
- Attachment C: January 16, 2018 memo

**G. PREVIOUS ACTIONS OR BRIEFINGS**

<u>Date</u>	<u>Action</u>
January 16, 2018	Briefing
November 7, 2017	Briefing
December 12, 2016	Briefing – NWPCAS Implementation Report
November 4, 2015	Briefing – NWPCAS Implementation Report

## Appendix A: Criteria Pollutants and Definitions

From the 2016 Puget Sound Emissions Inventory

Pollutant	Sources	Health & Environmental Effects
<b>Oxides of nitrogen (NO<sub>x</sub>)</b> is the generic term for a group of highly reactive gases; all of which contain nitrogen and oxygen in varying amounts.	NO <sub>x</sub> forms when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO <sub>x</sub> are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.	NO <sub>x</sub> can react with other compounds in the air to form tiny particles adding to PM concentrations. NO <sub>x</sub> is an ozone precursor and is also associated with respiratory health effects.
<b>Particulate matter (PM)</b> refers to tiny, discrete solid or aerosol particles in the air. Dust, dirt, soot, and smoke are considered particulate matter. Two types of PM are included in this emissions inventory: <b>PM<sub>10</sub></b> , which consists of particles measuring up to 10 micrometers in diameter; and <b>PM<sub>2.5</sub></b> , which consists of fine particles measuring 2.5 micrometers in diameter or smaller.	Vehicle exhaust (cars, trucks, buses, among others) are the predominant sources of fine particles in urban areas. In rural areas, land-clearing burning and backyard burning of yard waste contribute to particulate matter levels.	Fine particles are a concern because their very tiny size allows them travel more deeply into lungs, increasing the potential for health risks. Exposure to PM <sub>2.5</sub> is linked with respiratory disease, decreased lung function, asthma attacks, heart attacks and premature death.
<b>Volatile organic compounds (VOC)</b> are included in the emissions inventory because they are an ozone ingredient.	VOCs come from the transportation sector: cars and light trucks, marine vessels, and heavy-duty diesel vehicles.	In addition to contributing to the formation of ozone, some VOC are air toxics which can contribute to a wide range of adverse health effects.
<b>Carbon monoxide (CO)</b> is a colorless, odorless, toxic gas commonly formed when carbon-containing fuel is not burned completely.	CO forms during incomplete combustion of fuels. The majority of CO comes from on and off-road vehicle engine exhaust.	CO combines with hemoglobin in red blood cells and decreases the oxygen-carrying capacity of the blood. CO weakens heart contractions, reducing the amount of blood pumped through the body. It can affect brain and lung function.
<b>Black Carbon (BC)</b> is a sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuel.	BC is non-anthropogenic and anthropogenic as a result of the incomplete combustion of fossil fuels. Primary sources are diesel engines.	BC is a global environmental problem that has negative implications for human health such as respiratory and cardiovascular disease, cancer and birth defects.

## Appendix B: Highlights of Spring 2018 PSCAA Guidance

Common themes and suggested best practices from the interviews are summarized below.

1. Many had to change their operations and/or business model. They typically do longer trips at least twice a week that include freeway driving at speeds over 50 mph for longer than 20 minutes each way.
2. Drivers have to understand their engines and stay on top of their maintenance.
  - a. Understanding the engines helps them stay on top of small problems before they turn into big problems.
  - b. It also helps to understand the truck's engine when take your truck to the dealer for repairs or DPF cleanings. Many drivers don't have the tools they need to work with dealers when things go wrong. This is exacerbated when English is a second language. Understanding the truck engine is an important tool to have.

The below information are excerpts from PSCAA's training modules; it is not a comprehensive list.

Five ways a clean diesel engine is different from older engines:

1. Idling is very bad for clean diesel engines. Drayage truck drivers should turn their engines off if they are waiting in line for more than 3 minutes.
2. Leaks (oil, coolant, exhaust) cannot be ignored. Clean diesel engines are sensitive to leaks and even small leaks can negatively impact the DPF.
3. Dashboard lights cannot be ignored. When the DPF and DEF lights go on there is a short time for action before more serious issues develop. Even if the light other than the DPF light is on, the DPF may not operate properly.
4. RPMS for new trucks are different for clean diesel trucks than older trucks. Drivers need to know what their ideal RPMs and try to optimize their driving.
5. Daily and other routine maintenance are more important because the clean diesel engine is so sensitive to leaks of any kind. The driver needs to be on top of issues.

Needed Maintenance

1. Each day, inspect fluid levels – both before starting a trip and after its complete.
  - a. DEF tanks should always be at least a quarter full.
  - b. Check oil and coolant levels. If one is checking every day, he/she will get to know the truck's normal fluid use. If a truck is using more oil or coolant than usual, it probably means there is a leak. Adding more fluid, and ignoring the leak, will just cause more problems. Don't add oil unless needed. Too much oil can cause engine leaks.
  - c. Check around the cab and under the truck daily for leaks including exhaust leaks, oil leaks, turbocharger leaks and coolant leaks. Exhaust leaks can be spotted by looking for areas of discoloration. Sometimes it's helpful to run your engine and listen for exhaust leaks.
  - d. If a leak of any kind is found, have a qualified mechanic fix it right away.

- e. The truck's dashboard lights can also warn of problems. Paying attention to these lights can save money and prevent expensive repairs. It is important that drivers understand the DEF and DPF dashboard lights or the truck may shut down. By the time a truck shuts down a lot of unnecessary damage will have already have occurred.
2. Routine truck driver maintenance
    - a. Changing oil is an example of routine maintenance. Do this as recommended by the truck engine's manufacturer. Only add oil when the level is at or below the "add" mark on the dipstick. Trucks have an optimum oil level. Too much oil in the tank is not good for your engine, and overfilling oil might cause a leak. Be aware that mixing engine oils can cause reactions that could hurt your engine.
    - b. DEF fluids should also be filled regularly. Keep the DEF tank at least a quarter full. Only use pure DEF fluid in the DEF system. You should never mix DEF with other fluids, or put it into other containers because they may have particles that could damage the DEF system.
    - c. Filters also need to be replaced routinely. Replace air filters as often as recommended by the manufacturer to avoid soot build-up and turbo leaks. Crankcase filters and oil filters should be replaced routinely to avoid oil leaks and other damage to the DPF.
  3. Routine maintenance by a qualified mechanic
    - a. Clean the truck's DPF at least once a year – that's in addition to routine regens. Some trucks need this professional cleaning more often, especially if they do a lot of idling or lugging.
    - b. When the mechanic cleans the DPF, also ask them to:
      - i. Check for doc clogging and look for crystallization in the DEF system. These systems can only be checked when the DPF is disassembled, so it makes sense to do it when your DPF is being cleaned.
      - ii. After the DPF is reinstalled, the mechanic must run a parked regen to be sure no warning lights come on. This also lets the truck know the DPF is clean.
    - c. When a DPF is cleaned, it may also be a good time to have a qualified mechanic service the DEF's parts, like the pump or DEF pump, the screen or DEF screen, and the injector, or DEF injector. Check the engine manufacturer's recommendations for servicing these parts.
    - d. Ask the mechanic to check the DEF system's wire harnesses, for signs of damage. The wire harness includes the wires that control the pump and temperature of the DEF system. Also check the wire connections for corrosion.

As a side note, if a truck has to do parked regens more than once a week, inspect the DPF injector, the EGR and engine injectors for soot build up. If they aren't working as they should, they will need to be fixed or your DPF will continue to clog.