




Board Agenda Item

TO: Air Pollution Control District Board

FROM: Aeron Arlin Genet, Air Pollution Control Officer 

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SUBJECT: Update on Vessel Speed Reduction Incentive Program

RECOMMENDATION:

Receive and file an update on the 2021 Vessel Speed Reduction (VSR) incentive program and future activities related to large ocean-going vessels.

BACKGROUND:

Large ocean-going vessels (OGVs) traveling along the California coastline and into California's ports are a major source of air pollution, as they emit significant amounts of nitrogen oxides (NOx) and other pollutants. Over the long term, international rules will require cleaner engines on newly built vessels, which will reduce NOx emissions from this sector. However, fleet turnover in this industry does not happen quickly, and it is expected to take 10-20 years to phase out the older, dirtier, engines. In the meantime, the marine shipping sector continues to be the largest source of ozone precursor emissions in Santa Barbara County.

Reducing NOx emissions through voluntary incentives is a critical part of the District's strategy to help prevent exceedances of the state and federal ozone standards. The District's 2019 Ozone Plan, that was approved by your Board in December 2019, includes an inventory of ocean-going vessels and a discussion of the air quality impacts from this industry.¹ Chapters 6 and 7 of the 2019 Ozone Plan include a description of the VSR program and a commitment to continue pursuing emission reductions through VSR. In recent years, the District and partners have implemented voluntary VSR incentive programs for immediate air quality and whale protection benefits. Decreasing vessel speeds increases the fuel efficiency of most vessels and reduces emissions of multiple air pollutants, including NOx, greenhouse gases (GHGs), particulate matter (PM), and toxic air contaminants.

¹ The 2019 Ozone Plan is available at www.ourair.org/wp-content/uploads/2019-12-19-Final-Plan.pdf.

In collaboration with other agencies, the District ran a trial VSR incentive program in the Santa Barbara Channel in 2014. Several shipping companies participated, and emission benefits were realized and quantified. In 2015, a working group was formed to further study marine shipping issues in the region. In 2016, the program restarted and nearly doubled in size compared to the initial trial. The program again expanded in 2017 to include speed-reduction zones in the San Francisco Bay Region. Then, in 2018, the program transitioned from incentivizing single transits to a fleet-based approach, which brought even more vessels into the program. Another major change occurred for the 2020 season where the VSR “Zone” was expanded to create a larger Southern California (SoCal) region. This change was made to align with the National Oceanic and Atmospheric Administration (NOAA) whale advisory zone, and it allowed the program to capture more of the transits that occur in the larger area outside of the designated shipping lanes. Program participation and emission reduction benefits from the VSR Program are summarized in Table 1 below:

Table 1: VSR Program Summary - 2014 to 2021

Year	2014	2016	2017	2018	2019	2020	2021
VSR Zone	Santa Barbara Channel Region		Santa Barbara Channel Region & San Francisco Bay Region			SoCal Region & SF Bay Region	
# Companies	7	10	11	12	15	16	18
# Vessels	14	25	44	295	349	483	545
Slow-speed Distance (nautical miles)	2,700	5,000	12,630	46,026	99,019	181,306	179,530
Overall Fleet Cooperation	--	--	--	36%	55%	60%	64%
NOx Reductions (tons)	12.4	25.6	84	266	536	748	650
GHG reductions (metric tons)	535	1,005	2,630	8,668	17,026	24,258	22,201

An additional benefit of the VSR program is marine protection. Reducing vessel speeds lowers the risk of fatal ship strikes on endangered whale populations including Blue, Humpback, and Fin whales that feed and travel in the waters off California’s coast. Reducing speeds also reduces ocean noise that can interfere with whale communication, navigation, and feeding.

There have been multiple attempts to enact legislation, on both the state and federal level, to support a voluntary VSR program in California. Such legislation could provide the needed resources for a sustained program, as previous programs have relied on a variety of funding sources and in-kind staff time from multiple organizations. Although these legislative attempts have not been successful to date, the program partners continue to advocate for and support such efforts.

DISCUSSION:

2021 VSR Program Implementation

The 2021 VSR Program was implemented successfully from May 15 to November 15, 2021, and coincides with peak ozone levels, as well as whale feeding and migration season. Participation included 545 vessels operated by 18 different shipping companies. As with other years, the program focused on large ocean-going container ships and auto carriers, since those ships have historically operated at higher speeds. Vessel operators were asked to slow to 10 knots or less in the VSR zones identified in the program materials. Automatic Identification System (AIS) ship tracking technology was used to track the cooperation level of the companies during the program period. Depending on the company's level of cooperation within the requested slow-speed zones, companies were placed in award tier categories as follows:

Sapphire: 85 to 100% of total distance travelled at 10 knots or less
Gold: 60 to 84%
Blue Sky: 35 to 59%

For the 2021 Program, the requirements to reach each award tier were increased by 10% (i.e., Sapphire award starts at 85% fleet participation at 10 knots or less instead of 75% used in 2020). Companies were notified of their award status in March 2022, with two companies achieving the Sapphire award level, nine achieving Gold, and four achieving Blue Sky. The companies that achieved the Sapphire and Gold levels received financial incentives ranging from \$5,000 to \$50,000 depending on the award tier and the fleet size. Several companies have generously declined their financial award payment in order to help fund next year's program.

Below is a list of the shipping companies that participated in the 2021 program and their award levels.

MSC (Sapphire)	Mol ACE (Gold)	“K” Line (Blue Sky)
Swire Shipping (Sapphire)	NYK-RoRo (Gold)	Evergreen (Blue Sky)
Yang Ming (Gold)	CMA CGM (Gold)	Hyundai Glovis (Blue Sky)
Cosco (Gold)	Wallenius (Gold)	GALI (Participant)
Hapag-Lloyd (Gold)	ONE (Gold)	Matson (Participant)
Maersk (Gold)	Wan Hai (Blue Sky)	Pasha Hawaii (Participant)

As shown in Table 1, the emission benefits for the 2021 program are 650 tons of NOx and 22,201 metric tons of GHGs. These numbers represent approximately a 25% reduction in NOx pollution and GHG emissions from the ships that participated in the program, as compared to baseline conditions. Although the total slow-speed distance traveled for the 2021 program was similar to the 2020 program, the amount of NOx and GHG emission reductions were less for 2021. There are two main reasons for this difference, the first being that the benefit calculations are based on ship-specific information. Each year, there is a different set of vessels in each company's fleet, and each vessel is equipped with engines that have different operational characteristics. The second reason is due to the port congestion problems at the Ports of Los Angeles and Long Beach in 2021, some vessels did not travel to the Port of Oakland, resulting in a different travel pattern with different emission benefit results.

Program partners have also quantified the whale protection benefits of the 2021 program. Point Blue, a conservation science institute, estimates that the risk of fatal ship strikes was reduced by 50%. The 2021 program was also estimated by the Scripps Whale Acoustics Laboratory to result in a 5 decibel reduction in ocean noise.

Importantly, all program participants that achieved the Sapphire, Gold or Blue Sky levels will receive several forms of recognition in addition to the financial awards at the Sapphire and Gold levels. Outreach for the 2021 program will include a news release, a 2021 program fact sheet that highlights the participating companies, articles and advertisements in trade and business journals, and social media posts. Physical awards will also be mailed to participating companies and photos of the awards will be used in the recognition materials.

New Website, Brand Ambassadors, and Partners

The VSR program has succeeded and grown over the years due to the efforts of many different agency, nonprofit, industry, and community partners. In 2021, the program launched a new website, www.bluewhalesblueskies.org, that functions as a clearinghouse for program information, results, enrollment materials, and other resources. An exciting new Brand Ambassador initiative was also launched, with the goal of raising awareness of the program and its benefits across the supply chains among cargo owners. By engaging this new audience, the program aims to create a new and sustained incentive for vessel operators to reduce speeds. Two companies, Nomad and Summit Coffee Roasting Company, recently signed on as Brand Ambassadors. This year, the Port of Oakland also made an official commitment to support the program.

Interagency Work on VSR

The District continues to work with the California Air Resources Board (CARB) on the mobile source emission inventory for this sector. In March 2022, CARB finalized a significant update to the Ocean-Going Vessel (OGV) emission inventory and related methodology. The updated inventory provides a more accurate estimate of the vessel operating conditions (ship speeds and engine loads). Changes to vessel operating conditions have occurred at least in part due to the VSR program. Overall, the newer data set results in a significant decrease in current and future marine shipping nitrogen oxides (NOx) emission estimates within Santa Barbara County waters, but this is still the largest sector in our emission inventory. The methodology update will help all the air districts that are impacted by shipping activity to have a more realistic emission inventory for their future air quality attainment modeling and planning efforts.

OGVs are primarily regulated by the U.S. EPA and the International Marine Organization (IMO). However, in December 2021, CARB finalized their 2020 Mobile Source Strategy, which includes potential regulatory scenarios requiring cleaner vessels visiting California ports and stricter federal and international engine emission standards.² The Mobile Source Strategy also addressed the concept of statewide incentive or regulatory measures that achieve slower vessel speeds within Regulated California Waters (24 nautical miles from shore). Such a measure is not anticipated until year 2025 or beyond, but the program could be similar to or work in conjunction with the voluntary VSR incentive program that is currently implemented in the Southern California and San Francisco Bay regions. The District continues to advocate for such a program

² <https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy>

as it would provide the necessary support and funding needed to achieve additional NOx reductions.

2022 VSR Program

The 2022 VSR program launched on May 1 and will run through December 15. As the program continues to expand, three significant changes have been incorporated into the 2022 program in order to achieve additional air quality and whale protection benefits. These changes are:

- 1) The program starts 14 days earlier and ends 1 month later. This change was made since whales are still present in the coastal waters in early May and mid-December. Higher levels of ozone are also experienced in early May.
- 2) The program expanded to include bulk and general cargo vessels. Additional emission reduction and whale protection benefits are achieved when the bulk and cargo vessels slow down to 10 knots or less.
- 3) The San Francisco Bay Region expanded to include the waters in the Cordell Bank and Greater Farallones National Marine Sanctuaries. This change results in participating vessels slowing down for approximately 35 to 55 more nautical miles when entering or exiting the northern route in the Bay Region.

As of May 10, 23 shipping companies have agreed to participate, four of which operate bulk vessels. Additional information and materials related to the 2022 VSR Program, as well as all previous programs, are available on the Program's website at www.bluewhalesblueskies.org.

FISCAL IMPACT:

District staff time spent implementing the 2021 VSR program was included in the District's adopted budget for Fiscal Year (FY) 2021-22. The District receives compensation for staff time spent implementing the 2021 and 2022 VSR programs through a CARB Supplemental Environmental Project Oversight Agreement managed by Ventura County APCD. The approximate revenue for the work performed is \$46,275 per year, and the revenue from the agreement is included in the District's draft FY 2022-23 budget.