

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 2020 Vessel Speed Reduction 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 In recent years, the District and partners have implemented voluntary Vessel Speed Reduction (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. 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.

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 channel. In 2016, the program grew to include the region south of the Channel Islands. The program again expanded in 2017 to include speed-reduction zones in the San Francisco Bay Area. Then, in 2018, the program transitioned from incentivizing single transits to a fleet-based approach, which brought even more vessels into the program. This fleet-based approach was again utilized in the 2019 and 2020 programs. In 2020, the VSR “Zone” for the Southern California (SoCal) region was expanded in order to align with the National Oceanic and Atmospheric Administration (NOAA) whale advisory zone. This allowed the program to capture more of the transits that occur in the larger area outside of the designated shipping lanes. Program participation, as well as emission reduction benefits, have increased each year as demonstrated in Table 1 below:

Table 1: VSR Program Summary - 2014 to 2020

Year	2014	2016	2017	2018	2019	2020
VSR Zone	Santa Barbara Channel	Santa Barbara Channel Region	Santa Barbara Channel Region & San Francisco Bay Area		SoCal Region & SF Bay Area	
# Companies	7	10	11	12	15	16
# Vessels	14	25	44	280	349	483
Slow-speed Distance (nautical miles)	2,700	5,000	12,630	46,026	99,019	181,306
NOx Reductions (tons)	12.4	25.6	84	266	536	713*
GHG reductions (metric tons)	535	1,005	2,630	8,668	17,026	23,016*

**Initial estimates; may change.*

An additional benefit of the VSR program is marine protection. For whales, slowing down vessel speed 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:

2020 VSR Program Implementation

The 2020 VSR Program was implemented successfully from May 15 to November 15, 2020. This time period coincides with peak ozone levels, as well as whale feeding and migration season. Participation included 483 vessels operated by 16 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: 75 to 100% of total distance travelled at 10 knots or less
Gold: 50 to 74%
Blue Sky: 25 to 49%

Companies were notified of their award status in March 2021, with five companies achieving the Sapphire award level, nine achieving Gold, and one achieving Blue Sky. The companies that achieved the Sapphire and Gold levels received financial incentives ranging from \$2,000 to \$30,000 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 2020 program and their award levels.

Polynesia Line (Sapphire)	NYK-RoRo (Gold)	Maersk (Gold)
MSC (Sapphire)	Wallenius (Gold)	CMA CGM (Gold)
Hapag-Lloyd (Sapphire)	Cosco (Gold)	Hyundai Glovis (Gold)
Yang Ming (Sapphire)	GALI (Gold)	Evergreen (Gold)
Mol ACE (Sapphire)	"K" Line (Gold)	ONE (Blue Sky)

The 2020 program had a much larger VSR zone in the Southern California region in order to align with NOAA whale advisory zone and also to capture more vessel transits that occur outside of the designated shipping lanes. The improved participation levels for 2020 resulted in more miles traveled at slow speeds. As shown in Table 1, the initial estimate of emission benefits for the 2020 program are 713 tons of NOx and 23,016 metric tons of GHGs. These numbers represent approximately a 24% reduction in NOx pollution from the ships that participated in the program, as compared to baseline conditions.²

Program partners have also quantified the whale protection benefits of the 2020 program. Point Blue, a conservation science institute, estimates that the risk of fatal ship strikes was reduced by 35%, combined for both the SF Bay Area and Southern California VSR zones. The 2020 program was also estimated by the Scripps Whale Acoustics Laboratory to result in a 4 decibel reduction in ocean noise.

² Emission reduction estimates may be refined based on revised emission factors from CARB or other data refinements; they are not expected to decrease.

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 2020 program will include a news release, a 2020 program fact sheet that highlights the participating companies, articles and advertisements in trade and business journals, and social media posts. Unfortunately, due to the COVID-19 epidemic, an in-person awards ceremony will not be held. However, physical awards will be mailed to participating companies and photos of the awards will be used in the recognition materials.

Interagency Work on VSR

During the first half of 2021, the VSR program received attention from local, state, and federal legislators and agencies. District staff participated in several meetings related to the South Coast Air Quality Management District (SCAQMD) 2022 Air Quality Management Plan. One of those meetings was the April 1, 2021 Mobile Source Working Group for Ocean-Going Vessels, where District staff provided a joint presentation with Ventura County Air Pollution Control District (VCAPCD) and Channel Islands National Marine Sanctuary staff. Air pollutant reductions from the VSR program also benefit air quality in the SCAQMD region, and so their agency is very interested in making sure that the emission benefits are included in all air pollution modeling and planning efforts to meet state and federal air quality standards.

The District continues to work with the California Air Resources Board (CARB) on the mobile source emission inventory for this sector. CARB's OGV emissions estimation model currently employs certain assumptions that may be overestimating emissions in this category. CARB staff have indicated that their OGV model is being revised to reference more recent AIS data, which will provide updated information regarding vessel speed trends and thus more accurate emissions estimates. The OGV model update will help all of 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. CARB is also currently working on their Draft 2020 Mobile Source Strategy, which includes potential regulatory scenarios requiring cleaner vessels visiting California ports and stricter federal and international engine emission standards.³

2021 VSR Program

The 2021 VSR program launched on May 15 and will run through November 15; as of May 11, 14 shipping companies have agreed to participate. Additional information and materials related to the 2021 VSR Program, as well as all previous programs, are available on the District's website at www.ourair.org/air-pollution-marine-shipping/.

FISCAL IMPACT:

District staff time spent implementing the 2020 VSR program was included in the District's adopted budget for Fiscal Year (FY) 2020-21. The District will receive compensation for staff time spent implementing the 2021 and 2022 VSR programs through a CARB Supplemental Environmental Project Oversight Agreement managed by VCAPCD. Revenue from the agreement is included in the District's draft FY 2021-22 budget.

³ <https://ww2.arb.ca.gov/resources/documents/2020-mobile-source-strategy>