Reducing Ocean-Going Vessel Speeds Protecting Blue Whales and Blue Skies CPRG Workplan

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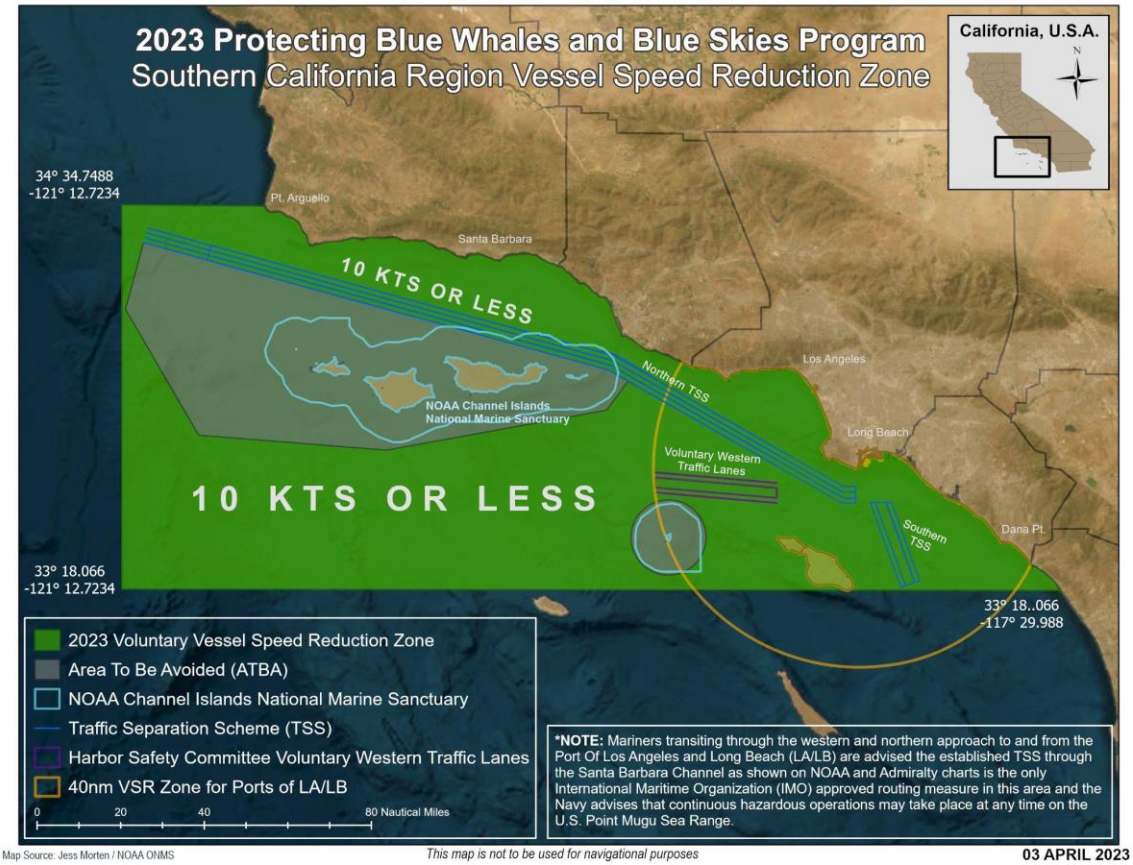
1. Overall Project Summary and Approach

a) Description of GHG Reduction Measures

Help us help the whales and coastal communities by supporting the Protecting Blue Whales and Blue Skies (BWBS) program. California's coastal waters are a superhighway of large commercial vessels that contribute to adverse impacts on endangered whales and other marine life, including in the form of collisions – known as ship strikes – and through introduced underwater noise. In addition, the black plumes of engine exhaust from the vessels on the superhighway include greenhouse gas (GHG) emissions, criteria pollutants, and toxic air contaminants that blow ashore, causing health problems like asthma and cancer in the coastal communities, and contributing to regional ozone formation. After nine years of implementation, the BWBS program, an incentive-based effort, has engaged and enrolled large global shipping lines to motivate them to reduce speeds in key areas off of the California coast to reduce air pollution, underwater noise, and the risk to whales. Now, as a result of this effort, instead of racing to get to port first, enrolled vessels in the BWBS program reduce speeds and earn awards and positive recognition for their willingness and efforts to operate more sustainably.

Ocean-going vessels (OGV) fall within the Transportation Sector of CARB's 2022 Scoping Plan, which accounts for 40% of California's 2019 GHG inventory. The BWBS program is an existing incentive-based program that goes above and beyond the OGV actions called for in CARB's Scoping Plan, yielding additional emission reduction benefits. Over the last 9 years of implementation, the BWBS program has scaled from a 2014 pilot program that targeted 14 vessels across 7 shipping lines operating in the Santa Barbara Channel to over 700 vessels across 33 shipping lines during the 2023 season, operating in key areas across Southern, Central, and Northern California (the BWBS program website is linked here). **Figure 1: Vessel Speed Reduction Zones** below shows the vessel speed reduction (VSR) zones that are currently part of the BWBS program.

Figure 1: Vessel Speed Reduction Zones



The BWBS program was included in the Thousand Oaks-Oxnard-Ventura Metropolitan Statistical Area's (MSA) Priority Climate Action Plan (PCAP) dated March 2024. Specifically, **Measure T-3** below highlights the GHG reduction measure associated with the BWBS program as stated in the PCAP.

Measure T-3: Leverage federal funds to expand the existing Reducing Ocean Going Vessel Speeds - Protecting Blue Whales and Blue Skies (BWBS) program to decrease greenhouse gas emissions associated with vessel speeds, reduce the risk of fatal ship strikes to endangered whale species and support the recovery of whale populations, which have been shown to be important global players for mitigating climate change through significant contributions to carbon storage and sequestration.

> **T-3.1:** Open BWBS program enrollment to all ocean-going vessels that transit the coastal waters off of California and potential for scalability to the whole west coast of the United States.
>
> **T-3.2:** Expand the current geographic scope of the BWBS program to include all areas of the California coast out to approximately 50 nautical miles.
>
> **T-3.3:** Expand the timeline of the program from seasonal (mid-May to December) to year-round.
>
> **T-3.4:** Initiate discussions between the BWBS program partners and other coastal states regarding implementation of vessel speed reduction programs in their jurisdictions.
>
> **T-3.5:** Expand corporate outreach to recruit additional cargo owners, such as manufacturers and retail outlets, to increase the demand-side pressure on ocean going vessel operators to participate in the BWBS program.

The known risks of the expansion of the BWBS program include:

- Since BWBS is a voluntary incentive program, there is a risk that some shipping lines operating OGV in the region will choose not to participate, limiting the overall effectiveness of the program. However, over the last 9 years of program implementation, the BWBS program has successfully increased participation from shipping lines and expanded the number of vessels enrolled in the program.
- Lack of funding to support analytics of program's co-benefits and to support public relations incentives and recognition of participating shipping companies.

The BWBS partners include the following key agencies and organizations:

- Coastal California air districts: Santa Barbara County Air Pollution Control District, Ventura County Air Pollution Control District, Bay Area Air Quality Management District, San Luis Obispo County Air Pollution Control District, and Monterey Bay Air Resources District
- National Marine Sanctuaries: Channel Islands, Cordell Bank, Greater Farallones, and Monterey Bay
- Non-profit organizations: California Marine Sanctuary Foundation, Point Blue Conservation Science, Benioff Ocean Science Laboratory (a center for applied marine conservation at the University of California, Santa Barbara), and Scripps Whale Acoustics Lab

b) Demonstration of Funding Need

The BWBS program has been funded through various sources since 2014, but the partners have not identified a stable source of funding for implementation of the program in future years. Previous funding has been provided through CARB's Supplemental Environmental Project (SEP) awards, a supplemental EPA grant to Ventura County Air Pollution Control District through the EPA 105 Grant program, private donations from The Volgenau Foundation, and donations from three marine sanctuary foundations.

Federal funding has also been provided by the National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries for staffing support for the program. In-kind support in the form of staff time and technical assistance has been provided by all of the program partners, including NOAA Marine Sanctuaries, California air districts, and non-profit organizations.

A grant award that would fund the BWBS program for 5 years would allow the partners to direct efforts toward making the program self-sustaining rather than seeking funds each year, as is currently the case. The BWBS program is currently eligible for CARB SEP funding and any SEP awards would be used to supplement the CPRG funding.

In addition to measurable emission reductions achieved by reducing OGV speeds, vessel speed reduction also reduces the risk of fatal ship strikes to endangered whale species and supports the recovery of whale populations, which have been shown to be important global players for mitigating climate change through significant contributions to carbon storage and sequestration.

c) Transformative Impact

The BWBS program is readily expandable to other parts of the California coastal waters given the resources and local partners. A statewide vessel speed reduction program could cut GHG emissions significantly as part of a comprehensive effort to reduce emissions from OGV. CPRG funding will allow the BWBS program to expand statewide and provide funds to expand outreach and develop partnerships with interested state and local agencies outside of California. Since vessel speed reduction is a behavioral change that reduces GHG emissions, no advanced technology or retrofits to OGV are necessary and the emissions reductions can happen immediately.

In addition to measurable emission reductions achieved by reducing OGV speeds, vessel speed reduction also reduces the risk of fatal ship strikes to endangered whale species and supports the recovery of whale populations, which have been shown to be important global players for mitigating climate change through significant contributions to carbon storage and sequestration.

2. IMPACT OF GHG REDUCTION MEASURES

a) Existing GHG Reductions

For a detailed summary of the methodology used in the air emissions calculations, please see the technical appendix included in this application. Emission benefits for each VSR season are estimated by looking at the difference in emissions between each participating vessel at its baseline speed and the actual emissions based on the VSR compliant speed observed during the season. For the first few years of the program, containerships and auto carriers were invited to participate if the historic, baseline speed of the specific vessel within the Santa Barbara Channel or San Francisco Bay Area zones was high.

At that time, limited funds were available for financial incentives, and so the focus of the program was on reducing the speed of the fastest ships in the region based on transit-specific data for the prior years.

However, with the expansion of the 2018 BWBS program to include all vessel activities under an enrolled company, the time intensive process of determining emission reductions based on historical transit-specific speeds of each vessel was no longer practical. The "fleet-based" methodology accounts for the normal operating speed of all vessels within a ship sector based on the 2016 and 2017 baseline "non-VSR speeds."

For the Santa Barbara Channel and San Francisco Bay Area regions, Automatic Identification System (AIS) data was obtained for vessel activities within each zone for calendar years 2016 and 2017. Vessel activities within the months of May through November were removed to prevent any bias from previous BWBS programs and from the NOAA requests for all vessels 300 gross tons or larger to slow down to 10 knots or less.

In 2020, the BWBS program expanded to include the Port of Los Angeles (POLA) and Port of Long Beach (POLB) 40 nautical mile VSR zone in Southern California. Permission was obtained to analyze the 2016 and 2017 calendar year Marine Exchange (MarEx) vessel speeds, which are based on AIS data, to help establish BWBS baseline speeds in these zones. Since these Ports have existing VSR programs to slow down to 12 knots or less, and the programs have been in effect year-round since 2001 with a high level of cooperation, no months were excluded from the baseline speed calculations for this zone.

In 2022 and 2023, the BWBS program expanded to include the three National Marine Sanctuaries in the San Francisco Bay Area. For these zones, a similar AIS analysis was performed using 2017 calendar year data. Data in the months of May through November were removed for the Cordell Bank and Greater Farallones NMS to prevent any bias from the NOAA requests to slow down to 10 knots or less. The Monterey Bay NMS did not participate in the NOAA requests in 2017, and so no data was excluded from the analysis for the MBNMS zone.

Table 1: Existing BWBS Program Results (2014 to 2023) below shows the results of the BWBS program from 2014 to 2023. As shown, the GHG emission reductions have grown over time, with a total GHG reduction of 45,785 metric tons in 2023 and total GHG reduction of 154,716 metric tons since the start of the BWBS program. Moreover, oxides of nitrogen (NOx) reductions have increased over time with a NOx reduction of 1,256 tons in 2023 and total NOx reduction of 4,498 tons since the start of the BWBS program. These reductions would be expected to continue as the BWBS program continues to expand. Additional notable benefits include an ocean noise reduction of 5.4 decibels and a 58% reduction in ship strike risk in 2023.

The BWBS partners intend to use CPRG funding as a bridge to support program expansion as the partners build a sustainable funding structure. The BWBS program will reduce emissions immediately and can continue to support emission reductions in the long term.

Table 1: Existing BWBS Program Results (2014 to 2023)

Program Year	2014	2016	2017	2018	2019	2020	2021	2020	2023
VSR Zone	**Santa Barbara Channel Region**		**Santa Barbara Channel Region & San Francisco Bay Region**			**Southern California Region & San Francisco Bay Region**			
# of Companies	7	10	11	12	15	16	18	23	33
# of Vessels	14	25	44	295	349	483	545	684	710
Slow-Speed Distance (nautical miles)	2,700	5,000	12,630	46,026	99,019	181,306	179,530	266,148	375,437
Overall Fleet Cooperation	--	--	--	36%	55%	60%	64%	78%	81%
NOx Reductions (tons)	12.4	25.6	84	266	536	748	650	921	1,256
Regional GHG Reductions (metric tons)	535	1,005	2,630	8,668	17,026	24,258	22,201	32,604	45,785
Ocean Noise Reductions (decibels)*	--	--	--	1.0	--	2.3	4.1	4.6	5.4
Ship Strike Risk Reduction**	--	--	--	--	--	35%	50%	44%	58%

* Represents the decrease in noise from participating vessels in the Southern California Region.
** Represents the proportional decrease in risk from participating vessels and not absolute estimates of mortality avoided.

b) Magnitude of GHG Reductions from 2025 through 2030 and 2025 through 2050

Baseline emission factors were adjusted throughout the analyzed timeline based on anticipated program changes, availability of improved technologies, and CARB's 2021 Ocean-Going Vessels Emissions Inventory. Anticipated program changes include extending the VSR season over time and assuming increased participation rates from enrolled companies, as well as increasing the number of companies enrolled in the program. It was also assumed that vessels would transition to lower carbon fuels (such as LNG) or other technologies with decreased carbon emissions, in accordance with the International Maritime Organization's (IMO) 2050 GHG Strategy. GHG calculation spreadsheets and supportive sources have also been provided in this application. **Table 2: Future Emission Reductions from BWBS Program**, shows the projected GHG reductions from 2025 through 2030 and 2025 through 2050. As shown, GHG reductions would be 766,100 metric tons from 2025 through 2030, and 3,861,168 metric tons from 2025 to 2050. Moreover, NOx and fine particulate matter ($PM_{2.5}$) reductions would be 21,016 tons and 87 tons respectively, from 2025 to 2030.

Table 2: Future Emission Reductions from BWBS Program

Pollutant	Timeline	
	2025-2030	**2025-2050**
GHG (metric tons)	766,100	3,861,168
NOx (tons)	21,016	TBD
$PM_{2.5}$ (tons)	87	TBD

c) Cost Effectiveness of GHG Reductions

The cost effectiveness of the GHG emissions reductions from the BWBS program is very favorable at $18.76 per metric ton, based on the grant request of $14,374,322 and the estimate of 766,100 metric tons of GHG emissions reduced from 2025 through 2030. However, this does not reflect the full benefits of the BWBS program from a climate, air pollution, or public health perspective.

The ocean captures about 31 percent of all carbon dioxide emissions, removing carbon from the atmosphere that would otherwise continue to trap heat and increase temperatures. Blue carbon, or carbon captured by ocean ecosystems includes:

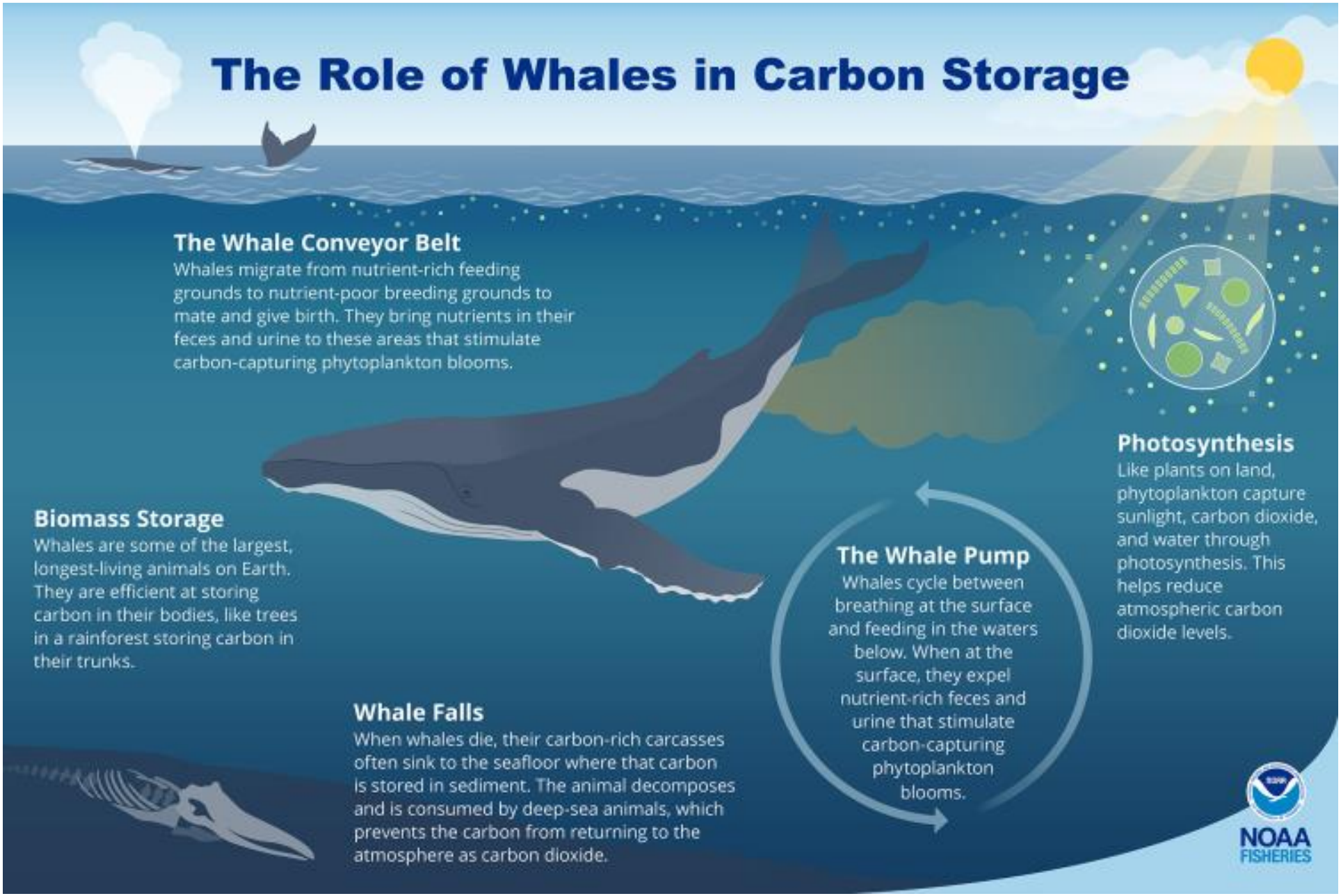
- Carbon absorbed by aquatic plants, algae, and phytoplankton;
- Carbon stored in the bodies of living animals; and
- Carbon sequestered in deep-sea sediments.

Scientists believe whales contribute to all three of these carbon storage mechanisms (see https://www.fisheries.noaa.gov/feature-story/whales-and-carbon-sequestration-can-whales-store-carbon). They likely supported even greater amounts of blue carbon storage before their populations were depleted by commercial whaling prior to the commercial whaling moratorium in 1985. Conserving and recovering whale populations can mitigate climate change by increasing blue carbon capture. The ship strike risk reduction resulting from slowing OGVs, especially if expanded to the whole California coast and beyond, will help endangered whales recover their populations and increase their climate mitigation impacts. One whale can capture an average of 33 tons of carbon dioxide over its lifespan. A live oak tree, one of the most efficient carbon-capturing tree species, captures roughly 12 tons of carbon dioxide over a maximum 500-year lifespan. **Figure 2: The Role of Whales in Carbon Storage**, shows how whales affect carbon storage.

The public health benefits from slowing OGVs and reducing emissions in coastal waters are also significant. OGVs contribute a growing portion of the NOx inventory in coastal communities due to their unregulated emissions. While criteria and toxic air pollutant emissions from stationary sources, on-road vehicles, and off-road equipment have been steadily reduced by state and local regulations, OGV emissions have grown due to increased ship traffic. The BWBS program has demonstrated its great public health benefits by reducing NOx emissions by 1,256 tons and fine particulate matter ($PM_{2.5}$) emissions by 5.2 tons in 2023. The NOx emissions reductions are directly benefiting ozone attainment efforts in some of the areas with the worst air quality in the country, such as San Diego, Los Angeles, and Ventura counties in California. The reduction in $PM_{2.5}$ emissions has a direct public health benefit in coastal areas, some of which are considered disadvantaged or low-income communities.

Using the same growth and estimation methodology for criteria pollutants as used for GHG emissions reductions, the BWBS program will reduce NOx and $PM_{2.5}$ emissions by 21,103 tons from 2025-2030. The proposed funding will result in a cost effectiveness of $681 per ton of criteria pollutants alone. This is quite favorable on its own and demonstrates the extremely valuable co-benefits generated by the BWBS program. It should be noted that NOx emissions reductions estimated at $39,000 per ton are considered cost-effective as best available retrofit control technology for stationary sources in Ventura County, California. The combined emissions reductions, including GHG and criteria pollutants, from 2025 through 2030 is estimated at 785,249 metric tons. The direct cost effectiveness of the proposed grant funding is $18.31 per metric ton of emissions reductions, including GHG, NOx, and $PM_{2.5}$.

Figure 2: The Role of Whales in Carbon Storage



3. Environmental Results – Outputs, Outcomes, and Performance Measures

a) Expected Outputs and Outcomes

As detailed in **Table 1** previously, results from the 2023 BWBS program (latest data available) showed the following:

- 33 global shipping companies participated.
- Total VSR distance: 375,437 nautical miles.
- Air pollution (NOx) reduced by 1,256 tons.
- Regional GHG emissions reduced by 45,785 metric tons.
- Ocean noise reduced by 5.4 decibels/transit on average.
- Risk of ship strikes to endangered whales reduced by 58%.
- The 2023 season results can also be viewed on the BWBS program website here.

Expansion of the program to a larger number of OGVs across a wider geographic extent with a CPRG grant would increase these outputs and outcomes significantly. In addition, the BWBS program currently supports an estimated three full-time equivalent positions at partner organizations to administer the program. A CPRG grant would support an estimated six full-time equivalent positions at a technical, scientific degree level or higher.

b) Performance Measures and Plan

The performance of the program can be evaluated based on several criteria:

- Percentage of the OGV operators and ships that transit the speed reduction zones that are enrolled in the program.
- The number of nautical miles traveled by operators and ships at 10 knots or less.
- The estimated reduction in GHG emissions when compared to baseline speeds of the participating OGVs.
- Estimated co-benefits, especially reduction in emissions of fine particulate matter and NOx.
- Estimated reduction in risk to endangered whales as a result of slower ship speeds.
- Estimated reduction in anthropogenic ocean noise as a result of slower ship speeds.

Note that the current BWBS program evaluates all of these performance measures each year.

Ship speeds are tracked using AIS data. All OGVs are required by International Maritime Organization regulations to transmit AIS data while not in port. AIS data near the U.S. coastline is collected by NOAA and transmitted to the BWBS partners through a cooperative agreement. Scientifically robust methods, in collaboration with analytical partners at Starcrest Consulting LLC, Scripps Institution of Oceanography, and Point Blue Conservation Science, are used to estimate GHG and other air pollution emissions reductions, ocean noise reductions, and the reduced risk of ship strikes on endangered whales.

c) Authorities, Implementation Timeline, and Milestones

The list below details the current Federal, local, and contracted entities currently involved in the BWBS program:

Federal Agencies	NOAA's Office of National Marine Sanctuaries, NOAA National Marine Fisheries Service, Channel Islands National Marine Sanctuary, Cordell Bank National Marine Sanctuary, Greater Farallones National Marine Sanctuary, and Monterey Bay National Marine Sanctuary
Local Agencies	Santa Barbara County Air Pollution Control District, Ventura County Air Pollution Control District, Bay Area Air Quality Management District, San Luis Obispo County Air Pollution Control District, and Monterey Bay Air Resources District
Current Contractors	California Marine Sanctuary Foundation (CMSF), Starcrest Consulting Group LLC, Point Blue Conservation Science, Benioff Ocean Science Laboratory (a center for applied marine conservation at the University of California, Santa Barbara), Scripps Whale Acoustics Lab

If awarded CPRG funding, the BWBS program would expect to utilize that funding during the 2025 to 2030 timeframe. As an already established program, incorporating the funding into the existing BWBS program would be seamless and can be utilized as soon as it's available. Moreover, the BWBS program is already capable of tracking and analyzing multiple parameters of success including GHG and criteria air pollutant reductions, ship strike risk reductions, and ocean noise reductions. As such, the BWBS will continue to successfully monitor these milestones if awarded CPRG funding.

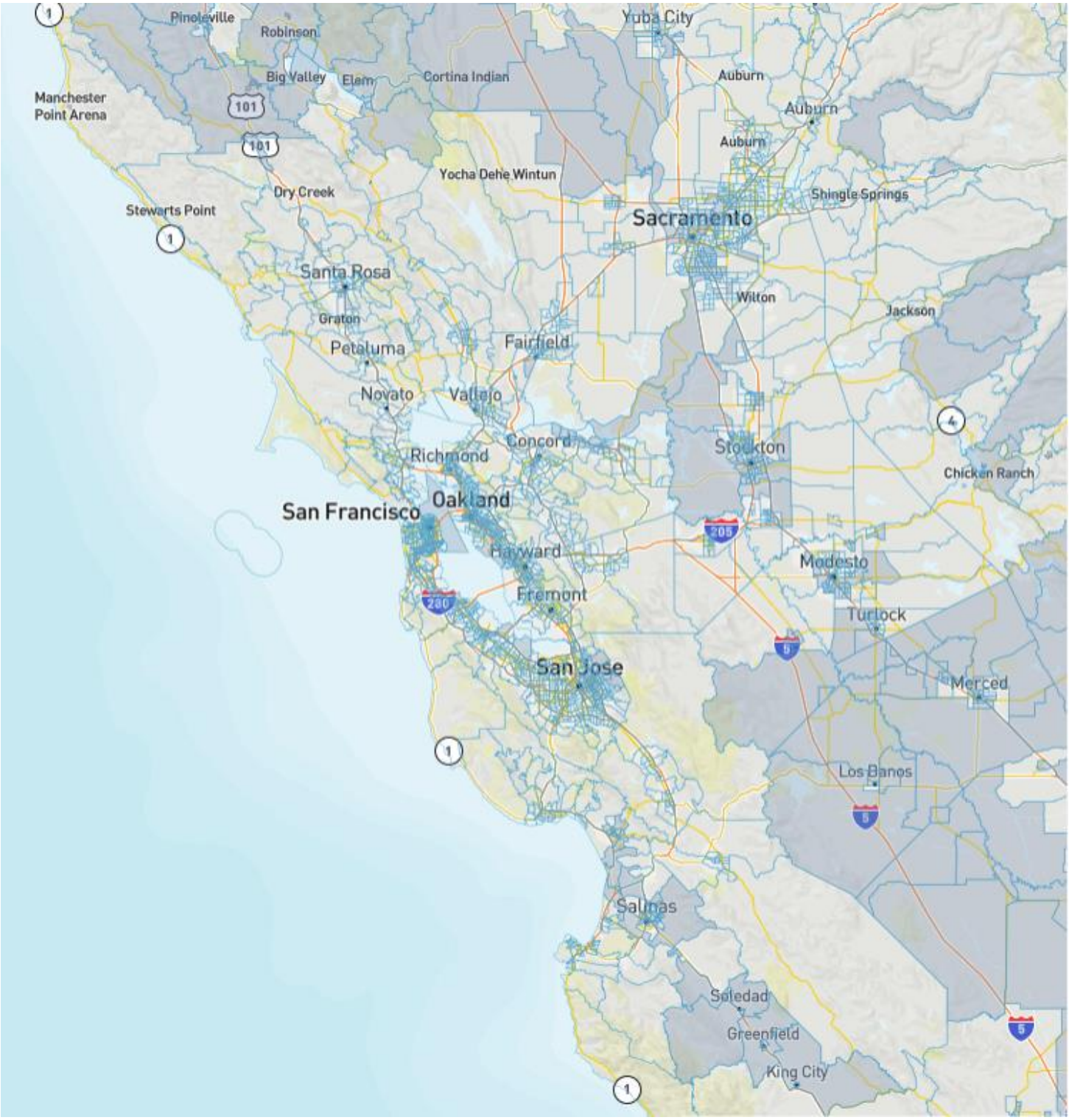
4. LOW-INCOME AND DISADVANTAGED COMMUNITIES

a) Community Benefits

The existing BWBS program reduces GHG emissions as well as criteria pollutant emissions of NOx, diesel particulate matter (DPM), particulate matter less than 2.5 microns ($PM_{2.5}$), and sulfur oxides (SOx) that blow onshore from the shipping lanes and negatively impact disadvantaged and low-income communities along the coast. In addition, the NOx emission reductions reduce ozone concentrations far inland due to prevailing onshore winds in many California communities.

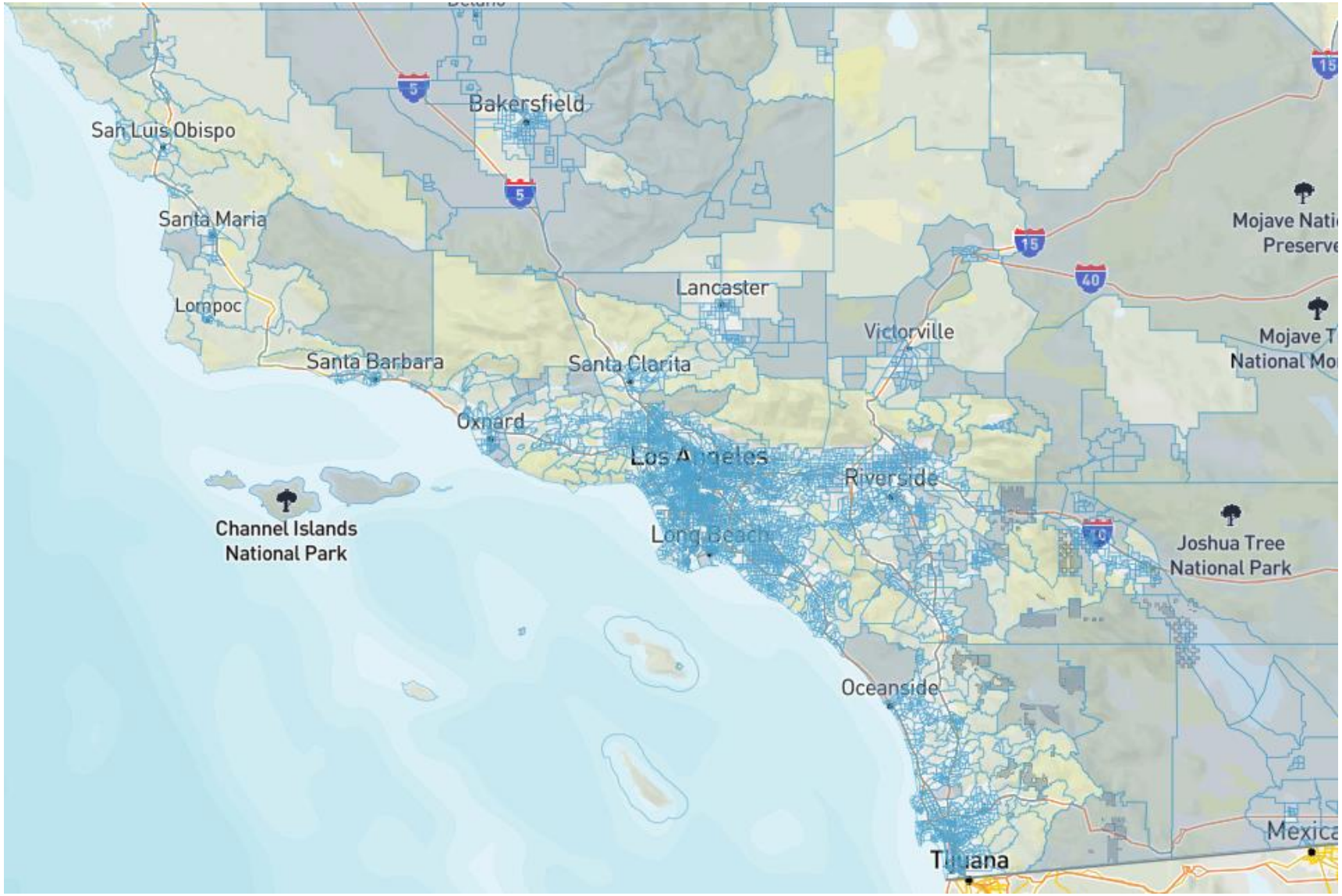
If awarded CPRG funding, the emission reduction benefits from the existing program would be expanded from the areas in proximity to the current VSR zones to all coastal California communities. Therefore, the emission reductions would benefit some of the most polluted areas in the State, including Los Angeles, San Diego, and Ventura Counties, which are classified as serious or worse federal ozone nonattainment areas. The $PM_{2.5}$ emission reductions will also benefit these communities and others such as those in the San Francisco Bay Area, which are also classified as federal $PM_{2.5}$ nonattainment areas. **Figure 3: Disadvantaged Communities - San Francisco Bay Region** and **Figure 4: Disadvantaged Communities – Southern California Region,** below shows the disadvantaged communities throughout California (shaded in blue) that could benefit from emission reductions from the BWBS program. A spreadsheet listing these disadvantaged census tracts from the Climate & Economic Justice Screening Tool is also included in this application.

Figure 3: Disadvantaged Communities - San Francisco Bay Region



Source: Climate & Economic Justice Screening Tool

Figure 4: Disadvantaged Communities - Southern California Region



Source: Climate & Economic Justice Screening Tool

b) Community Engagement

To engage community members, NOAA's Office of National Marine Sanctuaries maintain community-based advisory groups, known as Sanctuary Advisory Councils, that are established to provide advice and recommendations to the superintendents of the sanctuary sites on resource management issues. Throughout the history of the implementation of the BWBS program, Channel Islands, Cordell Bank, Greater Farallones, and Monterey Bay National Marine Sanctuaries have engaged Sanctuary Advisory Council stakeholders – representing interests such as research, conservation, education, tourism, maritime industry, agency partners, tribal representatives, and members of the public – to provide feedback and advice to BWBS program staff on the creation and expansion of the program.

Moving forward, to continue to engage community members in these efforts, NOAA partners and the BWBS program will continue to engage the Sanctuary Advisory Councils on the format and implementation of the program. A proposed new sanctuary site in central California, known as the Chumash Heritage National Marine Sanctuary, also provides opportunities for expanded engagement with tribal communities on this climate and conservation effort in future years.

5. MARKETING

Part of the BWBS program includes marketing efforts to help incentivize shipping companies to continue participating in the program or consider joining the program. The marketing, outreach and advertising campaign is designed to increase the visibility of the shipping company participants and Ambassadors to recognize their engagement. Advertising sources have been selected to reach the audiences most relevant to shipping participants and Ambassadors. The campaign uses a combination of press releases, print and digital advertisements, sponsored features, online promotion, and social media to reach targeted audiences. The 2023 Season Campaign Report summarizing the marketing efforts of 2023 can be found here and is summarized below.

The 2023 season campaign was extremely successful. The campaign used a combination of print and online display ads, online "banner" ads, newsletter ads, and social media ads with a common theme and design. Separate ad messages were created for the overall BWBS program and for the Ambassador initiative. Half-page ads were placed in Maritime Executive and Pacific Coast Business Times. Page dominant, or "island" ads were placed in Long Beach Business Journal, and a premium full-page ad was featured on the inside front cover of Bay Nature. BWBS ads ran in every issue of the PMSA's West Coast Trade Report. Online ads that link to the BWBS website were placed with Supply Chain Dive, gCaptain, Maritime Executive, Long Beach Business Journal, Long Beach Post, Pacific Coast Business Times, San Francisco Business Times, and Bay Nature. Social media on news sites accompanied many of the ads, and BWBS ran LinkedIn advertising. Sponsored news features were coordinated with select media outlets, where a feature story was placed and promoted about BWBS or the Ambassador initiative. Ambassadors are encouraged to announce their participation via press releases, social media, website, and annual sustainability reporting.

In 2023, the BWBS program issued four press releases to California and shipping industry media contracts. Each press release appeared on more than 200 news sites. Moreover, news stories appeared on over 900 news sites totaling over 25 million impressions. BWBS was also featured in 180 ads totaling over 30 million impressions. The campaign also received approximately 50,000 LinkedIn impressions and approximately

7,500 website visits. If awarded CPRG funding, these marketing campaigns would be able to continue their success and expand to include additional ads and news stories.

6. JOB QUALITY

The BWBS program currently supports an estimated three full-time equivalent positions across partner organizations to administer the program. The requested CPRG funding would support an estimated six full-time equivalent positions at a technical, scientific degree level or higher.

In addition, the BWBS program contributes to needs for expanded staff capacity at participating shipping lines focused on biodiversity protection and Corporate and Social Responsibility.

7. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

a) Authoritative Regulations

The following statutes and directives provide the project partners the authority to implement the BWBS program:

- California Health and Safety Code Division 26 - Air Resources, Part 3 - Air Pollution Control Districts, Chapter 1 - General Provisions, Section 40004, states: A district may sponsor, coordinate, and promote projects that will lead to the prevention, mitigation, or cure of the adverse effects of air pollution, including the adverse health effects of air pollution.
- The National Marine Sanctuaries Act (NMSA) 16 U.S.C. 1431 authorizes the Secretary of Commerce to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or esthetic qualities as national marine sanctuaries.
- 16 U.S.C. 1431 sec. 301 (b) The purposes and policies of this chapter are:
    - (3) to maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes;
    - (7) to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;
    - (8) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques.

b) Past Performance

Past performance of the BWBS program has shown incredible success at reducing GHG and criteria air pollutants, as well as reducing ship strike risk and ocean noise pollution. As detailed in **Table 1** previously, results from the 2023 BWBS program (latest data available) showed the following:

- 33 global shipping companies participated.
- Total VSR distance: 375,437 nautical miles.
- Air pollution (NOx) reduced by 1,256 tons.

- Regional GHG emissions reduced by 45,785 metric tons.
- Ocean noise reduced by 5.4 decibels/transit on average.
- Risk of ship strikes to endangered whales reduced by 58%.
- The 2023 season results can also be viewed on the BWBS program website here.

c) Reporting Requirements

As discussed previously, the BWBS program analyzes the success of each VSR season on an annual basis and provides those results on the BWBS website.

d) Staff Expertise

A summary of key staff who participate in the BWBS program is included under *Other Attachments* in this application. Since the initial pilot program in 2014, the program has grown from slowing 14 vessels a total of 2,700 nautical miles in the Santa Barbara Channel to 33 carrier fleets achieving over 375,437 slow-speed nautical miles in the Southern California region and approaches to the San Francisco Bay in 2023. As the program has grown, cost-effectiveness has improved, and the program has received national and international recognition.

The air districts have extensive experience implementing SEP awards and managing air quality incentive programs such as the Carl Moyer Memorial Air Quality Standards Attainment Program, the Community Air Protection Program, and other local programs. The NOAA Marine Sanctuaries have experience implementing vessel speed reduction programs. CMSF is skilled at developing, fostering, and managing public-private partnerships to achieve program success. As the program has grown, the implementing agencies have also pulled in other companies and research organizations with specialized skill sets and tools to evaluate air quality and whale protection benefits. For example, Starcrest Consulting Group has calculated air emissions benefits, and the Scripps Whale Acoustics Laboratory and the Point Blue Conservation Science organization have assessed whale protection benefits related to ocean noise and whale strikes. In addition, the Benioff Ocean Science Laboratory has joined the partnership and provides near-real-time ship cooperation data and monthly reports to enrolled carriers so that the carriers can track their performance and identify opportunities to improve.

8. BUDGET

A detailed budget spreadsheet has been included in this application. **Table 3: Proposed BWBS Budget by Year**, shows a summary of the proposed 5-year budget for the BWBS program if awarded CPRG funding. As shown, the total CPRG-funded budget for the BWBS program over 5 years would be approximately $14,374,322. This does not include an estimated $260,424 in in-kind labor support contributions from various project partners to run the program during the 5-year project period. See spreadsheet 'In-Kind Contributions calcs_VCAPCD.xlsx' under *Other Attachments* in this application for more detail regarding in-kind contributions.

Table 3: Proposed BWBS Budget by Year

CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
TOTAL PERSONNEL	$774,000	$822,375	$870,750	$919,125	$967,500	**$4,353,750**
TOTAL FRINGE BENEFITS	$172,080	$182,835	$193,590	$204,345	$215,100	**$967,950**
TOTAL TRAVEL	$65,135	$65,265	$65,395	$65,525	$65,655	**$326,975**
TOTAL EQUIPMENT	$6,800	$0	$0	$0	$0	**$6,800**
TOTAL SUPPLIES	$45,500	$45,500	$45,500	$45,500	$45,500	**$227,500**
TOTAL CONTRACTUAL	$1,330,000	$1,330,000	$1,330,000	$1,330,000	$1,330,000	**$6,650,000**
TOTAL OTHER	$50,340	$50,340	$50,340	$50,340	$50,340	**$251,700**
TOTAL DIRECT	*$2,443,855*	*$2,496,315*	*$2,555,575*	*$2,614,835*	*$2,674,095*	***$12,784,675***
TOTAL INDIRECT	$305,925	$311,371	$317,744	$324,117	$330,490	**$1,589,647**
TOTAL FUNDING	$2,749,780	$2,807,686	$2,873,319	$2,938,952	$3,004,585	**$14,374,322**