

A Revitalization Plan for U.S. Maritime Trade, Commerce, and Strategic Competition



Developed by:



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OVERVIEW

The U.S. has much to gain by becoming a major competitor in international maritime trade and commerce. There is an urgent need for a strategic shift in U.S. maritime practices, both to overcome current dysfunction and to create strategic capacity and economic vitality that will last into the next century. In an increasingly volatile world—with aggressive competitors with different values—it is critical for the U.S. to develop maritime capacity that upholds a rules-based international order and promotes transparent global maritime trade and commerce. Increased U.S. participation will strengthen America’s soft power relationships and competitive influence, all while providing enormous benefits and opportunities to the U.S. economy.

This “Revitalization Plan for U.S. Maritime Trade, Commerce, and Strategic Competition” (The Revitalization Plan / Plan), developed by the Northeast Maritime Institute – Center for Ocean Policy and Economics (NMI/COPE^o), provides short, medium, and long-term solutions and benefits for the United States. This Revitalization Plan delivers positive national security, trade, sovereign capability, and sustainability outcomes through maritime initiatives. The Plan builds upon the Merchant Marine Act of 1920 (The Jones Act) to provide a framework for a coherent and comprehensive national maritime strategy that protects both domestic capacity and enhances international operations. The Plan also addresses many of the areas of concern identified in the Department of Transportation’s (DOT) “Goals and Objectives for a Stronger Maritime Nation.”

The COVID-19 pandemic has highlighted an array of alarming trends in the U.S. maritime sector. Disruptions at major ports and chaos along the entire supply chain have revealed the dire state of U.S. assets and infrastructure. Facilitated by a lack of investment in domestic capacities and an increase in foreign trade dependencies over the last fifty years, it has produced serious economic and national security vulnerabilities. Recent publications by leading experts have described the diminished Sealift capacity of the U.S. merchant marine as a debilitating weakness during a protracted conflict, one of many strategic challenges facing the U.S. maritime sector.¹

This plan will usher in a new era of global maritime trade by establishing greater transparency; develop infrastructure to increase economic productivity; create innovative, globally scalable products and technologies; improve economic and sustainability outcomes through green initiatives in construction, trade, and commerce; upskill the existing workforce using the latest education and training practices; and stimulate jobs across a variety of sectors.

The Revitalization Plan builds on a Memorandum of Agreement signed in December 2021 between NMI and the U.S. Virgin Islands (USVI). The U.S. Virgin Islands are an organized, unincorporated sovereign U.S. territory exempt from the Jones Act. USVI is the most strategic location in the United States from which to stage a core aspect of this plan. Basing a new maritime registry and related initiatives in the USVI allows the United States to maintain the regulatory framework of the Jones Act, a ‘Separate, Yet One,’ policy, and at the same time increase U.S. international competitiveness and influence in the global maritime community.

¹ See, for example, [To Expand the Navy Isn’t Enough, We Need a Bigger Commercial Fleet](#), and [Why Maritime Infrastructure is About More than the U.S. Navy](#).

STRATEGIC CHALLENGES

1. U.S. commercial vessels constitute just 0.4% of the total global fleet. In five years, the U.S. commercial fleet declined by 12% as the People's Republic of China's increased by 55%.²
2. The U.S. is almost entirely reliant on other countries for trade. Less than 2% of U.S. imports are carried on U.S.-owned ships, and less than 1% of U.S. imports are carried on U.S. flagged ships. U.S. maritime operators and government agencies have little control over vessels registered under opaquely operated foreign flags, which facilitate criminal activity.
3. The U.S. ranks 1st in global naval capability, but only 21st in commercial (merchant marine) capacity. The People's Republic of China is ranked 2nd in both.
4. The Department of Defense is heavily reliant on foreign-flagged tankers. This dramatically increases national security risks, especially during prolonged conflicts.
5. The U.S. lacks around 1,800 mariners and 60 ships to meet statutory requirements for Sealift wartime capacity. This means the U.S. will not be able to operate a sizable merchant marine support fleet during a period of conflict of six months or more. This skills shortage increases with each passing year due to a lack of personnel; a lack of modern methods to upskill, train, and re-train; and a lack of commercial deep sea employment opportunities.
6. The Jones Act admirably serves to protect U.S. coastal trade but hinders overseas influence and strategic competitiveness. U.S. laws disincentivize U.S. ownership of vessels and the registering of vessels under the U.S. flag. These structural complexities impede geostrategic effectiveness and hinder the U.S.'s ability to take a leading role in global maritime initiatives.
7. The U.S. is vulnerable to supply chain volatility, which can be used as a tool of economic warfare by competitors. The U.S. lacks a resilient, technologically enabled maritime supply chain capable of securing and monitoring cargo entering the continental U.S. (CONUS).
8. U.S. shipbuilding accounts for only 0.12% of the global total. The top nine container firms are organized into three alliances that dominate 83% of maritime trade. Sixteen companies control 80% of the world's shipping container construction and leasing. None of these leading container companies are American.
9. Heavy dependency on foreign vessel and container manufacturers significantly reduces the U.S.'s organic capabilities, has cost the economy thousands of jobs, and means the U.S. cannot take a leading role in decarbonizing these critical industries.

² As measured by deadweight tonnage.

PRACTICAL SOLUTIONS

The Northeast Maritime Institute – Center for Ocean Policy and Economics’ (NMI/COPE°) “Revitalization Plan for U.S. Maritime Trade, Commerce, and Strategic Competition” provides short, medium, and long-term benefits for the U.S. and global economy and delivers positive national security, trade, commerce, sovereign capacity, law enforcement, and sustainability outcomes.

1. Immediately establish an open international U.S. flag in the U.S. Virgin Islands (USVI) to provide responsible and transparent oversight to a commercial fleet of foreign and domestically owned and operated vessels.
2. Immediately begin construction of a secure, high-throughput, and technologically advanced transshipment hub in the Caribbean, to increase U.S. trade capacity and resiliency, with an emphasis on secure cargo and efficient, sustainable short sea shipping.
3. Rapidly deploy modern maritime education and training methods in the U.S. and abroad—including in-person, online, mixed-reality and simulator training—to attract new talent and upskill existing maritime workers.
4. Establish a Maritime Venture Capital Fund (MVCF) to rapidly build commercially successful solutions that are technologically innovative, economically viable, and globally deployable with a goal of solving maritime and ocean industry problems with a focus on ecological sustainability.
5. Partner with U.S. interagency counterparts as well as international organizations and collaborators to develop new technologies and a specific set of measurement and assessment tools to address strategic maritime issues, increase transparency, and enforce legal and ethical standards.
6. Establish a National Maritime Sustainability Strategy including Green Maritime Highways and a Green Shipping Certification Program for USVI-Flagged Vessels, with requirements and benchmarks for environmentally sustainable construction, operation, management, and planning.

Each proposed solution in the Plan has been specifically designed to be practical, achievable, and cost-effective. Many of the solutions can be self-funded or financed through private partnerships. Most solutions are ‘shovel ready’ and can be started immediately with the support of the United States Government (USG) or have already commenced and require additional support from the USG. Elements of this plan have been set in motion with the signing of a Memorandum of Agreement with the U.S. Virgin Islands (USVI), in December 2021.

THE CENTER FOR OCEAN POLICY AND ECONOMICS

Northeast Maritime Institute has established the Center for Ocean Policy and Economics (COPE°) in response to concerns by U.S. agency and department heads, industry leaders and global partners and the growing need for the United States to reassert its leadership and power of example in the maritime domain.

The COPE° leadership team has established a group of full-time staff, leading experts, and “Blue Ribbon” advisors to study, research and create a strategic direction for U.S. maritime activities. This group is uniquely positioned to provide solutions and expertise to transform U.S. maritime strategy in an integrated and comprehensive fashion. COPE° fellows and advisors bring decades of successful interagency, private sector, governmental, and international experience in a diverse array of fields including maritime safety and security; maritime law enforcement; marine environmental protection; maritime education and training; homeland security; oceans and environmental and technology policy; development and deployment of unique maritime technologies; international relations; national flag policy development; and maritime logistics and operations.

COPE° applies a pragmatic systems approach to the development of commercial solutions and maritime policies to enhance geostrategic competitiveness and positively impact global sustainability. COPE°’s policy and legislative proposals are collaborative and carefully designed to complement existing transportation, trade, commerce, defense, homeland security, and climate change policies.

COPE° fulfills the U.S.’s urgent need for a non-governmental organization dedicated to maritime issues, with the background and expertise to deliver practical outcomes. The Revitalization Plan for U.S. Maritime Trade, Commerce and Strategic Competition represents a serious commitment from COPE°—including carefully selected experts and an extensive network of collaborators—to tackle systemic crises facing the U.S. and its allies.

REVITALIZATION PLAN

Introduction

America is an exemplary “nation of all nations,” and its exceptionalism has been facilitated through its diversity, adaptability, and competitive spirit. These qualities position it well to lead the world in facing today’s challenges, especially in the maritime domain. America’s leadership role can be further realized through revitalization of commercial infrastructure and a bold plan to become a strategic global competitor in maritime trade and commerce now and in the future.

Global maritime tonnage is expected to triple by 2050, providing numerous and enormous economic opportunities that the United States can capture. Chief among these are expanded areas for finance, investment, technological and ecological innovation, job creation, and the re-establishment of a transparent and rules-based international order. The U.S. must begin executing a pertinent and robust maritime strategy that will carry the nation through the present century and into the next to ensure global relevance.

Infrastructure can and should include a diverse array of maritime commerce and trade related initiatives at home and overseas that can be launched in relatively short order. Our diverse maritime linkages to every corner of the earth are one of the ready building blocks for this plan, along with diverse commercial, technological, and maritime assets and initiatives. We must diversify, we must be bold, and we must assert ourselves in the most powerful economic driver in history – maritime trade and commerce.

The current supply-chain crisis is but the latest manifestation of our near-total dependence on foreign maritime distribution and an American maritime industry in steady decline over the last half century. This is a serious strategic vulnerability for the American homeland. It is time for an honest realization that our nation must build up its domestic maritime capacities.

The action items in this plan can be launched immediately and accomplished in relatively short order. NMI’s global network and Center for Ocean Policy and Economics platform can facilitate its successful implementation. Revitalization will provide a new level of economic stability and environmental protection. The U.S. must recognize the strategic importance of being a major competitor in international maritime trade and commerce, which will continue to grow exponentially through the 21st century and beyond.

Action Item 1: Launch Open International U.S. Flag

Immediately establish an open international U.S. Flag in the U.S. Virgin Islands (USVI) to provide responsible and transparent oversight to a commercial fleet of foreign and domestically owned and operated vessels.

New international standards are required to create a safer, cleaner, and more transparent shipping industry. The U.S. remains an illogical bystander as other major shipping nations set their own agendas within international forums, carving out their own interests. An immediate and effective way to create new international behaviors and lead through the power of example is for the U.S. to establish an open international U.S. flag in the U.S. Virgin Islands (USVI). The flag will allow the U.S. to command a diverse commercial fleet and reform the practices of international flags.

The shipping industry moves more than \$4 trillion USD of imports and exports into and out of the United States every year. For the past fifty years, the U.S. has increasingly relied on shipping lines from other countries to carry most of these goods: Maersk based in Denmark; CMA-CGM based in France; MSC - Switzerland; COSCO - The People's Republic of China; ONE - Japan; Hapag-Lloyd - Germany; Evergreen - Taiwan; HMM - South Korea. The top nine container firms are organized into three alliances that dominate 83% of maritime trade. None of these companies are American. 16 companies control 80% of the world's shipping container construction and leasing. None of these companies are American either. There is only one U.S. shipping company in the top 30: Matson, ranked 26th, with only 0.2% of global market share.

Fifty percent of the ships that traverse our international waterways are registered in just three jurisdictions – Panama, Liberia, and the Marshall Islands – where loosely enforced regulations and lack of due diligence and oversight has created enormous risk to the U.S. and global shipping industry and facilitated illicit activity on the high seas. The U.S. has traditionally supported the top three open international flag state regimes; however, they have since grown too large for true compliance oversight and lack the desire to provide genuine global law enforcement services. Many open international flag states have knowingly or unknowingly enabled much of the illicit and unsustainable practices seen on the high seas today. In some cases, flag states have turned a blind eye to further restrict the disruption of these practices, running contrary to the U.S.'s strategic interests. The long-term results are plainly visible in the supply-chain dysfunctionality that has occurred over the last year and other unruly behaviors by state actors that run contrary to a transparent and rules-based international order on the high seas.

The creation of an autonomous international flag based in the USVI would allow the U.S. to take a leading role in quality and sustainable management practices and set new standards in maritime operational excellence. A new secondary U.S. Flag dedicated to international trade and commerce would provide a significant increase to U.S. tonnage; increase U.S. maritime labor capacity; uphold higher international standards for the safety of seafarers; allow for greater oversight of global trade and commerce; facilitate green seas initiatives, and incentivize U.S. financing, investment, and ownership in domestic maritime initiatives.

The USVI Flag would also help to meet the needs of the U.S. Military Sealift. Through its formal relationship to the U.S. Flag, USVI-Flagged merchant vessels and U.S. mariners would be permitted and called upon to bolster the needs of Sealift, including through the Voluntary Intermodal Sealift Agreement (VISA) or other USG programs. U.S. Agency stakeholders in the maritime industry such as the United States Coast Guard (USCG) and Maritime Administration (MARAD) would have considerable involvement in the outcomes of the USVI Flag.

The protection of a nation's sovereign flagged vessels on the high seas is the traditional mission of any deployable Navy. The U.S. Navy has a long history of safeguarding navigational rights and freedoms around-the-globe for ships of all nations, while also engaging adversaries and non-state actors to protect U.S. flagged commercial vessels wherever they may sail.

As an organized, unincorporated United States' territory, the United States maintains sovereignty, oversight, foreign affairs, and defense responsibilities for the USVI. The creation of an open, international U.S. Virgin Islands registry will expand the number of U.S.-flagged vessels traversing the world's oceans. Those ships that fly the USVI flag will carry the same level of protection as their U.S.-flagged counterparts as they travel around-the-world.

This new arrangement will result in additional planning and mission responsibilities for U.S. naval forces in the event of conflict or interference directed at a USVI vessel engaged in lawful trade; this especially applies in global hotspots. With the world's largest Navy, Coast Guard, and deployable Special Forces, the U.S. will not require an expansion of operational capabilities for this enhancement of operational capacity but may require the engagement of these forces on a more frequent basis. This engagement may be as simple as an increased presence in shipping lanes under threat, an activity that the U.S. already engages in regularly. Such engagements will further strengthen the international freedom of the sea that has facilitated U.S. political, diplomatic, and economic power for the last two centuries.

As the U.S. flag state administrator, the U.S. Coast Guard (USCG) is well-suited to take a leadership role in the oversight and compliance strategy of this new USVI registry. The USCG's expertise in maritime safety and security will be critical to the transparent functioning of this new registry. The USVI registry will meet or exceed all international standards and governing treaties set by the International Maritime Organization but will also benefit from the USCG's broad experience in overseeing foreign and domestic vessel compliance.

The USVI registry would be professionally managed as an independent entity while being completely open to all USCG officials, inspectors, and law enforcement personnel. Though independent and separate from the U.S. registry, the USVI registry will enjoy complete synchronization with the USCG and be accessible by other USG agencies involved in maritime safety and security. COPE^o will work with the U.S. Congress to ensure any legislation required for implementation enshrines a robust, practical oversight role for the USCG in this new open international registry and ensures complete transparency between the USVI registry and U.S. intelligence, law enforcement and regulatory agencies. This blend of transparency, oversight and independence has the potential to transform the international flag-state apparatus and be the exemplar of compliance-driven, business-friendly, and accountable registries in the global market.

Implementation Capacity

Northeast Maritime Institute developed and currently manages and operates the Commonwealth of Dominica International Ship Registry. The Dominica Registry was facilitated by the U.S. Department of State and the United States Coast Guard, commencing operations in 1999. For the last 21 years, the Dominica Flag, known as the “Flag of Responsibility,” has proven to be a great asset for the disruption of illicit activities—such as human trafficking and sanction/treaty violations—by discovering techniques and identifying problem areas that exist as vessels, commodities and cargo traverse the ocean. While there has been some success, there have been serious limitations on how far the Dominica Registry could go, particularly with the government of Dominica’s inability to ratify relevant treaties, maintain transparent domestic support, and maintain the traditionally needed resources.

Alternatively, the USVI flag will benefit from the full collaborative capacity of U.S. government partners as well as interagency cooperation. Northeast Maritime Institute will bring considerable knowledge and expertise to the development and management of the USVI Flag and stands ready to work alongside U.S. partners and international allies to ensure the success of this unique initiative, including facilitating robust interagency collaboration:

Objectives:

- Continuously upgrade the USVI-flagged fleet, including with state-of-the-art multipurpose crane ships (self-unloading container, dry bulk, break bulk, project ships) and commodity tankers to increase commercial capacity, decrease sovereign risk, and improve national security outcomes.
- Provide extensive maritime employment opportunities to U.S. and international merchant mariners ensuring relevant and active jobs on commercial ships to earn qualified sea time and hone critical skills, including modern and advanced Maritime Education and Training (MET) initiatives.
- Provide financial incentives to U.S. shipyards, ports, and workshops that maintain multi-functional, environmentally sustainable, and economically viable ships.
- Encourage foreign owners to register vessels under the USVI Flag and engage in trade with the U.S., giving the U.S. direct oversight of these vessels and their owners.
- Provide a global reach that the U.S. flag has not seen in half a century, expanding the influence of the United States, and building transparency into global shipping practices.
- Provide an obtainable Carbon, Nitrogen Oxides (NOx), and Sulfur Oxides (Sox) reduction incentive program to facilitate alternative fuel expansion in the maritime sector.
- Enhance maritime strategic benefits through direct alignment with U.S. policies abroad.

Key Benefits:

- Competes with China's Maritime Silk Road, a core part of the Belt and Road Initiative.
- Provides the U.S. Government with a platform for further intervention on the high seas to counter a wide variety of illicit activities: Combatting Illegal, Unreported, and Unregulated (IUU) fishing, wildlife trafficking, counter-proliferation at sea.
- Increases ability of U.S. military to enforce security upon the high seas and in foreign trading lanes.
- Adds and maintains multipurpose crane ships and product tankers required for Sealift capacity. This also reduces operational and maintenance costs.
- Provides a destination for U.S. corporate investment in maritime transport.
- Supports short sea shipping initiatives and improves efficiencies, frequency, and the security of cargo as it moves through regional transit points.
- Addresses the need for more qualified personnel in the U.S. merchant marine.
- Provides employment opportunities for U.S. mariners to keep them trained, employed, and qualified during peacetime to prepare for wartime events or Sealift surges.
- Supports and enhances local universities and colleges with maritime education and training capabilities that meet USCG and international standards.
- Creates employment opportunities, economic diversification, and resilience for the USVI.
- Provides more flexibility and cost benefit in maintaining a multipurpose commercial international fleet (since USVI is exempt from the Jones Act.)
- Helps decrease costs of transportation for regional and affiliated states and territories, thus lowering costs to citizens.
- Rejuvenates island economies and stops the brain drain after recent hurricane devastation, through local economic multiplier effects.
- Provide tonnage and vessels to cater to industrial needs (e.g., U.S. Marine highways).
- Reduces port fees and costs for cargo and vessels entering the U.S. through increased U.S. ownership, including financial incentives facilitated by the USVI flag.

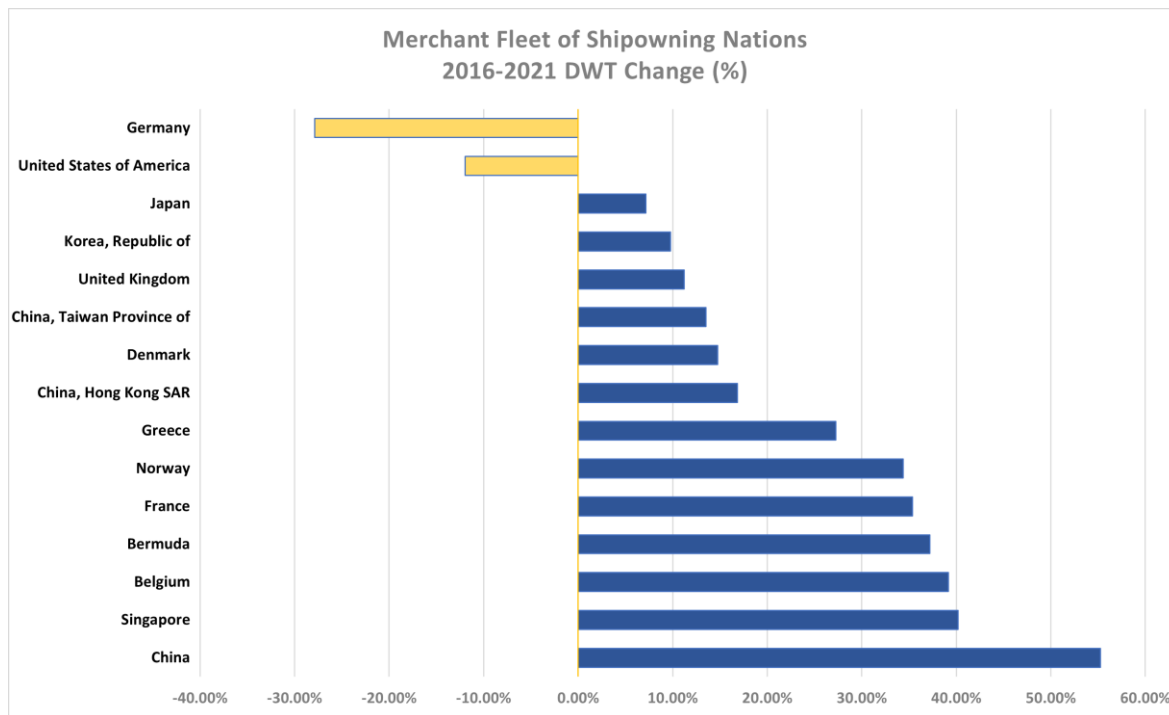


Figure 1 - Chart of Merchant Fleet ship owning nations ('000 DWT). Note the dramatic reduction in the U.S. fleet compared to most other nations.

Spotlight: Illicit Cargo vs Transparency

Many countries have become increasingly vulnerable to the illicit goods trade. The rise of “narco states” and other malign actors has made maritime security increasingly risky. It has also increased the volume of illicit goods, weapons and narcotics ending up on U.S. shores. Two obvious reasons for the rise of such activities are weak international regulation and a disjointed approach to enforcement by the global shipping community.

Data from the OECD shows that the highest number of customs seizures of counterfeit and pirated products were from postal parcels. Sea transport accounted for the most seized value (see FIGURES 2 and 3 below). Over the last five years, containerships have been responsible for carrying over 55% of the total value of seized counterfeits. In terms of number of seizures, trafficking of fakes via small parcels is growing and becoming a significant problem in terms of enforcement; however, in terms of value, counterfeits transported by container ship has continued to rise.

One of the major reasons for the increased volume of illicit goods being transported across major shipping routes is the use of “Flags of Convenience.” As previously stated, fifty percent of the ships that traverse our international waterways are registered in just three jurisdictions – Panama, Liberia, and the Marshall Islands – where loosely enforced regulations and lack of due diligence has created enormous risk to the U.S. and global shipping industry and facilitated illicit activity on the high seas. The USVI Flag offers a unique opportunity to create a new model for open international registries that will drive new behaviors, standards, and sustainable shipping practices.

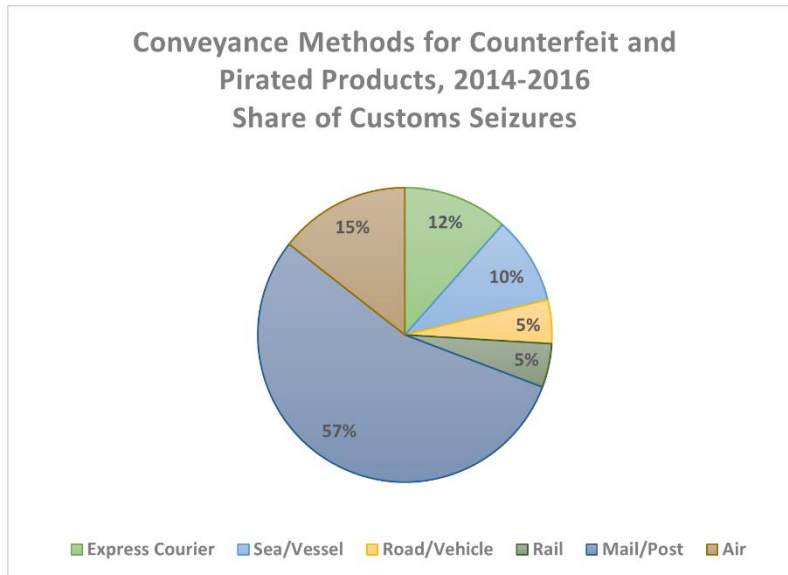


Figure 2 - Conveyance methods for counterfeit and pirated products (Source: OECD - 2019).

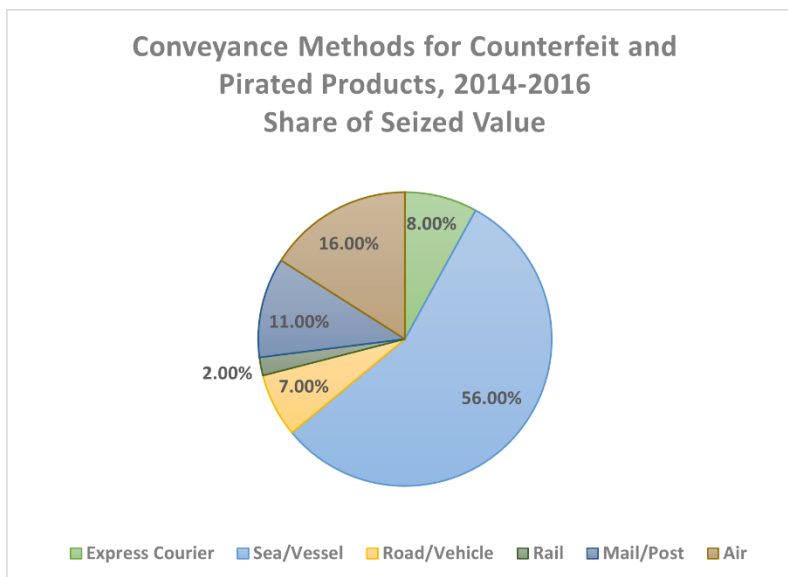


Figure 3- Conveyance methods for counterfeit and pirated products: Share of Seized Value (Source: OECD - 2019). Note: The percentage of customs seizures for sea/vessel would increase dramatically if the number of container inspections increased. Some leading experts estimate that only 1% of all illicit cargo is intercepted before it reaches consumers.

Action Item 2: Establish Short Sea Transshipment Hub

Immediately begin construction of a secure, high-throughput, and technologically advanced transshipment hub in the Caribbean, to increase U.S. trade capacity and resiliency, with an emphasis on secure cargo and efficient, sustainable short sea shipping.

The Transshipment Hub will establish new standards of excellence in global trade, through the secure, efficient, transparent, and sustainable handling of shipments and cargo. The Hub's strategic location in the Caribbean provides unprecedented economic and geographic advantages, making it the ideal location to process traded goods, produce, and commodities from all over the world. Efficient transshipment processing will increase regional prosperity and measurably improve the productivity and security of global trade.

A 'Hub and Spoke' model will allow for the utilization of a highly efficient short-sea logistics and distribution network to ensure incoming cargo is rapidly distributed to southern and eastern U.S. Ports, along with the Caribbean and Central and South America. This arrangement also accommodates autonomous, feeder and other inter-island vessels (such as barges and ferries) to facilitate and bolster local and regional trade.

The Hub will utilize highly effective methods for processing vessels and cargo. An entirely transshipment-focused layout—including the use of magnetic/suction mooring, dual-sided container loading, and dedicated zones for storage, inspection, consolidation, and deconsolidation—will decrease turn times and increase cargo handling throughput. Modular facilities will exceed industry standards for the processing and storage of general cargo, refrigerated produce, food, agricultural products, and dangerous goods. These facilities will minimize spoilage, increase inspection and monitoring efficacy, and allow for the safe processing of hazardous materials. These facilities will also employ refined inspection and customs procedures, using augmented-reality visual interfaces alongside muon and X-ray scanning technologies.

The Hub will be defined by a 'data and digital first' methodology. Operators will handle shipments, transfers, and manage Hub operations through digitized control towers with intuitive user-interface controls such as touchscreens and voice-activation. Ship-to-shore, straddle cranes and shuttles/tractors will be electric, autonomous and roboticized. Terminal management, infrastructure monitoring, vessel, container, and personnel marshalling will be underpinned by data driven insights and machine-learning analytics.

The movement and processing of shipments, including the flow of documentation and administrative information will be entirely digital from point of origin, through the Hub, and to destination. Pallets, containers, and cargo will utilize digital smart seals and sensors, which will dramatically increase processing capacity, visibility and safety while transforming national and

regional security outcomes. Data standards will be adopted to improve communication accuracy and reduce administrative overheads. These new features will increase the velocity of global trade and introduce a new era of supply-chain assurance, transparency, and accountability.

The Hub will achieve highly desirable commercial outcomes while being environmentally and ecologically sustainable. A sizable proportion of electricity for Hub operations will be harnessed from renewable sources e.g., wind and solar with battery backup deployed for continuous operation. Energy conservation techniques will be employed in all areas, from container movements and vessel handling to infrastructure management. Waste, ballast water, biofouling, and cargo handling by-products (e.g., dunnage) will be intelligently processed.

A hurricane-proof design will ensure the protection of infrastructure and assets and allow for continued operation during tropical storms. Minimizing ship movements, utilizing shore-side power, intelligent anchoring, and resource marshalling, and increasing cargo processing efficiency will significantly reduce emissions and minimize the Hub's impact on the surrounding environment. Inspiration for the Hub has been drawn from several sources, and notably from the design and construction of the Tuas Mega Port in Singapore.

Hub services and facilities will be uniquely designed to honor the mariners who serve and visit. Onsite workers will be upskilled on the latest technologies and procedures, which will enhance personal creativity, increase engagement, and job satisfaction, and improve worker safety. Other features include purpose-built crew break-out facilities (with broadband, eating areas, sleeping quarters, and recreation spaces), rapid transit corridors to air or sea transfer stations, and the provisioning of broadband to waiting ships via shore-to-ship wireless links.

The transshipment Hub will be carefully developed in two phases, in close consultation with regional partners, trade participants and key international allies.

Objectives:

- Facilitate short sea shipping initiatives to reduce congestion at major ports, moving cargo closer to final destinations over marine highways to reduce land mileage (and therefore reduce the adverse effects of transportation on the environment and infrastructure).
- Establish a trusted, digitally enabled security layer for cargo prior to entry into the continental United States (CONUS) and other regional trading partners. This layer will seek to intelligently secure shipping containers and standardize authenticated data sharing to drive beneficial commercial and national security outcomes. This will improve current cargo handling requirements; an enhanced Customs – Trade Partnership Against Terrorism (C-TPAT) or a 'C-TPAT+'.
- Create the safest and most environmentally sustainable port in the United States.

Key Benefits:

- Reduces wear and tear on the nation's road and rail infrastructure.
- Reduces national security and biohazard risks associated with cargo entering the United States.
- Reduce the risk to personnel, inspection teams and Agencies that handle dangerous, toxic, or hazardous cargo.
- Modernizes trade flows through newly created digital mechanisms and data sharing.
- Allows the U.S. to create new infrastructure models for shipping without disrupting existing port infrastructure and capacities.
- Encourage additional coastal trade along U.S. marine highways, adding jobs and economic opportunities for coastal communities.
- Provides expanded opportunities for short sea shipping initiatives, to improve sustainability outcomes and bring economic benefits to Caribbean communities.

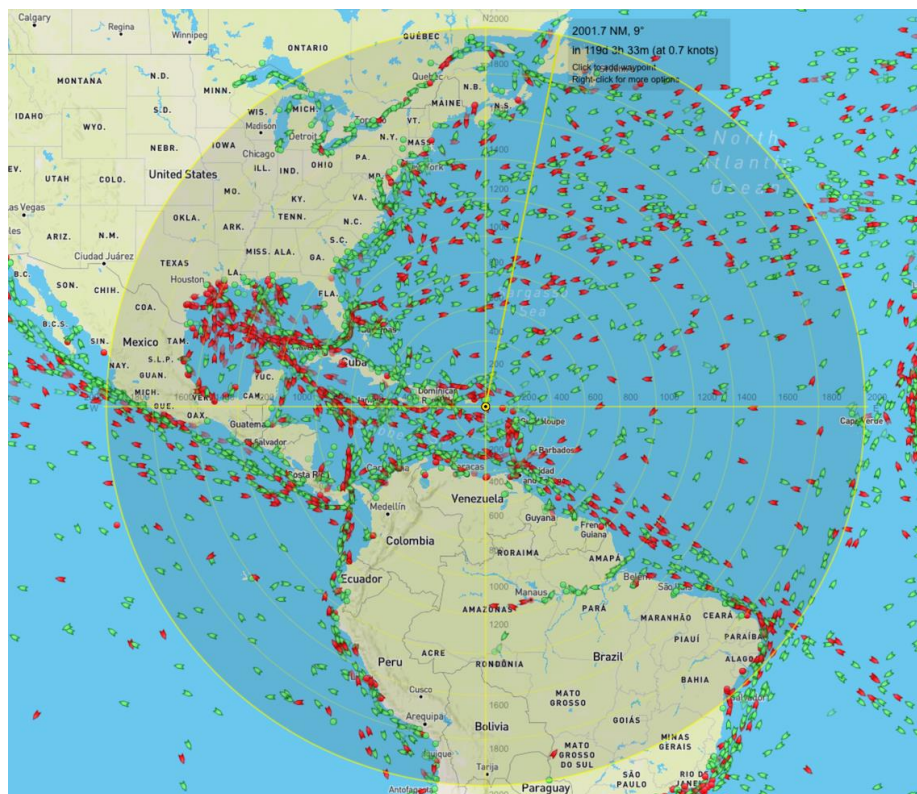


Figure 4 - 2000nm radius around the proposed Caribbean transshipment Hub. The Hub is strategically located to serve vessels transiting the Panama Canal; provide feeder vessel and short sea shipping options to all critical Ports on the U.S. East and Gulf Coasts; service trading partners in South America (Peru, Brazil, and Columbia), Mexico and Canada (as far north as the Port of Halifax); and provide alternate staging options to major Atlantic shipping routes

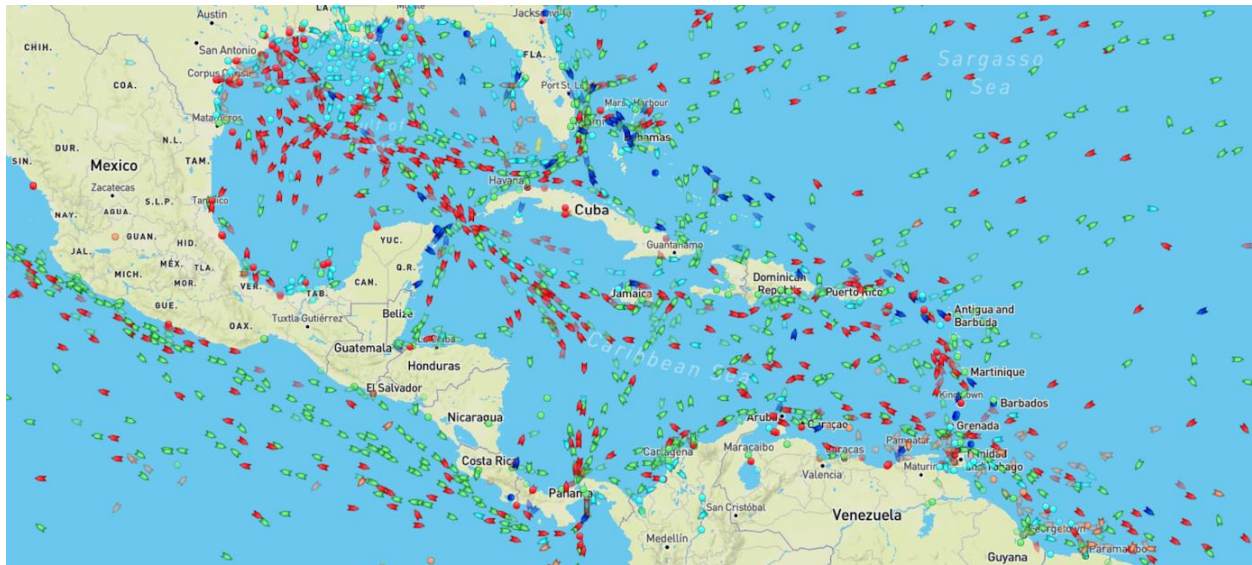


Figure 5 - Vessel traffic in the vicinity of the Caribbean. Cargo (Green), Tankers and Bulk Commodities (Red), Passenger vessels (Blue), Tugs (Cyan), Fishing vessels (Orange)

Spotlight: Short Sea Shipping

For the last three decades Short Sea Shipping (SSS) has been described as the most important development in American transportation. It was recently renamed to "America's Marine Highways," given priority status by the U.S. Department of Transportation and has since received widespread bipartisan support in the U.S. Congress and at the state level.

Here are the key reasons why SSS is critical for the nation's future:

1. Environment, Fuel Consumption & Cost - According to MARAD, ocean transport:
 - Burns 3 times less fuel, emits 3 times less pollution than trains.
 - Burns 10 times less fuel, emits 10 times less pollution than trucks.
 - Burns 100 times less fuel, emits 100 times less pollution than planes.
2. Ocean transport is much less susceptible to terrorist attacks and acts of war.
3. Enhances Merchant Marine Capacity for War Time and National Emergencies. As James Mattis, former U.S. Secretary of Defense, explained, "As small as our Merchant Marine may be today, it is absolutely essential. It's in every war plan that I review, I guarantee you." Short Sea Shipping can provide the U.S. Merchant Marine with trained personnel and vessels. A ready supply of such personnel and vessels has been a critical factor in every conflict ever fought.

4. Loaded trucks damage bridges, roads and infrastructure resulting in expensive repair bills and contributing to dangerous road conditions.
5. SSS helps mitigate trucks from highly congested roads especially at vehicular choke points - where many cars and trucks move through narrow roads—or where physical features or regulations prevent expansion.
6. Short Sea Shipping stimulates the national economy by providing a more cost-effective alternative for American businesses by utilizing existing ports and infrastructure. This shifts the reliance away from larger regional super-ports, such as Los Angeles/Long Beach (LA/LB), Houston, Savannah, and New York/New Jersey (NY/NJ).

In addition to these existing benefits, short sea shipping is ideal for piloting and deploying new green shipping technologies, such as fuel-efficient design improvements, new fuels, new battery and storage capacity, and other green shipping infrastructure.

America has some of the best river systems, inland waterways, and favorable coastlines in the world. Over the last ten years, most large countries in Europe and Asia have successfully invested billions of dollars in Short Sea Shipping for similar reasons as those outlined above. The People's Republic of China is currently investing billions more to purchase and build Chinese owned and operated SSS ports in Africa and around the world. In contrast, the United States has not implemented any major Marine Highway plan and spending on related initiatives has been minimal. An ad hoc version of Short Sea Shipping is currently occurring on the West Coast of the U.S. to alleviate the offloading backlog, but not in an efficient, cost-effective manner.

A high number of existing SSS initiatives and ideas require large up-front investments and the building of new vessels and facilities to move cargo from land to sea and back. This top-down approach stands in stark contrast to the way most successful technology companies of the modern era build large scale networks; by starting small and focusing first on a minimum viable product (MVP). MVP based startups look to reduce the number of services offered to the customer by starting small and plugging into existing infrastructure, existing networks, and existing technologies to create something simple and novel.

SSS will progress through active collaboration with local, state, and federal stakeholders to leverage the use of existing facilities, infrastructure, and equipment and to create opportunities through federal partnerships and funding.



Figure 6 - The U.S. inland waterway system - 'Marine Highways'. Source: Wikipedia

Action Item 3: Modernize Maritime Workforce

Rapidly deploy modern maritime education and training methods in the U.S. and abroad—including in-person, online, mixed-reality and simulator training—to attract new talent and upskill existing maritime workers.

There are numerous systemic issues facing the U.S. maritime workforce. In addition to a shortage in personnel, the U.S. does not have sufficient employment opportunities for the 1,800 personnel required to meet the requirements of Military Sealift. This will have dire consequences should the U.S. be engaged in a sustained wartime effort of six months or more. However, even if the U.S. had 1,800 qualified maritime workers, it does not currently have enough credible employment opportunities to keep them well trained, upskilled, and employed during peacetime.

Many U.S. mariners are only engaged in coastwise or inland trade. One of the advantages of a USVI-Flag is the U.S. commercial fleet will expand (in both tonnage and capability) which expands the training and employment opportunities for U.S. mariners. This ensures that critical skills are honed and developed for larger scale operations. Knowledge and expertise in deep sea activity and logistics is critical to support wartime needs. U.S. adversaries have been building these capabilities far more rapidly than U.S. allies, leaving the U.S. vulnerable in the event of a maritime skirmish and particularly vulnerable during a prolonged conflict.

While adding tonnage and employment opportunities is necessary, the U.S. must also adopt new methodologies for the delivery of Maritime Education and Training (MET). Northeast Maritime Institute's College of Maritime Science, the nation's first and only private maritime college, has been delivering a maritime education model that prepares and licenses students in just two years for participation in the U.S. merchant marine. The result is a workforce of mariners who are eager, incur low debt, have a fulfilling job and a well-paying career.

American students have clearly expressed a desire for meaningful careers without incurring exorbitant debt. The NMI model seeks to accelerate a student's journey into gainful employment and has proven that a rapid attract-train-send education methodology is possible. There are enormous economic opportunities for employment in, on, or near the water that are yet to be realized by the U.S. maritime industry.

NMI has also been a leader in providing MET online through a comprehensive learning management system that pairs audio, visual, text, simulation-based training, and examination monitoring software for both continuing and higher education. Northeast Maritime Online (NEMO^o) allows mariners across the U.S. and abroad, to augment their maritime careers without incurring the costs of travel, lodging, and time away from home. Recently, the Alaska Department of Labor and its Alaska Vocational Technical Training (AVTEC) signed an agreement with NMI to deliver MET across the state using this modern, comprehensive system.

Objectives:

- Increase and improve the U.S. maritime workforce in conjunction with the creation of new employment opportunities.
- Create sustainable relationships with international maritime workforce development like those currently facilitated by the military; student exchanges are critical in creating like-minded mariners across the globe.
- Introduce new MET models and methodologies across the U.S. and abroad.
- Continue to improve the delivery of online MET to improve access to education and continuing education for mariners.
- Expand Knowledge, Understanding, and Proficiencies (KUPs) into new areas such as cybersecurity, enhanced automation, and digital operations.

Key Benefits:

- USVI Flag will facilitate the creation of additional jobs, and highly attractive ‘greener’ jobs for U.S. mariners due to an increase in ‘green’ tonnage.
- Expands educational opportunities for those who might otherwise have had financial or other barriers to entry.
- Students do not incur exorbitant debt to achieve similar outcomes.
- Modernize the existing workforce, and provide unique training opportunities for the emerging workforce; this will naturally attract more candidates to the maritime sector

Spotlight: Securing Cyber + Space

Global shipping is increasingly subject to cyber security threats, attacks, and disruptions. Maritime assets and critical infrastructure must be carefully monitored for a range of emerging threats from financially motivated hackers to ideologically driven state-based or non-state actors. Almost all major shipping lines suffered significant outages from cyber-attacks in the last 24 months. Global shipping lines and most participants in the supply chain (including vessel, port, and critical infrastructure operators) are not keeping pace with emerging cybersecurity risks. (Common examples are shown in FIGURE 7). Disruptions at scale that continue for some time past the initial attack - crippling entire industries or market segments, and dramatically impacting the economy - reflects an under-investment in appropriate technologies, systems, protocols, and training at every operational level.

Cybersecurity deficiencies in maritime pose a significant security risk to the United States, especially as the size of vessels and the velocity of trade increases. These deficiencies must be urgently addressed using modern training methods (online, simulator, mixed reality), specific upskilling regimes, and the deployment of new processes and technologies.

Of equal importance, is the establishment of global satellite connectivity to reduce communications, personal, safety and cybersecurity risks in the maritime domain. Improved global satellite coverage – at the LEO, MEO, HEO and GEO layers - will enhance every aspect of maritime operations, including the delivery of education, medical, mental health and support services to mariners serving out at sea. Because of the critical role it plays in connecting disparate parties and transmitting actionable information, secure maritime communications underpin all the other activities described in this revitalization plan.

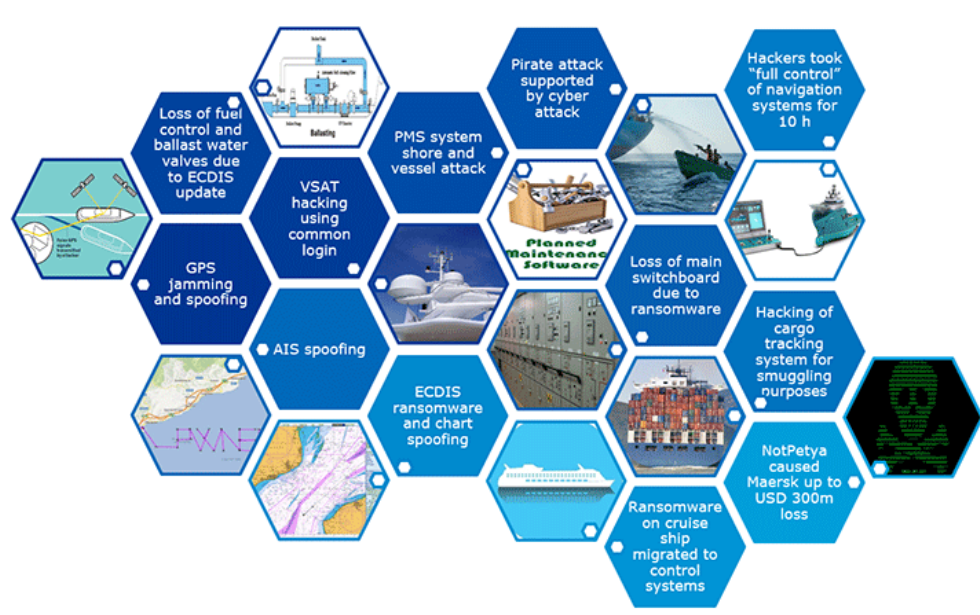


Figure 7 - Common maritime attack vectors and cybersecurity events Source: DNV

Action Item 4: Create a Maritime Venture Capital Fund

Establish a Maritime Venture Capital Fund (MVCF) to rapidly build commercially successful solutions that are technologically innovative, economically viable, and globally deployable with a goal of solving maritime and ocean industry problems with a focus on ecological sustainability.

The U.S. must invest in future-focused maritime and ocean related technologies. Due to the complex nature of maritime operations, it can be very challenging for maritime technology startups to scale up their innovations beyond initial seed grants. The market for new maritime technologies is not yet fully mature; Federal involvement will help the U.S. build the next generation of products and services, and grow the next cohort of industry leaders, in a similar fashion to the private space sector.

Technological innovation is critical to the ongoing success of the maritime sector. New technologies can assist with a wide variety of needs:

1. New methods of propulsion, including the redesigning of propellers, hulls, and entire vessels can reduce drag coefficients and improve fuel efficiency.
2. Material science innovations can improve surface durability, reduce the amount of toxic or lead-based additives in marine paint, that will improve environmental outcomes and decrease ongoing maintenance costs.
3. Extensive research must be applied to discover new low and zero-emission fuels. Examples include Very Low Sulphur Fuel Oil (VLSFO) equivalents, through the efficient use of LNG, green hydrogen, and wind power as well as battery assets and infrastructure for short sea shipping.
4. Improving range, coverage, and decreasing the cost of marine communications and connectivity – with a focus on improving maritime satellite coverage and performance – will allow for additional technologies to be tried and tested in previously unreachable areas of the world.
5. Deploying transformational technologies and systems– e.g., using augmented reality to enhance safety/inspections, or voice-controlled facility management – will increase efficiencies and allow for rapid onboarding and the transfer of knowledge.
6. Detailed analysis of the role of Artificial Intelligence (Machine Learning), Natural Language Processing, and ‘big data’ analytics tools, must be completed. These will radically transform how trade data is handled and generate new revenue streams for

governments, including specific government agencies. A ‘secure and accurate’ data policy and adherence to data standards will ensure that accrued information is ingested correctly, so that meaningful outcomes can be derived.

7. The roll-out of Internet of Things (IOT) Sensors, and smart container seals will enhance the work of C-TPAT and other programs that seek to enhance global supply chain security, visibility, and transparency.
8. Investigate the role of autonomous vessels – feeder, barge or for short sea distribution – to drive sustainability outcomes and improve delivery efficiencies.
9. Research and deploy ‘miniaturized containers’ to improve Less-Than-Container-Load delivery outcomes and improve the overall effectiveness of a short sea distribution network.

These and a plethora of similar technologies are being researched and built by allies and foreign competitors. Singapore, Israel, and various European countries have successfully created maritime startup innovation hubs to encourage the ‘experiment fast and rapidly deploy’ approach that is characteristic of more nimble entities. Small investments have yielded spectacular results, with some startups going on to become very large commercial entities that positively contribute to global trade and the evolution of international maritime practices.

The Maritime Venture Capital Fund would operate in a similar fashion to ARPA-E and ARPA-C, with the oversight and guidance of skilled operators who can mentor and coach participants. This new program may be designated ARPA-M (Maritime).

Objectives:

- Invest in technologies and startups that have enormous commercial potential and environmental benefit with a focus on digitizing trade, improving environmental sustainability and the energy transition away from fossil fuels.
- Introduce incubated research and innovations such as green technologies to a U.S. fleet and U.S. owned vessels.
- Finance minimum-viable products (MVPs) for commercial development using new research or existing ‘science-on-the-shelf.’
- Introduce widespread use of modern and innovative technologies and systems such as blockchain to create systemic improvements to the maritime industry and broader supply-chain, especially through the expansion of aggregate data-systems to improve analytics.

Key Benefits:

- Makes the U.S. a key global stakeholder and industry leader in reducing carbon emissions from the shipping industry.
- Reduces emissions in major ports which have been analyzed as having potentially severe health impacts on nearby communities.
- Creates new jobs in sustainable energy sectors.
- Encourages the roll-out of new technologies including digitized trade tools, intelligent shipping containers, IOT Sensors, Augmented Reality systems and new platforms for data processing, storage, and analytics.

Spotlight: Philanthropic Capitalism

There has been an accelerating trend in recent years to fund green—ecologically mindful and environmentally sustainable—projects. An emphasis has also been placed on organizations to report and map the progress of Environmental, Social and Governance (ESG) and Corporate Social Responsibility (CSR) initiatives. Younger generations are increasingly choosing careers that offer meaning and purpose, aligned with their values, and that offer a chance to work on things that are “bigger than themselves.” This heightened sense of awareness has changed the nature of work and has also altered the way funding is applied to organizational priorities, academic research, project planning and product development. The rise of purpose-driven and mission-aligned funding has given rise to a concept that is commonly referred to as “Philanthropic Capitalism.”

Philanthropic Capitalism blends free-market economics and for-profit structures with value-based pursuits such as social responsibility and environmental sustainability initiatives. This is sometimes described as “For profit, for purpose” or to borrow a phrase from the playbook of a large U.S. company, “Doing well by doing good.” Capitalism makes philanthropy possible by creating a system that both creates wealth *and* allows for it to be discretionarily disposed. It is one of the most transformational mechanisms available to humanity, and when employed in a purposeful way, can be used to enact great change over relatively short periods of time.

Commercial realities are not abandoned inside the model of philanthropic capitalism. It is imperative that a product or service is commercially successful and prove its utility in the open market; subsidies can only serve to assist initial introduction to the market. The MVCF will be guided by these same principles, and will seek to fund and finance the discovery, creation, and scaled expansion of new technologies, products, and services that commercially succeed, while contributing to the greater good. The MVCF places a higher priority on weighty problems such as mitigating the effects of climate change or reducing sea surface temperatures; issues that must be swiftly addressed, with great courage and resolve as they deeply affect us all.

Action Item 5: Build Public-Private-International Partnerships

Partner with U.S. interagency counterparts as well as international organizations and collaborators to develop new technologies and a specific set of measurement and assessment tools to address strategic maritime issues, increase transparency, and enforce legal and ethical standards.

The U.S. maritime industry requires new forms of openness and cooperation among all stakeholders and participants—as the U.S. already does with international scientific research collaboration—with a newfound willingness to engage with partners and allies across the world. Collaboration must be the dominant paradigm as these strategic activities are undertaken. Siloed data, harbored research outcomes, and the inability to share discoveries has hampered scientific and technological progress for too long.

The success of this Revitalization Plan hinges on close collaboration with local, national, and international government bodies, companies, organizations, agencies, and industry leaders alike. Here are three collaborations that are transformational in scope and can be scaled up immediately:

- 1. Partner with DHS, DOD, and DOT to improve national security outcomes:** As is well known, the Department of Homeland Security is responsible for securing U.S. borders, a mandate that includes the movement of people and cargo. Most of the elements described in this plan require the express involvement of DHS officials, including representatives from: Customs and Border Protection (CBP), Immigration and Customs Enforcement (ICE), Transportation Security Administration (TSA), Federal Emergency Management Agency (FEMA), Office of Infrastructure Protection Office of Operations Coordination (OPS), Office of Infrastructure Protection (IP), the U.S. Coast Guard (USCG) and various other agencies. Engaging in close dialog with the DHS will ensure that flag, port, trade, and commerce activities can continue to occur in a secure and efficient manner. Close collaboration with DOD, DOT, and their Agencies and Administrations will also be needed to ensure shared interests are considered when developing new capacities and initiatives.

Specific Example: Work with CBP to improve the function and effectiveness of existing cargo-handling practices, by introducing intelligently secured shipping containers with integrated IOT sensors and standardized data sharing capabilities. This will drive greater transparency in cargo movements, greatly enhance local and regional security practices and improve trade related outcomes as well. This approach may be designated “C-TPAT+.”

2. **Engage with the Five Eyes (FVEY), QUAD and G7 countries to improve knowledge and data sharing outcomes:** The FVEY community – US, United Kingdom, Australia, New Zealand, and Canada – share stable democratic governments, common interests, and values, and have been a readily available during periods of contest or conflict to support the U.S. and allied nations. The recently signed AUKUS agreement is testimony to the strength of such partnerships and builds on a centuries-long relationship with Australia and the United Kingdom. Alignment with other global Allies—including members of the Quad, and G7 - allows the U.S. to take a strategic lead in sustainable trade, set benchmarks for data sharing and interoperability, while deploying key assets and infrastructure across major routes and in major shipping lanes across the world. This will lead to a general increase in the protection of all maritime participants, increase the safety and protection afforded to USVI and U.S.-flagged vessels, and projects soft power into areas of the world that may otherwise have been destabilized.

Specific Example: The COPE° Revitalization Plan is directly aligned with the five strategic pillars of the FVEY (Five Country Ministerial) “Border of the Future 2030 Strategy.” The Strategic Pillars in that strategy include recommendations for secure cargo management, authentication, identification, and data sharing, features that have been intentionally incorporated into the solutions at the core of the COPE° Revitalization Plan.

3. **Engage with the IMO to improve international relations:** The global shipping regulator, London-based International Maritime Organization, requires a more focused and robust engagement from the United States and like-minded partners to engender the real reform that is needed in the shipping industry. Leadership at NMI have participated and attended most committee and subcommittee meetings at IMO since 1996 and has an extremely keen awareness of the positive and negative goings on at IMO and how the organization functions in real time.

The IMO plays a critical role in coordinating the activities of member states and has an implicit mandate to set standards for international ship management, safety, and pollution. Stronger representation at the IMO will ensure that U.S. interests are protected, and lead to greater transformational change with standards, sustainability, and the enforcement of the IMO’s mandates.

Specific Example: NMI will continue its proud history of representation at the IMO as the COPE° Revitalization Plan progresses. Representatives from NMI have participated and influenced policy decisions at the IMO for the last 20 years. It is critical for this work to continue, and for all decision makers in the global maritime community to come together for collaborative discussion and debate.

International partnerships are foundational to the success of the COPE^o Revitalization Plan. Detailed engagements with key partners in Australia and Singapore have already begun and will continue as each stage of the project unfolds.

Objectives:

- Seek further participation from the DoT, USCG, other components of DHS, Department of State, DoD, DoC, and other agencies to collaborate on serious maritime issues and interests
- Develop coherent and relevant goals to establish the expectations of the maritime industry for the next half century
- The U.S. can re-establish itself as a global maritime leader, and advocate for strategic changes and improvements in the global maritime community
- Develop a specific set of measurement and assessment tools to drive coherent policy

Key Benefits:

- A more unified global maritime community creates harmonious and synchronized changes needed to adapt to the challenges of today and the difficulties of tomorrow
- Influence change through the U.S. maritime industry, setting an example for the international community to follow suit
- Increase interagency collaboration by engaging with DHS and other local stakeholders
- Drive more collaborative opportunities and outcomes with FVEY, G7 and Quad communities

Spotlight: Collaboration yields advances in emissions and propulsion

Global shipping volume (in TEU's) is expected to triple by 2050, highlighting a concern in the use of fossil fuels in the maritime industry to meet these escalating demands. The industry needs a viable alternative fuel type and to invest in new methods of propulsion to power the vessels of today, and those that will be constructed in the future. A sincere effort to create a plan or test minimum viable products (MVPs) in the supply chain is yet to be seen. The U.S. has an opportunity to seed new innovations and translate science-on-the-shelf into new commercial solutions.

At present, many companies are building small-scale solutions, but harboring data about those solutions in private forums; this increases opaqueness in the sector. There is an opportunity for the U.S. government to front-run these activities by trialing new innovations in a nimble fashion. In parallel, open data sharing should be encouraged, to maintain a collaborative environment and to assist with transparency on critical matters like technological impact, emissions reductions, and personnel safety. This approach will help build the most efficient and environmentally sustainable shipping vessels and maritime infrastructure in the world.

Interagency and international collaboration is critical for the success of these initiatives. The success of vessels such as the Yara Birkeland (FIGURE 8) was only possible through the involvement and co-ordination of government regulators, industry partners, and transportation and maritime agencies. The USG can coordinate such activities with all relevant stakeholders to produce vessels that exceed the capabilities of the Birkeland. When deployed, such a vessel would radically transform, and dramatically reduce the environmental impact of cargo movements that occur on America's marine highways.



Figure 8 - The Yara Birkeland, a fully autonomous electric container barge, is deployed in Norway, November 2021. Such vessels provide clean propulsion and are aided by the latest and most advanced methods for navigation. Source: Engadget

Action Item 6: Establish and Implement Green Shipping Strategy

Establish a National Maritime Sustainability Strategy including Green Maritime Highways and a Green Shipping Certification Program for USVI-Flagged Vessels, with requirements and benchmarks for environmentally sustainable construction, operation, management, and planning

To address climate change, the shipping industry must decarbonize. On current trajectory, shipping could triple its carbon dioxide emissions within the next thirty years, with little chance of enforcement given the fragmented nature of the international regulatory environment. Global shipping opted out of the Paris Agreement and has since moved toward weak industry self-regulation. This has not produced meaningful results over the last ten years.

If shipping is to decarbonize, the U.S. and industry needs to rapidly invest in low carbon shipping technology as Europe and the People's Republic of China have been doing. The U.S. is falling behind globally, despite having some of the world's best technical universities and national research laboratories that can lead on smart maritime clean technologies (e.g., MIT, Princeton, Stanford, Berkeley, for universities). The U.S. can also take a pioneering role in the research and development of new fuel types that are devoid of aromatics and low in particulates such as carbon black.

The U.S. and EU have attempted to set stricter environmental standards, but the U.S. is hampered by not having a flag state regulator or top 10 shipping line through which to enforce these agreements. Oversight at the flag level and establishing a leading international U.S. shipping line, would allow the U.S. to procure or build carbon-neutral ships.

In recognition of the U.S.'s renewed commitment to addressing climate change as evidenced by recent progress at COP26, creation of a National Maritime Sustainability Strategy provides a clear framework to deliver positive environmental outcomes across the U.S. maritime industry, while demonstrating global leadership on green initiatives; job creation, innovative technologies, and providing new avenues for scientific research and academic collaboration.

The following Sustainability Strategy initiatives complement this Revitalization Plan and are aligned with the key objectives of the DOT National Maritime Strategy:

1. **Green Maritime Highways:** Identify priority Green Maritime Hotspots to channel federal funding to electrify ports, ferries, and transportation. This could include the San Francisco Bay Area, San Diego, New York ports where significant traffic can be taken off roads and placed on sustainable and short sea shipping routes.

2. **Green Shipping Certification Program for USVI-Flagged Vessels:** Rigorous environmental / sustainability standards can be applied to new-build vessels as they are on-boarded into the USVI-Flag. These standards can encourage immediate action but will also take a realistic approach as some of these changes will need to be completed over time. The goal of a Green Shipping Certification program is to ensure that all USVI-Flagged vessels have a plan to address the most serious environmental / sustainability problems within their fleet and can demonstrate measurable progress in reducing the impact of their vessels and operations over defined periods of time.
3. **Shipping emission disclosures by all major retailers:** Retailers do not currently disclose their shipping emissions. This will be a huge factor in ensuring such retailers procure shipping from the most responsible and ethical transporters; there is a growing appetite from consumers for such data, as witnessed in the rise of public ESG reporting, and the increased frequency of ethical transportation activism. Digital and LEO/GEO satellite technology means that such disclosures can be established very rapidly, at low cost and can be run along the same lines as the TCFD (Taskforce on Climate-Related Financial Disclosures).
4. **Mitigation of Sargassum Patch and Great Pacific Garbage Patch:** A vast mat of brown *Sargassum* algae extends all the way across the Atlantic Ocean stretching 5,500 miles (8,850 kilometers) from West Africa to the Gulf of Mexico. It has become evident that this patch acts as a heat synthesizer and a disruptor of surficial currents; it may even be disrupting the Gulf Stream. The mitigation of Sargassum Algae is possibly the single greatest opportunity for the slowing and possible reversal of climate change if technologies can be expanded for the harvest and utilization of the algae. Likewise, the Great Pacific Garbage Patch poses similar problems in the Pacific Ocean, but with the compounding problem of plastics and micro-plastic pollution affecting marine flora and fauna.

Objectives:

- Create a National Maritime Sustainability Strategy.
- Create a Green Maritime Highway for priority infrastructure funding.
- Establish a Green Shipping Certification Program under USVI to incentivize the creation of greener tonnage, U.S. financing and investment in reducing environmental impact of shipping.
- Identify and map carbon emissions from the shipping industry

Key Benefits:

- Reduces carbon output of shipping industry by tonnage.
- Encourages investment in more environmentally sustainable practices and technologies.
- Develop a greener U.S. maritime fleet.
- Pioneer new accountability metrics for a wide range of retail and consumer industries.
- Create innovative sustainability projects such as modernizing fuel types, and decarbonizing Port operations
- Solidifies the U.S. as a world leader in green (and sustainability) initiatives
- Create a focused, scientific, and pragmatic approach to counter global problems such as ocean pollution and climate change

Spotlight: Improving environmental outcomes in maritime infrastructure environments

Investments in green maritime infrastructure, alternative fuels, electrification of ports and intermodal segments, and short sea shipping will vastly reduce the pollution impact of shipping and ports. Studies have revealed that while ports add enormous benefits to local economies, they can also be a contributor to adverse health effects on the populations living near them.

Additionally, given that shipping is more efficient than all other methods of transport, increased short sea shipping routes will lead to less pollution and less damage to land-based infrastructure, as loaded trucks contribute greatly to the decay of roads and highways.

Moreover, improving opportunities to capture carbon near high activity coastal environments would improve water qualities and mitigate adverse effects. This can be achieved through aquaculture methodologies in mixed-use environments including around critical maritime infrastructure. New studies have shown that aquaculture can coexist within port, marina, and offshore energy areas, and should be a serious consideration when making investments in sustainable ports, and green maritime infrastructure.

NMI's Center for Ocean Policy and Economics is a conduit for change, and has a proven track record of policy, education and job creation while maintaining commercial sustainability. NMI recently conducted work in Restorative Aquaculture with the assistance of global leaders in this field that included scientists, engineers, and technologists from the U.S. National Oceanic and Atmospheric Administration (NOAA); Woods Hole Oceanographic Institute; Duke University Marine Labs; University of North Carolina Institute for the Environment; Roger Williams University, and other contributors. This is one of many examples where NMI has demonstrated leadership in collaboratively solving complicated problems.

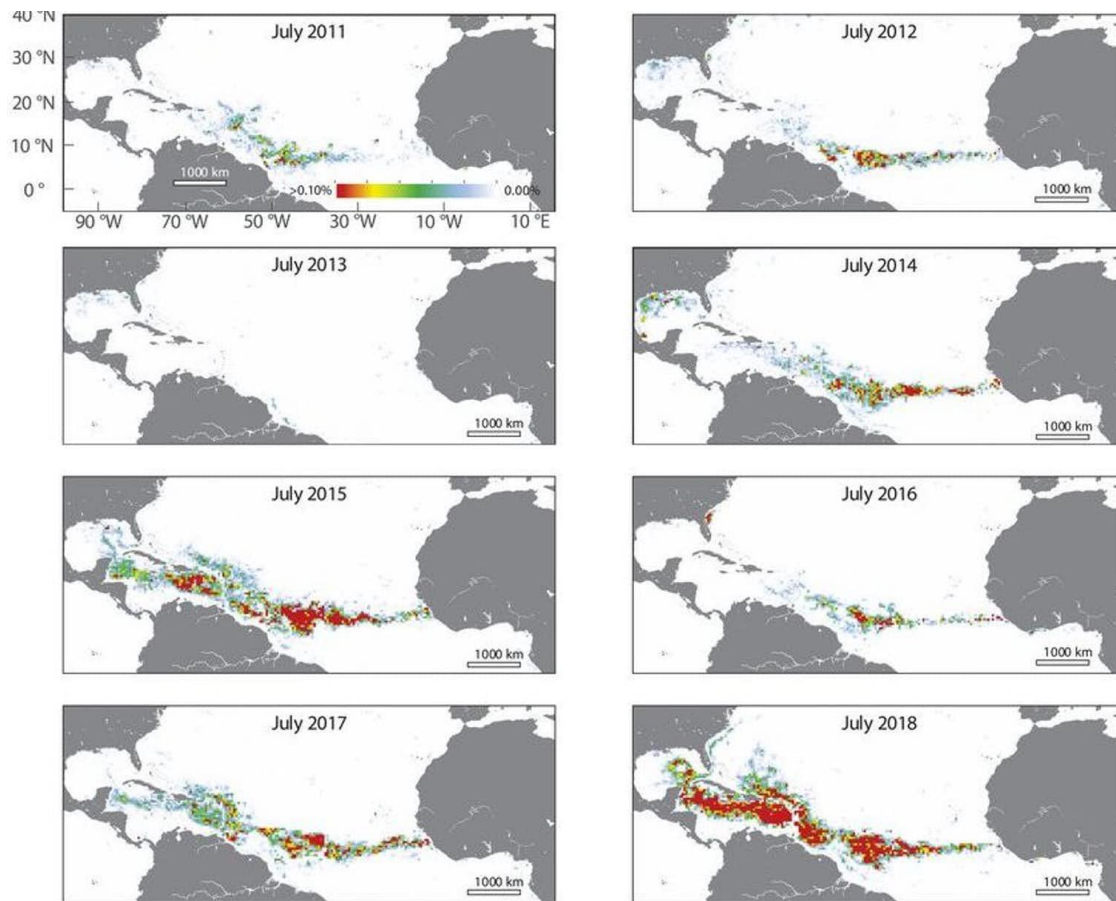


Figure 9 - NASA satellites reveal the largest marine algae bloom in the world, belt of sargassum that contains over 22 million tons of seaweed stretched some 5,500 miles across the Atlantic to West Africa.

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