GREAT LAKES ST. LAWRENCE RIVER SYSTEM SHIPBUILDING AND REPAIR CAPABILITIES

Strategic Recommendations

June 2026

MICHIGAN ENGINEERING
NAVAL ARCHITECTURE & MARINE ENGINEERING
UNIVERSITY OF MICHIGAN

Samuel Hankinson and Thomas McKenney

Contents

Executive Summary

The Conference of Great Lakes-St. Lawrence Governors and Premiers commissioned the University of Michigan's Naval Architecture and Marine Engineering department to assess shipbuilding and repair capabilities across the Great Lakes-St. Lawrence River System (GLSLS). This report synthesizes Phase 1 findings with subsequent analyses of relevant vessels, shipyard capacity and new site selection, and the regional marine supply chain, and translates those findings into strategic recommendations for the region.

The report's central finding is that the GLSLS can play a much larger role in North American shipbuilding, repair, and maritime innovation than it does today, and that many of the constraints commonly attributed to the region are perceived rather than genuine. Compared with the East, West, and Gulf coasts, current activity remains far below what the region could support. The core challenge is not a lack of capability, but underutilization of existing assets: Active and underutilized shipyards, Brownfield and Greenfield waterfront sites, a broad supplier base, strong engineering and skilled-trades talent, and a growing maritime technology ecosystem.

The analyses validate five investment pathways first identified in Phase 1: maritime technology R&D and commercialization, marine supply chain growth and supplier conversion, unmanned surface vessel production, distributed ship production for coastal assembly, and construction and repair of Seaway-max and frigate-sized vessels. These pathways should be understood through a regional lens that treats the binational corridor, rather than any single State or Province, as the unit of competitive advantage. For that reason, the report argues that the region should first market itself collectively and act as a pre-competitive industrial bloc before encouraging intra-regional competition.

The opportunity is substantial. The vessel analysis found that 46% of the 668 naval vessels assessed fit within Seaway limits, along with 97% of the 568 Coast Guard and Army vessels assessed and 57% of the 67,438 commercial vessels reviewed. The shipyard study identified 44 shipbuilding and repair sites across the 10 States and Provinces studied (17 Active sites, 6 Brownfield sites, and 21 Greenfield clusters) while the supplier analysis documented more than 12,000 supplier locations across the region. Together, these studies provide a documented inventory of what the GLSLS can build, what it can supply, and where shipbuilding and repair can occur.

The clearest opportunities build on assets already in place. The region can strengthen existing shipbuilding capability and co-locate new capacity where vessels, suppliers, and viable land converge, publish a compact Greenfield shipyard framework for waterfront communities, build a more integrated binational supply chain, repatriate conversion and repurposing work that has shifted overseas, market regional capacity to foreign-flag operators renewing Great Lakes-sized tonnage abroad, and use smart-vessel technologies and regulated autonomy pilots to improve existing operations while proving future routes and demand.

The report recommends organizing these opportunities through maritime industrial clusters that connect shipyards, suppliers, workforce assets, and technology institutions across jurisdictions. In the United States, Maritime Prosperity Zone concepts can provide part of this structure, while parallel mechanisms can be formalized in Canada. Near-term priorities include establishing a Maritime Industrial Base Task Force, converting the supplier inventory into a living binational platform, defining priority clusters, and launching visible pilot projects in autonomy, smart-vessel systems, and distributed production.

The analyses confirm that the GLSLS already possesses the core assets required to become a more important North American maritime industrial corridor, and that targeted, coordinated investment can translate those assets into durable regional prosperity and a more resilient continental maritime base.

Introduction

As part of the Great Lakes St. Lawrence Governors and Premiers (GSGP)-funded Great Lakes St. Lawrence River System (GLSLS) Shipbuilding and Repair Capabilities project, the University of Michigan's Naval Architecture and Marine Engineering research team conducted a series of analyses to assess what the region can build and repair, where these activities can occur, and which national and binational trends create opportunity. This document consolidates those findings into a set of actionable regional recommendations.

The report begins by revisiting the project's Phase 1 findings on competitive positioning and early action priorities, including five investment pathways, and confirms that each is supported by subsequent analysis. It then summarizes three supporting studies (Relevant Vessels, Shipyard Inventory and Site Selection, and Suppliers) and distills the insights most relevant to regional strategy. Finally, the report presents recommendations organized around the five pathways, framed through a regional lens, and concludes with a set of priority actions for regional stakeholders.

Competitive Insights and Early Action Priorities

The Phase 1 report, *Competitive Insights and Early Action Priorities* (February 2026), established the baseline argument: the GLSLS shipbuilding and repair sector is positioned to play a more central role in North American maritime strategy than it currently does, and many of the constraints commonly attributed to the region are perceived rather than genuine. Taken together, the evidence points to a strategically significant industrial corridor with substantial but underutilized shipbuilding, repair, supplier, workforce, and innovation capacity that can be aligned more deliberately with evolving U.S. and Canadian defense, commercial, Arctic, and decarbonization priorities.

More specifically, the analysis identifies a combination of underutilized shipyard infrastructure, a dense network of maritime and adjacent-sector suppliers, a deep engineering and skilled-trades workforce, and a growing maritime technology ecosystem across the region. It also concludes that while Seaway dimensions, lock access, and seasonal closures are real operating conditions, these constraints do not preclude the region from supporting targeted shipbuilding, repair, modular production, technology development, and specialized vessel programs.

The findings further suggest that this opportunity is reinforced by a favorable policy and market environment shaped by naval and coast guard recapitalization, Arctic and icebreaking demand, commercial fleet renewal, and maritime decarbonization pressures in both the United States and Canada. National policy initiatives, including the U.S. Maritime Dominance Executive Order and its Maritime Action Plan, including Maritime Prosperity Zones (MPZs), the SHIPS for America Act, U.S. Section 301 investigation into China's unfair trade practices, Canada's National Shipbuilding Strategy, and the Icebreaker Collaboration Effort **(**ICE Pact) are levers the region can leverage. On that basis, five strategic investment pathways emerge as the most promising framework for translating regional strengths into practical investment priorities, industrial coordination, and subsequent analysis.

Maritime Prosperity Zones (MPZs) will be federally designated maritime regions that use Opportunity Zone-style tax and regulatory incentives to attract investment in shipbuilding, maritime manufacturing, ports, and workforce development. They function as focused hubs for maritime manufacturing, repair and overhaul, workforce training in advanced marine technologies, and strengthened commercial-defense supply chains, with zones selected for their strategic location, skilled workforce, innovation ecosystem, supply chain strength, and overall capacity to enhance U.S. maritime competitiveness.

The **ICE Pact** is a trilateral partnership among the United States, Canada, and Finland to recapitalize aging icebreaker fleets by pooling design, construction, and workforce expertise across their shipbuilding bases. First announced in 2024, it was formalized through a memorandum of understanding in November 2024 and reinforced by a Joint Statement of Intent in November 2025, setting a multi-year framework for cooperation. The Pact already runs through the GLSLS: Chantier Davie, a key shipyard in Québec, has acquired Finland's Helsinki Shipyard and a Texas yard it is developing as an "American icebreaker factory," while the U.S. Coast Guard's Arctic Security Cutter program is drawing on designs from Davie-Helsinki and Seaspan-Aker teams. In this sense, the ICE Pact begins to realize the posture this report recommends (i.e., treating GLSLS yards as integrated nodes in binational and allied programs) but it is only a first step. Future tranches must more deliberately route icebreaker construction and major module work into GLSLS shipyards, so the region becomes a primary build center, not just a design or ownership hub.

Davie Defense Arctic Security Cutter

Five Strategic Investment Pathways

Phase 1 concluded with the definition of five strategic investment pathways. These pathways structure the final strategic recommendations of this report. They are restated here (Table 1) and have been validated by the three subsequent supporting studies.

Table 1: Five strategic investment pathways

#	Investment pathway	Brief description
1	Maritime technology R&D and commercialization	Positioning the GLSLS as a testbed and commercialization hub for autonomy, advanced energy and propulsion, and Arctic-capable systems
2	Marine supply chain growth and supplier conversion	Scaling existing marine suppliers and converting adjacent manufacturers (automotive, aerospace, energy) into qualified marine and naval suppliers
3	Unmanned surface vessel (USV) production	Building on the region's concentration of small- and medium-craft yards to produce USVs and related support craft
4	Distributed ship production for coastal assembly	Sections and modules for coastal assembly, fabricating hull sections and complex modules in the region for barge transit to coastal yards for final integration
5	Construction and repair of Seaway-max and frigate-sized vessels	Full construction and lifecycle repair of vessels within the Seaway-max envelope, including frigate-sized combatants, icebreakers, auxiliaries, and specialized commercial craft

The investment pathways were derived by mapping the GLSLS region's demonstrated capabilities and constraints against emerging U.S. and Canadian maritime needs, with an explicit focus on scaling existing assets rather than building from scratch. They leverage the region's dense industrial and Navy-relevant supplier base, deep engineering and skilled-trades workforce, research universities, test ranges, and large-vessel shipyard, and concentrate investment in areas where modest, targeted upgrades are likely to unlock disproportionately high impact in national shipbuilding capacity, innovation, and fleet readiness.

Vessels suited to GLSLS shipbuilding and repair

The Relevant Vessel Analysis assessed what can realistically be built or repaired within the Seaway's governing dimensions of 740 feet in length, 78 feet in beam, and 26.5 feet in draft, which apply to vessels transiting through the Seaway locks into the upper Great Lakes and do not constrain shipyards located seaward of the lock system in Québec. Its central finding is that the GLSLS faces two opportunities simultaneously: a new near-term opportunity to build, assemble, and repair defense and oceangoing commercial vessels for export to other U.S. and Canadian regions, and a longer-horizon regional renewal opportunity tied to changing commercial cargo patterns, especially the decline of traditional bulk trades and the rise of containerization. The export-oriented defense and shipbuilding opportunity is identified as the more consequential near-term pathway.

Vessel fit studies show that:

- 46% of the 668 naval vessels assessed fit within the system,
- 97% of the 568 Coast Guard and Army vessels fit, and
- 57% of 67,438 global commercial vessels fall within Seaway limits, including containerships up to about 1,700 TEUs and tankers up to around 17,800 DWT.

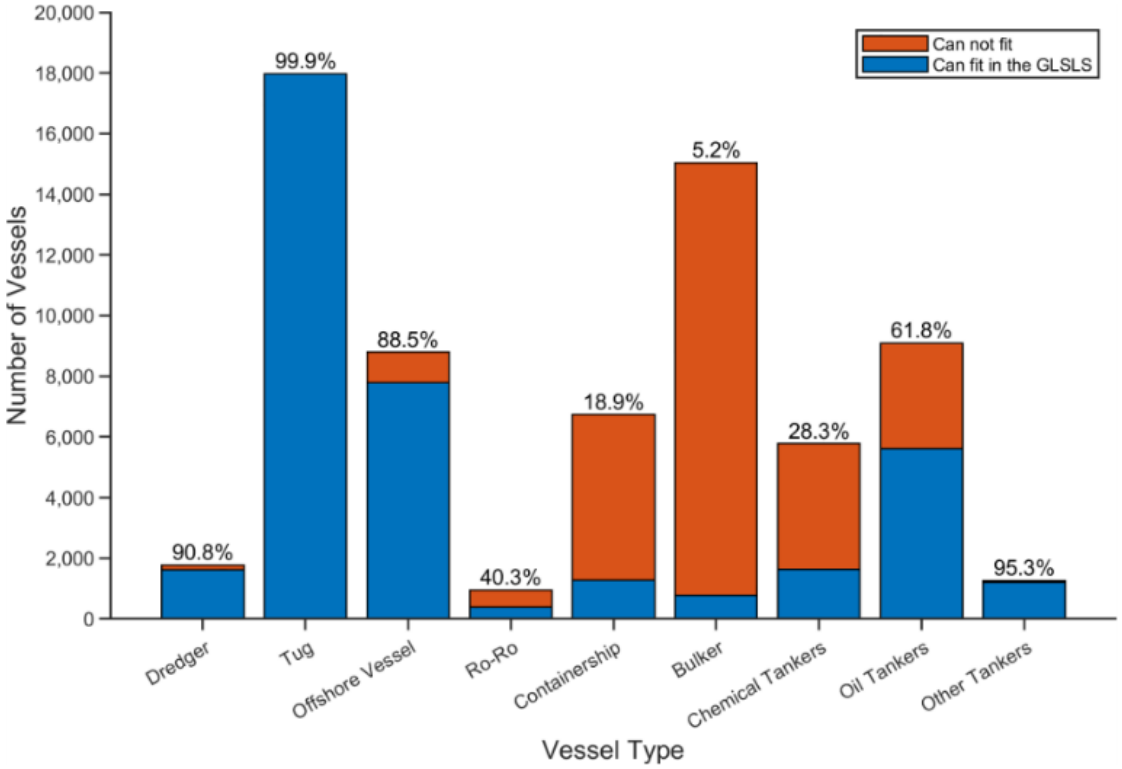


Figure 1: Suitable types of commercial vessels

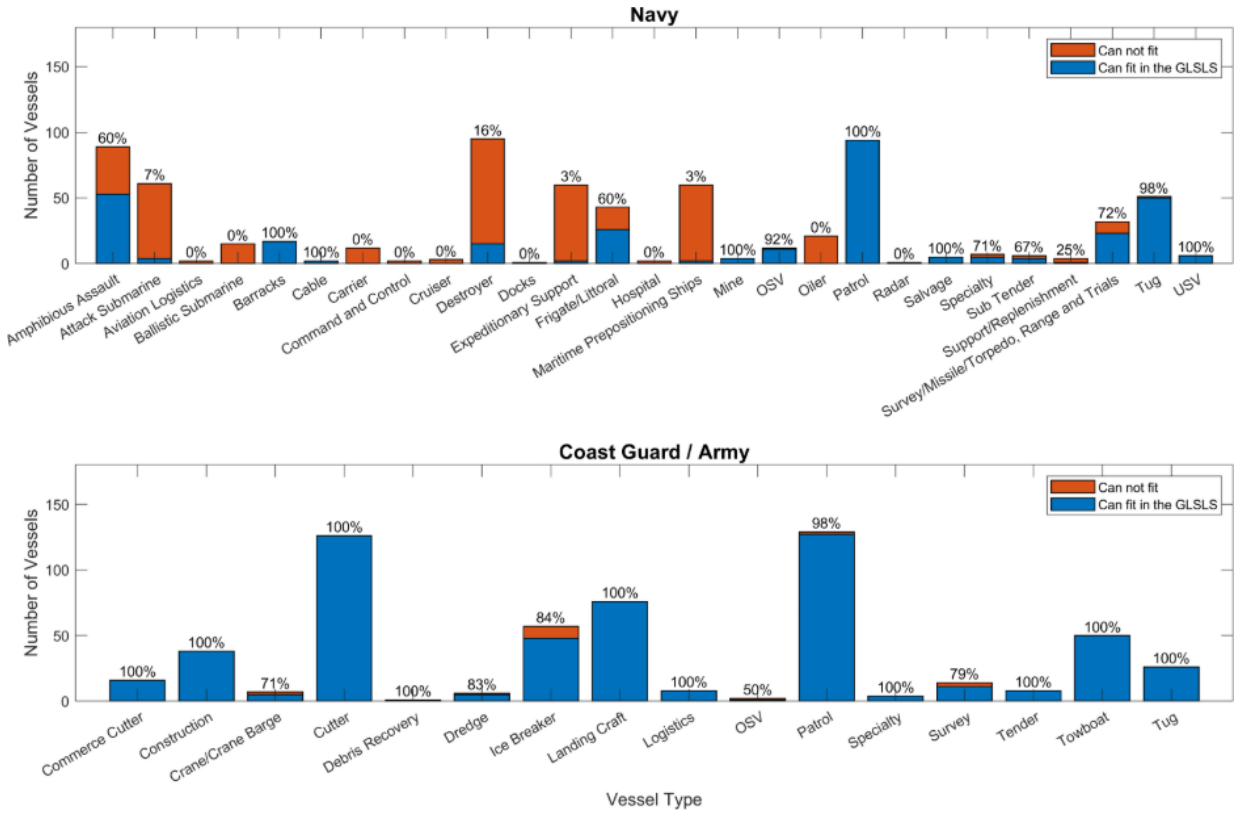


Figure 2: Suitable types of Army, Navy, and Coast Guard vessels

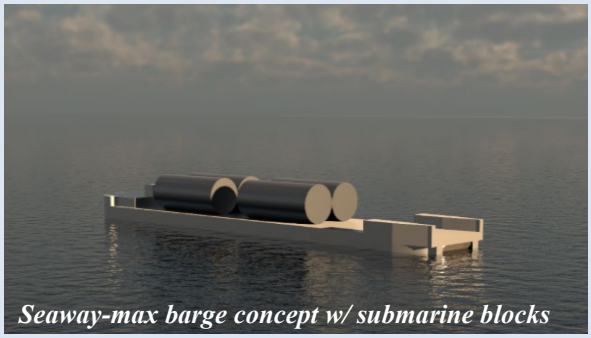
Four focused technical studies deepen this picture:

- **Heavy-lift barge concept:** A self-propelled, self-ballasting Seaway-max heavy-lift barge (433.2 ft × 78 ft), modeled on General Dynamics Electric Boat's Holland barge, can carry four Virginia-class Virginia Payload Module (VPM) sections or three Arleigh Burke-class destroyer hull blocks, directly enabling distributed and modular production consistent with Investment Pathway 4. This concept builds on practices already in use in the region, where Fincantieri Bay Shipbuilding fabricates large hull sections in Sturgeon Bay and ships them by barge across Lake Michigan to Marinette Marine for final assembly.
- **Submarine buoyancy assist feasibility:** An assisted-buoyancy transit carrier concept is viable for Virginia-, Seawolf-, and Los Angeles-class submarines, enabling their passage within Seaway draft limits, but beam is the controlling constraint, so Ohio-class and likely Columbia-class submarines cannot meet draft requirements within the system's fixed width. All current and proposed Canadian submarine classes can transit the system unassisted.
- **Destroyer feasibility:** Arleigh Burke-class destroyers exceed Seaway draft and air-draft limits at full load, but at lightship the estimated draft falls just within the 26.5-foot limit. The air-draft issue could potentially be managed through mast removal (mirroring the Constellation-class approach), but official naval data are required to confirm feasibility and operational practicality of large destroyers from being built and/or repaired in the region.

A brief evaluation of a potential **alternative route to the Gulf Coast** from Lake Michigan to the Mississippi and Gulf via the Illinois Waterway. The Waterway is a 9-foot-deep, lock-controlled barge corridor with a shallow draft and very low fixed-bridge clearances, making it unsuitable for large ship blocks. Instead, it could be best utilized for smaller modules, lighter components, or specialized barge moves between Great Lakes and Gulf Coast facilities.

A Seaway-max heavy-lift barge concept, combined with existing barge operations for submarine and ship blocks, demonstrates that distributed, modular ship production is feasible in the region.

Holland barge (General Dynamics)



Seaway-max barge concept w/ submarine blocks

On the commercial side, the analysis finds that **fleet renewal** in the U.S. and Canadian Great Lakes trades remains highly episodic, triggered by cargo-owner-anchored contracts and life-extension strategies rather than coordinated system-wide recapitalization. Great Lakes demand for Seaway-capable tonnage is increasingly being met by overseas shipyards, with the region generating the cargo but capturing virtually none of the shipbuilding value. **Containerization** emerges as the clearest pathway to new and sustained commercial demand, but progress is gated by port infrastructure investment and regulatory hurdles such as SAFE Port Act radiation-screening requirements in the United States and CBSA sufferance-warehouse and port-of-entry designations in Canada. Overall, the study concludes that the export and defense-oriented opportunity is the more consequential near-term avenue for leveraging GLSLS shipbuilding and repair capacity, while commercial fleet renewal tied to containerization and shifting bulk flows represents a slower-moving but strategically important long-term play.

Shipyard Inventory and Site Selection

The Shipyard Inventory and Site Selection study developed the first public inventory of shipbuilding and repair sites along the binational GLSLS shoreline, using a five-step, data-driven methodology to identify, classify, and assess candidate locations. In this framework, **Active** sites are locations where shipbuilding or repair is currently underway, **Brownfield** sites are locations that previously hosted shipbuilding or repair but are now inactive, and **Greenfield** sites are physically suitable locations that have not yet hosted shipbuilding activity. See Figure 3 for an overview of the framework.

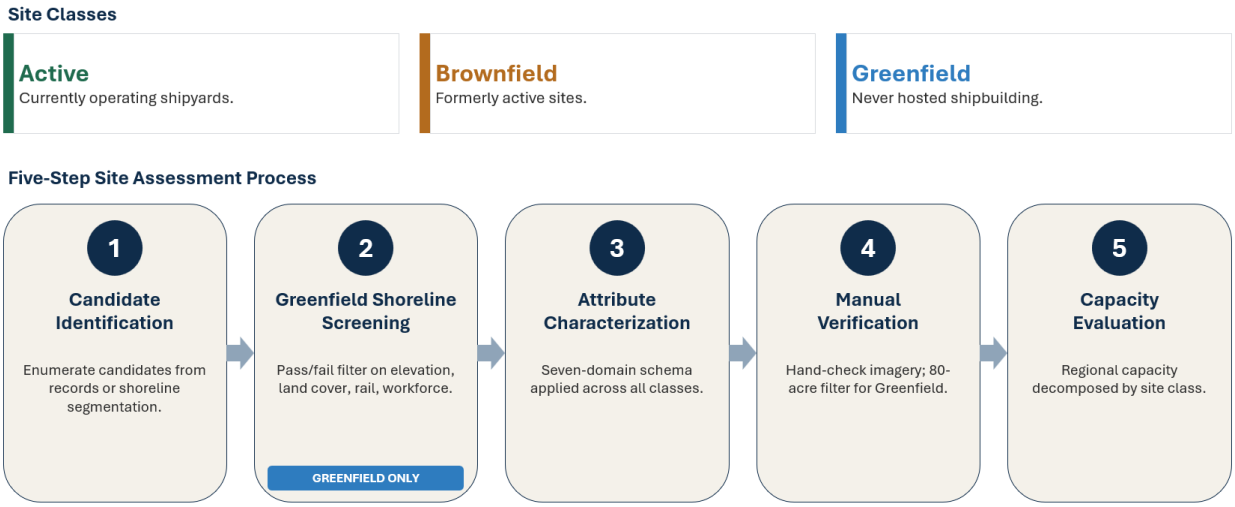


Figure 3: Shipyard inventory and site selection framework applied to the three site classes

For Greenfield projections, the study adopts Irving Shipbuilding's Halifax Shipyard as the representative template, reflecting an outfit-optimized, climate-controlled, parallel-shop "block microfactory" strategy that aligns with GLSLS demand for low-volume, high-complexity, outfit-dominated naval and complex commercial work (see sidebar). An 80-acre minimum area filter and a Seaway-max vessel envelope govern Greenfield viability; however, certain outer-Seaway sites in Québec are not lock-constrained and can accommodate larger vessels. Applying this framework across the region produces a first-of-its-kind inventory and aggregated capacity estimate, answering not only what can be built or repaired in the GLSLS, but also where and at what indicative annual throughput.

The GLSLS inventory identifies 44 shipbuilding and repair sites across the 10 States and Provinces (17 Active, 6 Brownfield, and 21 Greenfield clusters), all characterized with a common five-step framework. Active shipyards report room to increase annual output beyond current levels, offering immediate capacity growth without adding new sites, while Brownfield locations retain core shipyard infrastructure that can support lower-cost restoration of large-vessel construction and repair capability in places where industrial ecosystems remain. Greenfield opportunities are widely distributed throughout the region, and the main constraints on their development are workforce depth and capital investment, rather than a shortage of suitable land, indicating that the GLSLS can sustain a significantly larger, more distributed shipbuilding and repair footprint than it currently has.

Table 2 and Figure 4 provide a breakdown of site classes within each State and Province, as well as a regional overview of the shipbuilding and repairs.

The **Ship Block Microfactory and Integration Yard** manufacturing strategy is the best fit for the GLSLS region because it aligns with the low-volume, high-complexity, outfit-dominated work that U.S. and Canadian naval and advanced commercial programs demand. In practice, this strategy is exemplified by Irving Shipbuilding's Halifax Shipyard, which organizes production around enclosed, climate-controlled construction halls where a high fraction of systems integration and outfitting is completed on each block before it leaves the shop floor, creating an "outfit-optimized block microfactory" architecture tailored to complex, change-tolerant projects. Halifax also demonstrates that this approach is not theoretical for North America: similar enclosed integration-hall concepts are already operating at U.S. yards such as Fincantieri Marinette Marine.

This manufacturing strategy pairs naturally with distributed production by having GLSLS yards build highly outfitted hull sections and complex modules under cover, then barge them to coastal yards for final integration and trials. The same architecture also supports full construction and lifecycle repair of Seawaymax and frigate-sized vessels (including combatants, icebreakers, auxiliaries, and specialized commercial vessels) within the Seaway's physical constraints.

Irving Shipbuilding's Halifax Shipyard

Table 2: Shipbuilding and repair site breakdown by State/Province

State / Province	Country	Active Sites	Brownfield Sites	Greenfield Site Clusters	Total
Ontario	Canada	5	0	4	9
Québec	Canada	4	1	2	7
Illinois	USA	0	1	1	2
Indiana	USA	0	0	1	1
Michigan	USA	1	3	7	11
Minnesota	USA	0	0	1	1
New York	USA	0	1	2	3
Ohio	USA	3	0	1	4
Pennsylvania	USA	1	0	1	2
Wisconsin	USA	3	0	1	4
TOTAL		**17**	**6**	**21**	**44**

Figure 4: GLSLS regional overview of shipbuilding and repair sites

Active GLSLS shipyards fall into four main roles (commercial newbuild, commercial repair, naval/Coast Guard newbuild, and naval/Coast Guard repair), with large-scale commercial repair being the most prevalent and heavily concentrated at Québec and Ontario facilities, supplemented by medium-scale repair yards and mobile repair teams that collectively sustain the laker and bulk carrier fleets. Large-scale naval and Coast Guard newbuild capability is concentrated at just two major yards, Davie in Québec and the Fincantieri facilities in Wisconsin, and the infrastructure profile of each active site (e.g., acreage, drydock type and size, crane capacity, and waterfront length) closely tracks its operational purpose, with

full Seaway-max hulls and heavy modules only feasible at a small subset of yards with large docks and high-capacity cranes. Capacity analysis shows that repair work is spread across many sites but is often below its potential, and that newbuild throughput for large vessels is limited to a handful of yards, most of which produce two or fewer ships per year. Confirmed newbuild contracts are concentrated at five facilities, while others focus on repair or actively pursue work, and surveyed shipyards report the ability to increase annual vessel production beyond current levels, indicating that the region's active infrastructure can support more output than current order books reflect. Table 3 provides an overview of the vessel orderbook of Active GLSLS sites.

Table 3: Vessel orderbook of Active GLSLS sites

Site	Naval / CG	Lakers / Bulk	Icebreakers	Ferries	Tugs	Barges	Offshore
Davie Shipbuilding	●		●	●			◐
ON Shipyards–Thunder Bay		–					
ON Shipyards–Hamilton	●	○		○	○		
ON Shipyards–Port Weller	◐	○	○	○	○	○	
Ocean Group–QC City	◐			○			
Ocean Group–Verreault	◐	○	○	○			◐
Donjon Shipbuilding		○			○	○	
Fincantieri Bay Shipbuilding	●	○		○	○	○	●
Fincantieri Marinette Marine	●						
Fraser Shipyards	◐	○		●	○	○	
Great Lakes Shipyard	○					○	
Ironhead Marine / Toledo		○		○	○	○	
Allied Marine & Industrial					○	○	
Navamar Ship Repair	○		○			○	
Toronto Dry Dock							
Nicholson Terminal & Dock						○	
H. Hansen Industries		○				○	
Legend							
● Active contract							
◐ Pursuing / Positioning							
○ Repair-only							
– Not disclosed							

A capacity evaluation concludes that meaningful shipbuilding and repair capacity exists across Active, Brownfield, and Greenfield sites in the GLSLS region. Active yards report unused headroom and, especially at larger sites over 80 acres, offer the fastest path to increased production, while smaller yards could expand through added acreage. Brownfield sites retain proven but idle infrastructure that, with reinvestment, could restore capacity more quickly than building entirely new yards. Greenfield land is available and well distributed, with the most practical approach being to cluster new micro-factory-style facilities near existing industrial activity. At a Halifax-equivalent rate of roughly one vessel per facility per year, the six Brownfield sites and 21 Greenfield clusters together represent a potential additional capacity of about 27 ships per year if fully developed.

Marine Supply Chain

The supplier analysis shows that the GLSLS region already has industrial depth and geographic coverage to support a competitive shipbuilding and repair industry, but this capacity must be better targeted, qualified for marine standards, and integrated with emerging demand and policy signals. The marine supplier inventory draws on five data sources (Submarine Industrial Base registry, Lloyd's Register, DNV, and two State directories) and organizes results into a three-tier taxonomy based on strategic importance to shipbuilding operations. Tier 1 encompasses core propulsion, mission-critical systems, and high-value equipment. Tier 2 covers important support systems and components. Tier 3 includes general materials and hardware. Drawing on five main data sources (Submarine Industrial Base registry, Lloyd's Register, DNV, and two State directories) and a three-tier taxonomy of strategic importance (**Tier 1**: core propulsion and mission-critical systems; **Tier 2**: key support systems and components; and **Tier 3**: general materials and hardware), the current inventory relies primarily on U.S. supplier data, with limited coverage for Ontario and Québec due to data availability. Even with limited Canadian data, it is objectively understood that Ontario and Québec are industrial and marine supply chain powerhouses.

Ontario and Québec are highlighted as marine supply chain powerhouses in an extract from the upcoming *State of Canada's Marine Industry Report*:

*"*In terms of marine supply chain capabilities for Ontario and Québec, initial custom tabulations informs us that Ontario ranks #1 in defence marine Naval Ships' Structural Elements, Platform Systems, Parts and Components (Excludes: Ship-borne Naval Mission Systems), and #2 in civil marine Ship-borne Software, Sensors, Electronics, Navigation Systems, and Equipment Control Systems and Components industrial activity out of 4 regions. Québec ranks #2 in civil marine Ships' Structural Elements and Platform Systems industrial activity out of 4 regions.*"*

Role of the supplier base: The analysis confirms over 12,000 supplier locations across the GLSLS region (see Figure 5), spanning propulsion, mission-critical systems, structural materials, fasteners, and electronics. Suppliers are widely distributed but cluster around established manufacturing centers, including Chicago, Detroit, Cleveland, Erie, Milwaukee, Toledo, and Buffalo. This breadth and concentration indicate that the main challenge is not creating new capacity but aligning existing capabilities and infrastructure with shipbuilding programs.

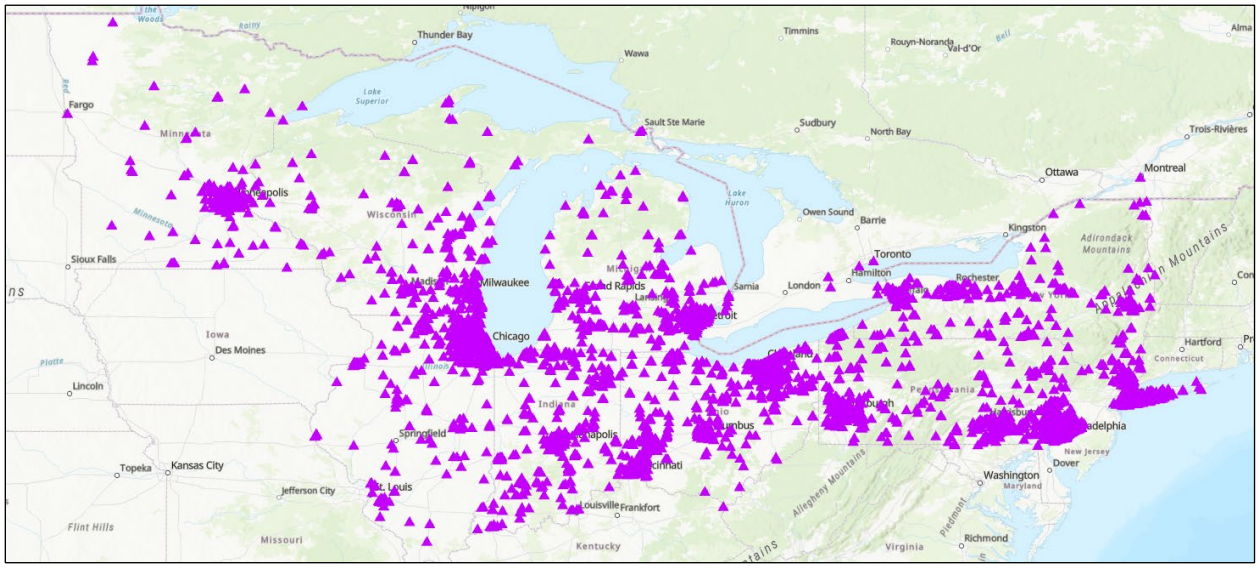


Figure 5: Tier 1 U.S. marine suppliers

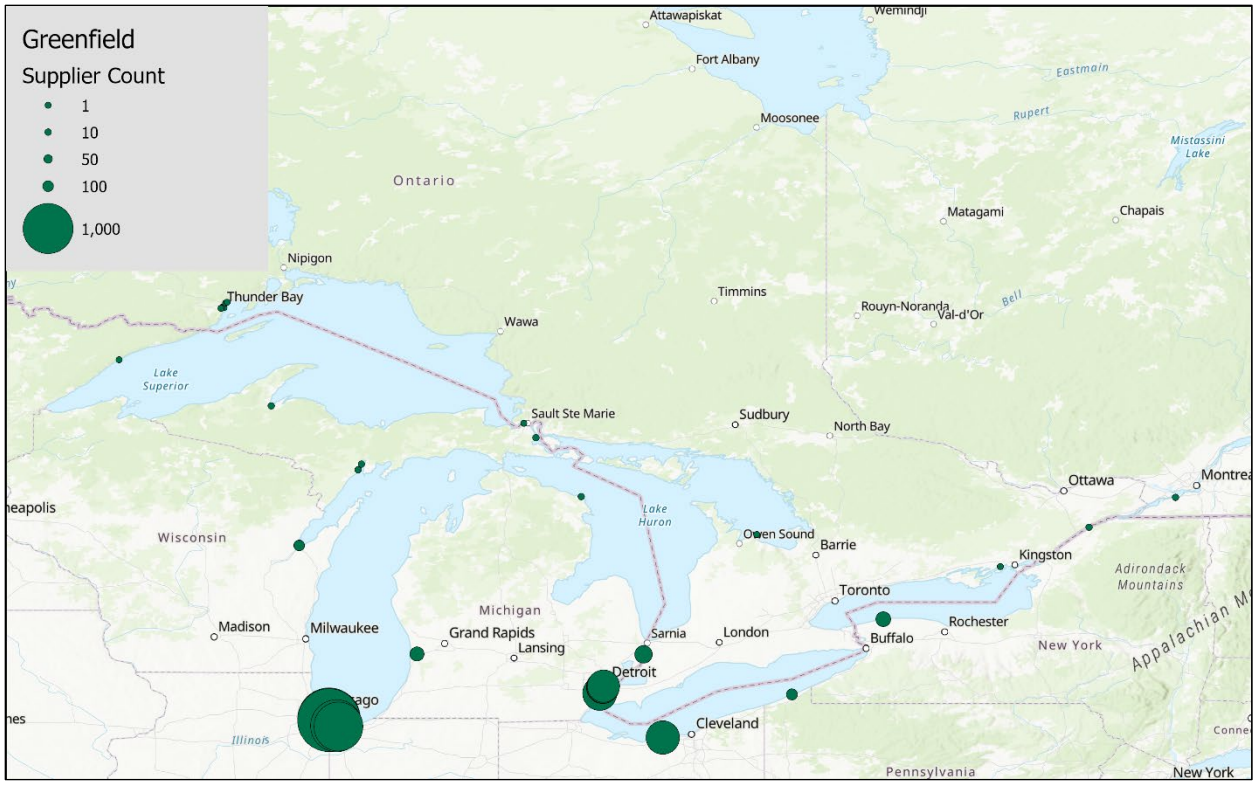


Figure 6: Distribution of U.S. marine suppliers within 50 miles of Greenfield sites

Geographic and sectoral strengths: State-level patterns show strong Tier 1 representation across Pennsylvania, Ohio, New York, Illinois, and other GLSLS states, suggesting a broadly similar industrial character and diversified shipbuilding-relevant capabilities in each jurisdiction. The data highlights especially dense clusters near potential sites (see Figure 6), including an underutilized concentration of suppliers around Chicago-Gary where no major shipyard currently operates. Computing hardware and electronics lead all product categories by volume, consistent with the region's strength in systems integration. Fasteners, fluids management, mechanical power transmission, and engines and engine accessories follow, collectively confirming that the region can support complex vessel construction and repair across the full product spectrum. Adjacent industries (automotive, aerospace, heavy manufacturing, electronics/defense, and industrial machinery) offer substantial transferable expertise in precision metalworking, systems integration, fluid systems, and advanced manufacturing that can either enter maritime supply chains or support scaling of existing marine suppliers.

The supplier analysis concludes that the GLSLS region's industrial base is already strong enough to support a competitive shipbuilding and repair industry, with the Great Lakes states hosting more U.S. Navy shipbuilding primes and suppliers than the Gulf Coast and West Coast combined, yet this national-scale asset remains underleveraged for marine production. Rather than building a new ecosystem from scratch, the strategic opportunity is to focus and upgrade existing clusters, backed by long-term vessel demand signals, domestic content policies, and targeted supplier qualification and modernization programs, so that this latent capacity becomes a resilient, marine-qualified supply chain. A dedicated Canada-U.S. supplier study to better capture Ontario and Québec data, coupled with a regional supplier data platform and structured engagement with adjacent industries, would help reveal the full binational depth of the industrial base, accelerate the transition of capable firms into maritime work, and reduce risk and time-to-market for new and expanded Great Lakes shipyards.

GLSLS Strategic Recommendations

Two principles frame the recommendations in this section.

Principle 1: Work together to build a strong regional maritime industrial base

The core challenge for GLSLS shipbuilding and repair is underutilization of an existing industrial base, not a lack of capability or capacity. The region should first act as a unified, pre-competitive bloc that jointly promotes GLSLS shipbuilding and repair potential, rather than encouraging States and Provinces to compete against one another too early. Current activity lags well behind what is possible relative to the East, West, and Gulf coasts, underscoring the need for coordinated messaging, shared marketing, and aligned advocacy among industry, communities, and elected officials.

Individual jurisdictions bring distinct strengths, but their decisive advantage lies in how they combine. Michigan's engineering and skilled-trades depth; production employment across Ohio, Pennsylvania, Illinois, Indiana, and Wisconsin; Ontario and Québec's trades base and operating yards; steel-producing ports such as Gary, Indiana Harbor, Burns Harbor, Hamilton, and Sault Ste. Marie; and cross-border industrial linkages all matter more together than apart. By building a strong regional maritime industrial base that can compete with the coasts, States, Provinces, and their companies all benefit. Each pathway that follows should therefore be read as a regional play: it names local strengths but resolves them into region-level action.

Principle 2: Develop maritime industrial clusters as the coordinating mechanism

Maritime industrial clusters provide a practical way to organize this regional approach and translate it into implementable action. In the United States, MPZs outlined in the Maritime Dominance Executive Order and its Maritime Action Plan can provide this structure, while a parallel framework can be formalized in Canada. The goal is not to constrain market-driven activity or exclude any part of the region, but to create a framework that aligns incentives, strengthens supplier participation, and connects coastal and inland capabilities through the GLSLS system.

At the regional level, leaders should advocate for multi-State, region-wide Maritime Prosperity designations that leverage adjacent Canadian industrial areas rather than isolated single-State zones. Those designations should be structured to interoperate with Canadian Provincial incentive programs in a manner consistent with the binational supply-chain posture that underpins all five investment pathways. The cluster framework should also be used to encourage long-term supplier commitments and to translate relevant capabilities from the automotive, aerospace, and defense sectors into shipbuilding and repair. Just as importantly, the region should present its partially developed infrastructure as a near-term advantage: the completed studies show that the core assets are already in place, including available waterfront acreage, supplier depth, and engineering talent. Existing and underutilized shipbuilding sites offer a lower-cost starting point than entirely new development, and targeted investment can turn them into productive anchors of a broader regional industrial base.

Sequencing recommendations and enablers

The next sections present the five strategic pathways, along with specific recommendations and actions associated with each. Subsequent sections propose a structured prioritization of recommendations and consolidate the cross-cutting policy reforms and enabling measures that support all pathways, rather than repeating them under each individual pathway.

Pathway 1: Maritime Technology R&D, Integration, and Commercialization

Pathway 1 builds on the region's existing strengths in research universities, naval and defense innovation programs, and a commercial fleet that already relies on winter layup and challenging operating conditions to test and refine new systems. The Great Lakes' inland geography and winter climate provide a uniquely controlled, lower-risk environment for Arctic-capable, ice-strengthened, and unmanned technologies that coastal test ranges cannot easily replicate. National initiatives such as the ICE Pact, U.S. Navy autonomy programs, and emerging zero-emission vessel efforts create a ready set of partners and demand signals for GLSLS technology pilots. On that basis, the recommendations below focus on near-term, applied technology programs that improve current commercial operations, prove out autonomy and alternative systems on defined routes, and link regional innovation assets directly to national and binational programs.

#	Recommendation
1.1	Prioritize "smart" upgrades to the existing regional fleet (e.g., digital twins, navigation and sensor suites, predictive maintenance, and ice and route monitoring) using structured pilots on routes with clear cargo demand so incumbent operators see immediate benefits
1.2	Systematically use Great Lakes winter conditions and inland geography as a controlled test range for ice-capable vessels, Arctic systems, and dual-use unmanned platforms
1.3	Establish binational IP and technology-transfer frameworks that tie GLSLS innovation assets directly into national programs such as the ICE Pact, the U.S. Navy's Medium USV Marketplace, and emerging autonomous and zero-emission vessel initiatives
1.4	Treat autonomy as a regulated, route-proving tool that works alongside the current fleet by outfitting existing hulls and barges with unmanned systems to de-risk new services, prove cargo demand, and build the confidence needed for long-term vessel and fleet investment

Pathway 2: Marine Supply Chain Growth and Supplier Conversion

Pathway 2 focuses on leveraging the GLSLS's broad industrial base to build a marine-qualified, binational supply chain that can reliably support naval and commercial programs. The analyses together show that the region already has the right mix of vessel opportunities, potential sites, and more than 12,000 supplier locations. The task is to connect them and lower barriers for adjacent industries to enter the maritime sector. The recommendations below emphasize scaling existing marine suppliers, converting automotive, aerospace, and clean-energy manufacturers, and using Brownfield and Greenfield sites, especially near steel-producing ports, as anchors for a more integrated "steel-to-hull" industrial corridor.

#	Recommendation
2.1	Scale existing marine suppliers and systematically convert adjacent precision fabrication, automotive, aerospace, and clean-energy manufacturers into qualified marine and naval vendors, recognizing that adjacent-industry conversion is where much of the regional upside lies
2.2	Site new shipbuilding and repair locations where relevant vessels, dense supplier clusters, and viable waterfront land intersect, with priority on steel-producing ports and heavy industrial corridors with deep-water access and skilled labor
2.3	Share the Greenfield "block microfactory plus integration yard" strategy with waterfront communities so they understand investor criteria, can self-assess and present their assets credibly, and can feed into a regional pipeline of candidate sites
2.4	Maintain a regional supplier database as a living, binational resource for shipyard procurement teams, government contracting officials, and economic-development agencies, and strengthen the binational supply chain by structuring U.S. and Canadian vessel programs to source components across the border where feasible and by expanding associated waterborne movement

Two regional examples show that the crosswalk from adjacent industries into maritime is already underway. In Detroit, propeller maker **Sharrow Marine** tapped the Michigan Central and Newlab ecosystem to adapt Ford's 3D sand-casting process, cutting production from 130 days to roughly two weeks. In Manitowoc, Wisconsin, on the site of a World War II submarine yard, Finnish crane builder **Konecranes** and its local partner Wisconsin Heavy Fabrication (formerly Broadwind, a wind-energy fabricator) assemble 140-ton portal jib cranes for the U.S. Navy that are too large for roads and travel by barge through the St. Lawrence Seaway to coastal shipyards.

Sharrow Marine Propeller

Konecranes 140-ton Cranes

Pathway 3: Small to Medium-Sized Unmanned Vessel Production

Pathway 3 builds on assets the region already has in place: a dense small-craft yard base in Wisconsin, Michigan, and Ontario, existing autonomy and unmanned testing activity on the Great Lakes, and early commercial wins that show leading autonomy firms already view the GLSLS as a viable production location. Federal experimentation through efforts like Silent Swarm on Lake Huron and regional initiatives such as the Smart Ships Coalition and Michigan Tech's Marine Autonomy Research Site demonstrate that the region can host, and safely regulate, uncrewed systems at scale. The recommendations below focus on turning these proof points into a coherent unmanned-vessel production cluster tied to specific cargo and security missions rather than stand-alone technology demonstrations.

#	Recommendation
3.1	Build around existing wins such as Saildrone's Spectre program at Fincantieri ACE Marine in Green Bay, positioning the region's distributed small-craft yards as the scaling solution for autonomy-first vessel developers
3.2	Establish a regional unmanned-vessel production cluster focused on cargo, freight, and defined routes by co-locating production yards, autonomy software firms, sensor integrators, and control-system providers across Wisconsin, Michigan, and Ontario, and by explicitly linking this cluster to ongoing research and test activity under Pathway 1
3.3	Pursue U.S. Navy, Coast Guard, and Department of Homeland Security pilots that specify GLSLS production and testing, leveraging the existing Silent Swarm framework and Lake Huron test range to anchor federal demand in the region
3.4	Pre-qualify Brownfield and Greenfield expansion sites adjacent to existing small-craft yards, using the Shipyard Inventory framework, so that as unmanned demand grows, new production capacity can be added quickly rather than starting from bare land

Fincantieri Marine Group has partnered with **Saildrone** to build Spectre, a 170-foot autonomous unmanned surface vessel (USV) designed for high-speed naval operations and submarine hunting. Fincantieri will manufacture the aluminum-hulled drones at its Wisconsin shipyards, with production beginning rapidly to hit initial sea trials by early 2027. Priced at roughly $40 million per unit, the 250-ton vessel will be built in two variants: a winged "Silent Endurance" version for ultra-quiet anti-submarine warfare, and a wingless "Stealth Strike" version optimized for low-profile sprint speeds up to 30 knots. Lockheed Martin is also collaborating on the project to integrate the vessel's advanced mission systems and payloads.

Saildrone's Spectre USV

Pathway 4: Distributed Ship Production

Pathway 4 leverages the fact that the GLSLS can fabricate large, high-complexity blocks and modules even when moving fully assembled warships through the Seaway is impractical. The GLSLS is arguably the best place to demonstrate and scale distributed ship production that draws on the region's full strengths and uses the Lakes and Seaway as its transportation backbone. The Seaway-max heavy-lift barge concept developed in the vessel analysis demonstrates that a purpose-sized carrier can move submarine and ship blocks within Seaway constraints, allowing GLSLS yards to act as block-fabrication nodes feeding coastal naval and commercial programs. The recommendations below focus on turning that technical feasibility into a repeatable distributed-production model, with standardized modular designs, barge logistics, and binational consortia linking multiple sites to East Coast assembly yards.

#	Recommendation
4.1	Use the validated Seaway-max heavy-lift barge concept to position the GLSLS as a block-fabrication hub for coastal naval programs, producing large pre-outfitted hull blocks and modules that move by barge to coastal yards for final assembly
4.2	Design and pilot modular reference architectures for frigates, auxiliaries, and ice-capable platforms that are optimized for Seaway-max block fabrication, with standardized barge-handling and logistics plans for transport to East Coast shipyards
4.3	Establish binational and interstate consortia to stand up a GLSLS distributed shipbuilding network, along with the build-out of the necessary design and knowledge backbone to make it successful

Pathway 5: Vessel Construction and Repair

Pathway 5 focuses on fully using and expanding the GLSLS yards that can already handle Seaway-max and frigate-sized vessels, positioning the region to build, home-base, and sustain complete ship classes rather than serving only as a repair backdrop. Vessel-fit analysis shows that frigate-sized combatants, icebreakers, auxiliaries, and specialized commercial craft all fall within Seaway limits, while the shipyard and supplier studies confirm that a handful of large, expansion-ready yards and a strong industrial base can support both new construction and lifecycle work. The recommendations below emphasize scaling these anchor yards, capturing full lifecycle value, and winning back conversion and newbuild work currently going overseas.

Chantier Davie, based in Québec, is Canada's largest shipyard and the third strategic partner in the National Shipbuilding Strategy, with at least 20 years and 8.5 billion CAD of national work programmed. Its current orderbook is dominated by government ice-capable vessels, including what is described as the world's largest heavy-icebreaker portfolio for the Canadian Coast Guard, including among them a six-ship Program Icebreaker fleet and the new Polar Max polar icebreaker now under construction following a 2025 award.

Canada's Polar Max Icebreaker

#	Recommendation
5.1	Focus near-term investment on expansion-ready yards such as Chantier Davie, Fraser, Fincantieri Marinette Marine, Fincantieri Bay Shipbuilding, and Donjon, as well as similar sites with underutilized land, proven workforces, and strong transport links, building on emerging collaborative frameworks among these yards
5.2	Develop concrete business cases to build and home-base selected naval, Coast Guard, and government-relevant commercial vessel classes within the GLSLS, prioritizing frigate-sized combatants, icebreakers, auxiliaries, and specialized craft
5.3	Position the region as the preferred location for the full vessel life cycle (new construction, repair, refit, mid-life renewal, and decommissioning), leveraging the shift toward scrap-fed electric arc furnace steel to support a more closed-loop maritime economy
5.4	Repatriate repurposing and conversion work that has migrated overseas by targeting forebody replacement, barge conversions, and major retrofits, including applications such as floating data centers that don't depend on new vessel programs or long national procurement cycles
5.5	Proactively market GLSLS yards to foreign-flag carriers renewing Great Lakes-capable fleets abroad, aiming to win even a small share of upcoming series orders for Seaway-sized bulkers, multipurpose vessels, and tankers to anchor steady commercial production

Prioritization, Policy, and Enablers

This section sets out a single implementation roadmap that sequences the five investment pathways to advance two goals at once: building a strong regional maritime industrial base (Principle 1) and organizing it through maritime industrial clusters and zones (Principle 2). Pathways 2-5 are the primary vehicles for physical capacity, suppliers, and lifecycle work, while Pathway 1 provides the shared technology and R&D pipeline. Together, they support near-term priorities, policy levers to unlock demand, and concrete actions that route that demand to GLSLS shipyards and suppliers across multiple jurisdictions rather than to standalone projects in any one place.

Figure 7 provides an overview of the GLSLS shipbuilding and repair strategic recommendations and implementation logic, including the two main principles, five investment pathways, and three initial priorities, each driven by a different type of lever.

Implementation priorities

The implementation priorities below are structured so that each advances both principles at once. They strengthen the shared industrial base by using clusters and zones as the default way for national programs, investors, and regional partners to engage with the GLSLS.

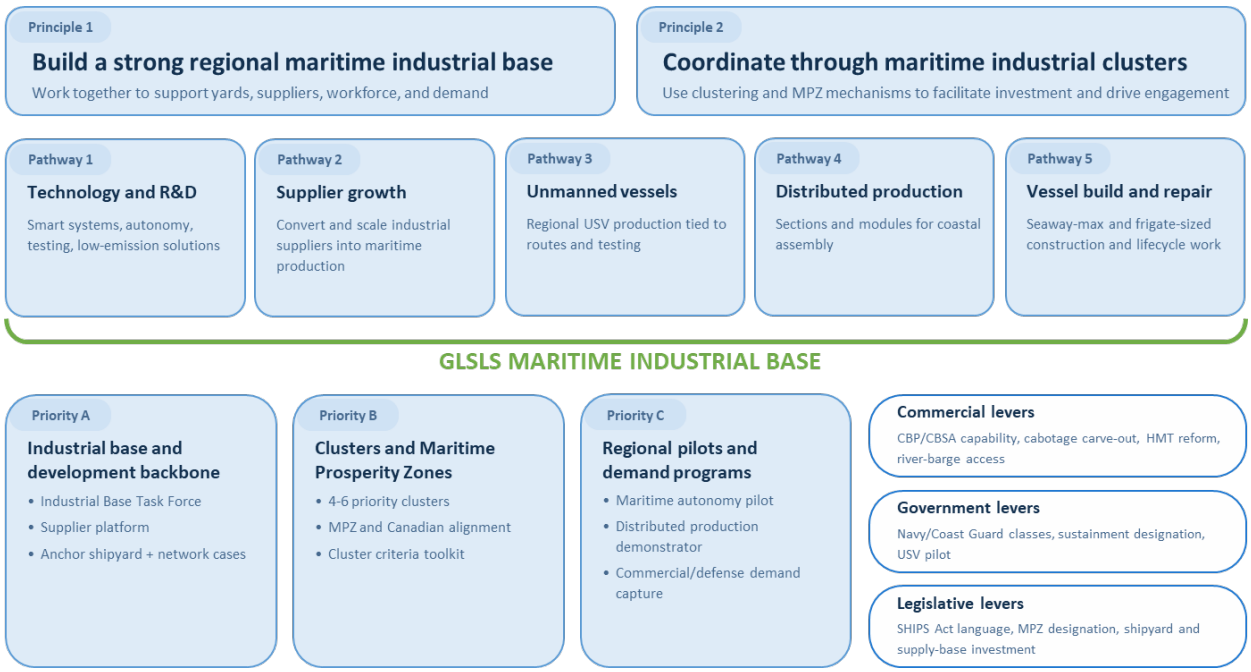


Figure 7: GLSLS shipbuilding and repair strategic recommendations and implementation logic

Priority A: Build the regional maritime industrial base and development backbone

This priority operationalizes Principle 1 by turning dispersed yards, suppliers, and innovation assets into a coordinated GLSLS industrial base with common tools, shared narratives, and visible anchor projects.

Launch a Maritime Industrial Base Task Force to develop joint projects and investment cases

- Establish the Task Force under GSGP's Maritime Steering Committee, with expansion-ready shipyards, key suppliers, research institutions, and State/Provincial economic-development agencies, to coordinate regional shipbuilding growth and industrial-base development, beginning with 3-5 near-term regional projects.
- Produce a shared *industrial base brief* that consolidates the completed analyses on shipyards, suppliers, workforce, test ranges, and technology assets into a common regional evidence base.
- Define *anchor shipyard plus network* cases by mapping suppliers and workforce around Active and potential shipyards to show how investment in one major GLSLS shipyard distributes work across multiple States and Provinces.
- Develop 2-4 detailed government and commercial vessel business cases linked to identified shipyards, suppliers, clusters, and technologies for use in federal government (including SHIPS Act) and national (including National Shipbuilding Strategy) discussions.

Convert the supplier inventory into a living binational platform

- Stand up a regional supplier database that makes the 12,000+ identified supplier locations searchable by tier, product category, and proximity to clusters and yards.
- Incorporate a flag for firms relevant to Pathway 1 technologies (sensors, autonomy, power systems, digital systems) so that innovation assets are presented as part of the industrial base.
- Use the platform as the standard reference in all regional marketing, MPZ applications, and federal/provincial briefings.

Priority B: Define and activate maritime industrial clusters and zones

This priority operationalizes Principle 2 by making clusters and MPZs the default framework for siting capacity, structuring programs, and aligning incentives.

Define priority clusters and launch a GLSLS maritime cluster and MPZ framework

- Identify an initial five priority maritime industrial clusters, with a longer-term vision for up to 25 across the GLSLS, using the provided analyses and examples such as Detroit-Windsor, Chicago-Gary, Green Bay-Sturgeon Bay-Marinette, Hamilton-Niagara, and Superior-Duluth.
- For each cluster, document eligible Active, Brownfield, and Greenfield sites, supplier density and specializations, and candidate roles across the vessel lifecycle and the five pathways, and translate these clusters into a formal GLSLS maritime cluster and MPZ framework for U.S. multi-state MPZ self-nominations and parallel Canadian mechanisms.
- Develop and publish a "cluster criteria" toolkit for waterfront communities that packages block ship block microfactory and integration yard requirements (e.g., 80-acre minimum footprint, suitable waterfront and depth, rail access, workforce) along with criteria for unmanned-vessel clusters and technology/test roles, so communities can self-assess and communicate credibly with investors and program offices.

Priority C: Launch visible regional pilot projects

This priority makes both principles tangible by using Pathway 1 technologies and the production concepts in Pathways 3 and 4 to demonstrate the region's maritime industrial base and cluster implementation in real programs, starting at a modest scale.

Implement maritime autonomy and smart vessel pilots

- Leverage regional strengths in decarbonization, digitization, and autonomy to demonstrate and commercialize these technologies on real, large-scale vessels (including existing assets) and to prove the viability of new commercial routes.
- Structure a formal pilot with contracts that specify GLSLS-based production and testing, require participation from multiple yards and suppliers within at least one defined cluster, and use existing regional test ranges to showcase a shared industrial base and cluster-based implementation.

Execute a distributed production demonstrator using a microfactory and Seaway-max barge

- Use an existing facility or develop a new microfactory in the GLSLS to build large pre-outfitted ship blocks and pair it with a purpose-sized Seaway-max heavy-lift barge for their transportation.
- Work with East Coast partners to fabricate and move one or two major blocks between GLSLS yards and a coastal yard, using the demonstrator to validate loading, barge-handling, and logistics, and to refine modular reference architectures optimized for Seaway-max fabrication.

Policy levers to unlock demand

Great Lakes ports and shipyards are already doing the work. What they lack is the policy support to scale both. Two demand engines (commercial container and short-sea trade, and naval and government work) feed one regional shipbuilding base. Unlock that demand, and it can be converted into hulls, blocks, and systems built and integrated in the GLSLS. The asks run in sequence: first the levers that generate demand, then the levers that let regional shipyards and suppliers capture it.

Unlocking commercial demand

Title	Description	Ask
Fund CBP container capability	Handling international containers depends on CBP customs designation (port-of-entry status plus a Centralized Examination Station under 19 C.F.R. Part 118 or a bonded Container Station under 19 C.F.R. Part 19), the U.S. mirror of Canada's CBSA sufferance-warehouse licensing. Cleveland and Duluth have these capabilities, while Monroe, Burns Harbor, Hamilton, and Picton are next in line.	Federal capital cost-sharing for container examination and related infrastructure, plus relief on SAFE Port Act / MTSA screening-equipment costs.
Carve out Great Lakes cabotage	The empty-backhaul rule under the Jones Act in the U.S. and the Coasting Trade Act in Canada undermines domestic feeder economics by preventing a vessel from carrying a domestic return leg.	A narrow binational short-sea feeder exemption for the Great Lakes, modeled on the CETA Halifax transshipment provision.
Reform the Harbor Maintenance Tax (HMT)	The Harbor Maintenance Tax under 26 U.S.C. §4461 penalizes short-sea moves.	Exempt short-sea / Great Lakes container moves from HMT.
Reopen river-barge access	Existing authority in 46 C.F.R. Part 45, Subpart E already allows unmanned river-barge service on specified Lake Michigan routes, including Burns Harbor and Milwaukee, for dry cargo.	Targeted Michigan-shoreline harbor improvements and a Subpart E scope review to permit containerized dry cargo on defined Great Lakes routes.
Add Great Lakes language to SHIPS Act	The SHIPS for America Act (S. 1541 / H.R. 3151) is moving through the FY26 NDAA and Senate Commerce processes, creating a near-term window during markup and conference.	Make Great Lakes / Seaway vessels explicitly eligible for fleet-renewal financing and designate the GLSLS as a strategic maritime industrial corridor in statute.

Unlocking naval and government demand

Title	Description	Ask
Anchor regional yards in new Navy classes	The Great Lakes already host an established naval base at Fincantieri's Wisconsin yards, and the Navy is shifting toward new manned and unmanned classes as the Constellation frigate line is scaled back.	Qualify and direct GLSLS yards for these emerging classes, fund a new Great Lakes Coast Guard icebreaker, and formally recognize the corridor in the defense industrial base.
Restore naval repair workflow	Although 10 U.S.C. §8669a is a homeport-preference rule rather than a Great Lakes ban, the absence of combatants homeported on the Lakes means sustainment work defaults to coastal yards.	Establish a Great Lakes homeport or sustainment designation (consistent with the 1817 Rush–Bagot framework) to create steady, year-round repair and refit work in the region.

Additional enabling measures

Several cross-cutting measures would make the prioritization and policy agenda more coherent, durable, and trackable over time.

- **Common messaging and data:** Develop and maintain a unified GLSLS industrial base brief and data pack, drawing on the shipyard, vessel, supplier, and technology analyses, and utilize in all major federal/provincial outreach and industry engagement.
- **Metrics and accountability:** Create a simple metrics framework and annual GLSLS maritime industrial base scorecard, tracking regional contracts won, cross-border supplier participation, cluster-based investments, shared pilot projects, and adoption of Pathway 1 technologies across the fleet and shipyards.

Together, these implementation priorities, policy levers, legislative changes, and enabling measures provide a clear path from principle to action. They show how the GLSLS can act as one industrial base, organize around clusters and zones, and translate commercial and government demand into sustained shipbuilding, repair, and technology work in the GLSLS.

Conclusion

The analyses undertaken for this project confirm that the GLSLS already possesses the core assets required to play a much more central role in North American shipbuilding, repair, and maritime innovation than it does today, and that many perceived constraints are surmountable with targeted, coordinated investment. Across vessels, shipyards, and suppliers, the evidence points to an underutilized but strategically significant industrial corridor that can support defense, Coast Guard, Arctic, commercial, and decarbonization priorities when aligned through binational policy and market signals.

Looking ahead, the five strategic investment pathways and associated recommendations provide a practical roadmap for translating this opportunity into action, beginning with maritime technology R&D and commercialization and extending through supply chain growth, unmanned vessel production, distributed ship construction, and Seaway-max and frigate-sized programs. Implementing these pathways through region-wide maritime industrial clusters, harmonized U.S.-Canadian incentives, and deliberate site and supplier development will require sustained collaboration among governments, industry, labor, and research institutions, but offers the prospect of durable regional prosperity and a more resilient continental maritime base anchored in the GLSLS.