DP WORLD

MODERN PORTS, MORE CANADIAN OPPORTUNITY:

A Case for Automation and Modernization



EXECUTIVE SUMMARY

Canada is a trading nation. Its prosperity depends not only on what Canadian businesses produce, mine, grow and manufacture, but on whether those goods can reach customers reliably and competitively.

Prime Minister Mark Carney has set an ambitious goal: **double Canada's exports to markets outside the United States over the next decade.** Achieving that objective will require Canadian businesses to reach more customers in more markets - and a transportation and logistics network capable of supporting that growth.

Canada's ports will be central to this effort. Nearly half of Canada's trade with markets outside North America moves through its West Coast ports, making them critical gateways for trade diversification.

But Canada's ports face intensifying global competition. Vessels are larger, supply chains are more integrated, and shipping lines can choose among competing gateways. Canada's West Coast ports compete directly with U.S. ports that continue to invest in capacity, technology and efficiency.

A new KPMG report, **Technology, Training & Job Growth at Canada's West Coast Ports, 2009 to 2025,** finds that approximately **80% of global container trade** is controlled by four major carrier alliances, underscoring the importance of reliability, productivity and cost in cargo-routing decisions.

Modernization - including automation, digital systems, remote operations and more efficient cargo-handling technology - offers an opportunity to increase the capacity and reliability of Canadian ports while improving safety and creating more highly skilled work.

Between 2009 and 2025, cargo volumes at Canada's West Coast ports increased by more than 70%, while the waterfront workforce expanded by roughly 3,600 workers.

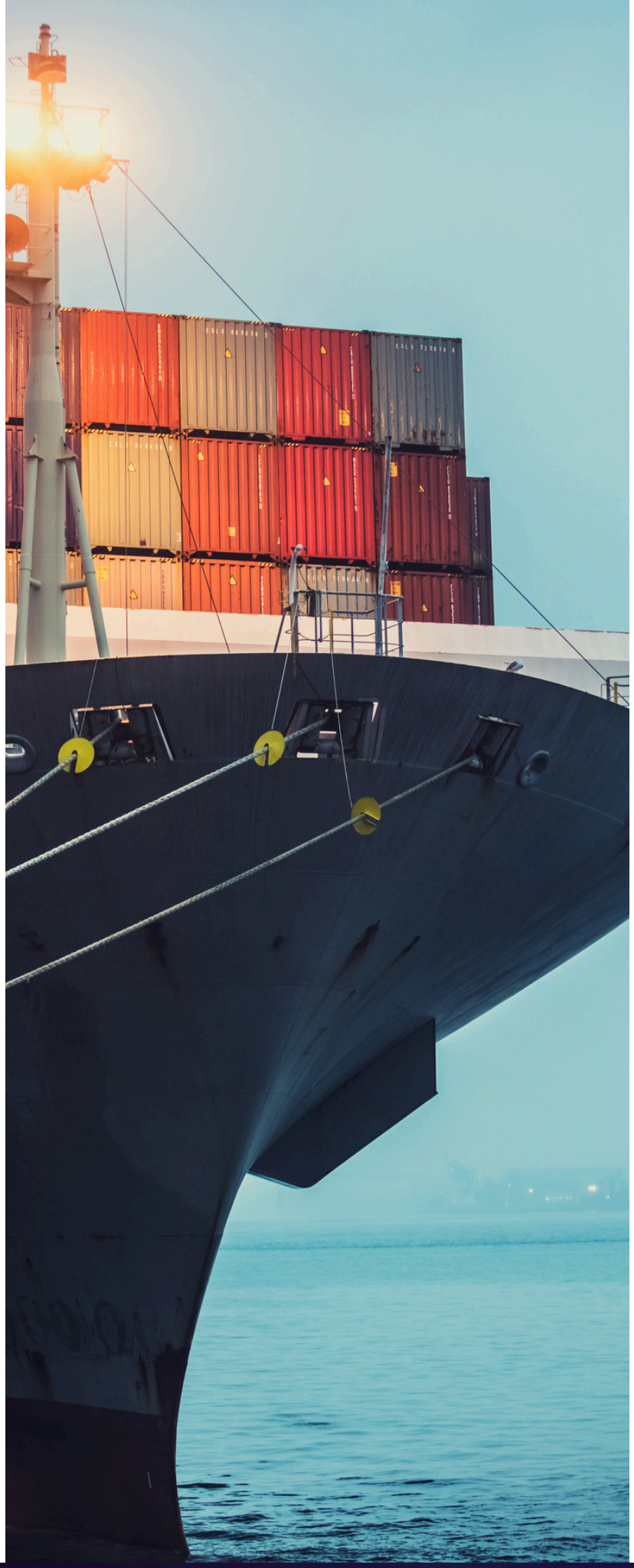
Payroll hours increased 83%, from approximately 4.9 million to 9 million hours, while waterfront employers invested more than $377 million in training and upskilling.

DP World's terminal at the Port of Vancouver provides a particularly instructive case study. A $600 million expansion combined infrastructure investment with automated truck gates, upgraded digital planning systems, expanded rail infrastructure and remote semi-automated equipment. Design capacity increased by more than 65%, while the terminal footprint grew only 15%. Over the same modernization period, total payroll hours increased by more than 59% and foreperson headcount increased approximately 75%.

The lesson is not that automation automatically creates jobs. It is that **capacity-oriented modernization can create the conditions for more trade and more work when technology investment is paired with infrastructure, workforce development and training.**



> The challenge is to modernize ports in ways that strengthen competitiveness, safety and economic opportunity.



CANADA'S TRADE AMBITIONS DEPEND ON MODERN PORTS

In 2025, Canada's West Coast ports handled approximately **$409 billion in cargo - about $1.1 billion every day - and contributed approximately $25 billion to national GDP.** The Port of Vancouver alone handles approximately $305 billion in goods and connects Canada with more than 170 economies.

Nearly half of Canada's trade with markets outside North America moves through West Coast ports, making their performance central to export diversification.

Today's shipping lines have choices. Ports along the U.S. West Coast, including Seattle, Tacoma, Oakland, Los Angeles and Long Beach, continue to invest heavily in capacity and efficiency. At the same time, container vessels have become dramatically larger. The biggest vessels can now carry more than 24,000 TEUs, increasing the importance of minimizing time in port and moving greater volumes of cargo efficiently.

The importance of port performance extends well beyond the waterfront. UN Trade and Development estimates that roughly 80% of international merchandise trade by volume moves by sea.

The World Bank and S&P Global's Container Port Performance Index measures port efficiency primarily through vessel time in port, underscoring the importance of fast, reliable cargo handling to global supply chains. In 2025, out of a total 405 ports, the Port of Vancouver ranked 375th, Prince Rupert was 322nd, and Saint John 268th in efficiency.

MODERNIZATION DOES NOT HAVE TO BE A ZERO-SUM PROPOSITION

Automation is often framed as a choice between technology and jobs. Evidence from Canada's West Coast ports suggests a more complex relationship.

According to KPMG's report, Technology, Training & Job Growth at Canada's West Coast Ports, 2009 to 2025, cargo volumes increased 73.5% between 2009 and 2025, rising from approximately 61.2 million to 106.2 million tonnes across the scope analysed.

Workforce participation grew alongside that expansion. The active waterfront workforce increased from approximately **5,100 workers in 2009 to 8,700 in 2025,** an increase of roughly 70%. Province-wide, foreperson numbers increased 95%.

Longshore payroll hours increased approximately **83%**, from 4.9 million hours in 2009 to approximately 9 million in 2025.

Pay also increased. In 2025, median earnings were **$162,521 for union longshore workers and $273,936 for forepersons**. In comparison, the average salary in Canada is $68,700 per year, based on recent weekly earnings of about $1,320 reported by Statistics Canada.

FIGURE 1

Cargo volumes 2009-2025

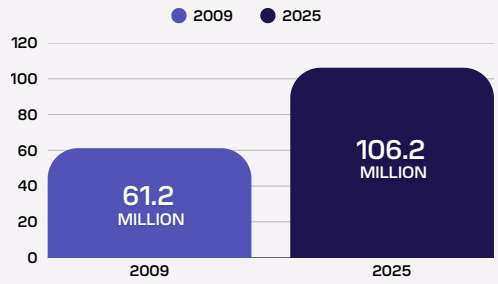


FIGURE 2

Active waterfront workforce 2009-2025

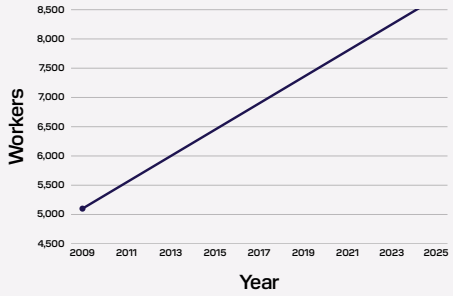
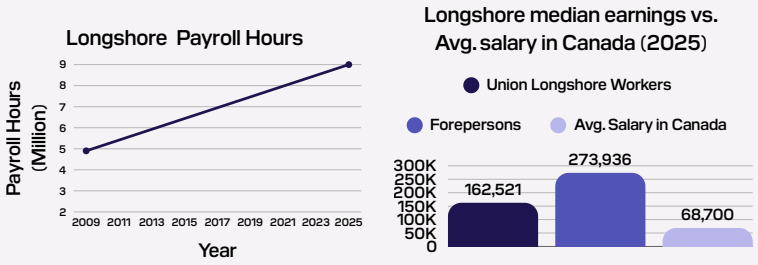


FIGURE 3



These figures should not be interpreted as evidence that automation alone caused employment or wage growth. Cargo volumes, capital investment, infrastructure, trade conditions and other factors all influence workforce demand.

The figures show that modernization and employment growth can coexist.

By removing bottlenecks, modernization can increase demand for operating hours, maintenance, supervision and technical support.

Technology can reduce the labour required for an individual task while simultaneously increasing the total amount of work performed across a growing operation.

International evidence also cautions against treating automation as a productivity strategy in isolation.

> The strongest case for modernization is targeted: use technology to address defined operating constraints, supported by infrastructure, processes and workforce skills.

WHAT PORT AUTOMATION ACTUALLY LOOKS LIKE

At DP World's terminal in Vancouver, automation addresses specific operating constraints. The decade-long $600 million Centerm Expansion Project combined semi-automated cargo handling, digital identification and equipment-positioning systems with berth and rail infrastructure improvements within a constrained urban footprint.

Automated truck gates and optical character recognition

The manual truck gates were replaced with an **automated system** supported by a pre-advised truck-visit community booking system.

The terminal uses optical character recognition (OCR) technology to identify and capture truck and container information, reducing manual entry and supporting more efficient truck movements.

Automated truck gates and optical character recognition

The terminal replaced some diesel-powered rubber-tyred gantry cranes in its rail operation with electric rail-mounted gantry cranes (RMGs) capable of remote semi-automated operation.

The rail system includes:



Remote semi-automated RMGs that allow operators to manage equipment movements from a remote operating environment.



Automated coordination between terminal vehicles and rail-mounted gantry cranes, signalling when the next stage of a container movement is ready to proceed.



Automated train spotting and railcar micro-positioning to improve alignment and compensate for limitations in railcar geometry information within the terminal operating system.



RFID-based anti-collision technology to support safer equipment movements.



Automated pedestrian gate controls to manage access around rail operations.

Operators continue to supervise the cranes, with automation supporting positioning, sequencing and safety.

Digital planning, identification, and control systems

In addition to truck gate OCR, the terminal uses a rail gate OCR portal to support the identification and processing of rail movements.

A rubber-tyred gantry crane Position Detection System (RTG PDS) provides equipment-positioning information that supports terminal operations.

Combined with digital planning tools, they improve coordination and require skills in systems management, maintenance and exception handling.

UNCTAD identifies digitalization - including AI and automation - as an important tool for improving port operations, reporting benefits including reduced waiting times, improved cargo tracking and more efficient transshipment at ports adopting these technologies.

Expanded and modernized rail infrastructure

On-terminal rail increased from approximately 8,000 feet to 15,000 feet. Rail throughput now averages approximately 20,000 feet processed per day and has peaked above 22,500 feet.

Greater rail throughput also requires operating crews, supervisors and maintenance support over longer and more frequent operating periods. The gains reflect coordinated investment in technology and infrastructure.



MORE CAPACITY WITHIN A CONSTRAINED FOOTPRINT

The project increased annual design capacity by more than 65%, from approximately 900,000 TEUs to 1.5 million TEUs, while increasing the terminal's physical footprint by only 15%.

Between 2019 and 2025, total waterfront payroll hours at DP World's Vancouver terminal increased from approximately 835,000 to 1.328 million - an increase of more than 59%. Terminal throughput increased 19% over the period, while foreperson headcount following the expansion increased approximately 75%.

AUTOMATION CHANGES WORK - WHICH MAKES TRAINING ESSENTIAL

As port technology evolves, some tasks become automated, existing roles change and new technical responsibilities emerge.

Canadian research reinforces the importance of preparing workers for technological change. The Future Skills Centre found that 43% of surveyed workers received no skills training in 2024, highlighting the need for employers to integrate workforce development into technology adoption. The waterfront industry's investment in training provides an example of how that transition can be supported.

At DP World's Vancouver terminal, higher cargo volumes and more sophisticated systems have increased demand for supervisory, maintenance, engineering, IT and management functions. Operators are learning to work with remote operations, automated gates, new rail equipment and modern planning systems.

As in other industries, adapting to these changes requires investment in training and skills development.

Across the West Coast waterfront, employers have invested more than $377 million in training and upskilling since 2010, including more than $45 million in the Waterfront Training Centre.

Meanwhile, hundreds of kilometres up the coast at the Port of Prince Rupert,433 workers were trained before a new terminal operating system went live. This included 23 planners, 55 checkers and 355 equipment operators.

That approach is consistent with international labour guidance. The International Labour Organization's port-sector training framework explicitly links competency-based training with worker safety, skills development, cargo-handling efficiency and the ability to capture the social and economic benefits of advanced cargo-handling methods.

SAFER WORK IS PART OF THE AUTOMATION CASE

Ports bring workers into close proximity with vessels, moving containers, rail systems and heavy machinery, often around the clock and in difficult weather. Targeted technologies can reduce some of these exposures.

Remote operations can move workers from equipment cabins and physically demanding operating environments into control rooms. Sensors, interlocks and system-enforced controls can reduce exposure to moving machinery and prevent equipment from operating when unsafe conditions are detected.

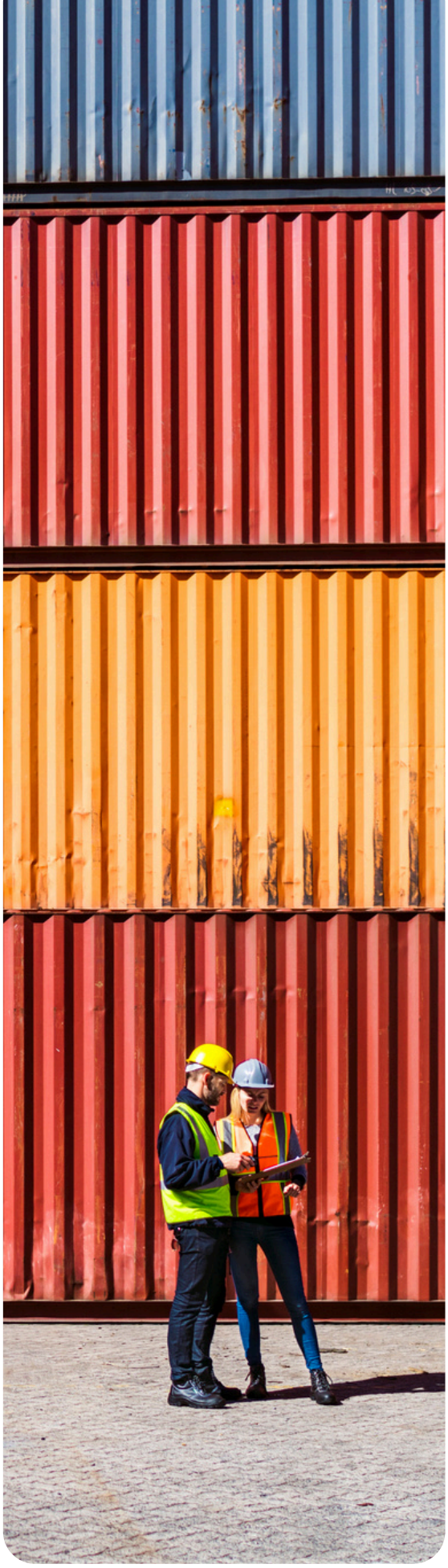
KPMG found that modernization across B.C. terminals increasingly moved workers away from higher-risk environments through remote operations, improved interlocks and engineered safety controls.

At DP World's Vancouver terminal, Yardeye (now branded as Mi-Star®) RFID-based anti-collision technology and automated pedestrian gate controls support safety in the semi-automated rail operation. Elsewhere in DP World's Canadian terminal network, functional systems include forklift driver alerts and personnel protection at DP World's terminals in Saint John and Fraser Surrey, and reach-stacker protection at Saint John. Reach-stacker systems at DP World's terminal in Prince Rupert and Fraser Surrey, and light-vehicle fatigue and distraction alerts at Fraser Surrey, remain in trial phases. These are targeted safety measures, not evidence on their own of lower injury rates.

The broader occupational-safety case for technology is also recognized internationally. The International Labour Organization, a U.N. agency that brings together governments, employers, and workers from 187 Member States - reports that automation and smart monitoring systems can reduce hazardous exposures, prevent injuries and improve working conditions.

At the same time, the International Transport Forum - an intergovernmental organisation with 63 member countries - notes that port-specific empirical evidence on overall safety outcomes remains limited - an important reason to evaluate individual technologies against measurable safety outcomes rather than assume that automation is inherently safer.

Safety outcomes should be measured alongside productivity, rather than assumed from the presence of automation.



MODERN PORTS, EVOLVING CAREERS AND GREATER PRODUCTIVITY



Across the economy, technology is changing how people work and the skills they need. Canada's ports are no exception. This evolution is particularly important as Canada confronts a longstanding productivity challenge.

In a March 2024 speech, then-Senior Deputy Governor Carolyn Rogers described Canada's weak productivity performance as a serious economic concern and emphasized the importance of business investment, technology and workforce skills.

Improving productivity – producing more value with the resources available – is essential to raising living standards, strengthening competitiveness and supporting long-term economic growth. For Canada's ports, that means finding ways to move more cargo safely, reliably and efficiently while making better use of existing infrastructure.

Automation is one part of that effort, but it is not a single operating model. It ranges from digital planning and automated gates to collision-avoidance systems, remote crane operations and more advanced container-handling equipment. Each technology addresses different operational challenges and has different implications for workers.

These systems work alongside employees responsible for equipment operation, supervision, maintenance, planning and technology management. Digital systems identify cargo and coordinate equipment movements, while remote semi-automated cranes and improved rail infrastructure support greater capacity and efficiency. Workers remain central to these operations, with evolving responsibilities in equipment operation, supervision, maintenance, planning and technology management.

The goal is not to remove people from ports, but to equip workers with better tools and opportunities to develop the skills modern operations require.





A CANADIAN APPROACH TO MODERNIZATION

Canada can pursue modern ports and good waterfront jobs, but doing so requires deliberate choices:

Modernize for growth.
Technology investment should advance clearly defined objectives, including capacity, reliability, safety and competitiveness – not simply reduce labour requirements for individual tasks.

Invest in people alongside technology.
Training, retraining and skills development should be integral to modernization programs from the outset.

Engage workers early.
Technological change should involve ongoing engagement with workers and their representatives, particularly when roles will change.

Recognize that transition takes time.
Ports are capital-intensive infrastructure, and modernization and workforce transitions can unfold over decades, not quarters.

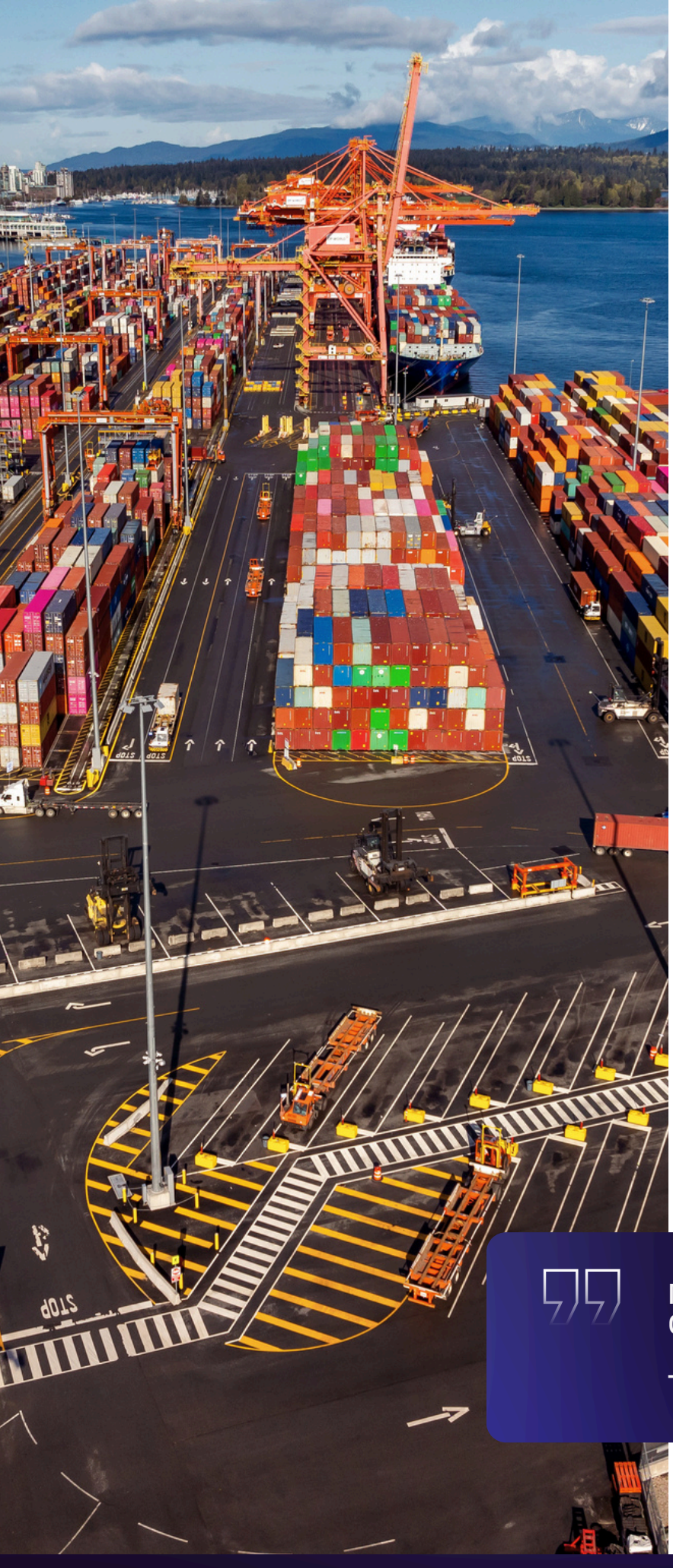
Create greater national alignment.
Government, labour and terminal operators should establish a national working table on port modernization, beginning with a shared definition of automation and a coordinated approach to technology adoption and workforce transitions.

Federal policy is beginning to address some of these priorities. Introduced in September 2026, Bill C-39, the proposed Building Canada Strong Act, includes measures to modernize port governance, strengthen trade corridors, improve supply-chain coordination and advance digital trade. It also proposes changes to federal labour relations and worker protections.

While not yet law, Bill C-39 could provide a foundation for broader modernization. A national dialogue on port automation would complement these proposed reforms by addressing the specific implications of technological change for port operations and workers.

Transport Canada's 2025 annual report identifies congestion at terminals, limited rail and road access, and insufficient coordination between transportation modes as continuing constraints on Western Canada's trade corridors. Addressing these bottlenecks will require coordinated investment in physical infrastructure, digital systems and operational efficiency.

Federal infrastructure investments support this direction. Approximately $4.1 billion has been approved for 215 projects through the National Trade Corridors Fund, including up to $51.2 million announced in 2024 for 19 supply-chain digital infrastructure projects. The additional $5 billion Trade Diversification Corridors Fund is intended to expand access to global markets and address transportation bottlenecks.



CONCLUSION: MODERN PORTS, MORE CANADIAN OPPORTUNITY

Canada's trade ambitions depend on its ability to move goods reliably and competitively. The West Coast evidence shows that port modernization has coincided with growth in cargo volumes, waterfront employment, payroll hours and training investment. It does not establish that automation alone caused that growth.

DP World's experience with its Vancouver terminal makes the opportunity tangible. Automated gates, digital systems, remote semi-automated rail equipment and expanded infrastructure increased annual design capacity by more than 65% while expanding the terminal footprint by only 15%. Between 2019 and 2025, waterfront payroll hours rose more than 59%, and foreperson headcount following expansion increased approximately 75%.

These outcomes are not guaranteed elsewhere, but they demonstrate the potential of coordinated investment in technology, infrastructure and people.

Canada needs a practical national approach: clear definitions of automation, early worker engagement, sustained training and evaluation of technologies against capacity, reliability and safety outcomes. More capable ports can help Canadian farmers, manufacturers, miners and exporters reach global markets while supporting evolving careers on the waterfront.

> Modern ports can mean more Canadian opportunity.
>
> The task now is to modernize well.