In a Tight Spot: North American Port Cities in Global Supply Chains[1]

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The Dissociation of Port-City Relations

The urban maritime landscape in North America has shifted amid profound economic, technological, and geopolitical changes (AAPA, 2024). In particular, the United States has lost its capabilities to project commercial maritime influence, having outsourced and offshored most of its commercial maritime capabilities, particularly in the container shipping sector. Still, given the size of its hinterland, North America remains the world's leading market, which creates some paradoxes between its capacity to generate substantial cargo demand and its ability to support its commercial interests on the world's maritime trade lanes.

Port cities have faced the brunt of this transformation through various forms of dislocation between ports and the urban landscape (Ducruet et al., 2015). Such tensions have been extensively documented, particularly because communities adjacent to ports are usually of lower socioeconomic standing (Grobar, 2008; Greenberg, 2021). The loss of maritime commercial power is also associated with trends of outsourcing and offshoring that have prevailed and have been strongly dissociative. The emergence of containerization in the 1960s led to the dissolution of port districts adjacent to port terminals, as labor requirements decreased. Further, the spatial requirements of container terminals prompted the development of new sites, often located away from the central areas where port terminals were more commonly located. With these sites came the related ecosystem of logistical activities, creating suburban clusters. Over time, and in line with the new logistical flows, these areas underwent a reinsertion of maritime activities into new urban forms, with the prominence of logistics clusters (Bowen and Slack, 2007).

The chapter will discuss the dissociation effects of port logistics on North American port cities, particularly container ports, which are the anchor of the logistics system. Four core factors contributing to supply chain inefficiencies can be proposed with their dissociative effects (Table 1).

[1] Note: This chapter is a significantly expanded and modified version of a testimony presented to the Joint Economic Committee, Congress of the United States, in June 2025.

Table 1 Main Factors of Dissociation in North American Port Cities

Factor	Issue	Implications for port cities
1. Volume	Growth in cargo handling	Expansion of terminal facilities and port-centric activities.
2. Scale	Growth in ship size	Local congestion, corridors and inland facilities.
3. Composition	Structure of imports and exports	Imbalanced flows. Inbound and outbound channels. Urban specialization effects.
4. Technology & Efficiency	Efficiency and automation	Footprint intensification. Effects on employment and economic multipliers at the local and regional levels

Factor 1. A matter of volume

Growth Dynamics

Since the 1990s, the volume of containers handled by North American ports has steadily increased, though it has been subject to setbacks linked to macroeconomic cycles. The first significant setback was the 2008-09 financial crisis, which led to a retrenchment in domestic consumer demand. The second was the temporary demand destruction effects of the COVID-19 pandemic in 2020, which was closely followed by a bounce back in 2021-22, linked with shifting consumption patterns and stimulus packages. This surge led to a counter-cycle in 2023, as the situation normalized and inflationary pressures dampened consumption. Between 2010 and 2024, 19.8 million Twenty-Foot Equivalent Units (TEUs) were added to the cargo handled by ports, bringing the total to 60.4 million TEUs (Figure 1). This absolute growth is equivalent to three times the cargo generated annually by Canada or twice that of Mexico. On average, North American ports, excluding Mexico, need to handle an additional 1.4 million TEU of cargo each year, corresponding to an annual growth rate of around 2.3%.

This organic growth in container traffic is derived from the dynamism of the North American economy, which is a positive factor, but also from the outsourcing and offshoring of American production, which is more controversial. Further, a dynamic shift has taken place with Mexico surpassing Canada in containerized volumes in 2018, which was associated with substantial investment in container port infrastructure. This is particularly attributed to the setting of USMCA in 2020, a revision of NAFTA (also known as NAFTA 2.0). Its main goal was to stimulate manufacturing growth and integration across North America through the selective application of country-of-origin tariffs. This has prompted major exporters, particularly Chinese manufacturers, to use Mexico as a production and distribution platform for the North American market, leading to growth in Mexican port volumes.

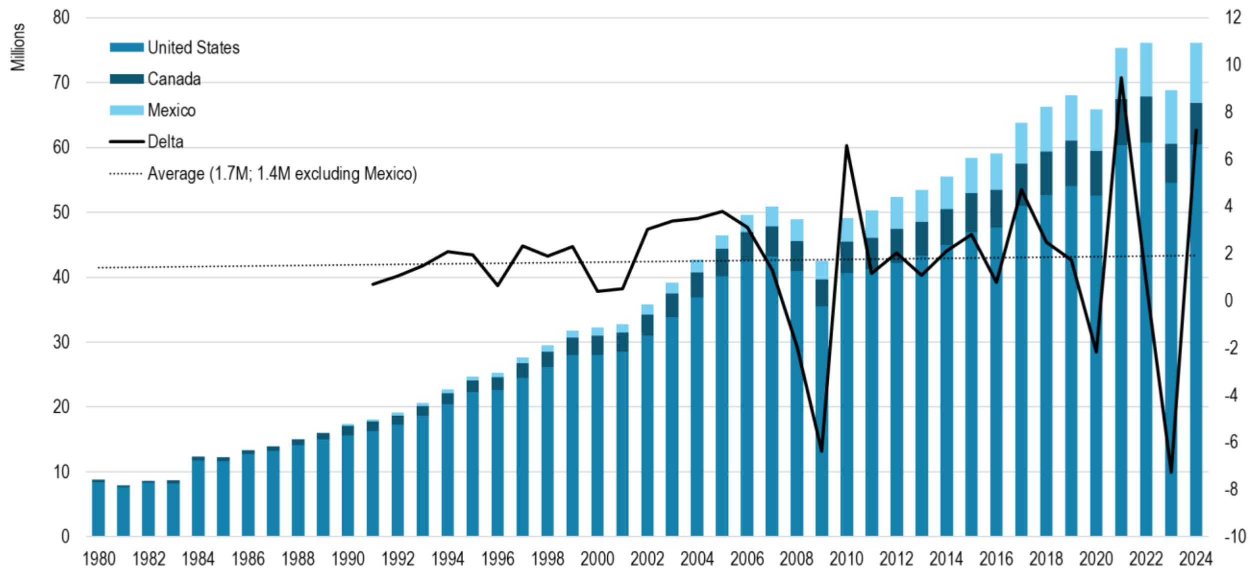

Figure 1 Container Traffic at North American Ports, 1990-2024 (in Twenty Foot Equivalent Units, TEUs). Note: Includes Mexico. Source: Own compilation based on reports from port authorities.

Maritime Range Dynamics

North America is in a unique situation of having access to three ranges of maritime circulation, the Atlantic, the Pacific, and the Gulf, with each range having its own dynamics (Rodrigue and Guan, 2009) (Figure 2). Arctic shipping is a marginal activity that has limited commercial considerations. The size, accessibility, and competitiveness of the North American hinterland closely align with the volumes handled by container ports, enabling megacities such as Los Angeles and New York to maintain their primacy in their dual roles as cargo generators and distributors. However, the strong growth in Savannah and Houston is indicative of regional changes driven by the demographic and economic dynamism of the Southeast.

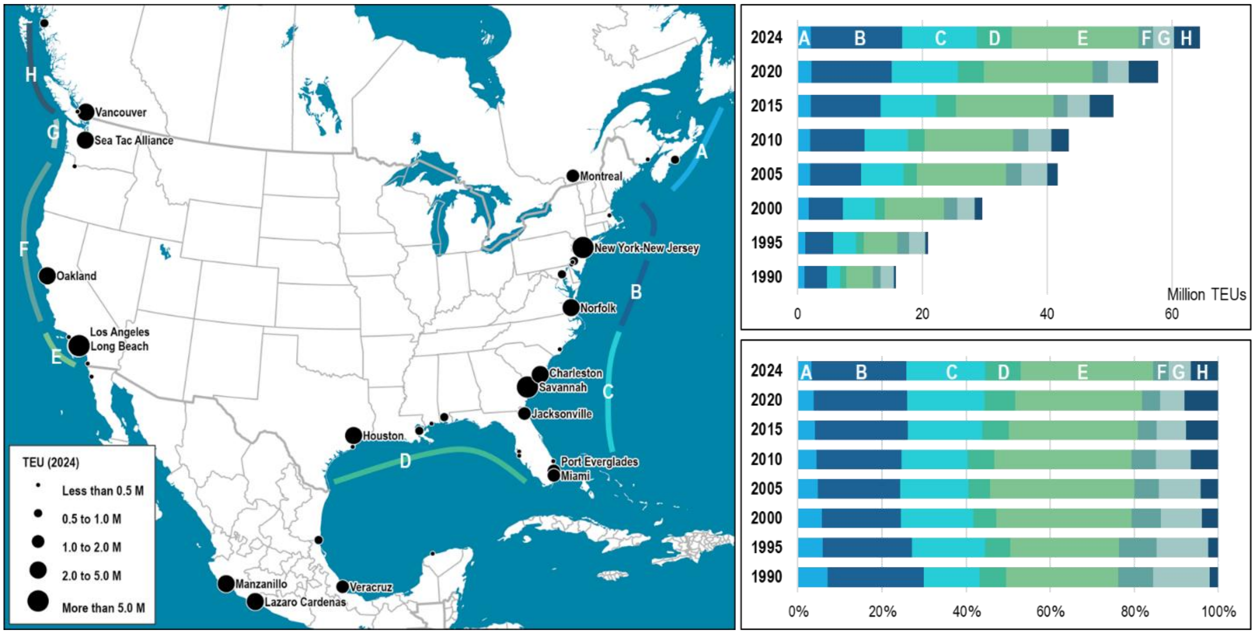

Figure 2 Main Ranges of North American Container Port Cities. Excludes Mexico

Excluding Mexico, eight significant container clusters port city activity can be considered in North America:

A. Eastern Canada (marginalization). The Canadian East Coast is experiencing marginalization, with its share declining from 7.1% in 1990 to 3.3% of the total TEU handled in North America in 2024. The two main ports of the range either have a weakness in hinterland accessibility (Halifax) or a limiting nautical profile (Montreal). The deviation that the St. Lawrence imposes on shipping limits port call options for inter-range services and ship sizes.

B. Northern Seaboard (enduring stability). This major demand cluster has maintained its share of around 22% of the activity. This enduring stability is mainly attributed to the strong demand generated by the Boston-Washington corridor, which has sustained consistent demand and related shipping services.

C. Southern Seaboard (growth). A dynamic cluster that has seen the emergence of Savannah as a major logistics platform for the southeast.

D. Gulf Coast (recent growth). A range that was in slight relative decline with 6% of the activity until the expansion of the Panama Canal in 2015, which was associated with a surge to 8.6% in 2024. Houston represents the leading regional platform that has driven the bulk of this recent growth.

E. San Pedro Bay (enduring stability). One of the most dynamic clusters in North America has systematically accounted for around 30% of all activity. The LA/LB port cluster is usually the first port of call for transpacific services and serves as the gateway to an extensive continental distribution system.

F. Central West Coast (decline). Experienced a noticeable relative decline, from 8.2% in 1990 to 3.7% in 2024, and marginal activities in Portland. More difficult access to the hinterland and the introduction of larger container ships made Oakland less accessible.
G. Puget Sound (enduring decline). Substantial decline in part due to the scale effect, as SeaTac was not able to generate enough volumes to justify an array of calls from large container ships on the main transpacific routes. Its share went from 13.4% in 1990 to 5.2% in 2024, underlining this marginalization.
H. Western Canada (recent decline). This range experienced steady growth through 2020, when it accounted for 8% of the total volume. This trend led to the development of Prince Rupert as a new container port in 2007, serving as a new transpacific gateway with a rail corridor extending into Chicago. However, from 2020, the situation reversed, and the share dropped to 6.6% with a notable decline in the traffic handled by Prince Rupert and no significant growth in the traffic handled by Vancouver.

Volumes and urban footprints

The ongoing growth in container volumes handled by North American ports requires a constant commitment to maintaining, upgrading, and expanding port infrastructure, including the construction of new terminal facilities. For instance, 1.3 million TEU of additional yearly port traffic requires about 40 hectares of additional container terminal space, assuming the average North American yard density and dynamic capacity, which is equivalent to one large terminal facility. In the short term, this pressure can be dynamically absorbed by existing facilities through expansion, intensification, and the use of available yard space. This figure stands at around 6,237 hectares[2] of container terminal footprint in North America, implying that a pressure equivalent to 0.6% of the total capacity is exerted annually. The typical response has been to expand container terminal facilities within the existing footprint available to port authorities. However, eventually, this growth pattern requires the construction of new container terminals on brownfield or greenfield sites, particularly since shipping lines are seeking alternative outside congested port areas.

Further, port-centric activities have expanded, particularly with distribution centers in areas with greenfield capabilities such as the Inland Empire near LA/LB and around Savannah. Each TEU requires about 7.5 square meters of warehousing space to handle its contents, which implies that an annual growth of 1.4 million TEUs generates the equivalent of 10.7 million square meters (1050 hectares) of warehousing space. The emergence of substantial port-centric logistics clusters has generated economic opportunities but also put pressure on the urban footprint. The competition for scarce waterfront resources is a recurring issue in North America and has placed port authorities in a key role in resolving these disputes.

[2] These figures are derived from a geodatabase that contains the perimeter of all container terminal facilities of significance in North America; 84 facilities with 11 in Canada and 73 in the United States.

Factor 2. A matter of scale

Panamax, Neo-Panamax and Coastal Dynamics

Since the 1990s, the maritime industry has been pushing for scale economies in ports worldwide through the deployment of larger containerships, going beyond the conventional Panamax standard (Notteboom et al., 2022). The North American port system, particularly on the East and Gulf coasts, was designed around the Panamax standard, the largest ship that could fit in the Panama Canal when it was initially designed in the early 20th century. In the late 1990s, the growth of transpacific trade enabled container ships beyond the Panamax standard to call West Coast ports with much deeper drafts. This created an imbalance between the capabilities of East and West Coast container ports and was associated with the dynamism of West Coast cities compared with the East Coast. Correspondingly, between 1990 and 2010, the share of West Coast ports in total container volume handled in North America rose from 50.4% to 53.3% (peaking at 54.4% in 2005).

When the Panama Canal was expanded in 2016, a new standard (New Panamax), was set, marking a turning point for North American ports in terms of infrastructure investments and their impact on the urban landscape of port cities (Park et al., 2020). The United States accounts, as an origin or destination, for about 75% of the traffic handled by the canal, corresponding to about 40% of all TEUs handled by American ports. The increase in the average size of a containership call has been notable. Between 2017 and 2023, the average ship size calling an American port increased from 5,120 to 5,920 TEU, a 15% increase (USDOT). On the East Coast, this figure rose from 4,770 to 5,640 TEU (18% increase), while on the West Coast, the average ship size rose from 6,492 to 7,615 TEU (17% increase).

The share of West Coast ports in total throughput declined from 53.3% in 2010 to 46.9% in 2024, the lowest in 30 years. The 2015 expansion was also accompanied by a wave of port infrastructure investments on the East and Gulf Coasts to ensure that major ports could accommodate the new ship class. However, it also resulted in a skewed distribution of the costs and the benefits. Maritime shipping lines benefit from economies of scale, but public port authorities bear the bulk of infrastructure costs to ensure that port cities keep their rank in the hierarchy of port services and continue to derive direct and indirect macroeconomic benefits from ports. For the United States, this figure was estimated at $2.89 trillion in GDP contribution (10.1% of the GDP) and 21.8 million jobs in 2023 (13.0% of employment) (AAPA, 2024).

Scale Capabilities

There are significant variations in the capability of American ports to handle larger container ships (Figure 3). While West Coast ports tend to have deep drafts and limited channel maintenance, many East and Gulf Coast ports are challenged to cover the costs of dredging and harbor improvement programs from public and port authority sources. Yet, evidence indicates that deep-water ports capture the largest share of the volume, while the share drops substantially as the port channel depth declines. 52% of the 2024 container volume concerns ports with depths greater than 50 feet (Figure 2). This share drops to 21% for ports with a channel depth of 48-50 feet and 10% for ports with a channel depth of 45-48 feet. Lower channel depths indicate a very small share of total traffic. The main reason Montreal endures among the top 15 container ports in North America, despite having the lowest draft (less than 38 feet), is its strong hinterland access and national policies governing the use of ports of entry for cargo bound for Canadian markets.

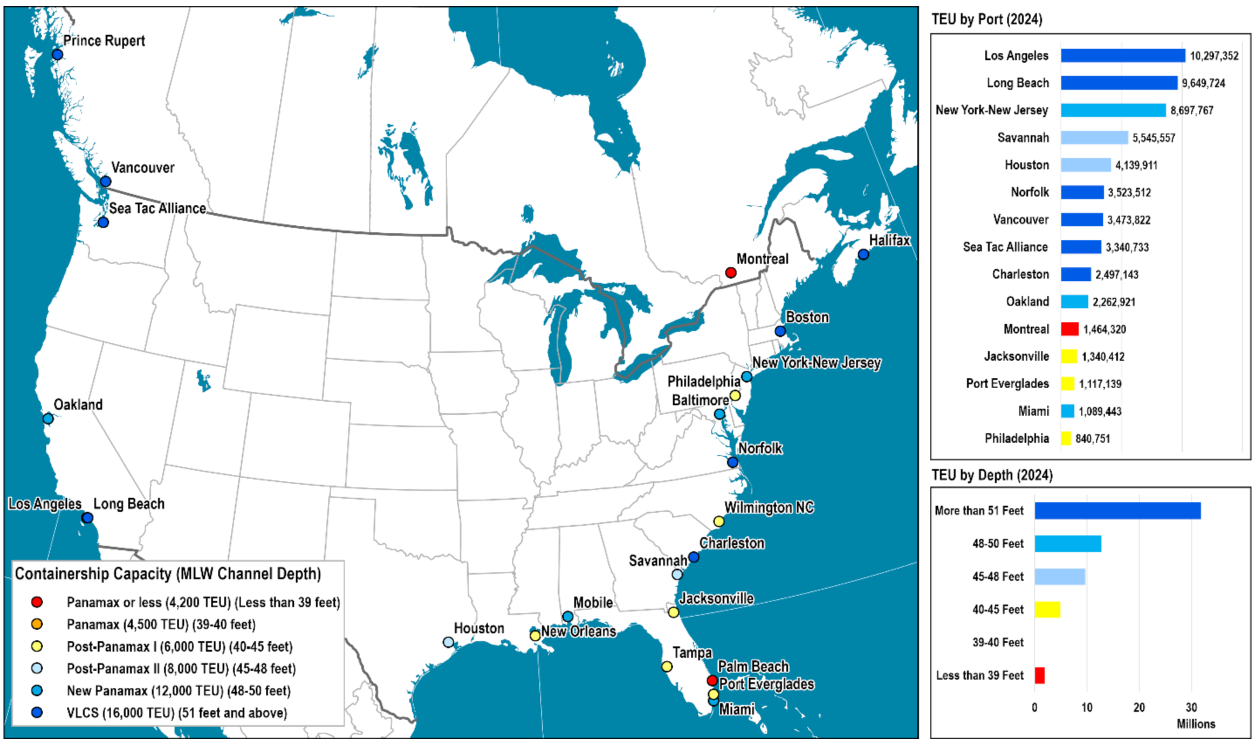

Figure 3 Channel Depth at Major North American Container Ports. Source: Own compilation based on port authorities and terminal operators.

The self-reinforcing cycle between channel draft, volume retention, and capture provides a strong incentive for port cities to improve the nautical profile of their container terminal facilities. While a 39-foot channel could accommodate a typical Panamax container ship, post-Panamax I container ships handling above 5,000 TEUs require a berth depth of 42 feet or more. A depth of 50 feet is required to handle ships above 10,000 TEUs. Under such circumstances, many ports on the East and Gulf coasts were inaccessible to the new post-Panamax container ships prior to the 2016 expansion of the Panama Canal. Fifty feet and a capacity of 12,500 TEU (which is associated with the Neo-Panamax ship class), became the new frame of reference. This triggered a “race to the bottom” in dredging at several major East and Gulf Coast ports, including Miami (50 feet achieved in 2014), New York (50 feet achieved in 2016), Charleston (52 feet in 2022), Savannah (47 feet in 2022), Houston (46.5 feet in 2025) and Mobile (50 feet in 2025).

Gateways and their Hinterland

Since North American ports are mainly gateways with limited transshipment, there is an apparent multiplier effect between port volume and hinterland traffic. With more than 30 million TEU of annual inbound full containers, North American port cities have a complex relationship with their hinterlands, with logistics processes linked with the deconsolidation of large container loads into individual last-mile deliveries of parts and commercial goods (atomization). With the massification of container loads, the North American urban landscape has become a network of logistical hubs for transloading and processing cargo. The efficiency of this interface is related to hinterland connectivity and the available rail options along long-distance corridors (Figure 4). Three major hinterland accessibility options support this interface:

- Inland Point Intermodal (IPI). Containers are moved directly to an inland destination, such as an inland port, mainly through an on-dock intermodal rail facility. This interface has a limited effect on the urban landscape as truck moves are within the terminal or over short distances (near dock rail facility).
- Transload. The contents of containers are transloaded into domestic containers and then placed on intermodal rail (or trucks) for the inland destinations. While this activity is mainly port-centric, it creates local congestion between terminals and transloading facilities.
- Truck. The containers are placed on trucks for local (mainly) or long-distance deliveries. This transport chain has the most externalities over the urban landscape since each container is directly associated with a long-distance truck movement and two movements if the truck arrives at the terminal empty.

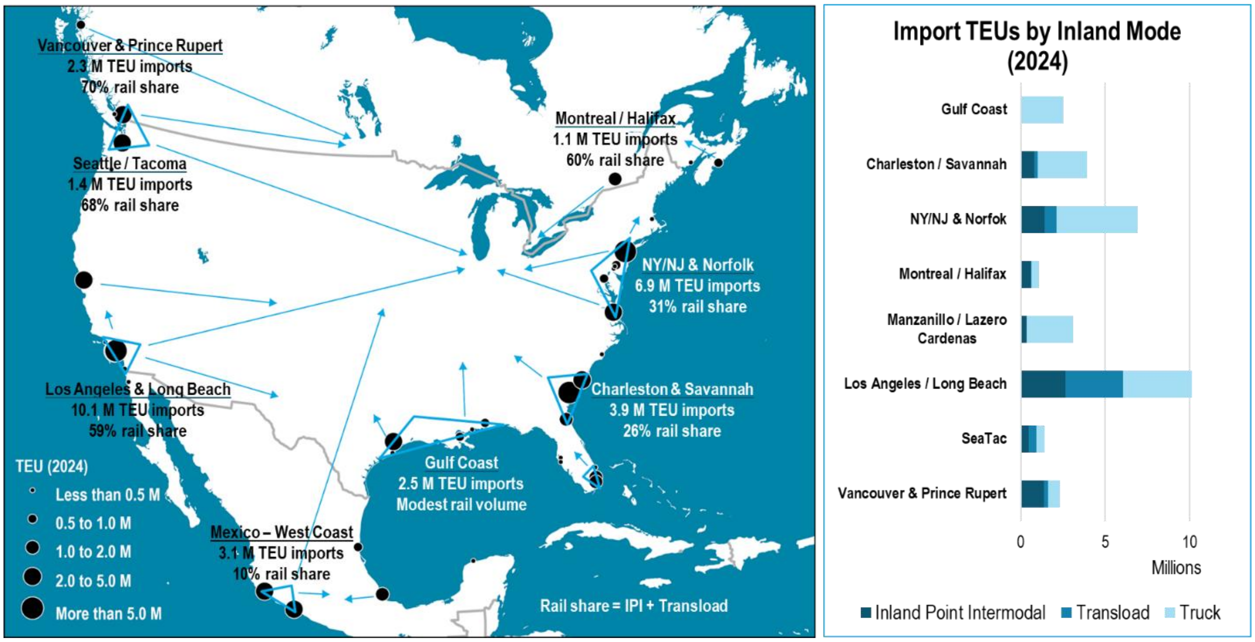

Figure 4. Transloading at Major North American Container Ports. Source: ANA, TTX, Port authorities, PIERS. Note: IPI = Inland Point Intermodal, the movements of ISO containers by rail directly to an inland location. Rail share = IPI + transload.

Of the 31.3 million TEUs of import containers handled by the major North American container ports in 2024, close to a quarter (24.2%) were directly brought by intermodal rail to their inland destinations. 16.1% were transloaded into domestic containers and then brought by intermodal rail. The majority of containers (59.6%) are delivered by trucks, mainly to local or regional destinations. In Los Angeles and Long Beach, more than 4 million TEUs per year are carried solely by truck from container terminals to inland destinations, similar to New York/New Jersey.

There are significant regional differences in the mode used for inland distribution, which underscore variations in the level of stress at the port/city interface. The share of rail is much higher on the West Coast, as containers are carried over long distances inland through double-stacked rail corridors. For instance, it ranges from 60 to 70% along the coast from Prince Rupert to Los Angeles. It is significantly lower for Pacific Coast Mexican ports (Manzanillo and Lazaro Cardenas), as most of their cargo is bound for the Mexico City metropolitan area, which is more accessible by truck.

The rail share is much lower on the US East Coast (25 to 30%), as most inland markets are reached over shorter distances and have higher economic density. For the Gulf Coast, rail share is very low, underscoring the east-west orientation of the intermodal rail network and much lower north-south intermodal connectivity. This creates a multiplying effect of externalities on port cities with a low rail share. For instance, Houston generates about 2.1 million inbound TEUs that are carried by truck, which is 52% of the level in Los Angeles and Long Beach, while its total inbound traffic is just 21% of the latter (2.1 M TEU vs 10.1 M TEU). Therefore, the modal orientation of inland distribution results in significantly different externalities on the respective urban landscapes (light blue bar on Figure 4).

Factor 3. A matter of cargo composition, seasonality and imbalances

Composition

The differences in the composition of imports and exports handled by ports are substantial, which is associated with logistical complexity and separate transport channels. While the majority of American containerized imports are linked with the retail sector, exporters are entirely different in nature (Figure 5). They mainly involve resource-based and agribusiness sectors, recycled goods, plastics, resins, and chemicals.

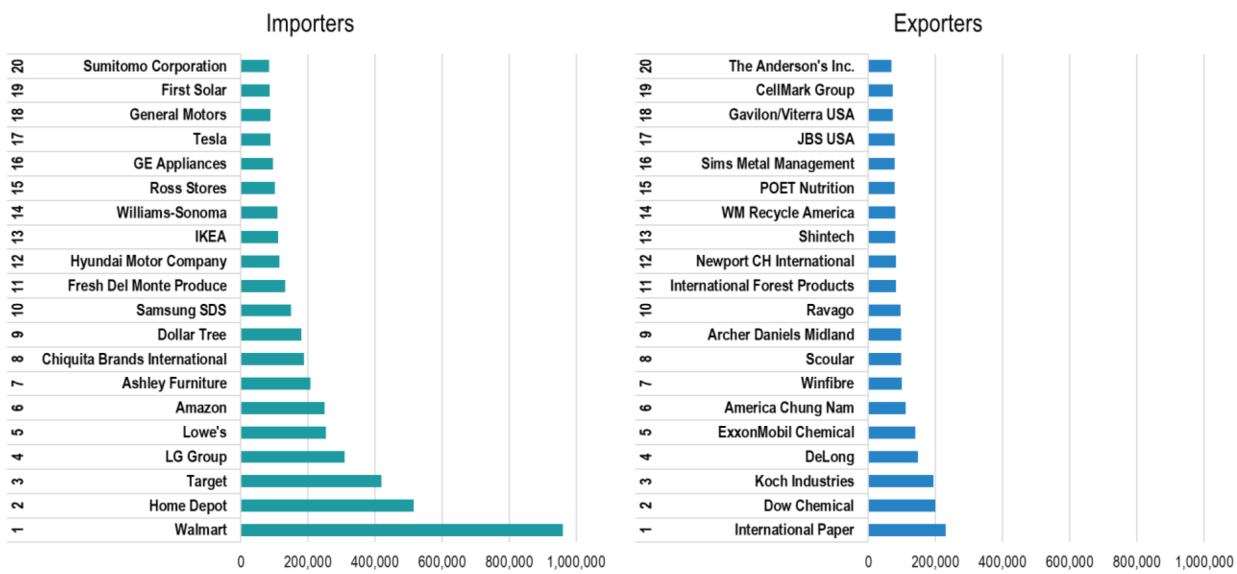

Figure 5 American Foreign Trade by Maritime Containers, 2024 (in TEUs). Source: Journal of Commerce.

North American containerized trade is thus characterized by an asymmetry between the urban consumer economy and the rural/resource/producer economy. Retailers account for a substantial share of containerized imports, mostly of finished consumer goods bound for major inland freight distribution centers. The largest importers, such as Wal-Mart, Home Depot, Target, Costco, Ikea, and Lowe's, are all mass (Big Box) retailers that rely on high-volume, low-margin goods. The online e-commerce giant Amazon is also among the top importers, reflecting the critical mass that home deliveries have achieved in freight distribution. The procurement power of large import retailers gives them substantial control over the price structure and the ability to direct flows accordingly. Alone, Walmart, Home Depot, Lowe's, and Amazon account for 2.146 M TEUs of inbound containers in 2024, which is close to 7% of all the inbound TEUs.

These importers have established what can be called a distributional hierarchy, where the destinations reflect the distribution of the North American population, which must be reconciled with the location of major gateways, which are a function of foreign procurement strategies. This composition highlights the variations in foreign procurement strategies that shape the choice and growth structure of gateways (ports of entry), which, in turn, influence the logistics of port cities as market service entities.

Exporters exhibit a distinct profile that aligns with the driving forces behind the dominance of the import logistics sector. A major category of containerized export concerns recycled goods with exporters such as America Chung Nam, WM Recycle America, or Sims Metal Management. Other major exporters include diversified resource-based (Koch Industries), forest and paper products (e.g., International Paper, International Forest Products), agribusiness (e.g., Cargill, Archer Daniels Midland), or plastics, resins, and chemicals (e.g., Dow Chemical, Shintech, ExxonMobile).

This has also had significant impacts on North American logistics. The import-driven segment involves a series of stages from port cities to reach a multitude of outlets with a freight density correlated with population density (Potter, 2015). Since the retail trade is essentially unidirectional, many retail goods are transloaded at gateways into domestic containers, while the maritime containers are re-exported empty. The export-driven segment relies on the massification of shipments at major gateways and inland ports.

As most resources (plastics, chemicals, forest products, food) are produced and extracted inland, at locations that are much less aligned with significant population centers, reconciling containerized import and export logistics is challenging. While millions of TEUs will leave American ports empty, many inland locations are facing container shortages, as priority is given to providing containerized capacity for higher-value inbound logistics. This became a source of friction between the import-based urban economy and export-based sectors.

Seasonality

The composition of this trade also contends with seasonality, with a peak in activity across all major port cities between July and October and low activity in January and February (Figure 6). Like most transportation infrastructure, this creates a capacity-planning problem and periods of higher stress at the port–city interface.

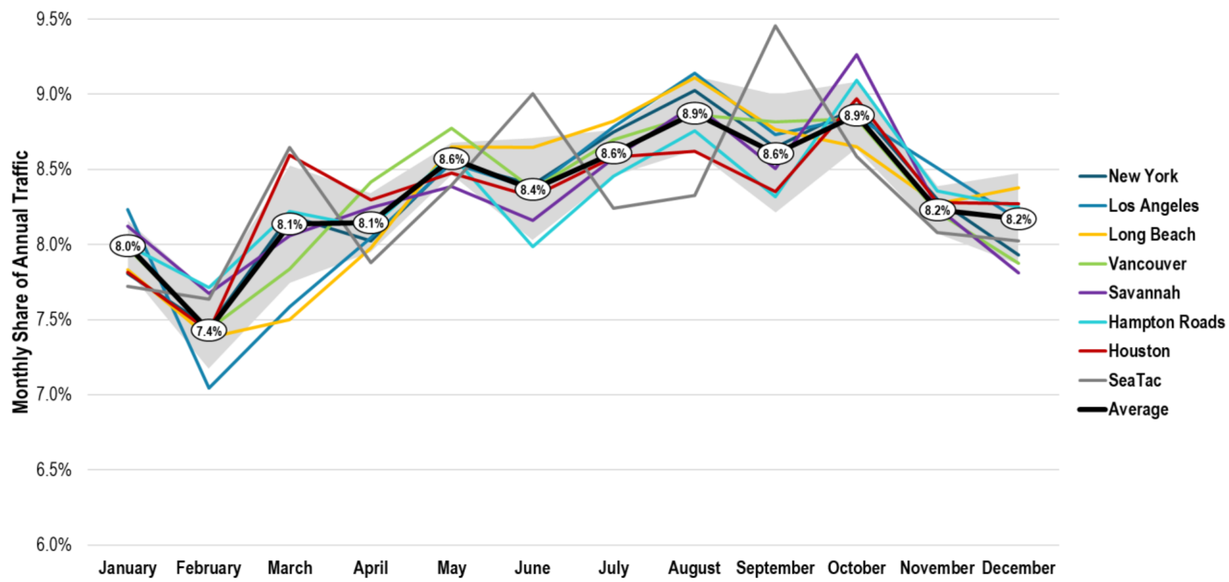

Figure 6 Average Monthly Container Traffic Share, Selected North American Ports, 2005-2023. Note: The grey area represents one standard deviation. Source: Port Authorities.

The composition of imports and exports, and their seasonality, cannot be effectively abated, as ports are not the drivers of the traffic they handle. Thus, seasonality remains an enduring factor in the variability of positive and negative externalities.

Imbalances

The systemic negative trade balance the United States maintains with several trade partners is well known and has endured since the late 1990s, driven by the offshoring and outsourcing of several segments of the manufacturing sector. It has profound implications for container flows, as there are substantially more inbound than outbound full containers (Figure 7; also evident in Figure 5). The strong import-based supply chains have led to the prioritization of the infrastructure and processes supporting these flows. The leading export of North American container ports is empty containers being repositioned, a “non-trade” function which accounts for between 40 and 75% of all outbound containers. There are two distinct classes of port cities concerning the preponderance of empties. The large gateway cities of Los Angeles (LA/LB) and New York have the highest share of outbound empties, above 70%, due to their strong service economies, which are associated with less export cargo. For LA/LB, the substantial share of rail and transloading (see Figure 4) generates large empty return flows, despite its extensive hinterland reach. For New York, 80% of the inbound traffic is bound for the New York metropolitan area and adjacent states, representing dense consumer markets. Smaller gateway cities such as Savannah and Hampton Roads (Norfolk) have a significantly lower share of empties in their outbound flows, at around 45%. They are proportionally more connected to their export hinterland.

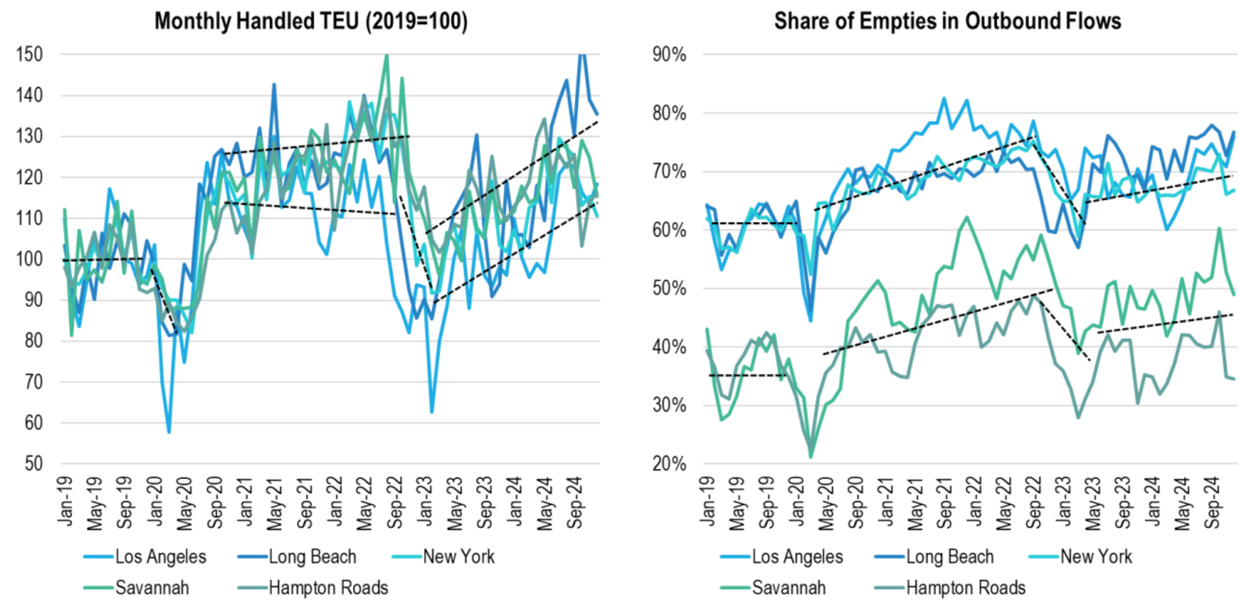

Figure 7 Container Flows, Selected American Container Ports, 2019-2024. Source: Port Authorities.

When container shipping faces a capacity shortage, the availability of export containers inland can be curtailed, as shipping lines prioritize importers. This imbalance has led to import-based logistics clusters clustering around port cities, contributing to regional congestion. There are no apparent mitigations to the acute imbalances in containerized trade flows handled by North American ports, aside from substantial changes to the trade regime.

Factor 4. A matter of technology and efficiency

Automation

Labor relations are another important expression of the nature of port-city relations, particularly in light of the dislocations in the direct employment and economic effects of port activities. This is further challenged by pressure toward automation, as automation and related technologies are essential to the future of port operations and logistics, as well as to mitigating externalities (Knatz et al., 2023). There are significant barriers to its implementation in the United States, and out of 84 container terminals, only six are automated.

- Three west Coast terminals are fully automated, implying that ship-to-yard (with Automated Guided Vehicles or Automated Straddle Carriers) and yard operations (with Automated Stacking Cranes; ASC) are automated.
- Three East Coast terminals are partially (semi) automated, implying that only yard operations are automated with ASC.

Longshore labor unions have also opposed automation, a process that dates back to the introduction of containerization in the 1960s, and have sought agreements on job security and compensation for dock workers displaced by port mechanization. Impediments to automation remain a barrier to improving American supply chains, as labor contracts limit automation by specifying which container-handling tasks at the terminal must be performed by labor. This opposition was evident during the ILA 3-day strike in October 2024, during which automation remained the core contention. As container volumes continue to grow, more container terminals will face pressure to automate.

Automation can mitigate container terminal pressure on the urban landscape but comes with lower employment multipliers. It shifts employment effects from direct port labor to indirect services, leading to an overall increase in wages but a reduction in the number of jobs and local economic multiplier effects. As automation advances, it risks further reducing the interactions between ports and the regional urban economy, particularly those directly related to employment. With container volumes continuing to grow at an average rate of 2% to 5% per year, several large terminal facilities may run out of footprint and their associated dynamic capacity in the medium term. Container terminal densification and expansion of dynamic capacity through faster dwell times remain among the few alternatives associated with automation.

Efficiency

Using comparative efficiency figures, North American ports usually perform below the global average. According to the Container Port Productivity Index (CPPI) released by the World Bank, no American port is among the top 50 in terms of its time performance. Using a national average, American container ports are about 20% less time-efficient than the global average (Figure 8). These productivity figures are of concern and related to the barriers discussed above, including the strong import-orientation of logistics flows. However, these figures must also be interpreted with caution as they may be symptomatic but are not explanatory.

Since North American container ports mainly act as gateways, they have a higher average number of container moves per port call, which, in part, explains their lower performance. 8 of the 12 largest container ports have CPPI well below the global average, and 62% of all TEUs handled are at port cities with time performance 20% or less than the global average. Inversely, only 22% of the TEUs are handled in port cities with a time performance above the global average by 20%. High-performing ports tend to be much smaller, suggesting that congestion is a byproduct of a port standing in the urban hierarchy. High-importance port cities attract higher volumes, which, combined with their strong import orientation, can be associated with longer ship turnaround times than ports lower in the urban hierarchy and less import-oriented. This can lead to an inverted interpretation of the CPPI, in which key North American gateways may receive lower scores despite their high attractiveness as logistical hubs.

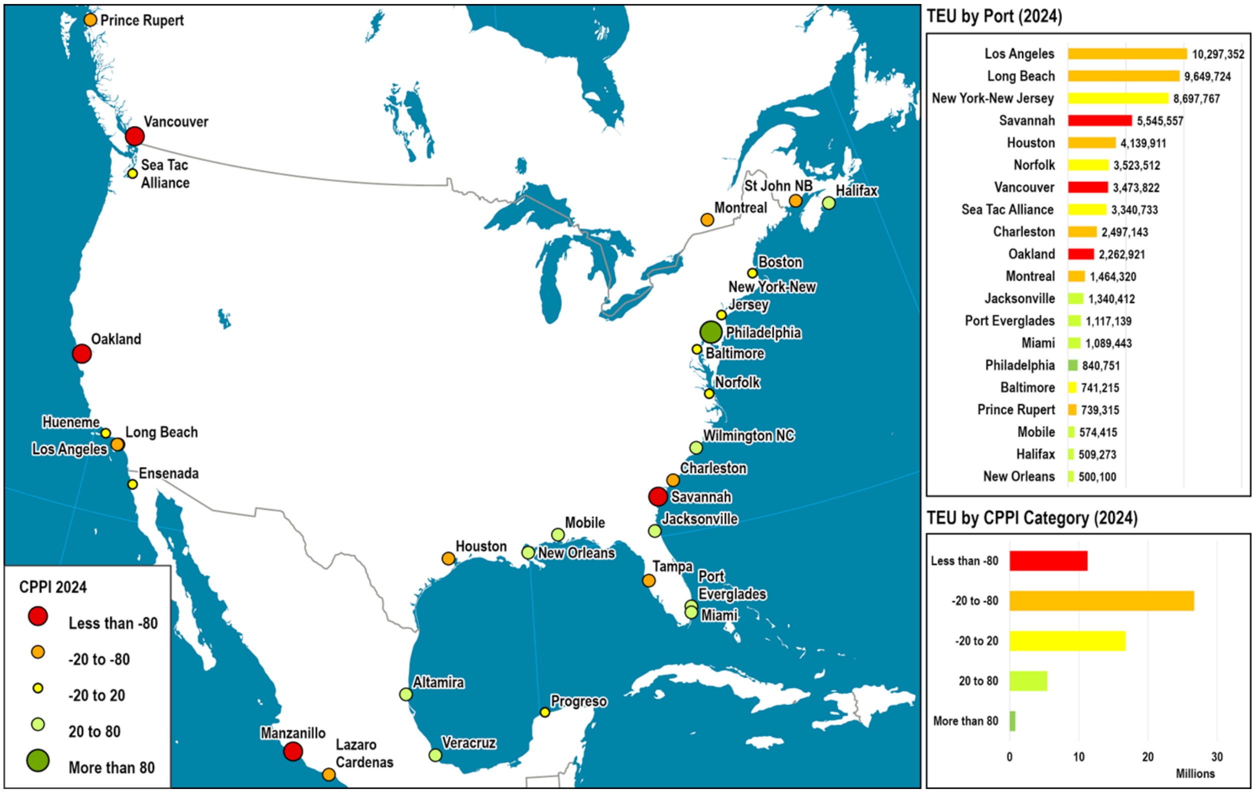

Figure 8 North American Container Port Productivity Index, 2024. Source: World Bank. Note: A value of 0 represents a time performance similar to the global average. A value above zero represents a time performance above the global average. A negative value indicates a time performance below the global average. Mexico is included, but not part of the compilation.

Still, increasing the efficiency of port operations is fundamental, but it requires addressing complex issues related to labor and automation. Meanwhile, other forms of automation, such as gate appointment systems (Giuliano and O'Brien, 2008), the digitalization of documentation and managerial processes, and warehousing automation, have led to noticeable improvements. Still, terminal automation is fundamental in the medium- to long-term, as port cities run out of land to handle traffic growth and the associated logistics. A core strategy is to increase the utilization of this land, which may require a shift in vision and a push for greater automation. Evidence underlines that automated terminals have about 40% higher stacking density than conventional terminals (Nacht and Henry, 2022). Port cities should not be seen as mere interchangeable real estate. They are strategic assets fundamental to national economic and geopolitical security.

Conclusion: Port Cities and Containerized Supply Chains

North American ports, particularly container ports, are in a tight spot. They are adapting to several barriers to their development and operations, which has incited a dissociation between the port and the city. This chapter has identified four dissociation factors that have been particularly influential in the North American port-city dynamics:

- Volume. The North American container port system requires the equivalent of 40 hectares of terminal expansion annually (0.6% of the existing footprint) to accommodate the average growth of 1.4 million TEUs. Additionally, this growth generates the equivalent of 1050 hectares of warehousing (617 warehouses, averaging 1.7 hectares per warehouse). Thus, the volume growth places pressure on North American port cities from both terminal footprint and port-centric logistics perspectives.
- Scale. The growth in ship size, particularly after the expansion of the Panama Canal in 2016, has incited improvements in the nautical profile of all the large container ports on the East and Gulf coasts. There is strong evidence that container cargo follows the nautical profile and that lower-draft port cities either undertake dredging projects or face marginalization. 52% of the 2024 container volume concerns port cities with depths greater than 50 feet, and only 11.1% of the traffic is accounted for by port cities with a draft of 45 feet or lower. The atomization of the loads for hinterland distribution, through direct truck deliveries, transloading, and intermodal rail, challenges the massification benefits provided by economies of scale. In North America, the modal orientation of inland distribution, particularly the rail share, results in significantly different congestion externalities on the respective urban landscapes
- Composition and orientation. Due to the composition of trade and its orientation, there are substantial dissociations between inbound and outbound containerized supply chains. Port cities ranking high in the North American urban hierarchy are also those with the most acute imbalances and the associated repositioning of empty containers. This discrepancy between inbound and outbound logistics is associated with additional urban truck flows. The variations in foreign procurement strategies shape the choice and growth structure of gateways (ports of entry), which, in turn, influence the logistics of port cities as market service entities.
- Technology and efficiency. The lower performance of North American port cities in terms of ship turnaround times masks their high attractiveness as logistics hubs. Efficiency is a double-edged issue, as automation is fundamental to future improvements in container terminals and logistics, particularly given the challenges of expanding the existing footprint of container terminals in North American port cities. Alternatively, the efficiency gains from automation in terminal operations are associated with a decline in the direct employment multiplier effect, further dissociating ports from their cities.

North American port cities have been adapting to economic, technological, and commercial changes since the onset of containerization. These processes have been dissociative and paradoxical, as globalization has underscored the strategic importance of port cities as generators of added value for the supply chains they support. At the same time, the direct relationships became less evident, such as the economic multiplier effects, which create tensions with communities. One potential element of a strategy to mitigate the ongoing dissociation is greater autonomy for port authorities, with expanded governance (World Bank, 2025). Many are landlords who may gain by acting more as entrepreneurs. As observed worldwide, port authorities and terminal operators have acquired or merged with others. Some have developed parent companies in logistics, infrastructure development, drone technology, and information technology. North American port cities have much to benefit from this perspective.

Another emerging risk is the vulnerability of mature and aging port infrastructures to massification, which can potentially create disruptions in the urban landscape. The 2024 bridge collapse in Baltimore, following a mega container ship collision, is illustrative of a black swan event. This had the dual effect of temporarily closing access to most of the facilities of a major port, removing an important road link in the regional transportation network, and creating a strong negative public image of mega container ships.

North America, particularly the United States, has a long maritime tradition, and the maritime orientation of its port cities supported its commercial ambitions, a tradition that has been substantially eroded. It will need to be revamped to reflect the challenges of the 21st century.

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