CMAP

Metropolitan Chicago's Freight Cluster: **A Drill-Down Report on Infrastructure, Innovation, and Workforce**

Summary Report, June 2012

The Chicago Metropolitan Agency for Planning (CMAP) is the region's official comprehensive planning organization. Its GO TO 2040 planning campaign is helping the region's seven counties and 284 communities to implement strategies that address transportation, housing, economic development, open space, the environment, and other quality of life issues.

See **www.cmap.illinois.gov** for more information.

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Chicago Metropolitan Agency for Planning

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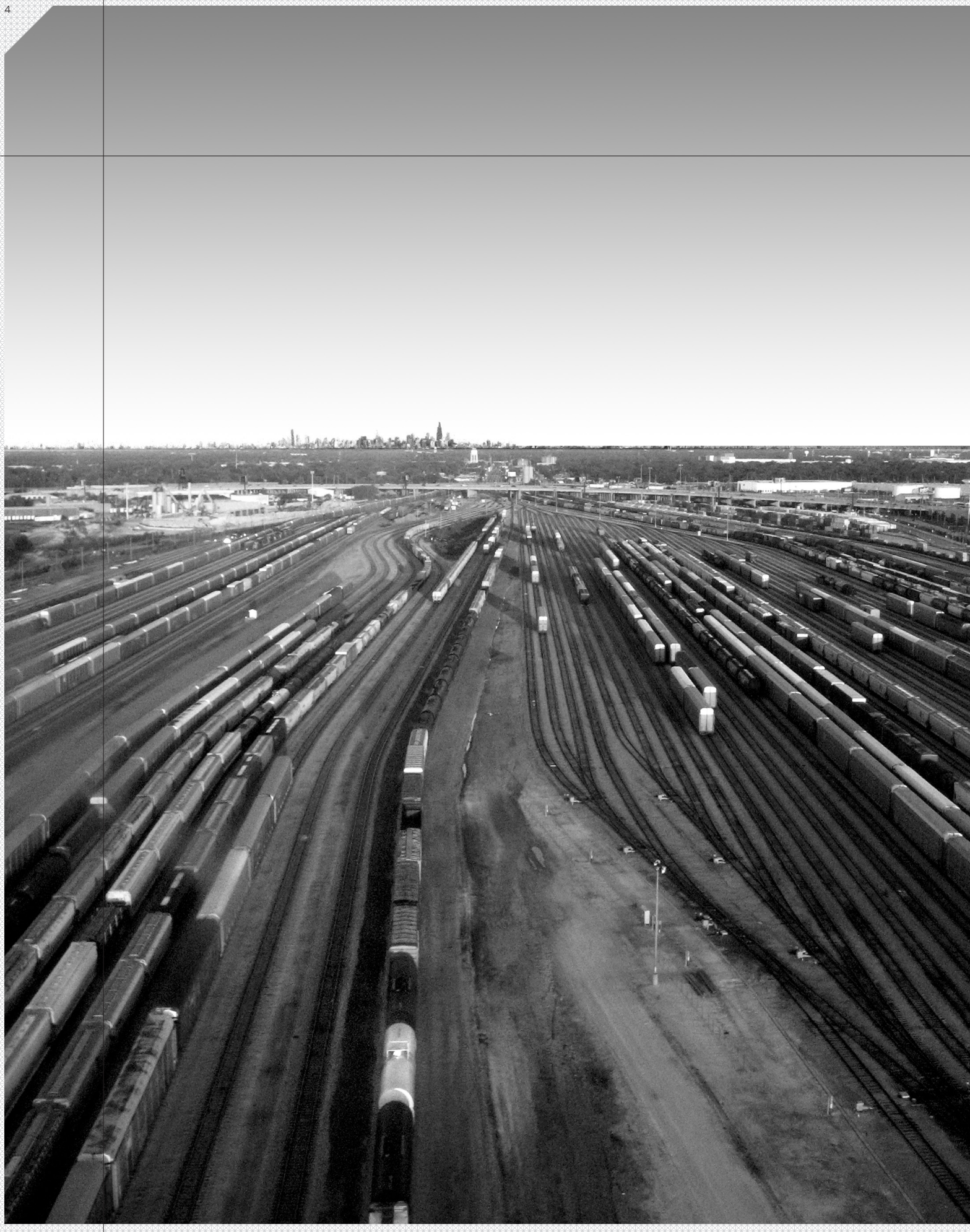


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Introduction

Metropolitan Chicago is one of the world's great economic centers. While the region enjoys a diverse mix of industries, it also realizes significant gains through its economic specializations. These "industry clusters" create high-quality jobs, spur innovation, and generate growth among numerous interconnected industries.

GO TO 2040 — metropolitan Chicago's first comprehensive regional plan in more than 100 years — calls for strategically organizing the region around its existing and emerging clusters of specialization to better compete in the national and international marketplace. The plan directs the Chicago Metropolitan Agency for Planning (CMAP), with the support of its partners, to perform "drill-down" analyses into specific industry clusters, including freight, advanced manufacturing, and biotech/biomed.

This drill-down report analyzes freight — one of the Chicago region's strongest specializations — to identify the major issues affecting this cluster's competitive advantage in the 21st Century. The first in a series of cluster studies by CMAP, this report explores connections between the freight cluster and the regional economy, examines how national and international developments are affecting freight in the region, identifies key infrastructure, workforce, and innovation challenges and opportunities influencing future cluster growth, and concludes with a short set of regional strategies to better align resources and investments with the needs of the freight cluster.

A companion technical document provides in-depth analysis as well as corresponding citations to support the conclusions of this report. This technical document and full bibliography can be found at **www.cmap.illinois.gov/freight-drill-down/**.

What is a cluster?

SECTOR
A broad set of similar economic activities — e.g., transportation.

INDUSTRY
Narrower than a sector — e.g., trucking.

CLUSTER
Interdependent groups of firms and related institutions that gain benefits from their proximity and interactions.

FREIGHT CLUSTER COMPONENTS



Source: CMAP analysis, 2012.
Note: Circle size represents relative size of cluster component by employment.

This graphic shows components of the metropolitan Chicago freight cluster. Firms in a cluster can be divided into core industries that drive economic activity; supply industries that provide the core with value-added inputs; support industries that offer maintenance and infrastructure; and customers who purchase goods or services from the core. The size of each circle approximates employment by industry.

The Cluster Approach to Regional Economic Development

An industry cluster is a group of interdependent firms and related institutions that draw a productive advantage from their geographic concentration and interactions. In addition to co-location, firms in a cluster share common resources and technologies, rely on a similar labor pool and institutions, and are linked through strong relationships and transactions.

The industry cluster framework has emerged as a preferred economic development methodology because of its ability to describe a region's economy, recognize the relationships between firms, and identify strategies for sustainable economic growth. Building on our unique freight cluster will help support long-term job growth and give the region competitive advantages in the increasingly global economy.

Metropolitan Chicago's Freight Cluster: Past, Present, and Future

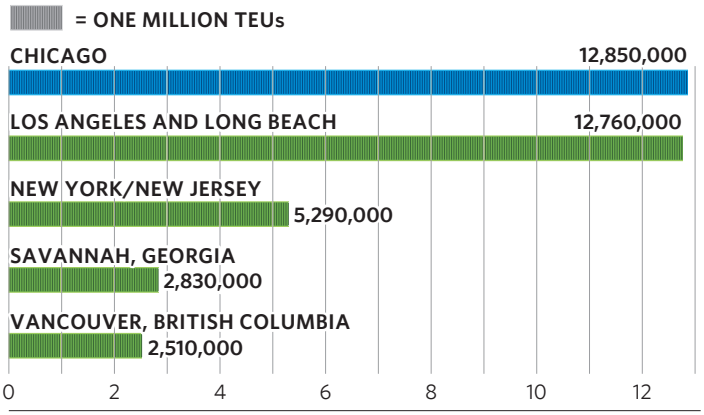
Metropolitan Chicago's status as the nation's foremost freight hub is rooted in its history. As the nation developed, this region became the conduit through which raw materials from the western frontier flowed east to factories in the industrializing north and manufactured goods returned to emerging markets in the west. As the region industrialized and grew, it also became a major exporter of goods.

The Chicago region's past has helped bolster its current position as the nation's freight hub as massive investments in transportation infrastructure and the built environment have entrenched freight operation in the region. Currently between a quarter and a third of all freight tonnage in the U.S. originates, terminates, or passes through the region. For intermodal moves, the region's concentration is even more striking, as upwards of half of all intermodal freight movement in the nation flows through Chicago.

Yet the conditions that fueled the early growth of our region no longer dominate in today's global marketplace. Innovation, technological adoption, and increased trade have revolutionized freight movement and produced longer, more fragmented global supply chains. To date, the metropolitan Chicago region has been able to adjust to these changes, becoming a transshipment center for intermodal cargo. Yet a number of new challenges have emerged, not only internationally, but also locally in terms of infrastructure, workforce, and innovation. Moving forward, the region must take decisive action in all these arenas to maintain its competitive advantage.

Between a quarter and a third of all freight tonnage in the U.S. originates, terminates, or passes through the Chicago region.

2010 top western hemisphere ports by twenty-foot equivalent units (TEU) container traffic, in millions



Source: CMAP Regional Freight System Snapshot for Chicago region, World Shipping Council for other regions, 2012.

The Freight Cluster: By the Numbers

Over a billion tons of freight worth over $3 trillion moved through the Chicago region in 2007, the most recent year of detailed freight estimates, though volumes have declined during the recent recession. By value, trucking accounted for two-thirds of these moves, rail another 30 percent, and air and water freight combining for the remainder.

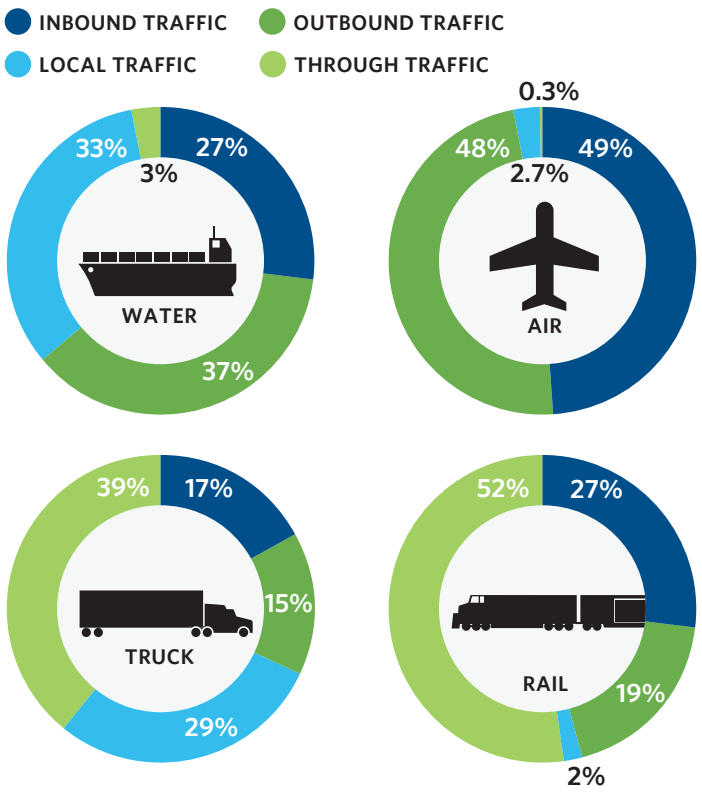
Regional Freight Movements by Mode

67%	30%	3%
TRUCK	RAIL	OTHER

Source: GO TO 2040.

In addition to varying by volume, regional freight modes also differ by trip type. "Through traffic" — which initiates and terminates elsewhere — is the largest component of both rail and truck freight because the region serves as the junction of eastern and western railroads as well as a midway point for continental moves. Trucking and water freight have a high percentage of local moves. Air freight is almost entirely divided between inbound and outbound traffic.

Percent of regional freight volume by trip type

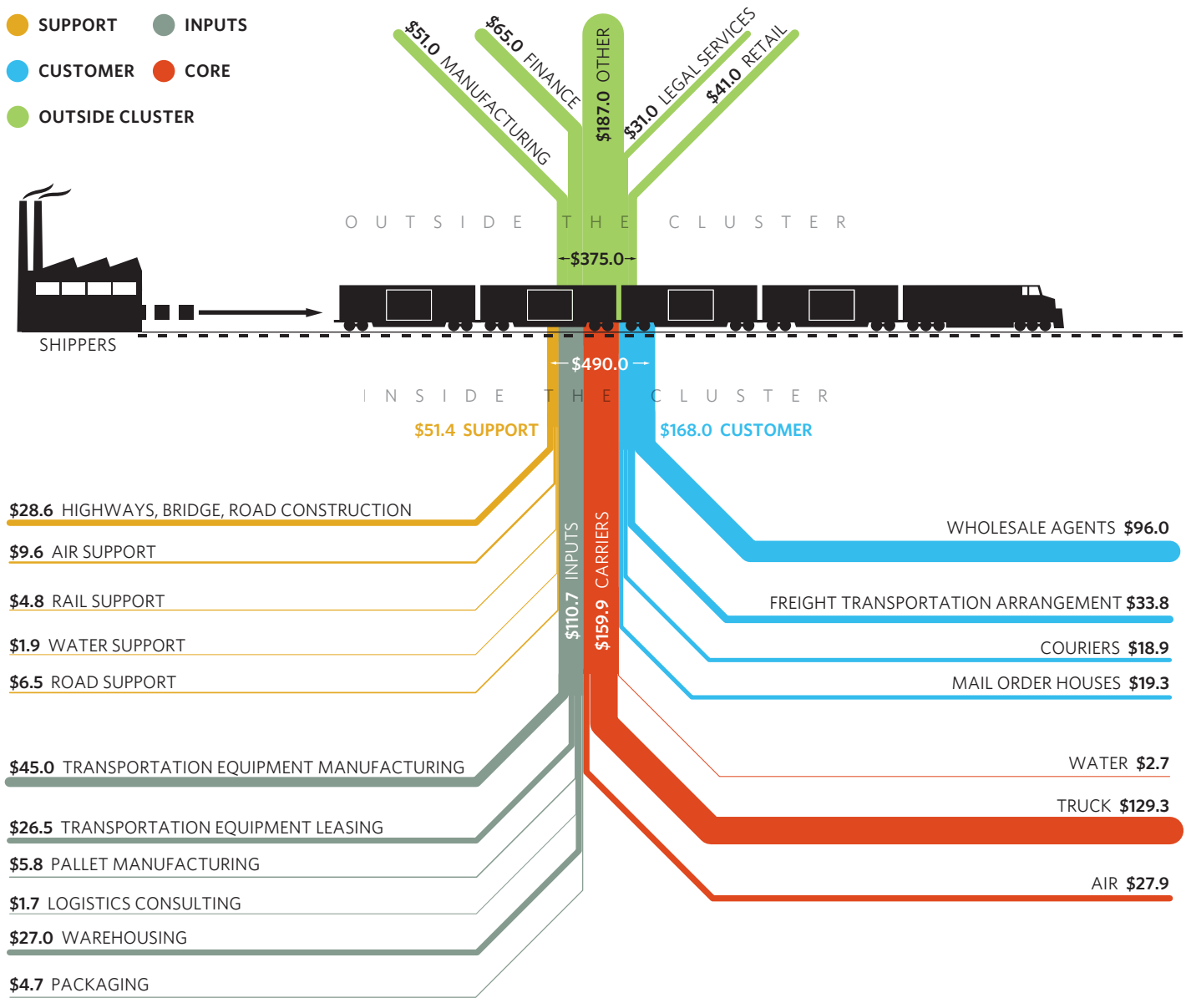


Source: Transearch database for year 2007. Estimates are for CMAP seven-county area.

Freight comprises a major slice of the regional economy — 4 percent of the region's private sector employment and $13 billion in personal income. Freight also generates a sizable "multiplier effect" on other sectors outside the cluster. Over a quarter of all the region's jobs are in industries directly tied to freight, and expansions or contractions in freight industries can substantially impact areas such as manufacturing, wholesale trade, and retail trade.

Overall a quarter of all the region's jobs are in industries directly tied to freight.

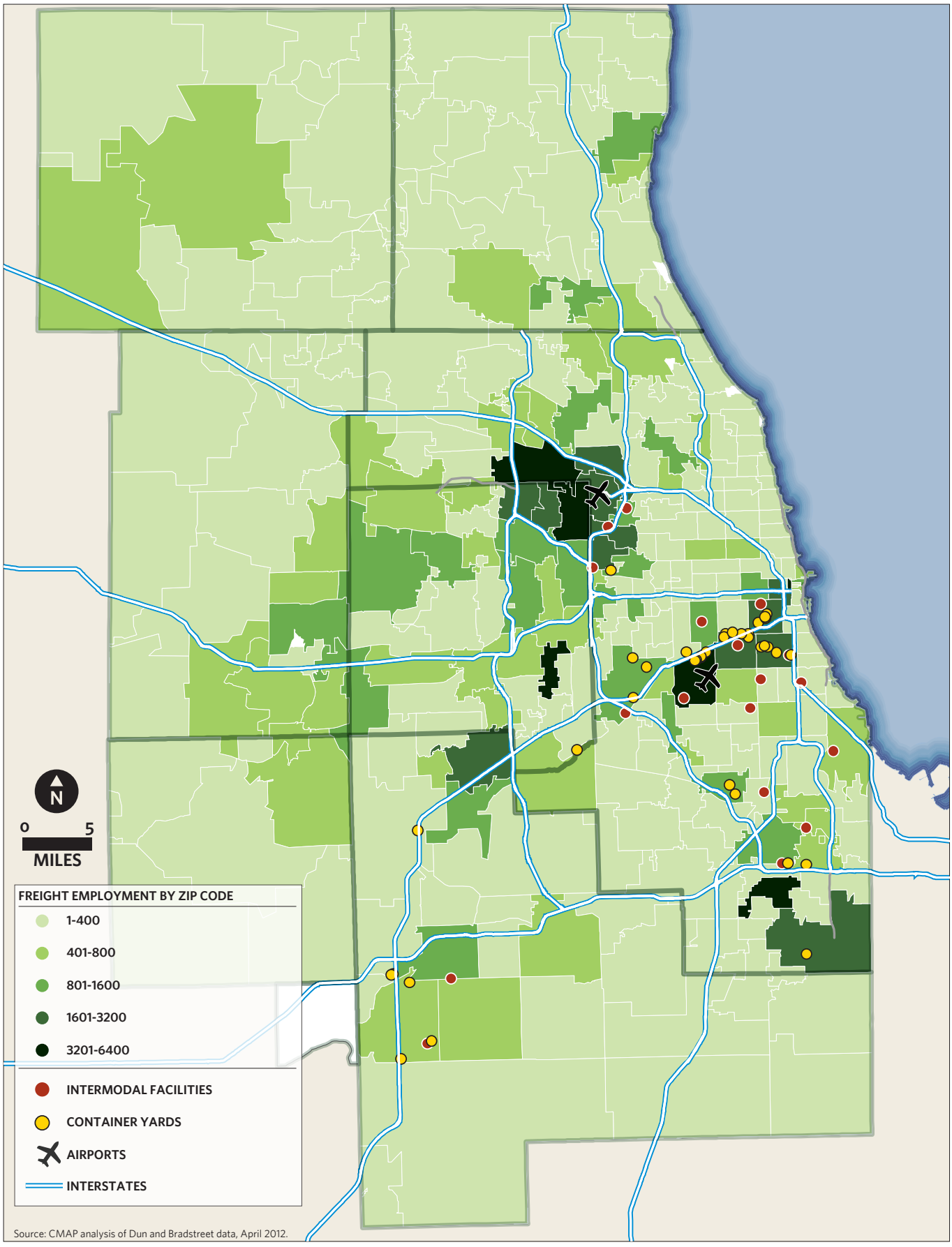
Economic multiplier from $1000 increase in rail sales



Source: CMAP Analysis of EMSI Input-Output Model, 2012.

The expansion or contraction of one freight industry has a substantial effect on both the freight cluster and the greater economy. This graphic depicts the ripple effects of a $1,000 expansion of the regional rail industry. This increase in sales would lead to $1,865 in economic activity ($1,000 in the sale itself and $865 in additional economic activity resulting from rail's expansion). The graphic shows that of the $865 in additional economic activity, $490 flows to industries within the freight cluster while $375 goes to industries outside the cluster.

Major employment centers of the freight cluster



While jobs in the freight cluster are located across the seven-county region, they concentrate along key corridors in close proximity to airports, intermodal facilities, and container yards. Major employment centers include the south side of Chicago, O'Hare Airport, northeastern DuPage County, southern Cook County, and an emerging concentration in southwest Will County.

Over the past decade, employment in the Chicago region's freight cluster has grown more (7 percent) than the overall regional economy (less than 1 percent). This growth has also outpaced New York and Los Angeles, the two other largest freight clusters in the U.S.

The metropolitan Chicago freight cluster comprises a large number of different industries, which can be classified into four distinct components: core, supply, support, and customer industries. Analyzing each of these four components across three separate metrics — current employment, employment growth, and "location quotient," which compares this region's employment to the national average — helps illustrate the region's comparative advantages, as well as areas where the cluster is underperforming.

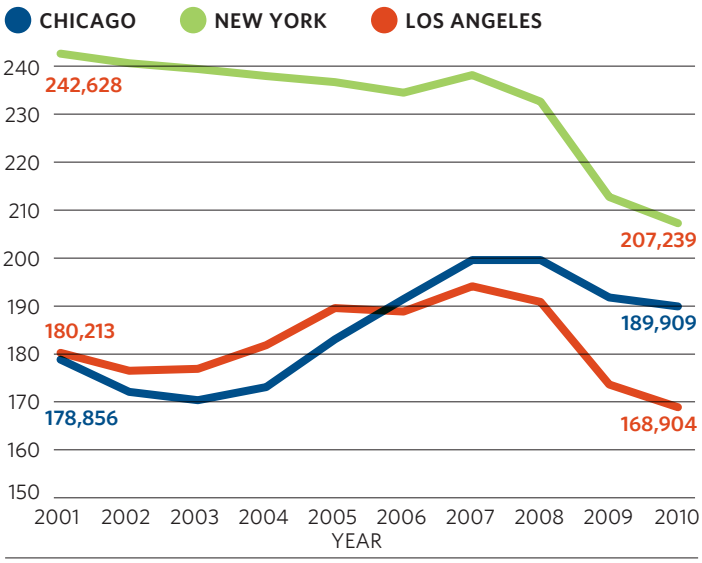
Strong elements of the freight cluster include those industries that added jobs while maintaining an above-average location quotient. Major cluster industries (those with at least 15,000 in regional employment) meeting this criterion are the trucking mode, freight transportation arrangement, and wholesale trade agents and brokers.

Regional strengths in smaller industries (less than 15,000 in regional employment) bolster the larger comparative advantages of the cluster. Air freight and operations, transportation leasing, logistics consulting, and rail support all have high location quotients and grew this past decade.

Some industries in metropolitan Chicago's freight cluster lost jobs this past decade but are still more concentrated in the region compared to the national average. Regional employment in rail, for example, fell by 1,000 jobs, but the mode continues to be heavily concentrated in the region. In fact, six of the seven largest railroads in the U.S. operate in Chicago, and the region handles 50 percent of all rail movement in the county. Further cluster industries that lost employment but sustained high location quotients include input manufacturing, packaging and labeling, road support, and mail-order houses.

While the freight cluster certainly exhibits many assets, not all functions essential for a thriving cluster are met within the region. Shrinking industries with below average location quotients include water freight and support functions, specialized freight trucking (a subset of the larger trucking industry that moves goods that cannot fit on standardized equipment), and couriers and express delivery services. Addressing industry gaps in the freight cluster can return upwards of $2 billion a year in economic activity that currently leaks out of the region.

Largest freight clusters in U.S., by number of employed, in thousands

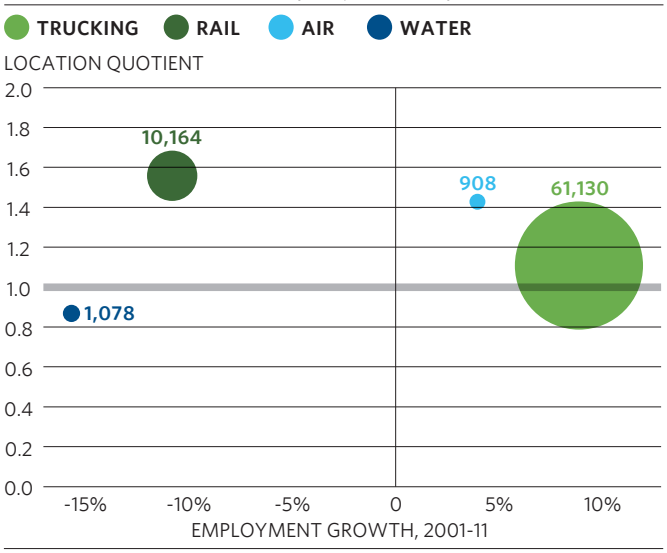


Note: Estimates exclude rail.
Source: QCEW and EMSI data. Data for Chicago region is for seven-county CMAP area. Data for New York and Los Angeles are for Metropolitan Statistical Areas (MSA).

Attracting underrepresented freight industries to the region and diversifying the functions of existing local firms can return upwards of $2 billion each year to the regional economy.

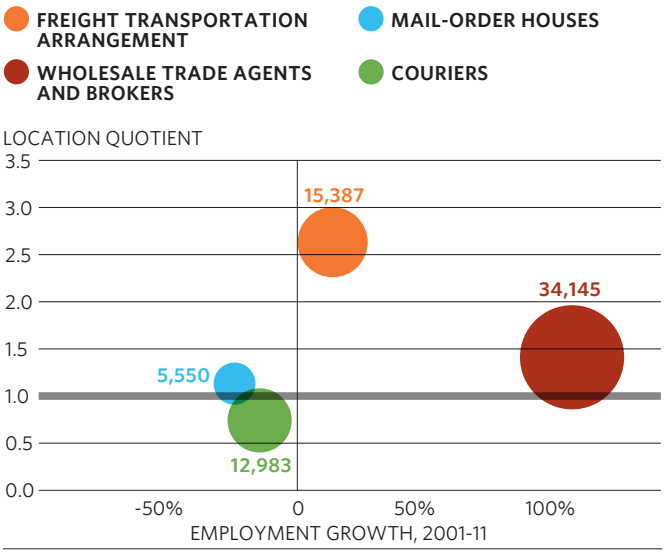
The horizontal axis in each of the four charts below measures regional employment change by industry for the last ten years, while the vertical axis shows the industry's 2011 location quotient. A location quotient compares the distribution of employment by a regional industry to the national average. A location quotient of one means the regional industry exactly mirrors the national average, while a location quotient above one indicates regional specialization and below one signifies underrepresentation. Current employment in the charts is measured by the size of each industry circle.

Core industries
Circle size indicates number of jobs per industry



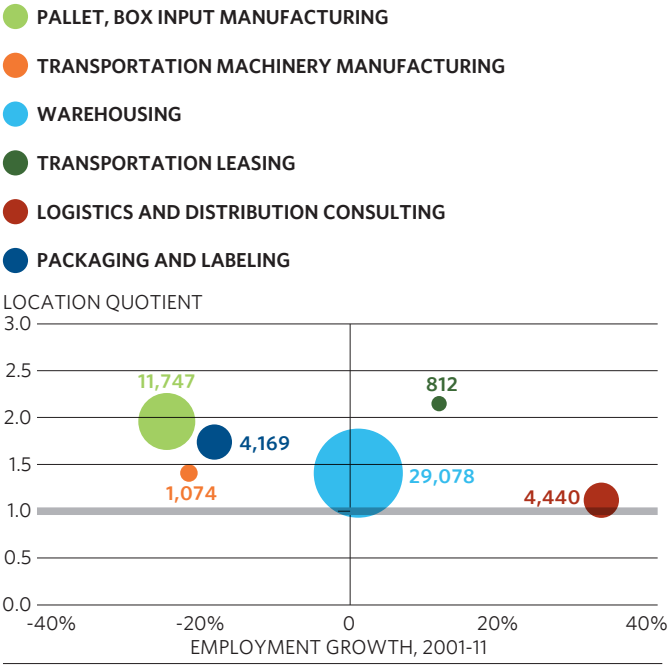
Source: CMAP analysis of EMSI data, 2012.

Customer industries
Circle size indicates number of jobs per industry



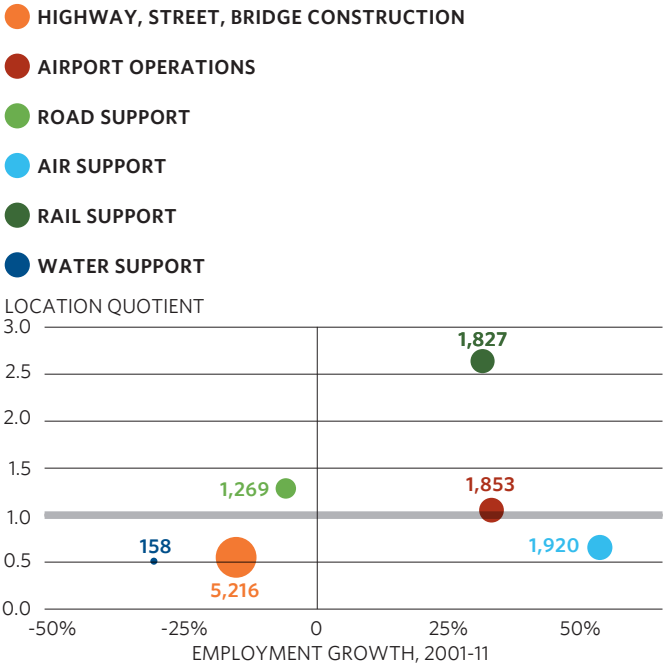
Source: CMAP analysis of EMSI data, 2012.

Supply industries
Circle size indicates number of jobs per industry



Source: CMAP analysis of EMSI data, 2012.

Support industries
Circle size indicates number of jobs per industry



Source: CMAP analysis of EMSI data, 2012.


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International and National Developments in Freight

Developments across the nation and the globe, including increased global trade, major infrastructure investments, and supply chain innovations, will continue to impact metropolitan Chicago's freight cluster. Some changes will present growth opportunities, while other developments may divert freight and related industries away from the region.

International Trends and Developments

Increased global trade has been fueled by growing commerce with Canada and Mexico and rapidly developing countries like China, Brazil, India, and South Africa. While imports to the U.S. still outpace exports, the U.S. Department of Commerce predicts an upsurge in U.S. exports to meet the new demand emerging in the developing world.

Indeed, U.S. export sales grew by more than 11 percent in 2010 — the fastest growth since 1997. Metropolitan Chicago is the nation's third largest export region by value, with manufacturing leading its growth in exports. Local, state, and national initiatives are underway to accelerate the growth of exports from Chicago and around the nation. Thus, not only will the increase in global trade bring more freight to the region in terms of imports, but metropolitan Chicago's strong industrial core also has the potential to increase freight through exports.

U.S. exports increased by more than 11 percent in 2010 — the fastest growth since 1997 — and are expected to continue their rapid growth.

Increased global container trade has sparked **expanded ship capacity**, which has prompted the expansion and modernization of the Suez and Panama Canals to support operation of larger container ships. The Suez expansion is complete, and much wider and deeper Panama Canal locks will open in 2014. Vessels with three times the cargo capacity, called "post-Panamax" ships, will be able to traverse the canals.

The expansion of the Panama Canal will possibly divert freight away from Chicago, which currently serves as a mid-journey staging ground for freight moving from Pacific ports to eastern markets. However, few east coast ports in North America are ready to receive the new fleet of larger ships. As late as 2011, only Norfolk, New York/New Jersey, and Halifax in Nova Scotia have the capacity to accommodate them. Ports along the eastern seaboard are exploring whether they will be able to modify their ports and waterways for the larger ships. Metropolitan Chicago continues to monitor these ports' progress to understand potential diversion of freight from the west coast ports linked to the Chicago region.

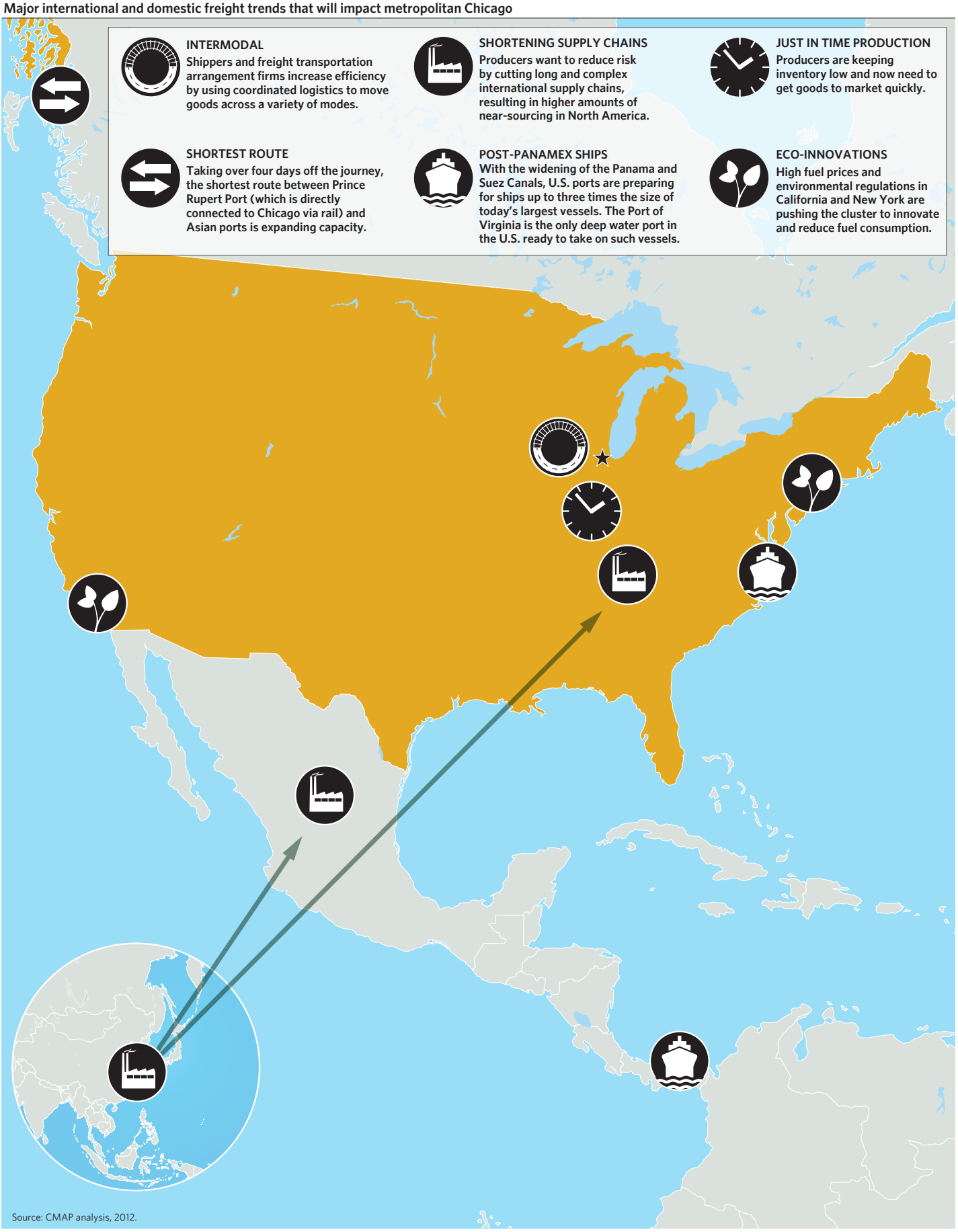
Increased global commerce has also sparked significant **port expansions and modernizations**, including larger cranes and wider berths. Prince Rupert in British Columbia will increase its capacity from 350,000 to 2 million TEUs by 2014. This port lies at the end of the shortest shipping route between China and North America. Both Chicago and Memphis are directly connected to Prince Rupert by Canadian National (CN) railway. Similarly, Mexico's Lazaro Cardinas is dramatically expanding its capacity from 160,000 to 2.2 million TEUs. Lazaro Cardinas offers direct connections to Chicago and Kansas City via Kansas City Southern Railways.

While globalization has enabled companies to realize efficiencies through more flexible sourcing of production, long and extremely complex supply chains can be disrupted by natural and man-made events such as the recent disasters in Japan and Thailand. Rising wages in Asia have reduced some of the cost advantages of production there, and higher energy prices have incentivized companies to seek shorter transportation distances. As a result, many firms have chosen "**near sourcing**," or moving production back to North America for its proximity to U.S. and European markets.

Producers can also reduce risk by adjusting supply chains. "**Just-in-time**" strategies keep inventory levels low and minimize the amount of time a product sits until it reaches the store or customer. Just-in-time production assumes predictable, reliable transport of goods. Because congestion and deteriorating infrastructure jeopardize just-in-time strategies, regions like metropolitan Chicago with heavily congested roadways and railways create a serious burden for shippers with tight timelines.

High and fluctuating fuel prices also push shippers to re-examine many longstanding practices and assumptions about transportation mode choices. Most notably, as rail technology improves and fuel prices continue to rise, **rail is becoming much more price-competitive**. Recent innovations in logistics have also enabled shippers to become more cost- and time-efficient, and the region's strength in intermodal and rail freight should position it well to take advantage of these emerging changes. Metropolitan Chicago maintains a significant competitive advantage over other freight hubs in intermodal operations.

Major international and domestic freight trends that will impact metropolitan Chicago



This infographic marks some of the major trends that stand to impact the Chicago freight cluster. The graphic is not intended to be a map of all trends, but it does mark the approximate location of some trends.

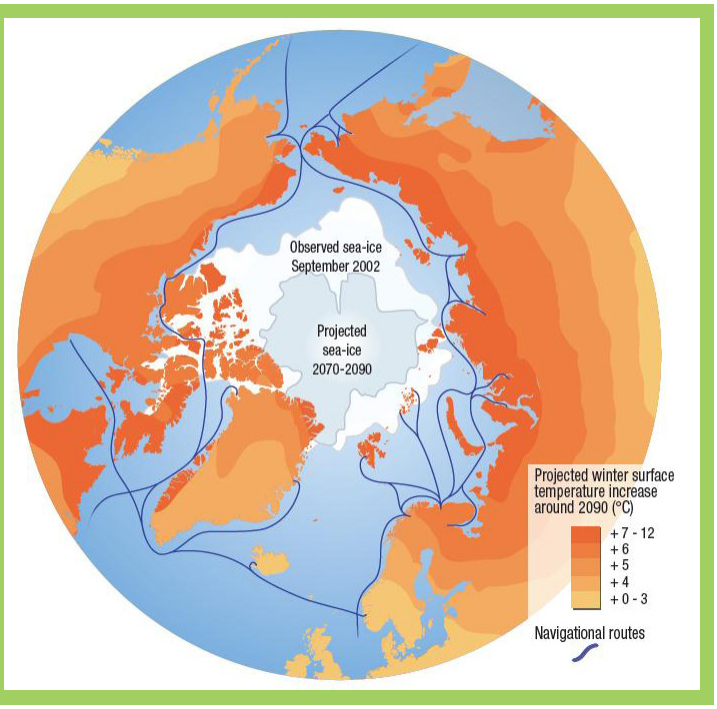
Domestic Competition

While the Chicago region's freight cluster remains the largest in the Midwest, other nearby regions, including Memphis and Kansas City, have recently made significant investments to compete. These metros have improved their infrastructure and enhanced the performance of their freight clusters. Both regions have also been proactive in crafting comprehensive economic development strategies that couple freight with manufacturing. They also boast less congestion than the Chicago region, making them more attractive for producers employing just-in-time strategies. The Chicago region must monitor these developments and respond appropriately to maintain its competitive advantage.

Midwest metros like Memphis and Kansas City are investing in infrastructure and have less congestion than the Chicago region, making them enticing alternatives to fulfill just-in-time shipping needs. Both regions have also been proactive in crafting comprehensive economic strategies that couple freight with manufacturing.

On the Horizon: Arctic Shipping

Shipping can change in unforeseen ways. The United Nations Environmental Programme recently found that increasing temperatures in the polar regions, receding icecaps, and decreasing permafrost have opened up several shipping routes in the Arctic Circle. In 2011, 18 cargo ships made the journey without encountering any ice impediments. The new route could cut nearly 3,000 miles (20 percent) off of the voyage from Shanghai to Rotterdam. While it is still unclear how this development might impact Chicago, it illustrates how the global freight landscape can change in dramatic and unforeseen ways.

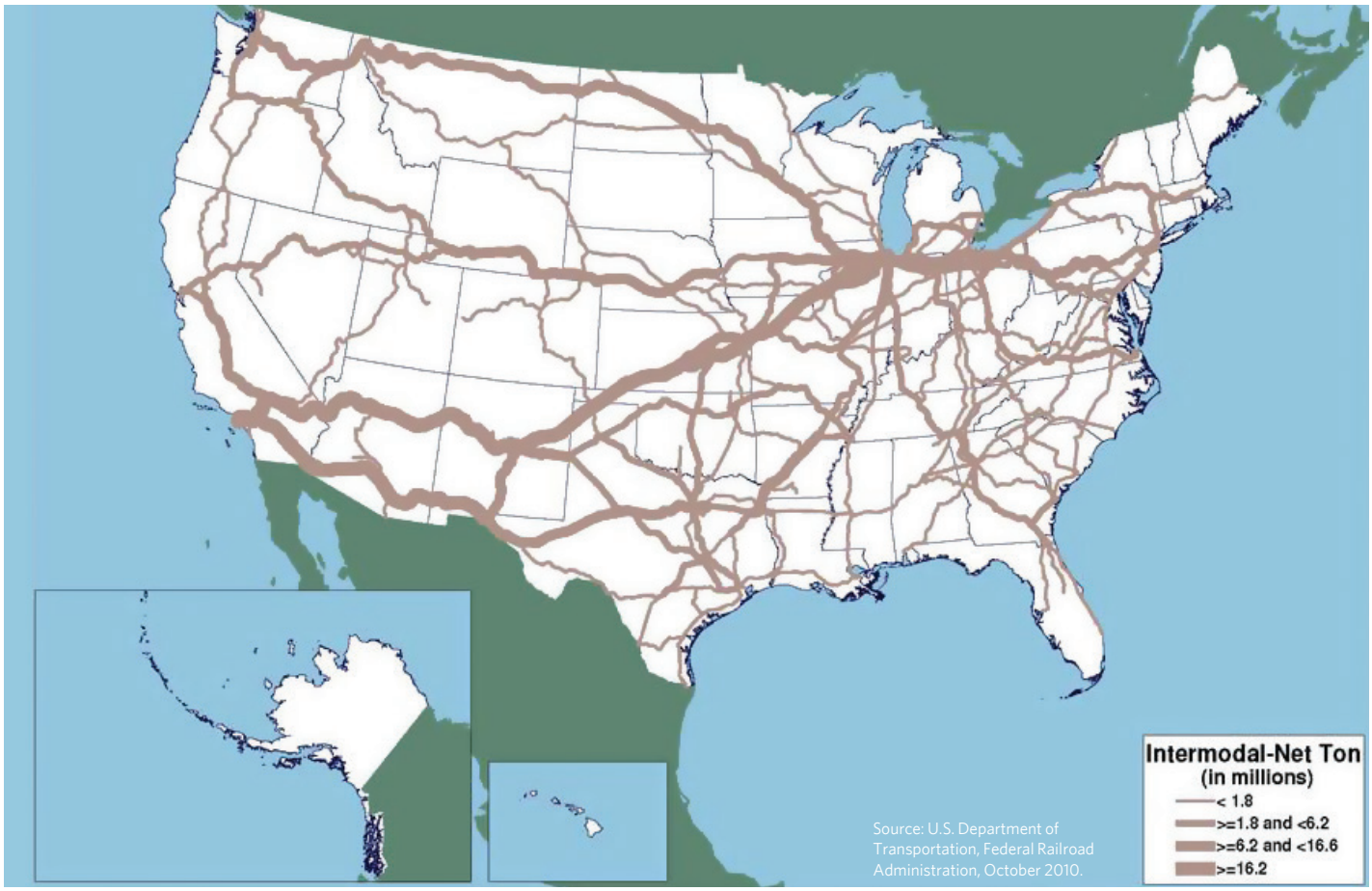


Source: United Nations Environmental Programme, available at **http://tinyurl.com/85nm4vy**.

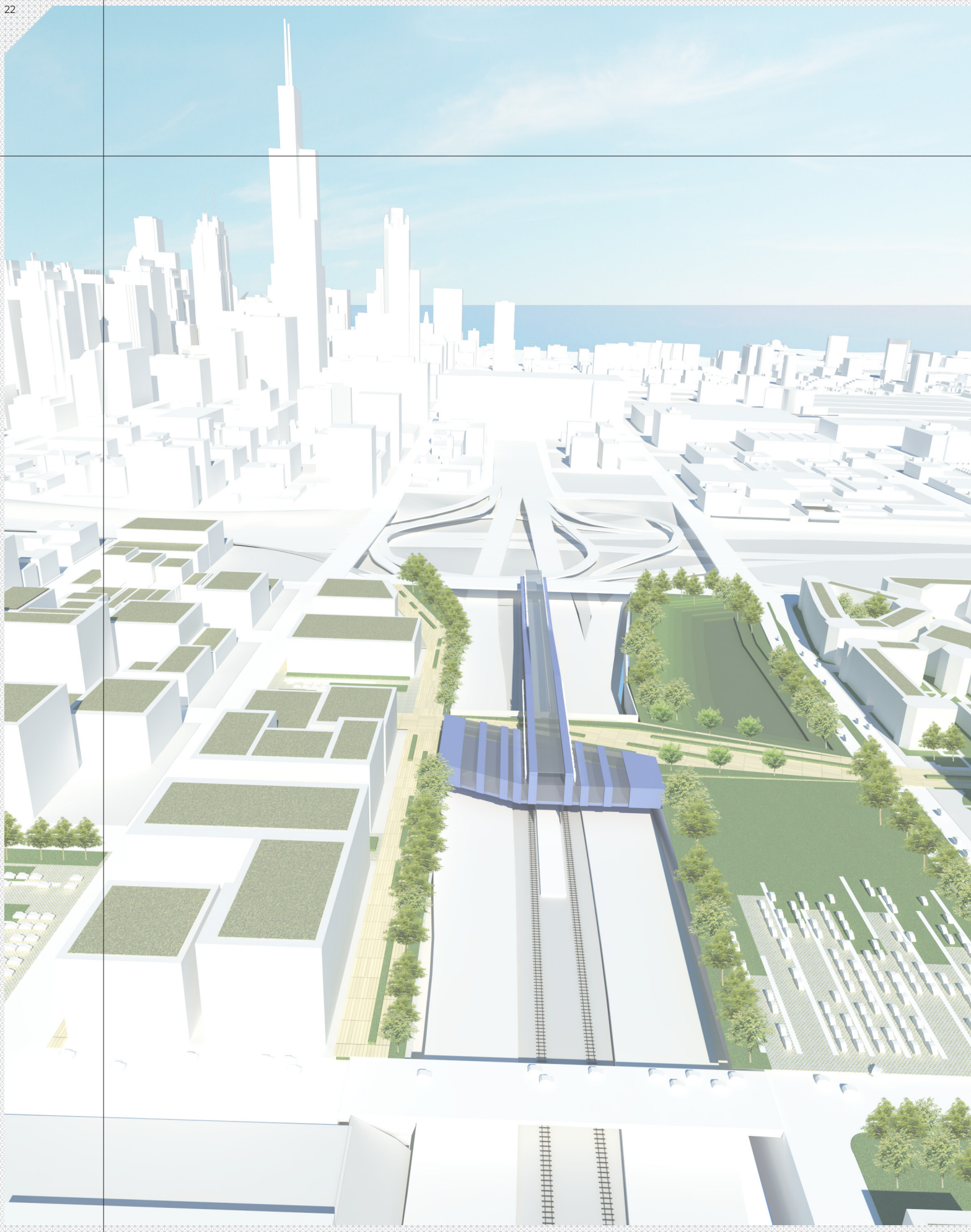
Home to the world's largest cargo airport, **Memphis** is served by five Class I railroads and has the nation's fourth largest inland water port and access to 11 interstates. The greater Memphis region is engaged in a cross-state partnership, coordinating resources to expand its manufacturing sector in conjunction with its rail and intermodal connectivity. Carriers have already invested over $500 million in upgrading or constructing tracks and new intermodal facilities. Memphis's existing infrastructure and availability of land make the region attractive to freight investment. Building from its air cargo shipping expertise, the region is positioned to become even more competitive in logistics and freight, challenging Chicago's status as the nation's dominant transshipment hub.

Kansas City's freight industry has expanded dramatically since the enactment of the North American Free Trade Agreement (NAFTA) in 1994. In taking a supply-chain oriented approach to its freight cluster, the bi-state region focuses on expansion of manufacturing industries related to freight. Four intermodal logistics parks in the region have recently opened or been upgraded. Five Class I rail lines and connectivity through three states with minimal congestion make the region an attractive hub for cross-country and freight coming north from Mexico. Under the regional economic development organization KC SmartPort, the region's shipping stakeholders have become more highly coordinated. KC SmartPort focuses on addressing both infrastructure needs and just-in-time production needs by clustering intermodal and warehousing facilities with manufacturing.

Tonnage of trailer-on-flatcar and container-on-flatcar rail intermodal moves, 2008



Chicago is the nation's intermodal hub facilitating the greatest volume of freight originating, terminating or passing through the region.



Challenges and Opportunities: Infrastructure, Innovation, and Workforce

Despite metropolitan Chicago's current strengths in freight, the future success of this industry cluster is not ensured. The cluster may be poised to grow its competitive advantage by seizing the right opportunities, but serious challenges within the region threaten to stifle or even prevent growth. Three distinct areas — infrastructure, innovation, and workforce — have considerable potential to influence the future growth trajectory of the regional freight cluster.

CREATE: Public-Private Partnership for Freight Rail Infrastructure

The Chicago Region Environmental and Transportation Efficiency Program (CREATE) is a public-private partnership between U.S. Department of Transportation, the State of Illinois, the City of Chicago, Metra, Amtrak, and the nation's freight railroads. Together, the partners identified and prioritized strategic rail infrastructure improvements to reduce congestion, especially those projects establishing rail/road grade separation.

Although CREATE has fostered a level of collaboration often seen in clusters, the project represents the first time the public sector has partnered with the private rail industry on such a large scale. Securing funding for future projects continues to be a challenge, but as of the end of 2011, 12 of the 70 CREATE projects were completed. The program is nationally recognized as example of an innovative approach to financing freight infrastructure improvements.

Infrastructure

Metropolitan Chicago is among the most congested regions in the nation. In the next 30 years, the region will add over two million people and more than a million jobs, while freight tonnage will increase by two-thirds along a shared transportation system already facing mobility constraints. Congestion costs regional businesses over $7 billion each year in lost fuel and time and undermines just-in-time shipment reliability that is essential in modern supply chains.

Like other parts of the country, metropolitan Chicago faces serious challenges in financing infrastructure improvements. The rising cost of construction and operations has significantly undercut the purchasing power of federal and state motor fuel tax receipts, which have fallen in real terms over the last 20 years. Capital investment decisions across all transportation modes remain largely formula-based rather than performance-driven. To date, our region has not implemented new innovative financing strategies like congestion pricing, which offers great promise in managing travel demand.

Freight improvements face particular institutional barriers in addition to financial hurdles. Freight remains a regional issue, where coordination, safety, and efficiency needs are broader and more complex than a simple accumulation of individual municipal interests. Freight improvements are intended to produce a mix of public and private benefits, but coordinating among private freight carriers within a competitive industry also remains a challenge.

GO TO 2040 examines transportation infrastructure, congestion, and funding in the region at length and recommends a series of actionable items to modernize the existing system, invest in public transit to alleviate some of the pressure on regional road network, establish user fees to manage demand (including the institution of congestion pricing and freight transfer fees), and implement a handful of major capital projects that have the most potential to maximize regional mobility. These action items represent a series of opportunities for the region to overcome its considerable infrastructure challenges.

Incompatible land use also diminishes the efficiency of the regional freight system. As municipalities in the region orient land use planning to maximize local revenues and minimize negative externalities, freight/industrial zoning has not kept pace with the designation of other land uses. Redevelopment also remains a serious challenge. Because of the fragmentation of parcels, underutilized land in existing communities is often less attractive for freight purposes requiring large footprints for terminals, warehouses, or other uses. Land assembly remains an expensive and time-consuming process, and a key challenge moving forward is how to make underutilized land in existing communities more appealing for freight investments.



Source: Will County Center for Economic Development, available at **http://www.willcountyced.com/midwestempire/inland_port_assets.aspx**.

CenterPoint's Logistics Park in Elwood, IL, shows the land intensity of freight activities, including terminals, warehousing, distribution, and logistics. For comparison, the park is about twice the size of the Loop in downtown Chicago.

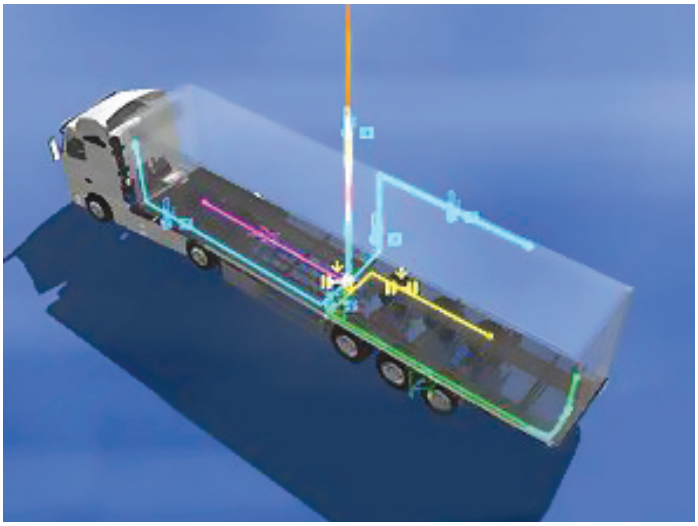
Innovation

Past innovations in freight have driven productivity gains and made industries and regions more competitive. The emergence of a standardized container in the 1950s, for example, revolutionized not only freight carriers but also logistics, distribution, and port operations. Since deregulation in the 1980s, the rail industry has embraced advances in rail track technology as well as introduced double-stack containers, all of which has enabled the railroad industry to triple its productivity, double its value, and cut its average cost per ton mile in half.

For the Chicago region to maintain its status as a leading freight center, it must continue innovating to spur job creation and economic growth. Industry clusters can help spur innovative activity, and understanding this is crucial for advanced economies to increase productivity and prosperity. Firms in a cluster are better poised to anticipate and react to new buyer needs. Ongoing relationships with other entities within the cluster assist the progress of formulating new technological, operating, or delivery possibilities. Since innovation often emerges out of the dense interactions and relationships of a cluster, the region's concentration as a major freight center represents an opportunity to capture an increasing share of innovative activity and a way to stay competitive into the future.

Innovation drives productivity gains — rail track technology improvements since the 1980s, including the introduction of double-stack containers, enabled the railroad industry to triple its productivity, double its value, and cut its average cost per ton mile in half.

Firms that offer technology-driven supply chain innovations, such as radio frequency tags, GPS routing, and backhaul utilization, will capture increasing segments of the freight market.



Source: Schmitz Cargobull, available at **www.cargobull.com**.

Digital sensors store, receive, and send information about the state of the vehicle, improving fuel efficiency, and reducing maintenance.

Technology-Driven Supply Chain Management

According to the former chairman and CEO of the transportation machinery maker Caterpillar, "the competitor that's best at managing the supply chain is probably going to be the most successful competitor over time. It's a condition of success." Controlling supply chains that stretch across the globe requires increasingly complex, technology-driven systems. Innovations such as radio frequency tags (RFID), GPS routing, backhaul utilization, and social media applications will increase efficiencies in freight movements; firms that can offer these efficiencies will capture increasing segments of the market.

Metropolitan Chicago may be poised to capture innovative supply chain management techniques because of its concentration in the freight transportation arrangement sector. The region has a broad mix of firms ranging from logistics giants like Exel to innovative leaders like Coyote Logistics, Echo Global Logistics, and Navman Wireless. The region also has strong startup activity in the industry. In 2011, freight transportation arrangement was second only to local trucking for the most new businesses created in the cluster. However, firms in the region have voiced concerns about the difficulty in attracting the high-skilled workers needed to manage complex supply chain solutions, as well as familiarizing existing workers with new technology requirements.

Terminal and Carrier Improvements

Facility management software continues to make ports and terminals more efficient. Intermodal facility software can indicate optimal container locations in seconds, replacing human estimates that took hours. Integrated systems can provide dispatchers with information concerning container availability, delay times at terminal entrances, and off-port traffic conditions. These improvements in operations allow terminals to be more efficient, overcoming some of the land use challenges associated with freight.

While market penetration of new technologies in the regional trucking industry is slow, the rail industry is implementing innovations such as electronically-controlled pneumatic brakes and distributed power. Trucking will certainly continue to serve as a major freight mode, but its cost and environmental pressures will provide opportunities for increased rail operations. The Chicago region is both the hub of carriers and suppliers; as rail grows as a freight transportation mode, so too will the cluster.

Regional innovations overcoming freight land use challenges

South suburban Hazel Crest is home to one of the world's leaders in intermodal equipment manufacturing. Mi-Jack's Rubber Tire Gantry cranes, now in use on six continents, have changed the standard for modern material handling practices by increasing yard storage and layout potential.

This innovation in efficiency allows terminals with the same footprint to lift, process, and store more containers than before, and do so more quickly as well. As a result, new freight investment can be sited where infrastructure and a freight-savvy workforce are concentrated but available land is relatively scarce, such as the southside of Chicago and the south suburbs.



Source: Hofstra University, available at http://tinyurl.com/6mj5n4f.

"Green" Innovations in Freight

Rising costs, fuel price fluctuations, and increased regulation are driving demand for more fuel-efficient freight vehicles. The primary focus of equipment manufacturers is currently on fuel efficiency and fuel economy systems. Telematics — digital sensors transmitting information on a vehicle's performance — also help carriers conserve fuel. The region's status as a nexus of rail movement bodes well for the cluster as firms look to mitigate their emissions through more fuel-efficient modes. While the region has made strides in addressing freight emissions, other freight centers like Los Angeles that push the frontier in incentivizing green innovations may capture an increasing share of this emerging market.



Source: Union Pacific Railroad, available at **http://www.uprr.com/she/emg/technology.shtml**.

GenSet switching engines reduce greenhouse gas emissions by 37 percent.

Workforce

The freight cluster includes a broad spectrum of jobs, ranging from low-skilled temporary positions to highly-skilled and technical positions. The cluster has also innovated over time, and today technology skills are a requirement of even the most basic freight job as new systems and programs are introduced. While this innovation creates a tremendous opportunity to grow the cluster, it also creates a "skills mismatch" that affects both the low and high ends of the skills spectrum. This mismatch is occurring precisely when demand for freight is growing. To thrive, the cluster will demand more high-tech workers like programmers and will also need to grow an entry-level workforce that is capable of using the latest field innovations.

Despite the recession and higher-than-normal unemployment openings, many entry-level jobs in the freight cluster remain unfilled. Though many jobs in the freight cluster require limited training, individuals who have the capacity to complete required duties often lack necessary soft-skills (e.g., basic problem solving and communication skills) for a professional setting or do not pass required drug tests.



Source: Hong Kong R&D Centre for Logisitics and Supply Chain Management Enabling Technologies.

Special locks on containers moving through Hong Kong can only be opened using an RFID reader, reducing inspection time from two hours to five minutes. Inspectors were retrained to become more tech-savvy.

Largest occupations in regional freight cluster

OCCUPATION	2008 JOBS	2011 MEDIAN HOURLY EARNINGS	EDUCATION LEVEL
Truck drivers, heavy and tractor-trailer	**23,322**	**$19.96**	**Moderate-term on-the-job training**
Laborers and freight, stock, and material movers, hand	**18,716**	**$10.96**	**Short-term on-the-job training**
Industrial truck and tractor operators	**5,815**	**$14.45**	**Short-term on-the-job training**
Packers and packagers, hand	**5,465**	**$9.44**	**Short-term on-the-job training**
Truck drivers, light or delivery services	**5,301**	**$15.55**	**Short-term on-the-job training**
Cargo and freight agents	**4,719**	**$18.53**	**Moderate-term on-the-job training**

Source: "Freight Cluster Drill-Down Regional Workforce Analysis," CWIC, 2011.

Transportation, Distribution, and Logistics Training Center at Olive-Harvey College

As part of the "Colleges to Careers" initiative, Chicago and state officials are developing an innovative program that links Chicago City Colleges to regional industry clusters. Olive-Harvey College on the south side of Chicago will be the state's first school to train people for jobs in transportation, freight, and logistics. A 200,000-square-foot training facility will anchor the program and prepare workers for various fields in freight such as repairing heavy equipment, forklift operation, warehousing technology, and avionics technician. The program is an example of public-private collaboration, with private freight firms such as American Airlines, Canadian National Railway, and Coyote Logistics providing input on the curriculum.



Source: City Colleges of Chicago Olive Harvey, http://tinyurl.com/769uzl3.

There are other challenges to filling freight jobs. They can be highly demanding and not well-compensated. Trucking, for example, often requires people to be on call 24 hours a day and leave home for extended periods of time. Truckers' salaries vary dramatically depending on whether a trucker owns his own rig or works for a larger company. Individual operators tend to make much more money and stay in the occupation for longer, but it is very difficult for individual truckers to secure financing to purchase their own trucks.

One key strength of the freight cluster is that many industries provide extensive on-the-job training. This provides significant employment opportunities for individuals with lower levels of education and can serve as a valuable career entry point for workers.

Industry involvement can also ensure that public workforce training programs provide relevant and up-to-date training that easily transfers into the workplace. Programs like the Transportation, Distribution, and Logistics Center at the Olive-Harvey College directly involve freight firms in designing and teaching the program.

The cluster also needs to be prepared for tomorrow's workforce. The Science, Technology, Engineering, and Mathematics (STEM) initiative at the state-level helps organize industries to inform educators preparing students for careers in fields that are growing and innovating. Partnerships like the Olive-Harvey College Transportation, Distribution, and Logistics program is a start; discussions to expand the program in the region are underway. When freight cluster industries are engaged with the workforce and education system, the skill mismatch is diminished and the workforce is more responsive to changing technologies and competencies.


TRUCK ONLY

Moving Forward: Strategies to Strengthen the Cluster

This concluding section of the drill-down report describes high-priority strategies for growing and supporting our region's freight cluster. While often overlooked, freight is a major strength of metropolitan Chicago's economy. Freight demand is expected to double in the next 20 years, representing enormous potential for regional economic growth. Though the region currently is a preeminent freight hub, its status is not assured in the future; to capitalize on that growth, stakeholders must proactively respond to the leading opportunities and challenges.

Among the opportunities, freight provides a broad spectrum of jobs that are particularly resistant to offshoring and outsourcing. Moreover, innovations in freight allow regional firms to be more competitive and gain greater access to distant markets. Many emerging trends — including increased intermodalism, global infrastructure investments, and supply chain management — will funnel future freight to Chicago, capitalizing on the strategic advantages of the region.

The cluster also faces a series of challenges, not only from international and domestic competition, but also from within the region in terms of infrastructure, innovation, and workforce. Moving forward, rather than rely solely on its current freight strengths, metropolitan Chicago must actively build on its regional specialization. Inaction will exacerbate the already considerable challenges facing the cluster and will cause stagnation.

It is important to note that economic growth and innovation are largely generated by the private sector. Indeed, most of the data and analysis in this report focuses on measuring the size and scale of private firms and workers within the freight cluster. Ultimately, the region's business leaders will be responsible for making many of the strategic decisions that create new breakthroughs and fuel metropolitan growth. However, the creation of new **strategic partnerships between private and public entities** emerges as a key theme throughout the following strategies.

The public sector has a significant role to play in making infrastructure investment decisions, training our workforce, and planning for future land use. But across all of these policy areas, harnessing the expertise of the private sector will be essential to addressing some of the most intractable challenges facing the freight cluster. Similarly, government can work to rationalize and prioritize sets of widely dispersed yet shared problems faced by private entities. Lastly, many civic organizations and public leaders can help to articulate a common regional direction and can play a vital role in providing support, services, and policy direction.

Infrastructure Implementation Action Areas

System Coordination

Next Step:
Evaluate the feasibility of a Regional Freight Authority.

Lead Implementer:
CMAP

Currently there is no unified voice for freight in the region, with limited collaboration between different modes, stakeholders, and levels of government. System coordination can be improved through a regional freight authority that plans on the regional-scale instead of focusing on isolated improvements. In partnership with industry and civic leaders as well as state and local government officials, CMAP intends to lead an inclusive effort exploring institutional responses to freight system coordination. The first step in the process will be for the CMAP Board to form a task force to analyze these complex issues and issue recommendations on next steps.

Innovative Financing and Project Prioritization

Next Steps:
Explore the viability of more targeted user fees.

Prioritize existing projects based on a freight mobility criterion.

Lead Implementers:
Public-private partnership of freight carriers (truck, rail, water, and air), public agencies (State of Illinois, municipalities, counties, CMAP), and civic organizations

Traditional means of financing infrastructure projects across the country are proving inadequate to maintain, modernize, and expand the transportation system. New ways of funding freight investments have emerged — such as a freight transfer fee, congestion pricing, or public-private partnerships — which could be replicated in Chicago.

The region has conducted a wealth of freight planning, including prioritizing through GO TO 2040 and CREATE a series of infrastructure projects that address freight mobility. Broad stakeholder support is needed to accelerate some of these key priorities, establish new partnerships among public and private interests, and assemble funding from both traditional and more innovative sources to move projects to completion. To build on regional strength, future investments in freight infrastructure should have a multimodal focus.

Coordinated Land Use

Next Steps:
Preserve freight designation along key corridors.

Establish freight coordination between municipalities.

Lead Implementers:
Municipal governments

While freight activities are extremely land-intensive, land-use planning for freight across our region has not kept pace with the designation of land for other uses. Land currently best suited for freight needs to be preserved along key corridors so that the cluster can expand in the future. Local governments throughout the region must lead this effort. The Green TIME Zone strategy serves as an example of multi-jurisdictional coordination, and resources such as CMAP's Local Technical Assistance program can also help target resources and address land-use challenges.

Innovation Implementation Action Areas

Maintain Comparative Advantages, Promote Innovative Industries, and Bolster Underperforming Sectors of the Cluster

Next Steps:
Align current economic development strategies to build on regional strengths.

Target effective economic development resources to innovative industries. Showcase the innovative strengths of the region to early stage financing firms.

Bridge current cluster gaps by bolstering underperforming and attracting underrepresented industries.

Lead Implementers:
Governor's Office, Illinois Department of Commerce and Economic Opportunity (DCEO), local economic development practitioners

Metropolitan Chicago specializes in key freight activities that seem primed to benefit from new innovations. Capturing those innovations within the region would fuel future growth in the cluster. Innovative trends include:

- Supply chain management
- Intelligent transportation systems
- Fuel efficiency and alternative fuels
- Backhaul utilization
- Modal transferability
- Intermodal facility operations
- Carrier improvements

Capturing these innovations will build on the region's comparative advantages in logistics and intermodal moves. The cluster can also be strengthened by bolstering underperforming and underrepresented industries including couriers, specialized freight and water freight. While these industries are less specialized in northeastern Illinois, they are more concentrated in other parts of the tri-state area such as northwestern Indiana, showing that more regional coordination is needed.

University Research That Leads to Commercialization

Next Steps:
Incentivize models that match university research with industry need.

Advocate freight-specific research and development initiatives.

Lead Implementers:
Regional universities, Illinois Science & Technology Coalition

Universities in the region can take on a greater role in supporting freight innovation by conducting research that is aligned with industry needs and has a clear path toward commercialization. Greater synchronization is needed at the beginning of the research process to match university expertise with industry need. Guiding research to address current industry challenges will in turn increase the commercialization of technology transfer programs. The Illinois Science and Technology Coalition, an organization that supports public-private collaboration in research projects, may be well-suited to lead this endeavor in conjunction with regional universities.

Expound the Region's Innovative Status

Next Step:
Highlight innovations within the cluster.

Lead Implementers:
Civic organizations

The Chicago region could benefit by drawing attention to its competitive advantages in freight beyond the well-known infrastructure assets. Organizations such as the Chicagoland Chamber of Commerce can showcase the region as a center of freight inventiveness, helping create a culture of innovation and concentrate future resources in the area. Industries should be encouraged to adopt new technologies. Companies creating and implementing innovations should be highlighted as national leaders.

Workforce Implementation Action Areas

Foster Public-Private Collaborations with Freight Cluster Industries and Education and Workforce Training Providers

Next Steps:
Evaluate data, monitor outcomes, and expand freight-cluster training model to other community colleges in the region as needed.

Develop strategies for workforce investment boards (WIBs) in the region to target freight cluster workforce needs.

Implement Illinois Pathways learning exchanges around transportation, distribution, and logistics.

Lead Implementers:
Freight industries, community colleges, WIBs, Illinois Pathways partners, advocacy and policy organizations, and universities

Innovations are rapidly changing freight workplaces. One way to meet the training needs is for community colleges and WIBs to work with the freight cluster to reshape their programming to more directly connect to the rapidly changing workforce. The Olive-Harvey Transportation, Distribution and Logistics "College to Career" program could serve as an exemplar to be replicated.

Stronger connections between industry and educators can help inform preschool through college education for STEM curricula to prepare students for the future needs of the freight cluster.

Address "Soft-Skills" Training Needs

Next Step:
Build collaborations to deliver soft-skills training that is relevant to the freight cluster.

Lead Implementers:
Freight industries, community colleges, universities, community-based training providers, and WIBs

Industries from across the cluster should collaborate with WIBs, community-based organizations, community colleges, and training providers to address the need for soft-skills training that is relevant to the workforce gaps in the freight cluster.

Retrain the Workforce

Next Step:
Develop retraining programs to upgrade skills of existing and potential workforce with private sector leadership.

Lead Implementers:
Freight industries, community colleges, universities, community-based training providers, and WIBs

As technology is rapidly changing in freight workplaces, many workers in the cluster need to upgrade their skills. There may also be opportunities for the private sector to reach unemployed workers with relevant skills.

Use and Refine Data Systems to Inform Freight Workforce Support

Next Steps:
Launch MetroPulse Jobs data portal with qualitative and quantitative data on freight cluster occupations and employment.

Promote use of Statewide Longitudinal Data Systems to evaluate the outcomes and impact of training programs.

Use CWICstats workforce research and data initiative to inform implementation of training programs.

Lead Implementers:
CMAP, Chicago-Cook Workforce Partnership, Chapin-Hall, and State data providers

Data on employment growth and related training opportunities, for instance, are vitally useful for training providers and economic development organizations to plan strategically to help meet the cluster's workforce needs. Several current initiatives could meet many existing gaps.

Conclusion

This freight cluster drill-down report stems from GO TO 2040's call to strategically organize the region around its existing and emerging clusters of specialization. This report has identified implementation action areas that are critical to the future of the freight cluster. Lead implementers, including a variety of public, private, and nonprofit entities, have been identified as the entities best positioned to carry out the strategies. The implementation action areas provide a framework that CMAP and its partners will use to capitalize on recent momentum concerning freight issues. This report can help highlight freight's importance to the regional economy, challenges facing the cluster, and most importantly, opportunities for coordinated action.



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