The Importance of Freight to Northeastern Illinois

The Nation's Freight Hub

Freight has long been central to the development of metropolitan Chicago. Since its settlement, businesses have utilized the region's transportation infrastructure as an economic advantage, capitalizing on the region's geographic position as the shortest distance by land between the Northwest and the Northeast, as well as the nexus between the nation's agricultural heartland and industrial markets.

In today's era of global trade, freight maintains the same fundamental role for economic growth. An unmatched combination of freight transportation modes and infrastructure has contributed to the region's position as a hub for not only domestic but also international freight transportation. This transportation infrastructure includes:

- Rail: Metropolitan Chicago is the only region served by six of the seven Class I railroads.
- Truck: Seven interstate highways converge in the region.
- Air: O'Hare International Airport is the nation's second busiest international air cargo gateway by value.
- Water: The region's water system serves as the only connection between the Mississippi River waterway and the Great Lakes-Saint Lawrence Seaway system.

A quarter of all freight in the nation originates, terminates, or passes through metropolitan Chicago.[1] As Figure 1 below shows, nearly half of freight in the region is through traffic, illustrating the region's strategic position as a key node in the national freight system. Through inbound, outbound, and local moves, the freight system also supports vital economic activity within the region. Businesses and consumers alike rely on regional goods movement to drive economic growth and improve quality of life. The role of freight in the region is projected to increase: by 2040, the region's population is expected to rise by a quarter but the amount of freight moving through metropolitan Chicago is predicted to increase by over two-thirds.[2]

[1] OECD, 2012, Territorial Reviews, "The Chicago Tri-state Metropolitan Area", p.207.
[2] GO TO 2040 and CMAP analysis of Transearch data for the seven-county CMAP region.

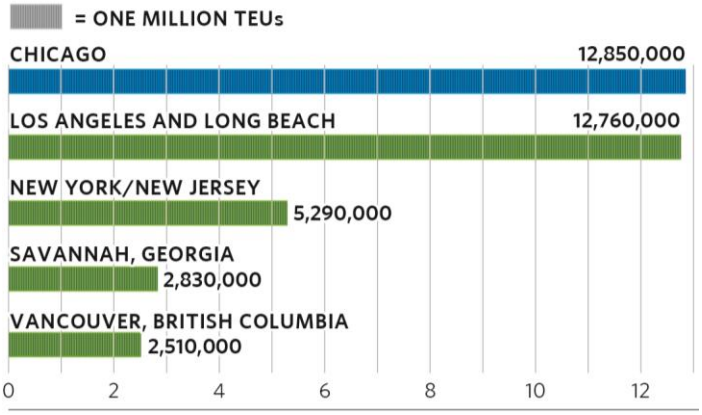
Figure 1. Freight Flows in the Chicago Region

Source: CMAP staff analysis

The region's concentration in intermodal moves—where freight shipped in a standardized container can be easily transferred between modes such as truck and rail—is even more striking. As an inland port, metropolitan Chicago often is not even counted in lists of global container traffic, but recent research from CMAP calculated nearly 13 million TEU (twenty-foot

equivalent unit) lifts in the region in 2010, on par with the shipment activity at the Ports of Los Angeles and Long Beach, and 2.5 times as high as the activity at the Port of New York and New Jersey, the nation's next largest port. Indeed, metropolitan Chicago's intermodal facilities vie with Los Angeles as the largest container handler in the entire Western Hemisphere.[3]

Figure 2. 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.

Chicago's Freight System is Vital to the Regional Economy

Over a billion tons of freight worth over $3 trillion move through the Chicago region each year, underpinning a national freight system that drives economic growth and improves quality of life for both businesses and consumers. In addition to playing a paramount role in the national economy, metropolitan Chicago's freight system also provides considerable economic benefits here in the region.[4]

Metropolitan Chicago's massive concentration in freight provides substantial direct employment in regional transportation industries. For example, freight carriers such as truckers or line-haul rail operators move freight into and throughout the region while warehouse and terminal workers divide, store, combine, and load orders. Increasingly, companies rely on logistics providers to organize such complex goods movements; such logistics firms represent a key specialization of the Chicago region. All told, these interrelated industries form the region's freight cluster, which accounts for 200,000 jobs and provides over $13 billion in personal income for the residents of northeastern Illinois.[5]

A greater proportion of metropolitan Chicago's employment falls in these freight cluster industries compared to the national rate, a regional specialization that has grown this past decade. Between 2002 and 2012, metropolitan Chicago's freight cluster grew by 14.5 percent, while the rest of the regional economy grew by 4.4 percent. This recent growth in regional

[3] CMAP, 2012, "Freight Cluster Drill-Down", http://www.cmap.illinois.gov/policy/drill-downs/freight.
[4] CMAP analysis of Transearch data for the seven county CMAP region.
[5] CMAP "Freight Cluster Drill-Down".

freight industries has also outpaced the national rate of 11 percent in the same industries, showing freight's potential to continue to fuel regional economic growth.[6]

Linking Economic Development and the Freight System

Freight's economic impact is not limited to core transportation industries. In addition to the direct freight cluster employment that has grown at three times the rate of the rest of the regional economy, the freight system touches almost every other economic sector – nearly all the goods that sustain and improve the welfare and competiveness of regional businesses arrive via the freight system. The link between an efficient freight system and economic competitiveness is especially pronounced in industries that rely on the frequent shipment of inputs and/or outputs, including manufacturing, construction, and retail trade. Collectively, these three freight-dependent industries represent nearly one-quarter of all jobs in the region and add over $115 billion per year to the regional economy.[7]

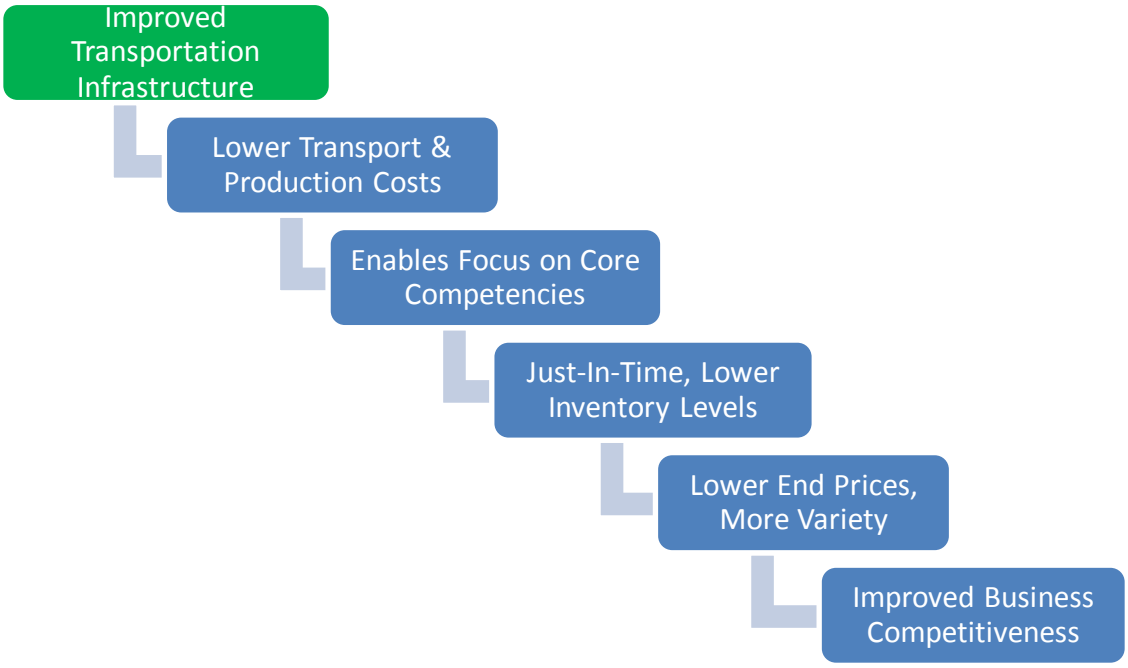
Manufacturing provides an example of the broader economic value of an efficient freight system. Regional manufacturers rely on a steady stream of raw materials and intermediate inputs to fuel the production process, and must ship their final products to customers. Parts of these supply chains are regional, while others stretch across the globe. The region's confluence of freight routes and modes allows manufacturers extensive choice to find a freight transport system that meets their needs. For example, one manufacturer operating under strict time constraints would benefit from the region's air freight connectivity, while another may find transportation costs more pressing and instead would use bulk modes such as rail or water.

Furthermore, metropolitan Chicago's extensive freight infrastructure provides not only modal options but also accessibility and reliability benefits to regional manufacturers. Faster travel times reduce direct operating costs for firms and expand market areas. As such, regional manufacturers can extend their supply chains to gain access to specialized niche suppliers, lower input costs through upstream competition, and reach distant markets and future customers. Additionally, a reliable freight system allows firms to operate under "just-in-time" production models that reduce inventory levels, excess waste, and distribution costs. Together these benefits allow firms to focus on their core competencies and make northeastern Illinois a desirable and economically competitive location for manufacturers.

[6] CMAP analysis of EMSI Complete Employment data, 2012.

[7] CMAP analysis of BEA and EMSI data for the Chicago MSA.

Figure 3. Economic Benefits of Freight



Source: CMAP staff analysis

Metropolitan Chicago's vast concentration of transportation infrastructure and freight flows provides substantial direct employment in fast-growing freight cluster industries and also supports nearly a quarter of all jobs in northeastern Illinois. The role of freight in the region's future economic competitiveness will continue to grow as heightened trade extends metropolitan Chicago's global reach. By the year 2040 an estimated 2 billion tons of freight will move through the region each year,[8] yet several challenges threaten to undermine freight's current and future economic benefits.

Challenges Facing the Regional Freight System

Congestion

According to the most recent Urban Mobility Report, the Chicago region experiences 271 million hours of delay in 2011, the third-highest in the nation behind only New York and Los Angeles.[9] The report estimates that this delay translates to a $6.2 billion total congestion cost, based on the values of wasted travel time and fuel. This estimate is broadly consistent with other attempts to quantify the costs of congestion in Chicago. In 2008, the Metropolitan Planning Council estimated a total congestion cost of $7.3 billion.[10]

[8] CMAP analysis of Transearch data for the seven county CMAP region.
[9] Schrank, David, Eisele, Bill, and Tim Lomax, 2012. TTI's 2012 Urban Mobility Report: Texas A&M Transportation Institute, the Texas A&M University System. Table 5: Truck Commodity Value and Truck Delay, http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/mobility-report-2012.pdf.
[10] Metropolitan Planning Council, 2008, Moving at the Speed of Congestion, http://tinyurl.com/lggddpw.

Focusing on the freight system, the Urban Mobility Report estimates that metropolitan Chicago has the nation's third-worst truck congestion as measured by hours of delay, with 22.8 million trucking hours lost in 2011. Additionally, the Chicago region has the nation's third-highest cost of truck congestion, with an estimated economic cost of $1.7 billion in 2011. The Chicago region also has the second highest proportion, 8.4 percent, of truck congestion to total congestion of the nation's fifteen largest metropolitan areas, behind only Phoenix. The Chicago region represents a disproportionate share of truck congestion among the nation's largest metropolitan areas, accounting for 9.3 percent of total annual hours of delay but 12.4 percent of truck annual hours of delay in 2011. In short, more of metropolitan Chicago's total congestion comes from trucks compared to other major metropolitan areas.

Table 1. Truck Congestion Metrics, 2011

Very Large Urban Areas	Total Annual Delay (1,000 hours)	Annual Truck Delay (1,000 hours)	Percent Truck Delay of Total Delay
New York	544,063	33,433	6.1%
Los Angeles	501,881	29,936	6.0%
Chicago	271,718	22,818	8.4%
Atlanta	142,041	10,326	7.3%
Dallas	167,718	9,750	5.8%
Miami	174,612	9,682	5.5%
Philadelphia	156,027	9,637	6.2%
Washington	179,331	8,628	4.8%
Houston	145,832	8,599	5.9%
San Francisco	155,157	8,442	5.4%
Phoenix	82,554	8,213	9.9%
Boston	136,966	7,372	5.4%
Seattle	100,802	7,154	7.1%
Detroit	106,434	6,266	5.9%
San Diego	72,331	4,123	5.7%
Top 15 Metropolitan Areas	**2,937,467**	**184,379**	**6.3%**
All 498 Metropolitan Areas	**5,520,205**		

Source: Texas Transportation Institute, 2012 Urban Mobility Report

Traffic congestion is concentrated in major metropolitan areas. The nation's three largest metropolitan areas, New York, Los Angeles, and Chicago, together account for 1.3 billion total annual hours of delay, or 45 percent of the total for the largest fifteen metropolitan areas in the country. Moreover, these three metropolitan areas account for 24 percent of the total delay in all 498 metropolitan areas included in the Urban Mobility Report. The same trends hold when focusing on freight. New York, Los Angeles, and Chicago together account for 86 million hours of annual truck delay, or 47 percent of the total for the top fifteen metropolitan areas.

Rail terminal operations in Chicago are beset by congestion, with numerous heavily-used freight lines crossing each other at grade and being used for commuter and intercity passenger

services. Much of the rail infrastructure in the Chicago region was built over a century ago and was not designed to accommodate current traffic volumes. Today, the Chicago region is the nation's largest rail bottleneck, with average speeds of freight trains ranging from 5 to 12 miles per hour.[11]

The Chicago Region Environmental and Transportation Efficiency Program (CREATE) is a public-private partnership of private railroads, the U.S. Department of Transportation, the Illinois Department of Transportation, the Chicago Department of Transportation, and Metra created in 2003. The CREATE program has identified a number of rail improvements including flyovers, grade separations, improved signalization, and modernization of equipment. The program's 70 projects are largely located on the south and west sides of Chicago and in the inner-ring suburbs of Cook County. The total cost of the program is approximately $3.2 billion, of which $1 billion has been secured to date.

According to a 2011 analysis by the CREATE partners, failing to complete the program's remaining nine unfunded projects would increase freight delay from 46 to 143 minutes per 100 freight train-miles in 20 years.[12,13] Passenger delay would increase from 0.6 minutes to 3.1 minutes per 100 train-miles. The study's technical report estimated current delay of 64.8 minutes per 100 train-miles.[14]

Additionally, highway-rail grade crossings can impose significant delay on motorists, pedestrians, and bicyclists. The Illinois Commerce Commission estimates that such grade crossings affect over 380,000 motorists each weekday, who are delayed a collective 7,817 hours.[15] While there are 1,468 highway-rail grade crossings in the region, the top 100 locations account for over 60 percent of total delay.

Congestion and Economic Risks

Congestion has immediate and direct economic impacts in the forms of the value of wasted time and fuel; these costs drive the metropolitan and national estimates of the costs of congestion used by the Urban Mobility Report and others. Published cost estimates of the economic impact of truck congestion range from a low of $32.15/hour (in $2005, or $38.44 in current $2013)[16] to $83.68/hour (in $2008, or $84.75 in current $2013).[17]

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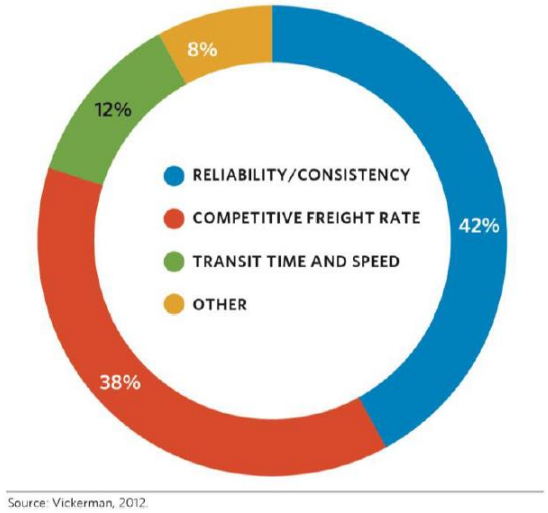
[11] CREATE program, "About CREATE", http://www.createprogram.org/about.htm#need.
[12] Note that this study does not include the CREATE program's 25 grade separation projects or four categories of "other projects".
[13] CREATE, 2011, "CREATE Rail Operations Benefits Summary", http://www.createprogram.org/factsheets/Rail_Operations_Benefits.pdf
[14] CREATE Chicago Planning Group, 2011, "CREATE Simulation Modeling", prepared by Willard Keeney, http://createprogram.org/tiger3_files/Simulation_Modeling.pdf.
[15] Illinois Commerce Commission, 2011, "Motorist Delay at Public Highway-Rail Grade Crossings in Northeastern Illinois: 2011 Update", http://tinyurl.com/mhaz9vt.
[16] Federal Highway Administration, 2005. An Initial Assessment of Freight Bottlenecks on Highways, http://www.fhwa.dot.gov/policy/otps/bottlenecks/.
[17] American Trucking Research Institute, 2008, An Analysis of the Operational Costs of Trucking, http://tinyurl.com/kbkap3v.

While these direct costs are real and substantial, they underestimate the full impact of congestion on the freight system and economic activity in the region. Even more than lost fuel and time, firms in the region's freight cluster may be most impacted by decreased shipment reliability if congestion continues to increase. Just-in-time inventorying and production means reliability is paramount as the window for transfers and deliveries decreases. In a 2012 poll of 1,000 of the top multinational shippers, reliability and consistency of shipments was the number one concern facing freight transportation.[18] If increased congestion prevents predictable transportation times, then firms in the region may not be able to operate under just-in-time processes that are now entrenched as profit-maximizing strategies.

Figure 4. Top concerns of freight shippers



Congestion is already adversely impacting the region's status as a freight center. Many carriers look for ways to route freight not bound to the Chicago region through other corridors, while some companies are moving operations entirely. For example, the Class I railroad CSX is investing heavily in northwest Ohio as a new center of operations. Other regions, such as Memphis or Kansas City, are devoting significant resources towards improving their freight infrastructure. A Government Accountability Office study suggests that current supply chain strategies targeting metropolitan Chicago will no longer be economically viable should freight mobility continue to decline.[19] Higher transportation costs will lead to higher overall operating costs as well as missed opportunities for investment and expansion.

Disjointed Governance

Northeastern Illinois contains 1,226 units of government, including seven counties, 284 municipalities, and 123 townships.[20] Those general purpose units of government, along with

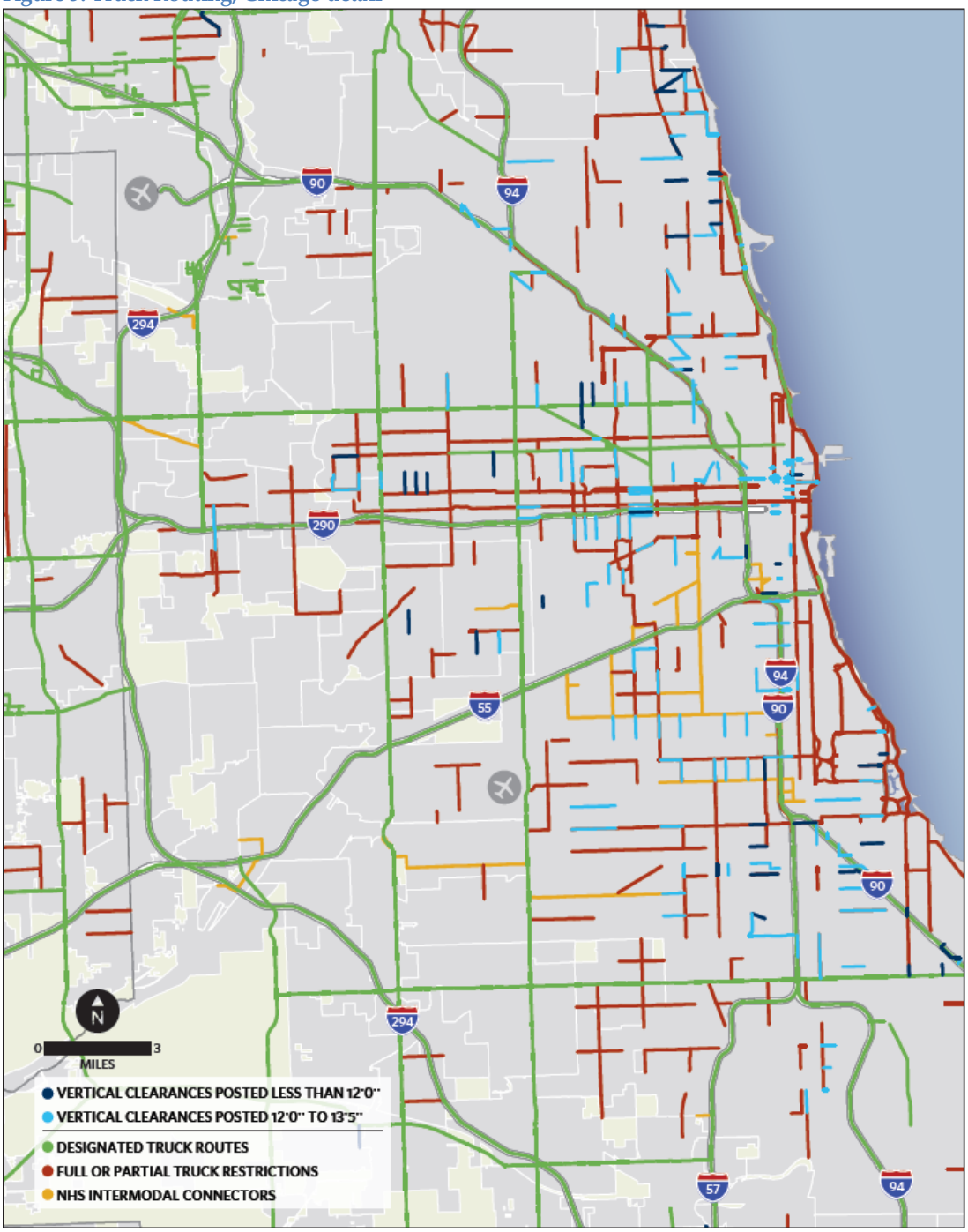
[18] John Vickerman, "Rail Delivers Jobs and Drives Economic Development," *The Rail Summit* hosted by the Lakeshore Chamber of Commerce, Chesterton, IN, March 16, 2012.
[19] U.S. Government Accountability Office, 2008, "Freight Transportation: National Policy and Strategies Can Help Improve Freight Mobility." GAO-08-287. http://www.gao.gov/assets/280/270874.pdf.
[20] CMAP, 2010, "GO TO 2040", p. 234.

the state, have jurisdiction over the highway network. Through that authority, they make key decisions to govern the identification of truck routes, regulate truck parking, and regulate delivery restrictions. They also determine size and weight restrictions for trucks and impose fees for vehicles that exceed those standards.

While these decisions may reflect local preferences, they do not always aggregate to a coherent whole. For example, a street crossing two municipalities may be designated a truck route in one community but not in the other, or the two communities may impose different size and weight restrictions. One municipality may impose time-of-day restrictions on truck deliveries, while its neighbors may impose different restrictions or no restrictions at all. Truck movements typically cross multiple jurisdictions, requiring truckers to be aware of multiple regulations and, in the case of oversized and overweight permits, to apply for permits from multiple municipalities. This patchwork of regulations may preclude the most efficient timing and routing of truck deliveries, increasing operational costs for truckers and potentially increasing overall vehicle travel as well.

The following three maps help to illustrate the range of regulations imposed by local governments on truck movements. The first map shows truck routes in Chicago, the second illustrates overnight delivery restrictions imposed by municipalities in DuPage County, and the third shows truck parking restrictions in northwest Cook County and north DuPage County.

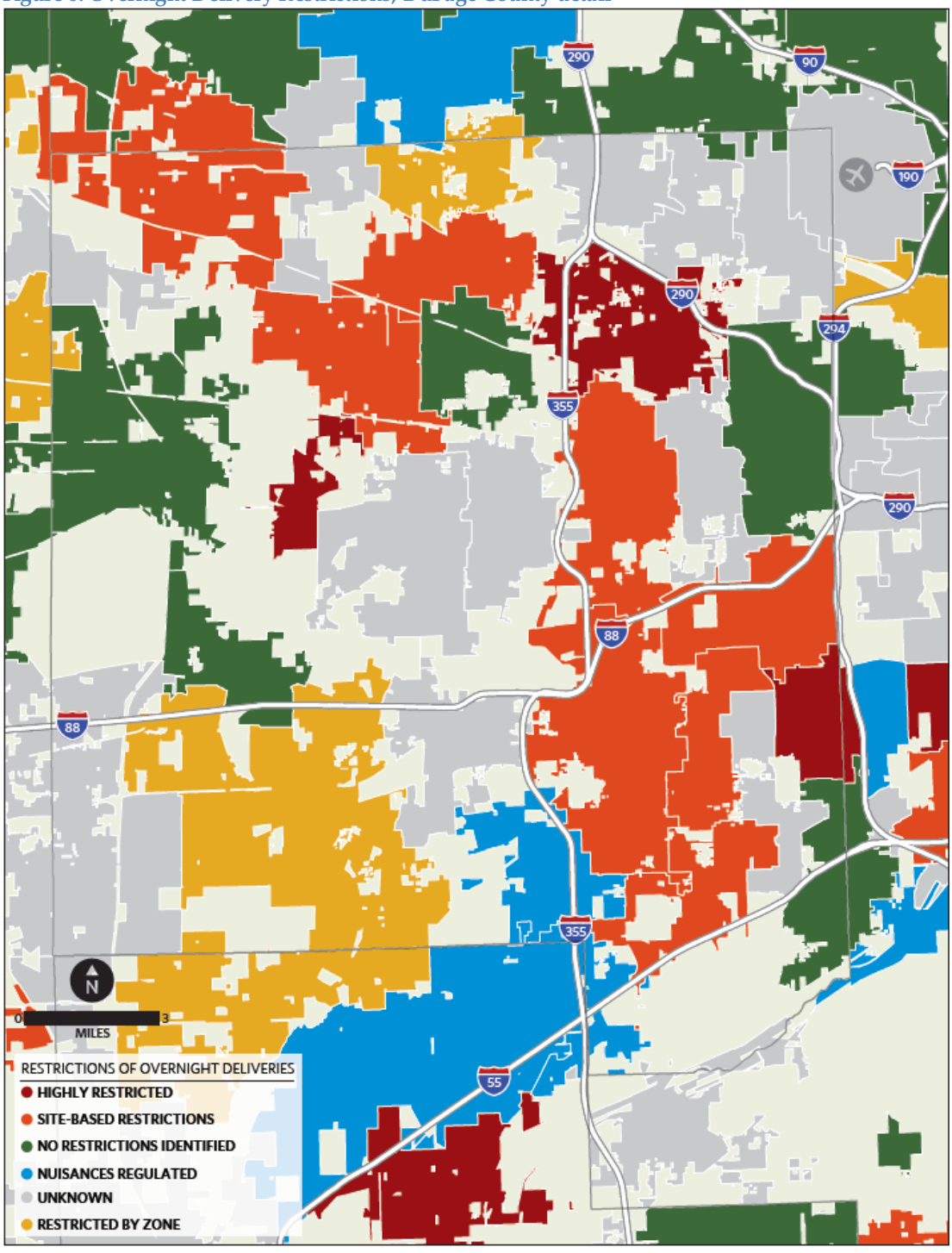
Figure 5. Truck Routing, Chicago detail



Source: CMAP staff analysis.

As the above map illustrates, a number of streets in Chicago are subject to full or partial trucking restrictions, including the city's boulevard system. These restrictions do not necessarily carry over into adjacent municipalities, and in some cases are not well served by nearby designated truck routes. Additionally, several intermodal terminals are not directly served by a designated truck route or a National Highway System intermodal connector.

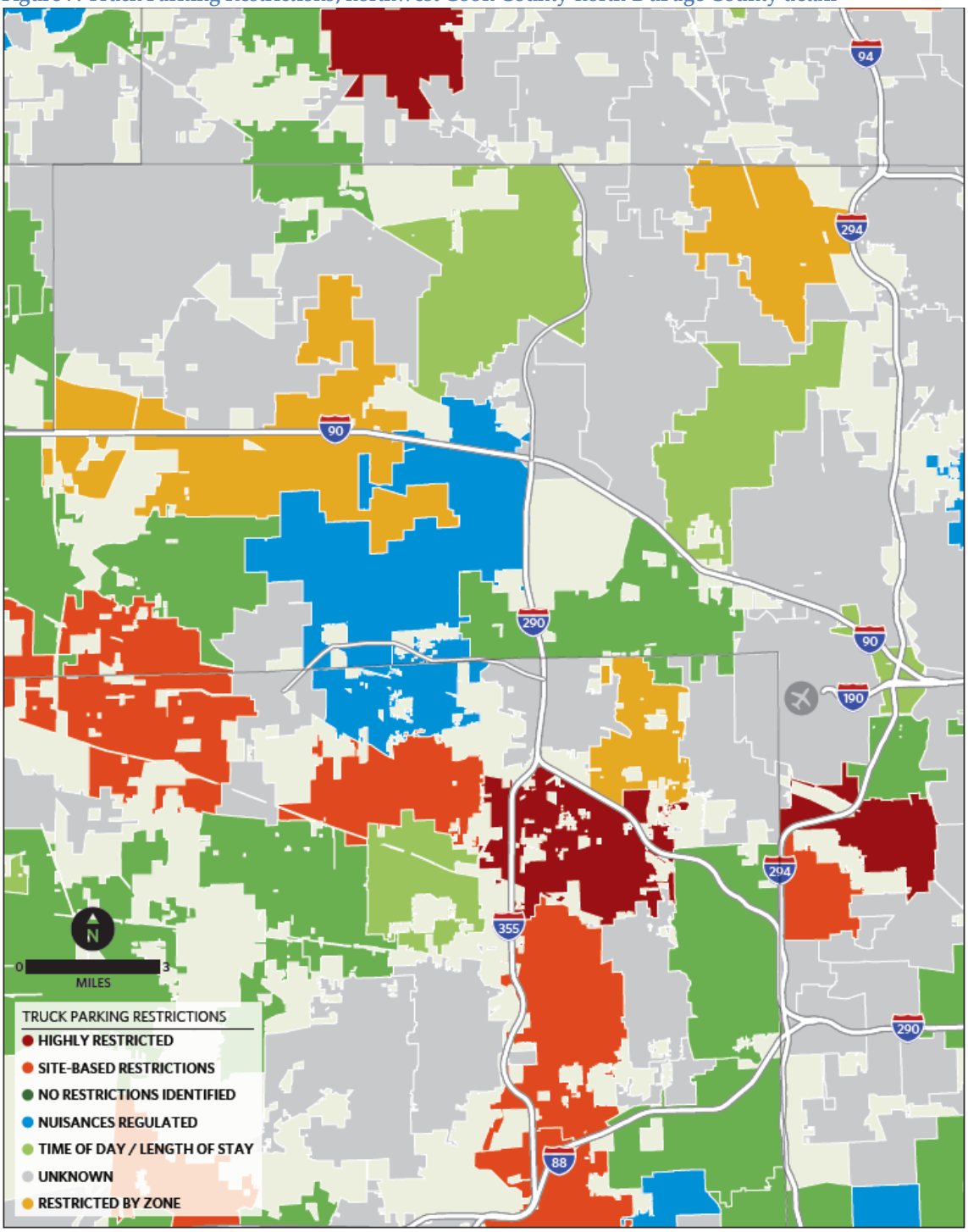
Figure 6. Overnight Delivery Restrictions, DuPage County detail



Source: CMAP staff analysis.

The above map illustrates the patchwork of overnight delivery restrictions in the region. In west Cook County and east DuPage County, neighboring municipalities impose a range of restrictions, from heavily restricted to no restrictions at all.

Figure 7. Truck Parking Restrictions, northwest Cook County-north DuPage County detail



Source: CMAP staff analysis.

The above map illustrates the range of truck parking regulations in the region. This detail of northwest Cook County and north DuPage County illustrates the range of truck parking regulations – by zone or site, time of day or length of stay, nuisance, not restricted to heavily restricted – even among neighboring municipalities.

On the rail side, coordination can be difficult among private firms in a competitive industry; to an extent, firms face a disincentive to share data with their competitors. This lack of coordination can lead to an inefficient system. For example, railroads often have little advanced notice about approaching trains from other lines that need to cross their right-of-way. Dispatchers manually call their peers at the other railroads to coordinate moves across lines, leading to slowdowns in regions like metropolitan Chicago where numerous railroads converge.[21] To help address this issue, the CREATE program includes the development of the "Common Operational Picture", an open interface to display freight and passenger rail movements in the Chicago Terminal. As of December 2010, four CREATE-partner railroads participated in a prototype Common Operational Picture. The CREATE program plans to expand this prototype to include the remaining six railroads and the entire Chicago area, but as of May 2013 this second phase of the Common Operation Picture is still under design.[22]

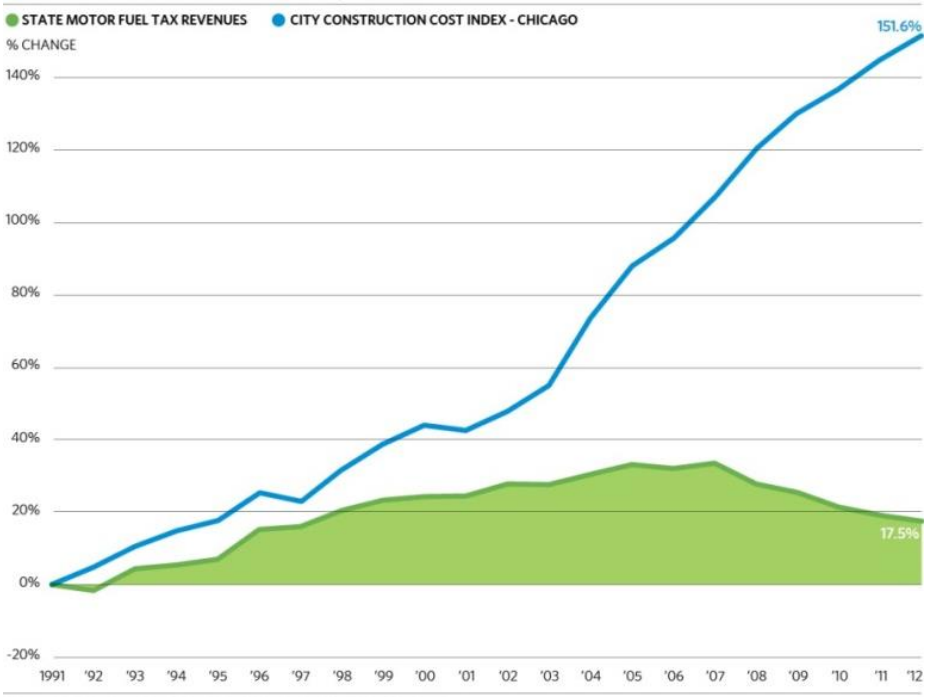
Funding

Federal, state, and local transportation revenues, including those that provide public funding for freight improvements, are predicated on traditional user fees. These fees include the motor fuel tax (MFT), vehicle fees, tire taxes, passenger fares, and tolls. While the user-fee model successfully financed the extensive federal and state highway networks in the postwar decades, it has come under pressure in recent years.

The MFT at both the federal and state levels is levied on a flat, per-gallon basis, and elected officials are typically reluctant to vote to raise motor fuel tax rates. The federal motor fuel tax was last raised in 1993, and has only been raised five times since its creation in 1932.[23] The Illinois MFT was last raised in 1990, with a total of only nine increases since its establishment in 1929. With a flat per-gallon design, motor fuel taxes are vulnerable to improvements in vehicle fuel economy, as well as to inflation. If the Illinois MFT rate of 19¢/gallon had been indexed to the Consumer Price Index, a national measure of inflation, in 1990, the rate would have risen to 33.3¢/gallon in 2012 – an increase of 75 percent. Note that other flat transportation user fees like tolls, vehicle registration fees, and transit fares are also susceptible to inflation. Figure 8 below illustrates the failure of the Illinois MFT to keep pace with inflation since the early 1990s.

[21] Federal Railroad Administration, March 2008, "Research Results: System for Monitory Multiple Railroad Operations Using an Integrated Track Display and Common Data Protocol."
[22] CREATE program, "Common Operational Picture: Project Fact Sheet", December 14, 2010, http://tinyurl.com/m9fbbf5, and "Status of CREATE Projects", May 13, 1013, http://tinyurl.com/l3wlg6l.
[23] Transportation for America, 2011. Transportation 101: An Introduction to Federal Transportation Policy. March 2011. http://t4america.org/docs/Transportation%20101.pdf. Accessed April 26, 2012.

Figure 8. MFT revenue and the Construction Cost Index compared to 1991



Source: CMAP staff analysis of data from the Illinois Department of Transportation and Engineering News-Record

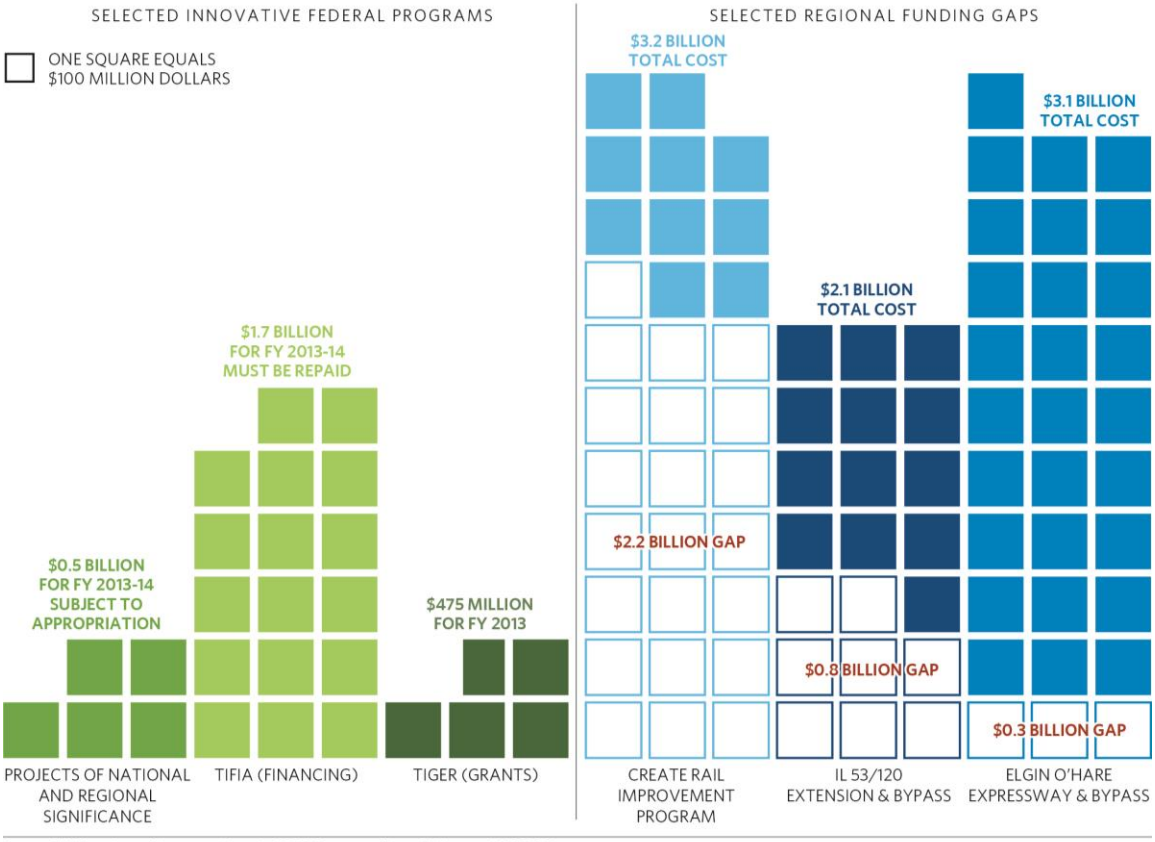
At the same time as revenues have declined, the capital needs of the system continue to grow. While estimates vary across different transportation providers, it is clear that these needs far outstrip the available capital revenues. GO TO 2040, the comprehensive plan for metropolitan Chicago, estimates that the regional transportation system will require somewhere in the neighborhood of $100-$220 billion in funding over and above forecasted revenues over the next 30 years to move the system closer to a state of good repair and to construct select major capital projects outside of what is constrained by the plan's limited budget.[24]

Many of the region's most vital capital projects currently under development—including freight-serving projects like the Elgin-O'Hare expressway extension and bypass and the CREATE rail improvement program—still face considerable obstacles in identifying funding. Project supporters often express interest in additional federal and state funds to close these funding gaps, but those funding opportunities have limitations. While innovative funding solutions are often explored, to date these sources have rarely achieved consensus from project stakeholders given a lack of political will or a misunderstanding of the scale or purpose of existing pots of federal or state discretionary money. These programs can be highly competitive, such as the federal Transportation Investments Generating Economic Recovery (TIGER) program and the recently expanded Transportation Infrastructure Finance Innovation Act (TIFIA) program. TIFIA provides credit assistance that must be repaid with interest, rather than the grants the federal government traditionally provides.

[24] GO TO 2040 Financial Plan for Transportation.

Figure 9. Innovative federal resources and regional needs

The federal government offers discretionary assistance programs, including grant and credit assistance, to help provide gap funds for transportation projects. These resources can help to leverage state and local dollars, but cannot fully address funding needs. The image below demonstrates that the collective funding gap for only three projects — CREATE, IL 53/120, and the Elgin-O'Hare — exceeds the combined assistance currently offered by these national programs.



Source: CMAP analysis of documents from the CREATE program, Illinois Tollway, and U.S. DOT.

Conclusion

Transportation infrastructure has long been the key to metropolitan Chicago's economic prosperity. It is hard to imagine where this region would be today without its convenient proximity to the Interstate highway system and major international airports, its pivotal location at the nexus of six Class I railroads, and the mobility choices offered by an extensive transit system and a growing network of bicycle and pedestrian facilities. Not coincidentally, one of our regional economy's specializations—past, present, and future—revolves around freight and logistics—industry clusters whose livelihood literally depends on moving goods into, out of, and around the region. Freight and related industries generate $145 billion toward metropolitan Chicago's gross regional product, accounting for a total of 1.5 million jobs and $77 billion in income.[25]

As such, it is imperative for the region to address the many challenges facing the freight system. Highway and rail congestion imposes significant delays on businesses and residents alike, and reduces the overall reliability of the transportation system. Disjointed local regulations reduce the efficiency of the larger freight system, and cooperation on common issues can be difficult

[25] CMAP analysis of 2011 BEA and EMSI data for the Chicago MSA. Freight and related industries include mining, agriculture, construction, manufacturing, retail trade, and transportation and warehousing.

among competitive private carriers. Additionally, public resources to support investments in transportation have failed to keep pace with needs, and innovative federal grant and financing sources are of insufficient capacity to fill all the region's funding gaps.

An institutional response may also be required to ensure the optimal functioning of the regional freight system. The Regional Freight Leadership Task Force will explore the various ways—including advocacy, streamlining of regulation, the raising of new revenues, and the programming of funds—that a potential regional freight institution could work to address the significant challenges facing northeastern Illinois. Next month, the Task Force will begin its work by investigating best practices from other states.