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THE IMPACT OF FREIGHT CONGESTION ON THE CHICAGO AREA COMMUTE

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ABSTRACT
Chicago has been the railroad hub of the nation since the middle of the 19th Century. It continues to maintain that distinction today as almost one-third of the nation’s rail freight originates, terminates or travels through Chicago. It is the fourth largest container handler in the world after Hong Kong, Singapore and Shanghai. It is also the crossroads of the nation’s Interstate Highway system. With O’Hare International and Midway Airports, it is the nation’s air hub as well.

Chicago also is one of the leading metropolitan areas in congestion. The Texas Transportation Institute ranks it second in the nation in congestion when measuring the travel time index. The U. S. Department of Transportation estimates the annual cost of congestion in the Chicago area to be in the order of magnitude of $11 billion. This represents time delays, excess fuel costs, productivity, environmental, safety and unreliability losses, cargo delays and airline and railroad congestion costs. Freight congestion is a significant cause of much of the delay that Chicago area commuters face.

Some of the freight impacts on the Chicago commute are as follows:

- Freight train interference impacts Metra’s ability to provide quality commuter rail service. It is a major cause of commuter train delays and resulting poorer on-time performance. In 2007, almost 18 percent of all Metra delays were caused by freight interference, an increase of 8 percent over the prior year. Additionally, freight train operations impede the ability of Metra to add service, particularly for the reverse commute, a growing need in the region, and for off-peak service.

- Congestion in rail yards causes back-ups of trains resulting in blocked highway-grade crossings. This delays auto commuters as well as transit and school buses. Blocked crossings also provide barriers to emergency responders in many communities.

- Rail yard congestion has also resulted in a large number of rubber-tire transfers via truck cartage from one rail yard to another. Container traffic is growing at a rate almost twice that of general freight. An estimated 15,000 such movements occur daily in Chicago area adding significantly to an already crowded roadway system.

- One of the largest components of increased VMT (Vehicle Miles Traveled) is increased truck traffic. Changing distribution patterns, smaller shipments, just-in-time distribution, has added vehicles to the highways contributing to congestion. Our research has shown that the largest increase in VMT, almost 42 percent, has resulted from non-household travel, trucks and external travel.

- Decentralization of manufacturing and distribution facilities to the outer suburban area increases cartage mileage and costs. For example, intermodal facilities have located in Rochelle and Joliet, 81 and 47 miles respectively from Chicago. Solid waste is being transported to Pontiac, Illinois, 98 miles from Chicago.

The Chicago metropolitan region has experienced increased congestion in the past two decades, much of it the result of increased truck and rail freight traffic. Forecasts predict
the trend will continue. If the region does not address these issues proactively, congestion will become worse and the cost to the region in economic and social terms will be great.

INTRODUCTION
Chicago has been the transportation hub of the nation since the settlement was first established in the early 19th Century. Chicago was initially established as a waterway center connecting the Atlantic Ocean via the Erie Canal, the Great Lakes and the Mississippi River. Later, in the mid 1800s, Chicago became the railroad center of the United States, a designation it still holds to this day. In addition, the region is a major junction of the Interstate highway system, and with O’Hare International and Midway Airports, it is the nation’s air hub as well. Finally, the Regional Transportation Authority is the nation’s second largest public transit system. (Young, 1998)

Its location as a freight center has served Chicago and the region well, but it is not without a cost. The cost is congestion; highway, rail and airport congestion. This paper will examine the impact freight activity has on the Chicago area commute and suggest some policy actions to mitigate congestion.

CHICAGO AS A TRANSPORTATION CENTER
In 1848, the first railroad began operating in the Chicago area. Within ten years, Chicago became the largest rail center in the United States. By the turn of the century, 650 freight trains operated in the city daily. (Young, 1998) By 1996, 610 freight trains daily hauled 37,500 carloads of freight carrying 2.5 million tons through the Chicago gateway. In addition, 670 daily passenger train movements occurred in the region. It is projected by 2020, the number of freight trains and freight cars will almost double 1996 figures. (Chicago Area Transportation Study [CATS], Statistical Digest, 1998 and Metropolitan Planning Council, 2000)

In terms of total freight tonnage, between one-quarter and one-third of all the freight in the United States either originates, terminates or passes through Chicago. (CATS, Statistical Digest, 1998 and MPC, 2000) Chicago also handles more intermodal containers than any other region in the United States. Compared to ocean-going ports in the world, in 2004, Chicago handled the fourth largest volume of containers -- 13,980,000 TEUs (Twenty-foot Equivalent Units) -- behind Hong Kong, Singapore and Shanghai. Container traffic is forecasted to grow at a rate twice that of general freight. (CATS, Working Paper 06-01, 2006)

The motor carrier industry is a major factor in the region’s freight handling activity. It is estimated that about 500,000 daily truck movements occur on the region’s roadways. In 1996, trucks carried about 1.6 million tons, which is forecasted to increase to 2.3 million tons by 2020. This includes 14,200 daily intermodal truck movements. (CATS, Statistical Digest, 1998)

O’Hare International Airport handled 1.7 million tons of freight in 1999, ranking it 6th in domestic tonnage and 11th internationally. (CATS, Statistical Digest, 1998)
CONGESTION
The Chicago region is one of the most congested urban areas in the United States and it is getting worse. According to the Texas Transportation Institute Urban Mobility Study, Chicago ranks among one of the nation’s most congested urban areas. In terms of travel time index, the ratio of peak period travel time to free flow conditions, Chicago ranks second in the nation after the Los Angeles area. (TTI, 2005) While Chicago ranks better in terms of annual delays and wasted fuel per traveler, these indices have been increasing. Between 1995 and 2005, annual delays per traveler increased from 33 hours to 45 hours, an increase of 35 percent. Likewise, excess fuel consumed increased from 22 gallons to 32 gallons over the same period, an increase of 45 percent. (TTI, 2007)

This congestion has impacted the Chicago area commute. According to the Bureau of the Census, the average travel time to work has increased in the region by 11.4 percent between 1990 and 2000. The average increases in travel times vary from 5.3 percent in Cook County to slightly over 40 percent in the outlying counties of McHenry and Will. (Sööt et al, 2005)

There are many causes for the increasingly congested commute, such as population growth and an increase in county-to-county commuting. It is the author’s contention that a major cause of highway congestion and increased commute times in the Chicago region is freight operations, both rail and motor carrier.

COST OF CONGESTION
The Texas Transportation Institute estimates the congestion cost in the Chicago region to be $3.968 billion resulting from travel delay. This is estimated at $24.60 per hour of person travel, $77.10 per hour truck time and the average cost of fuel for excess fuel consumed per year of 141,612,000 gallons. This does not include any social costs. (TTI, 2007)

The U. S. Department of Transportation has determined the rough, order-of-magnitude total congestion costs to be $11 billion. The components of their estimates are:

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Amount (billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time delays and excess fuel costs</td>
<td>$4.43</td>
</tr>
<tr>
<td>Productivity losses</td>
<td>2.1</td>
</tr>
<tr>
<td>Unreliability losses</td>
<td>2.1</td>
</tr>
<tr>
<td>Airline and railroad congestion costs</td>
<td>1.4</td>
</tr>
<tr>
<td>Safety losses</td>
<td>0.5</td>
</tr>
<tr>
<td>Environmental losses</td>
<td>0.4</td>
</tr>
<tr>
<td>Costs of cargo delays</td>
<td>0.2</td>
</tr>
<tr>
<td>Total Chicago congestion costs</td>
<td>$11.13</td>
</tr>
</tbody>
</table>

(Wells, 2006)
The total cost of congestion, any way it is calculated, is a significant cost that is not only wasteful but puts the region at a competitive disadvantage with other regions in the United States.

**RAIL FREIGHT IMPACTS**

Rail freight congestion impacts the daily commute in Chicago in several ways. Freight trains, in many cases, use the same tracks as Metra for the operations of the region’s commuter rail system. Where commuter trains do not share the tracks with freight, there are a number of rail-to-rail junctions due to the sheer number of railroad lines that can interfere with and delay commuter trains. During the second quarter of 2007, Metra reported 312 incidents of commuter train delays caused by freight interference. This represents 17.3 percent of all delays, an increase of 8 percent over the same period in 2006. (Metra, 2007)

The fastest growing markets for Metra ridership are the reverse commute and the suburb-to-suburb commute. To better serve these markets in the future, the operation of additional trains will be required. However, the number of freight trains utilizing track capacity will limit Metra’s ability to add service or alternatively, will require expensive additions of infrastructure. For example, on the Metra North Central service, double tracking along much of the route was required in order for Metra to add rush hour, midday and evening service. (Metra, 2006)

Rail congestion, in particular yard congestion, negatively impacts auto and bus commuters because waiting trains result in blocked rail-highway grade crossings. This results in increased delay and lengthier trip times for auto commuters and Pace and CTA bus riders in the suburbs. Communities with numerous rail grade crossings, such as Des Plaines, Melrose Park and Blue Island, experience significant times with crossings blocked. In addition, school buses and emergency vehicles also experience delays. In some communities, fire and police facilities are constructed on both sides of heavily used freight lines in order to have emergency responder access to the entire community.

Since the region has almost 2,500 rail-highway grade crossings, the danger for collisions with pedestrians and autos is a major safety concern. In 2006, there were 174 collisions in the state of Illinois resulting in 71 injuries and 25 fatalities. In a study undertaken by Operation Lifesaver in the Chicago region, in 59.2% of collisions, the motorist either failed to stop or stopped on the crossing. In addition, another 21.5% drove around the downed gate. This may be due to driver frustration of waiting for the large number of trains and for the length of time for the trains to pass. (Operation Lifesaver, 2007)

Another problem with rail-highway grade crossings is malfunctioning gates. This presents a problem to both motorists and municipalities, which need to send police to manually direct traffic at the location of the malfunction. While there is no regional data on such incidents, the city of Des Plaines, with 33 grade crossings, undertook a study in 2006. Their findings revealed 342 incidents of malfunctioning crossing warning devices
for a period of 12,237 minutes, an average of 36 minutes per incident. Not only were motorists, trucks and buses delayed, the city had to incur more than 204 hours of response to deal with the situation. (“Train Gate Malfunctions…,” Daily Herald, November 27, 2007)

The forecasted growth in freight traffic can only make the commuter delay and increased safety concerns at rail-highway grade crossings more acute.

**MOTOR CARRIER IMPACTS**

Traffic congestion in the Chicago metropolitan region is bad and getting worse. Between 1990 and 2005, vehicle miles traveled (VMT) on area expressways increased 52.2%, congested travel (percent of peak vehicle miles traveled) increased from 60% to 82%, and annual delay in person hours increased 118%. (TTI, 2007) During roughly the same period, nationally, truck ton-miles increased by over 55%. (USDOT, 2002) Research undertaken by the Urban Transportation Center reveals that much of the increase in vehicle miles traveled is due to increases in truck traffic. Using data from the latest Household Travel Survey (1990), the increase in VMT for the period 1970 to 1990, trucks and external travel represented 41.4% of the increase in VMT. Work-related trips represented 37.6% of the increase and all other travel including school and shopping represented 21%. (Sööt, 2001)

The reason for much of the growth in freight traffic is due to national and global trends. The increased use of just-in-time (JIT) transportation results in smaller, more frequent shipments. The proliferation of delivery services such as FedEx, UPS and DSL greatly contribute to these upward trends. Additionally, increased foreign trade has resulted in increased truck shipments in Chicago. Container traffic is growing at a rate twice that of general freight. (CATS, 2006)

Decentralization of distribution and intermodal facilities also increases vehicle miles traveled. It is estimated that roughly 15,000 daily truck movements in the region are trucks carrying intermodal containers. One-third of these movements are “rubber tire” transfers from one rail yard to another. For example, The Union Pacific’s new intermodal facility is located in Rochelle, 81 miles from Chicago. Similarly, the Burlington Northern Santa Fe located their new intermodal and auto mixing facility in Joliet at the site of the former Joliet Arsenal, a distance of 47 miles from Chicago. The trend of solid waste sites moving further from the central city also increases truck miles. The huge solid waste disposal facility in Pontiac, Illinois is located 98 miles from Chicago. While these distances are from downtown Chicago (Google, 2007), local cartage distances have increased due to sprawling business and distribution facilities to outer suburban areas.

**CONCLUSIONS**

The Chicago metropolitan region has experienced increased congestion in the past two decades, much of it the result of increased truck and rail freight traffic. Forecasts predict
the trend will continue. If the region does not address these issues proactively, congestion will become worse and the cost to the region in economic and social terms will be great.

There are a number of policy actions that can be taken by local, regional, state and national leaders to alleviate freight congestion, improving the flow of goods and thereby improving the region’s commute:

- Business and government should support the Chicago Regional Environmental and Transportation Efficiency (CREATE) Program, a jointly sponsored program of the City of Chicago, the State of Illinois, the six Class I freight railroads serving Chicago, Amtrak and Metra to fund infrastructure improvements to speed the movement of trains through the region. The $1.5 billion program is funded by the local partners and from a grant application to the U. S. Department of Transportation. The federal government provided just $100 million and only the higher priority projects have begun. (CREATE, 2007) Since this program has national implications, it is imperative that the federal government increase its funding to this program. Given that Chicago is the rail hub of the nation, similar to O’Hare International being the air hub, a delay in Chicago impacts the rest of the nation.

- Consideration should be given to support private business initiatives to solve freight congestion. The proposal by the Canadian National (CN) to purchase the Elgin, Joliet & Eastern Railroad (EJ&E) is an example. The CN is willing to invest $100 million to improve the EJ&E’s infrastructure to reduce the amount of operating delays through Chicago. (CN, 2007) Some communities that will experience an increase in the number of trains have indicated opposition to the proposal although most communities and the entire region will see a major improvement at no public expense. (“Battle Brewing…,” Daily Herald, December 17, 2007)

- Congestion pricing, like variable tolls for trucks on the Illinois State Toll Highway Authority (ISTHA), are methods to manage demand. Various states and regions are examining this potential solution because it is an efficient alternative to the major cost of infrastructure improvements. So long as highways remain a “free good”, there are no incentives to seek alternatives to rush hour congestion. (Reason Foundation, 2007) The region, perhaps as a committee of the Chicago Metropolitan Agency for Planning (CMAP), should pursue the issue of congestion pricing for both commercial and private automobiles, in particular, single occupant vehicles.

- Regional employers should support public transit and ride sharing for their employees. The UTC undertook a survey of 16,000 employers with fifty or more employees at a work site and 60% responded they were unaware of the pre-tax commuter benefit. (Allen et al, 2004) Businesses and the Regional Transportation Authority should increase their efforts to market the benefit to employees. Increasing public transit usage and reducing the number of single occupant automobiles, particularly at rush hour, will speed truck travel times and improve delivery service and reliability.

- CMAP should continue to plan for the Regional Freight System component of the 2030 Regional Transportation Plan for Northeastern Illinois. The excellent work
of the Intermodal Advisory Task Force (IATF) should also be continued and expanded.

REFERENCES


