2014

A market-based, results-driven plan to increase private investment in four underutilized regional land assets that were vacated as a result of the severe destabilization of the automotive industry.

Align Manufacturing with Global Supply Chains

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While the Midwestern economy is only beginning to recover economically from the Great Recession, it is apparent that there are deeper structural shifts underway that will also influence the pace and direction of economic recovery. These changes will influence the path forward for Central Indiana, with clear implications for future job creation. The conversation begins with the notion that transportation and logistics are a cost of doing business. As such, improvements to the transportation system, while not necessarily job producing, enhance the competitive position of a region to grow and create employment opportunities in other sectors. For companies involved in freight, implications relate to either reducing the cost of local interchange, or increasing the predictable velocity of freight movement.

For manufacturers and distributors, pressure to reduce costs is driving greater fuel efficiency, interest in alternative fuels, larger distribution buildings, closer physical alignment between intermodal yards and distribution centers, and interest in overweight truck routes to directly connect these assets. There is a need to focus on areas where intermodal connections between truck and rail can be improved, and how these nodes align with land use, particularly underutilized sites proximate to intermodal locations that have growth potential.

Recent experience points to the willingness of railroads (Class 1 and short lines) to invest in projects jointly with the public sector. For the private sector, critical questions relate to confirming benefits and ensuring that outcomes can be controlled.

Sustainability questions associated with freight movement are also moving to the forefront. As freight tends to concentrate in metropolitan areas, “negative externalities” tend to emerge, related to air emissions / air quality, including particulates associated with diesel emissions (PM 2.5), congestion resulting from “run-through” and “last mile” freight movements, and broader social justice and equity concerns. While sustainability arguments have not gained universal traction, experience reinforces the reality of how higher fuel prices are gradually pushing freight from air and truck toward rail and water. From an efficiency standpoint, one rail car can generally carry 112 tons of cargo, or 4,000 bushels of volume, while one truck can generally carry 26 tons of cargo or 910 bushels of volume.

Recent federal policy directives have reinforced basic concerns about US freight infrastructure planning. It is clear that transportation planning does not fully account for freight impacts, and that economic development and transportation programming are largely disconnected. With clear expectations for growth in freight volumes, deliberate responses are needed to resolve all-too-common misalignment between industrial land use and transportation in addition to capacity constraints and modal disconnects. For Indianapolis, key implications include the following:

- While Central Indiana ranked 32nd in total population in 2011, the area ranked 21st in total origin / destination freight tonnage, and 10th in inland port total origin / destination freight tonnage.
- Indianapolis was one of five US metros that ranked in the top 20 for both absolute freight tonnage by truck and the percentage share of freight tonnage by truck.
- As a logistics hub of national significance, Indianapolis must prepare for future growth in freight volumes. Over the next 25 years Central Indiana planners will need to anticipate more than 60% growth in freight volumes, with an increasing percentage of freight moving by rail and intermodal.
- More frequent and longer freight trains and more at-grade crossing delays point to need for more grade separations.
- While logistics can be a strategy for economic development, it is imperative that value be added locally, otherwise mitigating impacts caused by thru-traffic becomes necessary. This point reinforces the need to focus on advanced manufacturing rather than distribution and logistics.
- Central Indiana benefits from the I-40 / I-44 / I-70 Interstate corridor, the shortest, least-tolled route between LA and NYC for higher value goods moved by truck. Values per ton carried by truck along I-70 are higher compared to routes such as I-65 to Chicago.
- More than 60% of all manufacturing jobs in Indianapolis are located within a 1.5-mile buffer of the I-70 and I-465 South interstate corridors.
- The CN / Indiana Railroad partnership appears to be significant for Marion County.
Economic Drivers

Re-shoring of manufacturing is one of the key trends that is beginning to influence the US. The trend is linked with significant labor cost growth in China, rapid labor turnover in India, higher transportation costs and more unstable supply chains. Mexico has been the primary beneficiary of this trend through 2012, including states such as Chihuahua, linked with investments by firms such as Foxconn.

Another driver concerns automotive production. Since 2005, auto production in Mexico has surged, growing from a 10% share of North American production (including the US, Mexico, and Canada) to a 19% share by 2012. Importantly, both US and Canadian auto production decreased in share over the noted period, with Mexican growth in share occurring particularly rapidly since the onset of the recession in 2008, when a significant number of US automotive assembly plants began to close.

Recovery in automotive is also linked closely to the currently unfolding shift toward intermodal service for movement of parts and modules. An increasing share of automotive components are being moved by rail, using intermodal shipping containers.

On a more basic level, the nature of manufacturing has changed fundamentally. Where once heavy manufacturing facilities imported raw materials and turned them into finished goods in a single large facility, manufacturing is increasingly an additive process, with products moving through several assembly stages, taking place over large distances and multiple suppliers, linked by increasingly nimble supply chains.

New technologies (3D / Additive Printing) and advanced materials (powdered metals / composites, plastics, and adhesives) will continue to influence manufacturing processes. Using the automotive industry as one example, industry reports point to continued growth in the use of lighter-weight aluminum and reconfigured power trains, along with powdered metals, plastics and special adhesives in future cars.

In line with the above, distribution has changed drastically. Where once goods were manufactured, stored in warehouses, shipped to retailers’ shelves, and sold, today goods are manufactured as they are needed; inventory is drastically cut down; and global supply chains provide just-in-time delivery. For many companies, “inventory” is more likely to be stored on a truck than in a warehouse.

Growth of the Internet has also led to the emergence of larger order fulfillment centers run by companies such as Amazon and others. This point is magnified by continued growth in Internet based shopping. According to the US Census, electronic shopping accounted for more than 10% of retail spending in 2012. Fulfillment centers used to be the reserve of catalog businesses, but have been reborn for the 21st Century.

Federal regulations related to the railroads are continuing to shift. The industry is currently struggling with implementation of Positive Train Control (PTC). Discussions within the Surface Transportation Board focused on the concept of reciprocal switching for “captive shippers” are also noted.

Workforce transitions, linked with impending Baby Boomer-generation retirements, will continue to challenge corporate America, and influence the economy as a whole. While the oldest Boomers turned 65 in 2011, by 2029, all of the Baby Boomer generation will be 65 and older. The railroad and manufacturing sectors are in the midst of pronounced generational changes, with considerable retirements coming in the next 10 years.

Air quality regulations will continue to impact transportation. While already twice as efficient as trucks in moving intermodal cargo, EPA air quality requirements will further transform rail transportation in the next 10 years. Growth in freight traffic directly relates to use of diesel fuel, with related concerns for particulates (PM 2.5), as well as broader social justice issues.
Air quality regulations are also impacting energy markets, linked with the impact of a reported 27 gigawatts of coal-fired capacity set to retire within the next several years. New extraction technologies have also increased the supply and lowered the cost of oil and natural gas, the latter of which is beginning to help manufacturing sectors that rely on natural gas as a feedstock. Even as domestic consumption has decreased, coal exports have grown dramatically. Growth has put pressure on existing export facilities and supply chains. Regions that produce lower-sulfur coal are likely to see growth in demand in coming years.

Manufacturers and retailers face continued pressure to keep shipping costs as low as possible, as transportation has consistently absorbed the largest share of logistics costs for companies. Drivers of higher costs include labor, as well as fuel, the latter of which has grown at rates well above the rate of inflation since 2007. While costs per gallon for low-sulfur diesel have grown at a rate of about 5.4% (annualized), rates for jet fuel have grown faster (about 6%). Increasing costs of jet fuel are one reason why air cargo growth has recently slowed, as cargo has diverted to expedited ground transportation.

From a trucking standpoint, there is greater emphasis on maximizing the volume and weight that an individual truck can carry. This point is impacting manufacturing production processes as well, better aligning manufacturing with transportation modes and costs. One clear outgrowth has been the emergence of Third Party Logistics Providers (3PL), who help companies optimize freight modes, carrier loading & scheduling, warehouse management, and outsourcing of some business functions, including customer returns and repairs. These companies now serve an estimated 80% of Fortune 500 companies, according to JOC.
INTERMODAL IMPACTS

Containerization of freight has dramatically reduced transportation costs. Worldwide, the number of shipping containers (20-foot equivalent units or TEU) continued to grow between 2000 and 2010 in spite of the recession. According to the US Army Corps of Engineers, the number of shipping containers increased from about 25 million to about 31.5 million, or about 3% annual growth. IHS Global Insight predicts that the number of imported TEU’s will increase from 17 million in 2011 to 60 million in 2037.

Across North American ports, the recent emergence of deep water ports in Mexico and Canada is notable. The Port of Prince Rupert in Western Canada has seen dramatic growth in TEU since 2006. The shift in share relates in part to higher costs linked with more stringent environmental emissions, particularly in California ports, as well as underlying trends related to re-shoring and near-shoring. For Mexican ports, current shifts in supply chains by companies such as Nike have shifted production from China to other Asian countries, as well as to Mexico.

Containerized commodities for export to Asia is viewed as a growth area with Midwestern implications. In 2011, 7% of U.S. grain exports moved by container (U.S. Department of Agriculture), up strongly from 2010. A share of end-users are concerned about a confirmed origin, and are prepared to pay a premium for container service.

For the Midwestern US, Intermodal discussions begin and end with the Chicago Area, one of three metropolitan areas served by six Class I freight railroads. The number of intermodal lifts has steadily increased particularly since 2009, led by railroads such as Canadian National (CN) and Norfolk Southern (NS).

More importantly, 3PL’s are increasingly helping companies add value to partially assembled products along their supply chains. Research completed by JOC indicates that about half of surveyed 3PL’s (more than 380 companies) in 2013 provide sub-assembly services. For Indiana, 3PL’s are having an increasing impact. According to Conexus, specific examples include:

- Ingram Micro, located in Plainfield, is a 3PL that provides support services to the telecommunications industry. They received cell phones from a manufacturer, program software, and then package and deliver directly to manufacturer’s customers.

- Integrated Distribution Services (IDS) is a 3PL also located in Plainfield. They work with Hanes underwear, receiving and sustaining inventory and responding to customer orders for specific items, which are packaged and shipped.

- MD Logistics in Plainfield works with Bayer; receiving supplies of pills, bottles and labels from Bayer which are then packaged by MD and distributed to customers. Life Science Logistics in Brownsburg provides a similar service for other Pharmaceutical companies.

For Indy FastTrack, key points include the following:

- 3PL’s are exerting more influence over how value gets added along supply chains.

- While all distribution buildings look the same, 3PL’s can be providing additional value added services, which could otherwise support higher wages as well.
Congestion in Chicago has encouraged several ideas for rail bypasses around the city, with the CN acquisition of the EJ&E (a smaller short-line railroad) providing the only clear bypass at present. Cities such as Indianapolis traditionally have been tightly connected to Chicago’s intermodal yards, with many import and export containers needing to be “drayed” from Chicago, at added cost to local shippers.

For Indianapolis, there are three related rail conversations:

1. The recently initiated intermodal partnership between the Indiana Railroad and CN is potentially quite significant. CN’s growth in intermodal car loads (11.8% annual growth since 2009), and TEU’s at Prince Rupert (10.5% annual growth since 2009) reflects this railroad’s strategic position, essentially connecting deep water ports on three coasts with Indianapolis.

2. CSX is the primary Class I railroad serving Indianapolis. While Indianapolis does not site on any of the defined primary CSX freight corridors, analysis suggests that their Avon Yard, located on the western edge of Marion County, is significant to the CSX system. Over the last several years, Indianapolis has sustained itself as the fifth busiest CSX yard in their system, in terms of units processed.

3. The recently announced partnership between CSX and the Louisville & Indiana Railroad includes $90 million in investment to upgrade track along a route that parallels I-65. The improvements will enhance CSX connectivity to the south, particularly to places such as Cincinnati.
INFRASTRUCTURE IMPACTS

The Panama Canal expansion includes a new parallel set of locks with a greater draft, and deeper navigational channels. The improvements will allow ships larger than the current Panamax standard to pass, creating potential savings and opening up new markets. According to the U.S. Army Corps of Engineers, in 2012 these ships made up 16% of ship inventory, but now account for about 45% of intermodal cargo capacity.

For the Midwest, some experts presume that the expanded canal will gradually benefit agricultural markets, given that a reported 44% of U.S. soybean exports already pass through the Panama Canal, primarily to Asian markets.

Port reactions to these investments vary. For example, while Gulf & East Coast ports are contemplating investments to support larger ships, analysis suggests that at present, only a small number of US ports have been dredged to the 50-foot standard required for post-Panamax vessels, including West Coast ports (LA/Long Beach, Oakland, and Seattle), as well as the East Coast ports of Norfolk and Baltimore. A project is currently underway to deepen the main channel and container berths at the Port of NY/NJ to the 50-foot standard, along with raising the height clearance of the Bayonne Bridge; the port of Miami is making similar plans. The Port of New Orleans, including terminals up to Baton Rouge, can only support ships that draw up to 45 feet; the Port of Houston is in a similar situation.

There remains a fair amount of uncertainty where post-Panamax ships will sail as they enter the fleet in larger numbers. Research suggests that ship owners are likely to be motivated to keep these assets at sea to minimize unloading time, suggesting that a smaller number of U.S. ports will see significant increases in activity, which will have ripple effects on land side port facilities, trucking companies, and railroads.

Class I Railroads are reacting to the canal expansion by investing in infrastructure and capacity, either through direct capital outlay or through public private partnerships. Since 1999 BNSF has invested $1.8 billion to increase capacity on its southern Transcon which now provides double-track service from Los Angeles to Chicago. CSX is developing its $842-million-dollar National Gateway project which will create double-stack container capacity along three rail corridors linking Mid-Atlantic ports to Ohio and Chicago.

NS recently completed a major upgrade to the Heartland Corridor, which effectively doubled container-train capacity from Norfolk to Chicago. The project involved raising tunnel clearances on 28 tunnels and removal of 24 overhead obstructions in Virginia, West Virginia, Kentucky and Ohio, at an estimated cost of $191 million, shared between NS and impacted state governments.

NS is working on the Crescent Corridor project with 13 states focused on 2,500 miles of rail infrastructure. The project, with a reported cost of $2.5 billion, will expand capacity from New Orleans and Memphis, through Birmingham, Chattanooga, Knoxville, and Charlotte, to connect with Philadelphia and New York.

Even as the Class I’s are benefiting from these corridor improvements, their local networks and yards continue to be a challenge, both in terms of operations and capital investment priorities. For cities, implications link with the reality that freight trains are getting longer, with consequences for older rail yards and at grade crossings. As well, many older yards are not equipped to deal with growth in intermodal.
From a Midwestern rail standpoint, the regional freight movement system is not standing still.

CREATE is beginning to solve freight bottlenecks in the Chicago area, one of three places where six Class 1 railroads meet. CREATE includes more than 70 projects with a $3-billion-dollar price tag.

NS is partnering with CN on the Mid-America Corridor, to reduce transit time between Chicago, St. Louis, and Memphis. The goal of this corridor partnership is to share track between the three gateway cities.

The CN continues to digest their acquisition of EJ&E, and announced an intermodal yard expansion in Joliet, IL in 2012. Given the fragmented nature of the freight system, it is difficult to predict how freight movement will adjust to these improvements. However, given plans by the CN to expand container traffic through the Port of Prince Rupert from about 500,000 TEU’s to a reported 4 million by 2015, it is reasonable to assume that CN container traffic to Chicago and Memphis will increase over time.

Across the Central U.S., Chicago, St. Louis, Memphis, and New Orleans serve as critical interchange points for cargo and containers originating from the Atlantic, Gulf Coast, and Pacific Coast. While Chicago is starting to implement rail efficiencies, these other critical nodes remain behind. St. Louis recently completed a freight planning effort that identified existing Mississippi River rail bridges as a future constraint to growth in rail traffic. As St. Louis is a key interchange point for eastern traffic on CSX, infrastructure decisions made locally could impact freight flows through Indianapolis. Current plans by IDOT for high-speed rail do include evaluation of alternatives to expand rail capacity across the Mississippi.

While Chicago remains a key node in the national freight movement system, Class 1 Railroads (particularly eastern) are appreciating the possibility of having traffic avoid Chicago, and route through Kansas City, St. Louis, Cincinnati, Memphis, or Louisville. A share of east-bound rail connections from St. Louis do connect through Indianapolis.

<table>
<thead>
<tr>
<th>Railroad Property Assessed Valuation in Marion County</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<td>$706,721</td>
<td>$786,848</td>
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**LOCAL FISCAL IMPACTS**

One remaining element with local implications in Marion County concerns the assessed value of railroad property. The table below summarizes recent trends for valuation of all railroad operating property around the county, representing an increase in value from about $22 million to $26 million between 2011 and 2013. Railroad property is valued differently compared to traditional real estate (i.e. houses or office buildings), with values linked to the financial performance of the railroad, linked with miles of track. Through this approach, most railroad operating property is valued for tax purposes at lower unit rates (per acre / per square foot). However, while the railroads have been consistently reducing the amount of owned miles of track, their stock valuations have grown, resulting in higher assessed valuations for property tax purposes. When looked at from a tax increment financing standpoint, the possibility of growth in valuations against a base year for railroad property has merit as a funding source for railroad improvements, including grade separations, spurs, and connections.
Freight Movement and Land Use Alignment

The Industrial Land Use context is shaped by clear expectations that freight volumes through metropolitan areas such as Indianapolis will only increase over time, and that the all-too-common misalignment of land use and transportation will otherwise increase costs and create other “negative externalities”, if not managed deliberately. It is also apparent that the connection between freight movement, land use and climate change will become increasingly important, with growing awareness of air quality impacts on adjacent / at risk populations.
**Indianapolis Fast Track**

CSX / I-70 Corridor:
Weekday PM Peak Hour
Average Truck Speed (June 2012)

*Data Source: Indiana Dept. of Transportation, American Trucking Research Institute*
The “Mass Ave Triangle”, bounded by Massachusetts Ave to the south, College Ave to the west and 25th Street to the north is a strategic area. Anchors include Keystone Enterprise Center and Major Tool. Existing at-grade crossings with CSX will need to be evaluated and infrastructure will need improvement. A number of sites within this area could benefit from enhanced connectivity to I-70. Opportunities for assembly are significant, along with challenges associated with brownfield sites.
The entire Shadeland Corridor inside of I-465 is a second priority area. It includes a number of existing anchors, including: Raytheon Western Select, Shadeland Commerce Center Former Maytag “Jenn Air” Plant.

This area supports a significant concentration of employment. In 2011, this area supported over 1,400 jobs in manufacturing, as well as 1,300 jobs in wholesale trade and 360 in transportation and warehousing, according to the US Census On the Map application. The area is well located in relation to I-70 and I-465. The existing industrial buildings are all older, and have been converted from single-tenant to multi-tenant use. For the Shadeland Corridor, consideration should be given to corridor enhancements. Specifically limited access treatment to the corridor north of Washington. The intent is to better connect existing industrial sites to primary interstates.
The Senate Avenue Terminal Area is generally bounded by McCarty Street to the north, Meridian Street to the east, the White River to the West, and Raymond Street to the south. The intermodal partnership between Canadian National (CN) and the Indiana Railroad (INRD) is one driver, linked with opportunities to increase intermodal container volumes through the area. While it is too soon to know for sure how many intermodal units will ultimately move through this yard in the future, broader growth prospects for intermodal along the CN system are dramatic. As the INRD yard connects with the Belt Line, understanding how this asset can be better used to connect industrial land use with rail access is an important consideration.

Today, the corridor is not well positioned to manage growth in truck traffic. Existing streets are narrow and there are a number of conflicts between residential and industrial uses.
INDUSTRIAL LAND USE IMPACTS