

Rockford Metropolitan Agency
for Planning

Rockford Regional Freight Study

Executive Summary & Final Report

Prepared for:

Rockford Metropolitan Agency For Planning

Prepared by:

AECOM

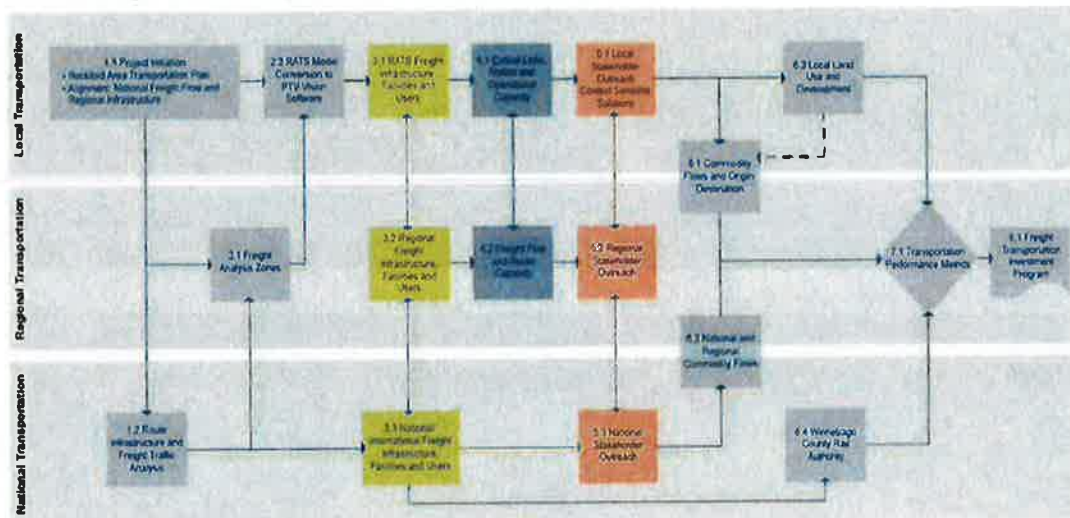


Rockford Regional Freight Study: Executive Summary

Project Background and Purpose

- "...making recommendations to invest in a series of projects to operatively improve the northern Illinois freight network..."
- Recommend supply chain enhancements critical to maintain current, as well as attract future industrial development for the RMAP study area
- Locational advantages and resources remain despite recent economic distress
- Transportation investment will lead to industrial supply chain attraction and operability, as well as multiplier effects for the regional economy

RMAP Regional Transportation Freight Study



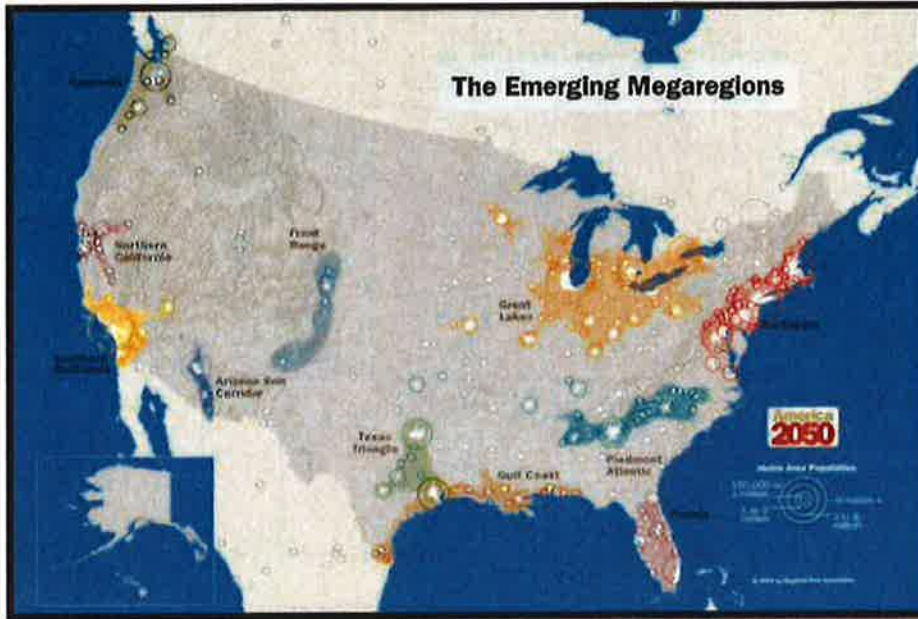
Scope of Work Definition

- Regional Setting: Proximity to Minneapolis, Milwaukee, Kansas City, St. Louis and Chicago
- Maintain and enhance the Tri-State cooperation for transportation network and freight movement

Davis Junction, Ogle County

Upgrading Transportation and Communications





Economic and industrial supply chains operating across the region's freight transportation infrastructure

RMAP Long Range Transportation Plan (LRTP)

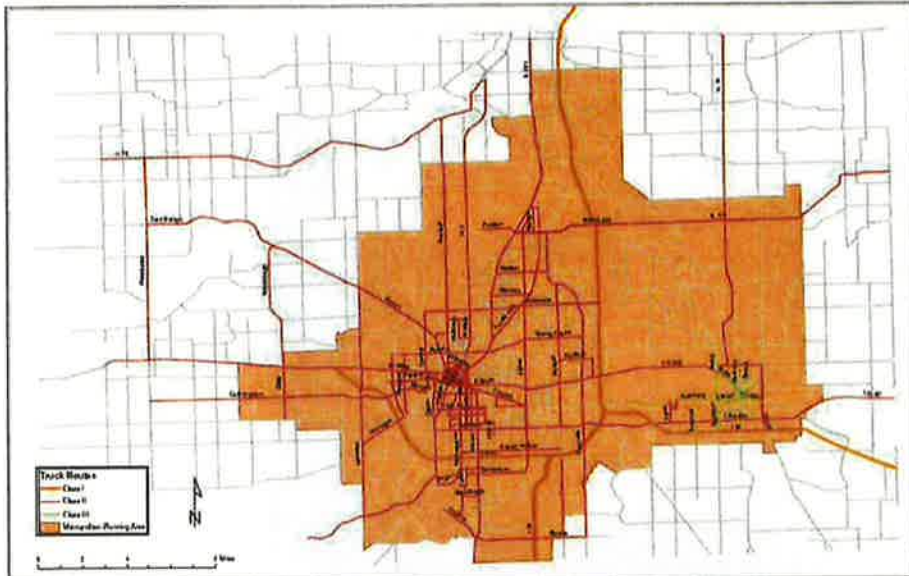
- Continuation of smart growth, setting and context for sustained industrial activity
- State of good repair of existing transportation assets
- Leverage and link existing and underutilized land use
- Balance operability improvements, the assets have to be utilized to add value
- Freight and passenger transportation models to examine network performance

South Main Street Yard

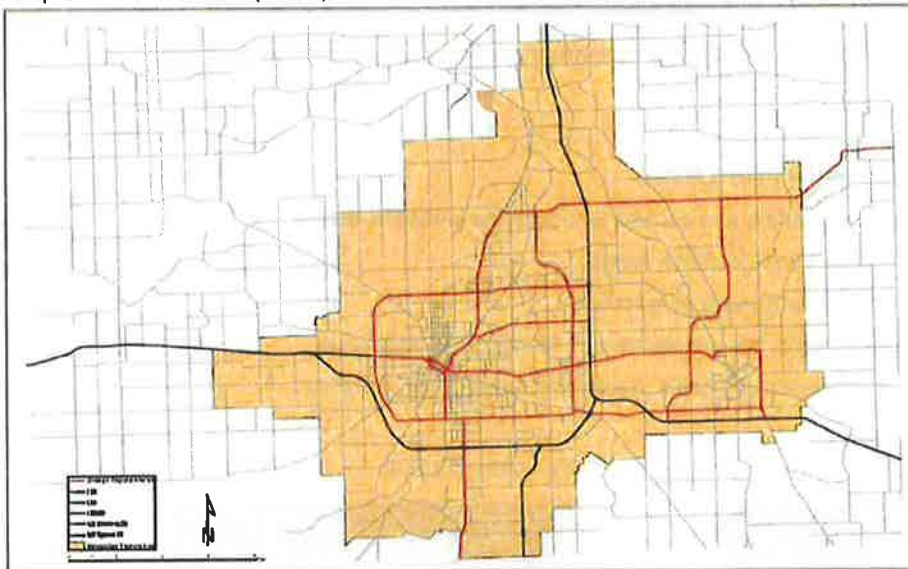


Winnebago Street





Map 7-2 Truck Routes (LRTP)



Map 7-3 Potential Strategic Regional Arterials (LRTP)

Policy and Program Recommendations

- Consensus of Stakeholders is imperative going forward, scarce public sector dollars will flow to an area where broad public support already exists, across multiple levels of government and jurisdictions
- The private sector will also invest where conflicts and uncertainty are minimized
- Industry decisions – supply chains, freight flow and the global marketplace all interact

- Transportation investments will aid in industry attraction by providing improved access and adaptability for industrial operations
- Sustain initiatives through adaptation and strategic alignment
- Sustain RFD as a catalyst for industrial growth and development, enhance linkage to other modes of transportation
- Hospitals, health care providers, the U.S. Postal Service, directory and mailing list vendors, wholesalers, and restaurants were among the largest customers of air transportation in both years – public and sector consensus behind the airport



Chicago Rockford International Airport

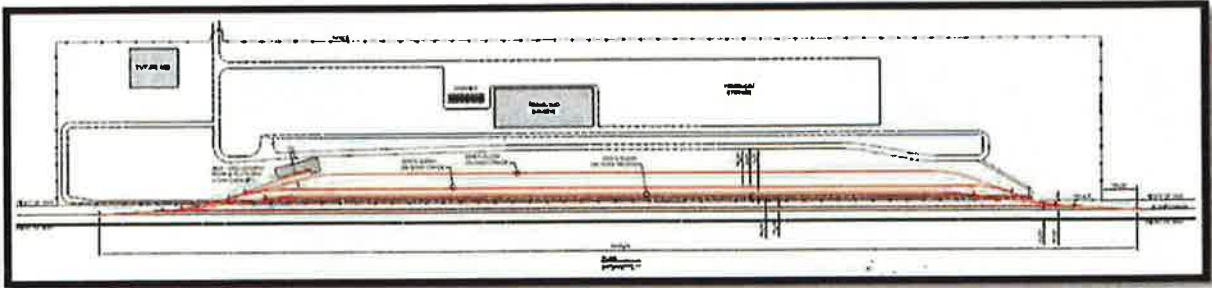


Land Development at the Airport

Multiple Transportation Mode Centers, known as Intermodal Facilities, are located and thrive where

- A market corridor exists capturing industrial supply chains
- An operational advantage arises from the location, attractive to industry and freight transportation companies

An Industrial Center served by Rail and Air Transportation



Role of the Private Sector

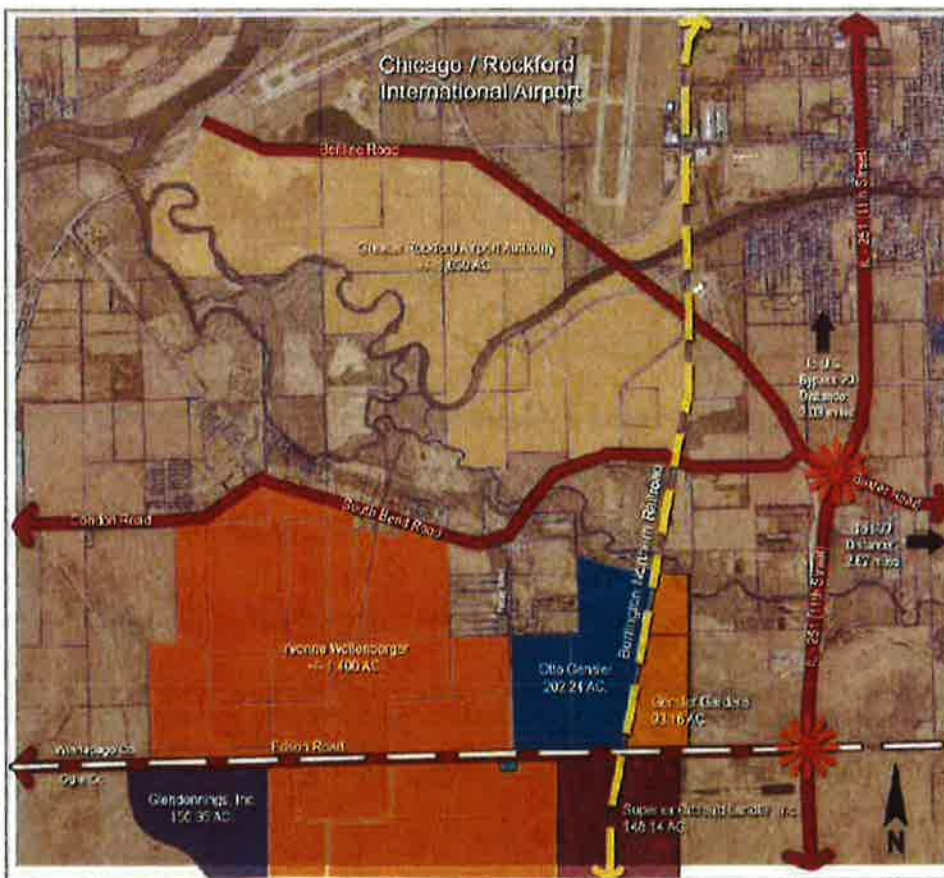
- Attract major shippers that can take advantage of the regions location and transportation operations
- Sustain freight forwarder interest and awareness of the region
- Targeted Industries will typically display the key attributes of innovation and technology, particularly for innovation in the mechanical, hydraulic and control systems
- Industry sectors favorably situated within the Rockford MSA, or could be attracted, include aerospace production and research & development, warehouse / distribution centers, industrial machinery manufacturing, metals manufacturing, chemicals and plastics manufacturing, food processing, transportation equipment manufacturing, as well as green technology and alternative energy development and production

- Maintain focus on supply chain integration where regional connections and cohesion are important, the successful logistics centers continually demonstrate the alignment
- Freight rail infrastructure upgrades will combine with private investment to create a rail-to-highway intermodal or transload facility that all railroads serving industries in the Rockford region can utilize

Targeted Industries

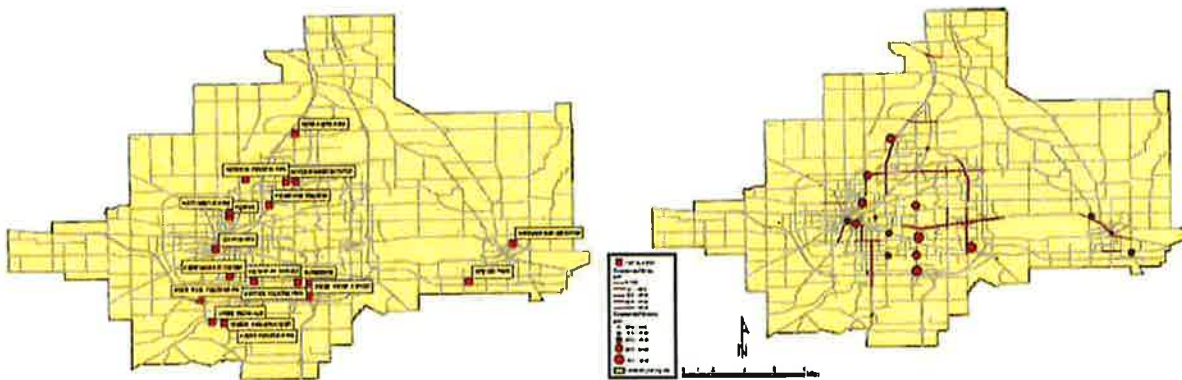
- Aerospace Production, Research, and Development
- Logistics
- Industrial Machine Manufacturing
- Metals Manufacturing
- Customer Service Centers
- Chemical Manufacturing
- Food Processing and Ag-Tech
- On and Off Road Transportation Equipment Manufacturing
- Green Industries and Alternative Energy
- Health Care

Industrial Sites in Rockford Derive Value through the Regional Connections



Public participation and perception exists at two levels: regional and local

- Address and sustain neighborhoods and local area accessibility
- Local / neighborhood infrastructure is most readily seen in the streets, stormwater management and utilities
- Alignment of legacy private and public sector resources – Urban Area railroads
 - Coordinated with Rockford's regional peers, eg Madison
 - Municipal grade crossing closures reflective of current land use and traffic patterns
- LRTP Map 10-6A identifies the significant industrial areas with the study area



Transportation Modes

- Assets connect land use to transportation networks, often integrating modes to support industrial supply chains
- Networks connect regions through corridors: Kansas City, Chicago, the Illinois River Valley to St. Louis (I-39/55)
- Capitalize on opportunities that arise across the RMAP area with other projects, eg., OmniTRAX rail line convergence with the Canadian National due to the Morgan Street Bridge replacement

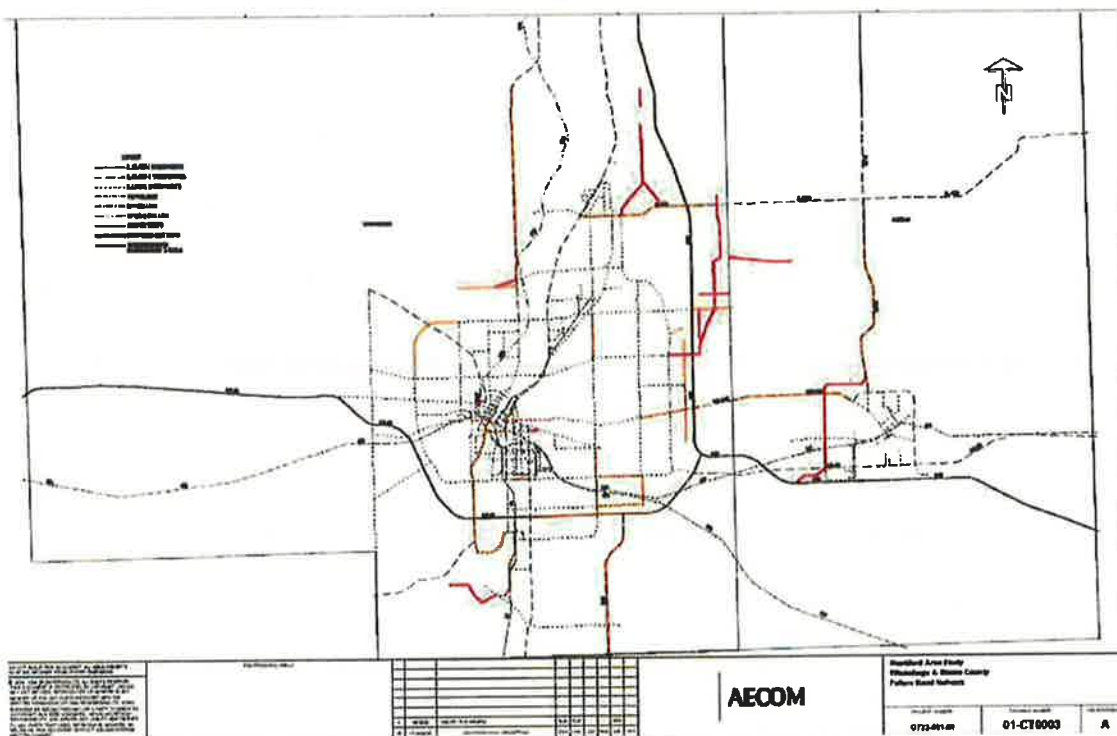
Management

- The Rockford Global TradePark, which surrounds RFD, brings together a multitude of economic development tools such as Foreign Trade Zone #176, US Customs Port of Entry, three economic recovery TIF districts and a planning area of over 6,600 acres in support for industrial and commercial projects
- Address the complexities posed by the governmental conditions in the State of Illinois
- Air Authority and Rail Authority Passenger and freight linkages, examine areas of overlap and complementary purposes
- Track US freight flows over the next three years
- Track and monitor freight flow changes
- Winnebago and Boone County planning activities in relation to land use
- Jurisdictions for different modes, within governing agencies

- Logistics industry infrastructure is most effective when it is linked with a coordinated, broadly engaged planning effort that involves partnerships between public and private stakeholders and the community.
- The mitigation of traffic/congestion impacts, as they may arise on local and regional transportation networks, is an important planning factor with significant economic and community benefit.

Modeling regional transportation

- PTV – Vision Software brings the RMAP procedures into the new transportation modeling paradigm



Railroads in the Rockford Area

- Arterial Roadways are shown as an inner and outer ring, together with the traffic performance measurement capabilities of the model

Specific industry supply chains to maintain awareness in the future

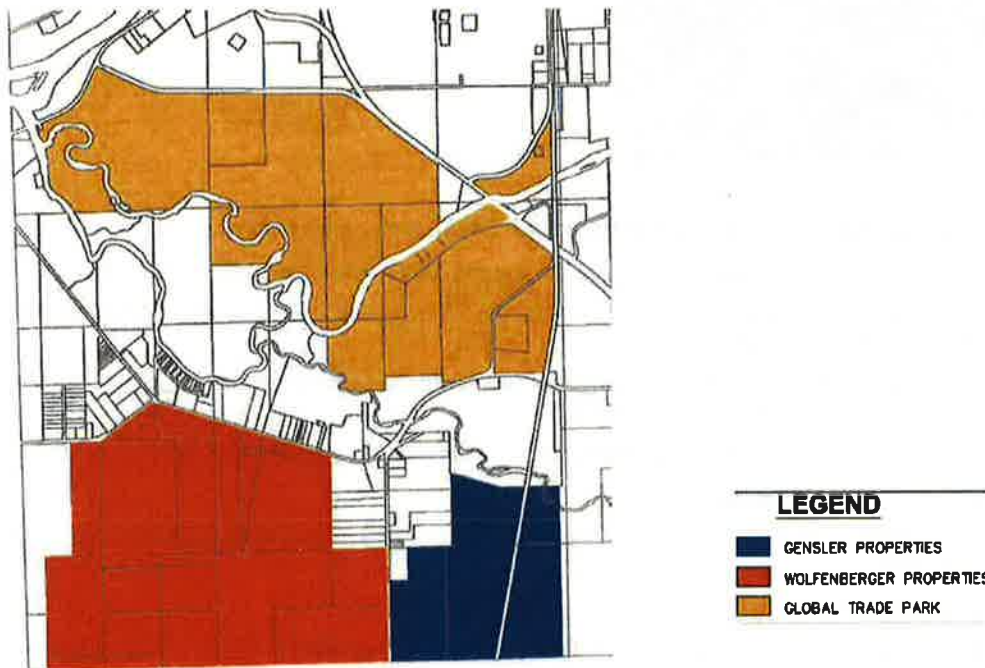
- Machine parts and machines
- Cars and vehicles
- Foodstuffs, drinks and pharmaceuticals
- Building materials
- Chemicals, petroleum

- Track freight within concentric rings 0 -120 mi, 120 – 360 mi, 360-500 mi, +500 mi

Opportunities that can Transition to a Favorable Economic Contribution

- Agriculture processing
- Multipurpose warehousing center
- Environmental evolution of green technology, GHG emissions, stormwater and water quality
- Exclusive truck facilities safety and mobility, infrastructure cost, productivity, modest passenger significant truck improvements, revenue generation and price service
- Technology for business management and the external transportation environment
- The Rockford Global TradePark has a track record of success as the region's premier public-private partnership (PPP).

Development sites exist within the region, in close proximity to regional and global transportation connections, in Winnebago County



Freight movement factors

- Industry's decision factors are shaped by on-time reliability, cost, transit time (damage, security, flexibility, frequency)
- Tollway improvements and technology has helped, as well as the connections to other interstates and railroads
- Technology: GPS and trucking, WISDOT, IDOT for I 39, Tollway highway performance monitoring
- Signalization and local truck routes / continuity

- Build origin - destination and through traffic tables
- Illinois as a state is considered well-integrated in many industry sectors. However, it could be an indication that further economic integration may be possible which would likely increase the efficiency of the goods movement system and decrease the costs to shippers and consumers, and may foreshadow a growth in local employment.
- The top twelve overall industry purchasers of rail transportation in the area includes: candy manufacturers; cookie, cracker, and pasta manufacturers; snack food manufacturers; and dog and cat food manufacturers. Paint and coating manufacturers are also a key customer of the rail transportation industry.



South Main Street Railroad Yard Redevelopment

Projects of Regional Significance as listed in the RMAP 2040 LRTP (Project #)

- Continuation of railroad consolidation projects as the the region develops and replaces infrastructure
 - Canadian National and OmniTRAX Railroads Diamond change-out at Buckbee Street for the Morgan Street Bridge Replacement Project
 - 20TH Street and the Railroad Viaduct – transition from freight to community use / priority (#1), linked to area land use and transportation alternatives
 - Sustain the reuse of the former Canadian National Railway South Main Street Yard
- Airport Drive – Industrial village (#5)
- Spring Creek Road & I – 90 Interchange (#16) together with I-90 and Perryville and Spring Creek Roads (#60), linked to land use and zoning
- Edson Road (#23)
- Edson / Friday Roads (#24), pending Wolfenberger Property development
- Falcon Road (#25)
- I-39 (#32)
- I 90 & Irene Road (#33), pending future needs and development
- I – 90 & I – 39 (#34), link with State of Wisconsin programming for interstate roadway development
- IL – 173 (#36)
- IL – 2 / South Main Street (#40)

- Mulford Road (#51), railroad consolidation to free up the Union Pacific ROW
- Newburg Road (#54), pending
- Jane Addams Tollway (#56), independent project with impacts for access to the Chicago region
- Poplar Grove Road Bridge (#63)
- Rockton Road (#67)
- Sandy Hollow Road (#70)
- South Bend Road (#71)
- US 20 By-pass (#79)
- Morreim Road (#82)

Winnebago County Rail Authority

- Rail passenger transportation and rail freight transportation, a potential source of regional consensus and infrastructure support
- Responsive to user and industry needs
- Taken as a whole the freight and passenger rail project brings together transportation investment that creates economic wealth for the region, serves the travel needs for a major segment of the personal and industrial population that has been the most severely affected by the economic downturn, and delivers public dollars into a highly successful public-private partnership that has a track record of creating jobs

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Union Pacific Railroad, Rochelle, Illinois



Railroad Diamond Replacement at Buckbee Street



Rockford Metropolitan Planning for Planning (RMAP)
Regional Freight Study:
Final Report

Introduction

The Rockford Regional Freight Study was initiated to identify the actions and transportation projects that could be undertaken within the region to increase industrial development and job creation for the area. Further, the Study was to examine the opportunity for the freight volumes currently bypassing the area traveling along major corridors to “stop for value added” by the unique and skilled work force in the greater Rockford / Belvidere area. The study identified the intrinsic value of supply chain operations and role in the business success for area industries.

The study also placed the study area in the larger regional context of the upper Midwest, as well as the global marketplace evidenced by the region’s transportation connections, including the Chicago Rockford International Airport. The transportation connections to Milwaukee, Madison, Kansas City, Peoria and of course Chicago through rail lines and roadways connect the areas industries to their respective marketplaces. Characterizing these marketplace attributes is the key element in the strategy to enhance regional freight transportation through projects and programs to increase industrial development and employment growth.

The greater Rockford region reflects the trends in the global economy as it reaches industries in the local area. The economic factors, and the industrial supply chains with freight moving through the area, are further impacted by the Rockford region’s proximity to Chicago and other Midwestern cities. The two factors, the global economy and the proximity to Chicago, are anticipated to remain major influences for the RMAP study area in the future. Divisions of multinational firms are anticipated to find locational advantages in the RMAP area, requiring the stakeholders involved in retaining and attracting industries to the region to stay actively supporting the global connectivity.

1.0 Project Background and Purpose

The City of Rockford / Rockford Metropolitan Agency for Planning issued the Request for Proposals for the Regional Transportation Freight Study (Study) to accomplish:

- Analyzing the regional freight transportation network
- Identify current operational strengths and weaknesses
- Evaluate findings relative to the area’s economic impacts
- Make recommendations for projects to improve the freight transportation network

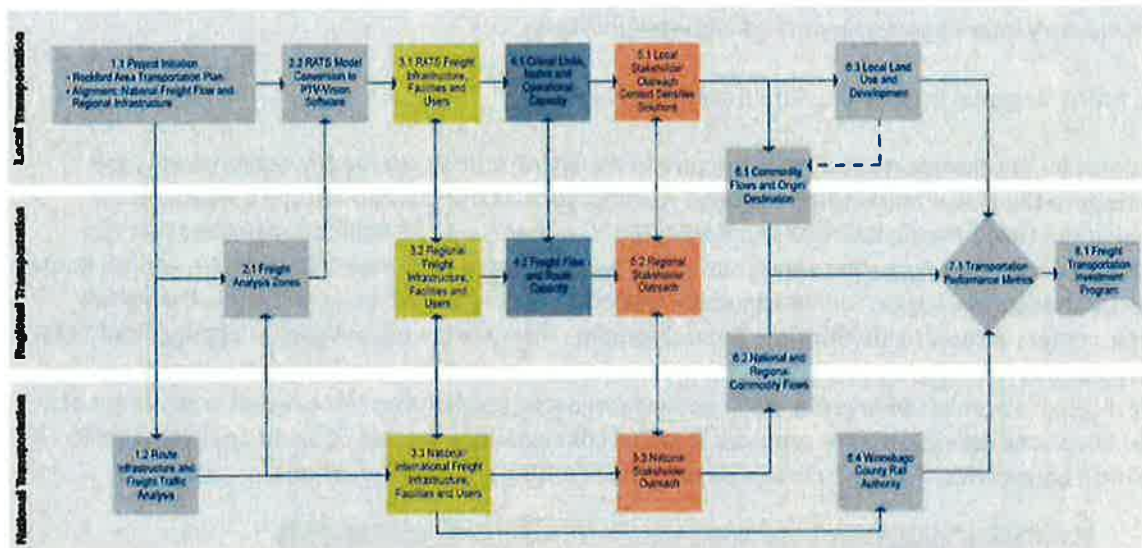
The report developed and presented here identifies the information captured and aligned to meet the above study purposes. Further, the Study is able to present the area’s locational advantages and resources that continue despite recent economic dislocations across the United States and shifting global economy. The Study presents information to identify the linkages between transportation investment, industrial supply chain attraction and operability, as well as multiplier effects in their own right and critical to effective industrial development, operations and employment growth.

RMAP Regional Freight Study

Specifically, the report identifies new, as well as reinforces existing recommended projects and investments for the region to operatively improve the northern Illinois freight transportation network in and adjacent to the RMAP study area. Recognizing the critical connection between infrastructure and operations serving industry, the study recommends supply chain enhancements critical to maintain current, as well as attract future industrial development for the RMAP study area. The transportation investment will lead to industrial supply chain attraction and operability, as well as multiplier effects for the regional economy.

Figure 1 Workflow Diagram

RMAP Regional Transportation Freight Study



2.0 Scope of Work Definition

2.1 Project Approach

The Project Approach was defined in part by the Request for Proposals (RFP) issued by the City of Rockford and carried through by RMAP as a result of the RMAP regional alignment undertaken during the course of the study. The Study initially focused on the freight transportation infrastructure locally and in the greater RMAP study area, including existing conditions, planned facilities and potential needs going forward. The project approach also included how industry supply chains work between industries in the study areas. The next step in the planning process included what can be built as well as how these supply chains can be sustained and enhanced.

2.2 Industry Supply Chains

RMAP Regional Freight Study

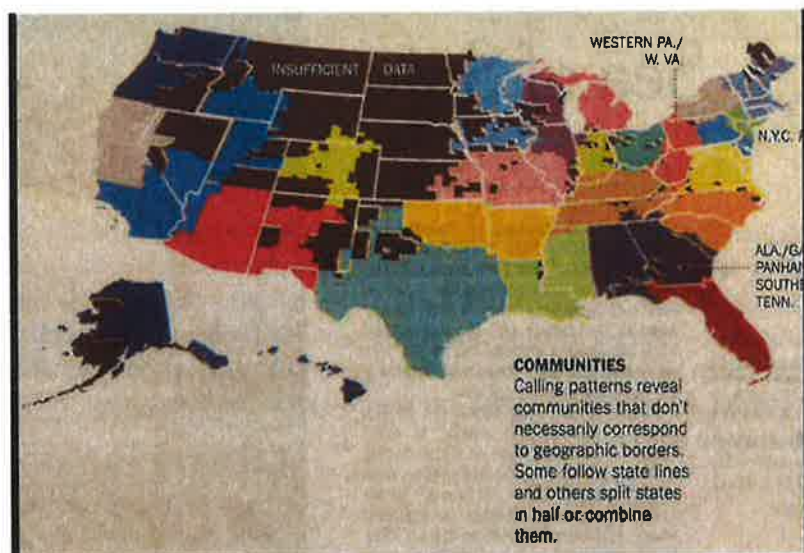
The project examined the relationships among the regions industries and how goods and services are exchanged. The importance of the supplier relationships became as compelling a factor as more traditional aspects of freight transportation infrastructure capacity in the study. Several sections of the report and Appendix A will address the merged aspects of freight transportation infrastructure, operations and industrial supply chains.

2.3 Examine the RMAP Region

The project included the RMAP transportation model conversion to enable RMAP to more fully model the metropolitan area's transportation while integrating land use and regional transportation zones. The detailed model conversion included examining data integration into the model at individual zones and links for the study area. The existing RMAP Long Range Transportation Plan was the initial point of departure to identify draft projects with a potential to have a significant impact upon freight transportation. The list was expanded to include projects identified during the course of the study through industry interviews and meetings with stakeholders.

2.4 RMAP Regional Setting in a Global Marketplace

The regional freight transportation infrastructure in the RMAP study area readily demonstrates the connections to the global marketplace through features such as the Chicago Rockford International Airport and the Union Pacific Railroad and Burlington Northern Santa Fe Railroad mainlines that run through Flag Center and Rochelle to the south. The two interstate roadways I-90 and I-39, and US Route 20, directly connect the region to five additional interstate routes and roadway networks linking key economic centers across North America. Steel shipments from northwest Indiana, Mississippi and Texas regularly serve as key freight components for area industry production. Regional patterns may become evident through a number of investigations and market sector evaluations. The recent assessment of regional telephone calling patterns reported regional connectivity's outside of traditional geographic and political boundaries. Figure 2a below depicts the resulting regional definitions.



RMAP Regional Freight Study

In March of 2009 the Federal Reserve Board of Chicago made a presentation to the North American Super Corridors Coalition about the regional nature of automobile assembly and supplier facilities across the United States. The Figure 2b below indicates the role served by the interstate highway network for assembly plants and the supplier plants critical the industries success.



2.5 RMAP Model Conversion

The legacy Rockford Area Transportation Study (RATS) transportation model was converted to the PTV – Vision software, together with a computer upgrade to manage the computational complexity and volume necessary with the new model. The new software brings the capability to examine freight movements in greater detail than traditional methods. Transportation planning and program development is capturing the unique attributes of freight movement, including shared roadway designations for Class I and II Truck Routes and industrial land use classifications. The model has the capability to focus on specific features such as railroad grade crossings, and include those features in through traffic modeling.

3.0 RMAP Regional Consensus

Freight transportation's operating success begins with the local area transportation infrastructure working well locally, regionally and nationally for the global economy. Industries and shippers select transportation modes based on the price and characteristics of the goods being shipped. While the choices for industry may be relatively inelastic for the short run, over time industries will relocate or undertake expansions at new locations based on their perceptions of cost and accessibility.

The competition for scarce infrastructure investment dollars, as well as the age of transportation infrastructure, poses and additional complexity as market conditions and service expectations continue

RMAP Regional Freight Study

to change. Taken together, these factors can be dealt with most effectively where an integrated regional consensus exists across transportation investment and land use. The recent purchase and investment in the EJ&E Railway by the Canadian National Railway was due to the delay in full program funding by the US Government for the CREATE Project.

3.1 Management

Industrial investment and retention is in part driven by their respective assessments of their supply chains, freight movement and the global marketplace they experience daily to move supplies and products through the transportation logistics systems. The private sector will begin and continue to invest where the potential for conflicts and uncertainty in the intersection of these forces has been reduced. The RMAP area has developed joint public and private sector integration in projects and programs with several companies in the region. The continual redevelopment / upgrade of the Belvidere Assembly Plant and Stamping Plant by Chrysler - Fiat Group, Woodward Governor expansion in Loves Park, United Parcel Service (UPS) and AAR's Maintenance, Repair and Overhaul hangar facility and additional development at and around the Chicago Rockford International Airport (RFD) and most recent investment along the Baxter Road Corridor just east of RFD towards Interstate 39.

The similar alignment of local and state leaders for the Rockford area will be important in the years ahead. Establishing and maintaining a regional consensus will be important in balancing tradeoffs among alternative infrastructure projects and in securing and allocating scarce capital resources.

3.2 Aligning Regional Strengths and Opportunities

Location continues to play a significant role for industrial supply chains to work effectively and efficiently. The location aspect is influenced by the transportation infrastructure that enables the movement of freight as the critical connection between manufacturing, supply and distribution between suppliers and customers. The RMAP area is well served by the interstate highway network with the presence of Jane Addams Memorial Tollway / I-90 and I-39 together with the direct connections to I-80, I-88, I-94 and I-43, as well as region routes such as U.S. Route 20 to the east and west. The Illinois State Toll Highway Authority is embarking upon its next capital program and continues to assist the RMAP area with the continual expansion and projects such as the interchange at Irene Road. The transportation infrastructure enables the region's industries to connect to other firms in their respective supply chains. With varying degrees of completeness, the three Class I and one Class III railroads, RFD and the Lake Michigan and inland waterway connectivity for the RMAP area industries exist as well.

A traditional evaluation tool to analyze a firm or region's competitive position is the strengths, weaknesses, opportunities, threat analysis, referred to as a SWOT analysis. It remains increasingly important to undertake the next step and identify the means to align the region's strengths with the opportunities identified. The constraints, resources and context are also necessary element to fully understand the existing conditions and identify future requirements for the regional freight transportation network.

3.3 Passenger Rail Service

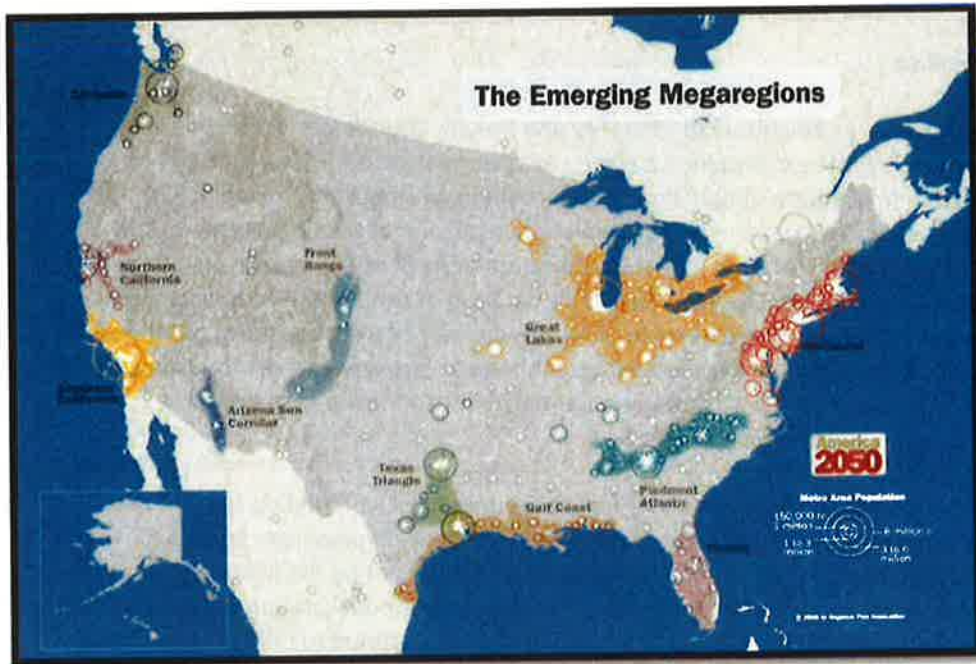
Boone and Winnebago Counties, as neighbors to McHenry and DeKalb Counties, and the cities of Rockford, Belvidere and Huntley, have maintained a steady involvement with the development of passenger rail transportation in northern Illinois since the declines in existing service in the 1970s. Each of the organizations and agencies has sustained an administrative alignment to support the regions public transportation connections and achieve a shared utilization of fixed rail infrastructure. Challenges have arisen in reaching a consensus over the years for ridership, level of service and route alignment. Throughout the recent planning period there has remained a dedicated interest and voice of support for rail passenger service in the region. RMAP area industries continue to strongly support the connectivity to Chicago, both for the industries in the area and the potential direct connections to the other international airports of O'Hare and Midway.

The RMAP region will need to sustain the focus and effort to secure sources of funding support and political consensus for the infrastructure and financing strategies to provide passenger service for the RMAP area adjacent to the greater Chicago area. The recent announcement by the Illinois Office of the Governor and Department of Transportation for the Rockford area multi-modal station is a critical first step. The strategic directions contemplated by Amtrak and Metra will continue to influence rail public transportation in the RMAP study area. Additionally, the alignment of State governmental units will remain important as well. The financial support from the Illinois Commerce Commission in providing railroad relocation and crossing improvement financing for railroad modifications was very important for the Morgan Street Bridge Project, another important transportation investment in the region.

4.0 Regional Setting: Proximity to Minneapolis, Milwaukee, Kansas City, St. Louis and Chicago

The RMAP location is characterized by the area's sitting on the western edge of the greater Chicagoland area metropolitan development and the agricultural foundation of the Midwest to the south, west and north. The RMAP area has a legacy of manufacturing linked to the northeast Illinois region, as well as southeast and south central Wisconsin. The growth of passenger and freight transportation since the 1950's has expanded the connections for industries in the Rockford area.

Major Regional Areas of the United States



4.1 RMAP Regional Connections

Freight transportation, land use and industrial development initiatives and responsibilities over the project area are distributed across several agencies and jurisdictions. The priorities and essential issues facing the respective agencies may pose constraints and conflicts for the respective leadership teams. The combination of freight transportation operations and infrastructure critical for industrial supply chains to be effective requires a consensus to exist across these multiple and overlapping jurisdictions. At a minimum, the process to address issues and identify longer term improvements needs to be available for the impacted agencies to draw upon as circumstances arise. Designated truck routes that lose connectivity between cities / counties are one example of potential impediments to the efficient movement of freight across multiple jurisdictions.

The regional consensus is important in the pursuit of scarce and competitive federal grants and program support, as well as negotiating with private sector companies. Individual companies have a desire to remove the uncertainties that may arise if a diverse set of interests have to come together for their individual projects and investments. The regional consensus mitigates these potential uncertainties and conveys a sense of shared purpose and commitments to freight transportation operating success.

4.2 Economic and Industrial Supply Chains

Access to multiple transportation modes provides companies with options on how to transport their goods. The trade-off for shipment costs is longer transit time and less predictability in shipping product via truck vs. rail vs. air. Over time, market changes may affect the attractiveness of one method of

moving goods may increase or decrease over another method. Close proximity and easy access to trucking, rail and air provides companies with a wider opportunity to react and respond to market fluctuations. Trucking is generally perceived as the most flexible option when compared with alternate modes. It is often used for the first mile, last mile and transfers between freight modes (i.e. transition between rail and air). The efficiency of trucking goods is dependent, among other things, on roadway conditions and congestion.

Existing congestion on roadways connecting Rockford with other marketplaces can burden existing and potential industries. While Rockford cannot control the Interstate system, it does have the ability to ensure that its roads are functioning at a level to sufficiently support the industries within the RMAP study area. The recent upgrades, and future Capital Development Plan for the Illinois State Toll Highway Authority, have successfully mitigated congestion on local roadway ramps and through lanes to ensure that Rockford is attractive to companies. The placement and functionality of ramps will remain an area to track over the future.

As an example, in New Jersey an opportunity was identified to more effectively connect an industrial area with the New Jersey Turnpike. The New Jersey Turnpike Authority is planning a connector road linking the Turnpike with Tremley Point and the Carteret International Trade and Logistics Center. One of the intentions of the project is to support the potential development of Tremley Point as a multimodal freight village.

Recently, the Canadian Pacific Railway (CPR) signed a 10-year memorandum of understanding (MOU) with the province of Manitoba, Canada. The MOU supports Manitoba's International Gateway Strategy, of which the CPR is a partner. The collaboration is intended to promote roadway and railway planning and improve the efficiency of the overall supply chain. It also includes the development of rail transportation logistics into CentrePort Canada, a new inland port.

4.3 Freight Transportation Infrastructure and Railroad Networks

The RMAP study area is directly served by three Class I railroads, the Canadian National Railway (CN), Union Pacific Railroad (UP) and the CPR, through their acquisition of the Dakota, Minnesota & Eastern Railroad (DM&E). A Class III railroad, OmniTRAX through their Illinois Railway (IR) operating company, connects the South Main Street yard with Flag Center south of Rochelle. The Burlington Northern Santa Fe Railroad (BNSF) goes through Flag Center. Also, the Wisconsin and Southern Railroad (WSR) provides railroad service across southern Wisconsin. Historically, railroad service in Rockford can be characterized as local end points for national railroad networks with distribution relative to Chicago. Recently an announcement was made for the WSR acquisition by the Watco Companies.

The CN acquired the Elgin, Joliet & Eastern Railroad (EJ&E) from US Steel Corporation in 2008 and developed the capacity to link their lines to the Chicago area along the outer ring trackage of the EJ&E. The CPR acquisition of the DM&E provided the CPR with a route to Kansas City, a connection that they did not previously have. In each of these instances for a change in ownership, the changes in railroad networks present opportunities to improve the network connectivity for Rockford area industries. The key element will be the balance of railroad service and freight volumes shipped via rail with the changes in service configuration and infrastructure ownership. Freight planning and implementation, for railroads and other modes, in the future will require an integration of public sector perspectives and

RMAP Regional Freight Study

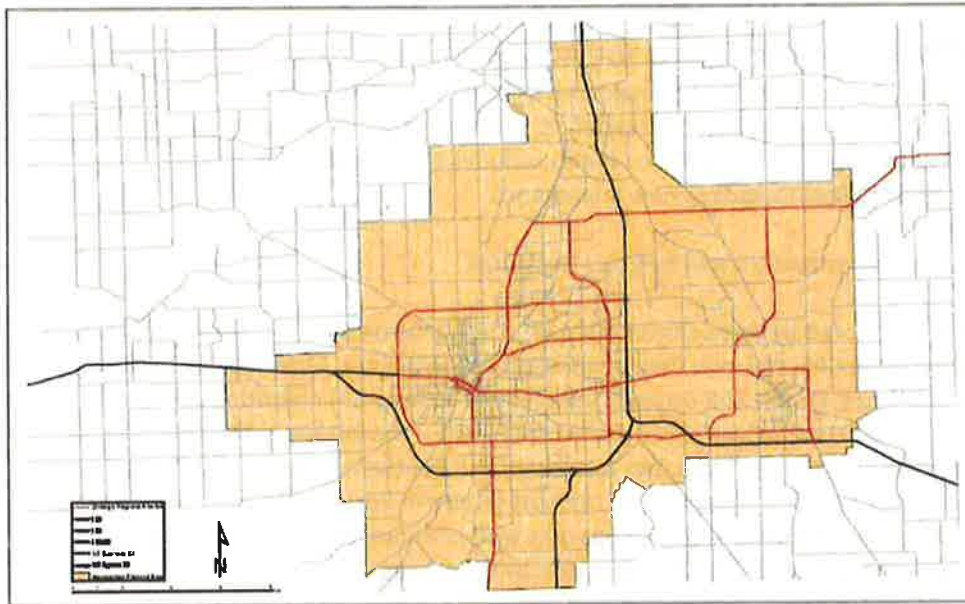
those the private sector industry and transportation companies to an even greater degree than in the past. Freight transportation, as an expression of industry supply chain movements, will always remain responsive to cost and dependability that are only partially responsive to infrastructure conditions.

4.4 2040 Transportation Plan

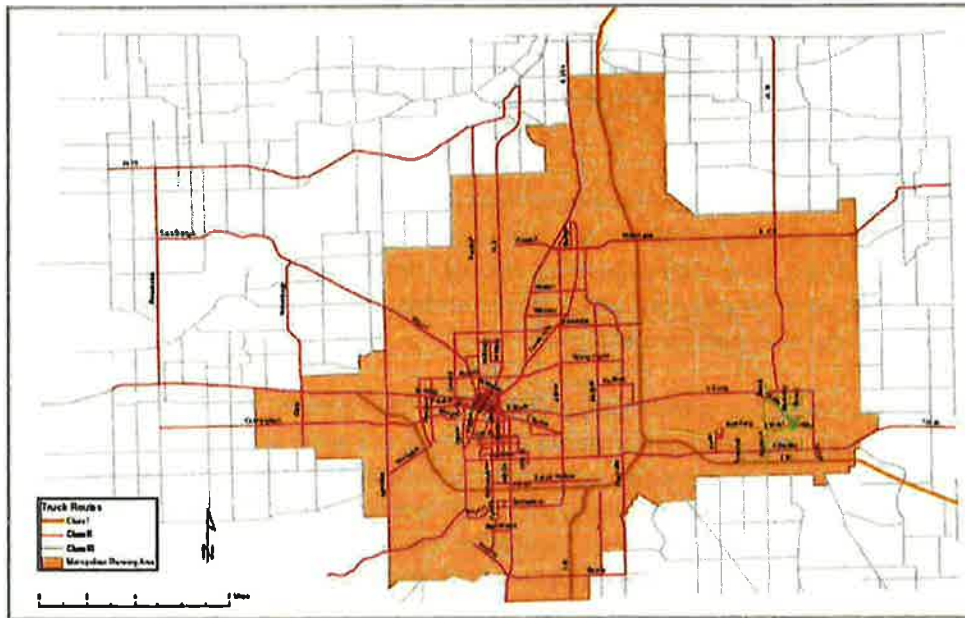
The RMAP long range transportation plan (LRTP) has been prepared with the 2040 forecast year. RMAP, as have many metropolitan planning agencies across the United States, has placed a detailed emphasis on freight transportation and its unique attributes and interconnectivity with other forms of transportation. The principals behind the 2040 Plan include the following.

- Continuation of smart growth, setting and context for sustained industrial activity
- Attenuate / mitigate externalities
- State of good repair of existing transportation assets
- Leverage and link existing and underutilized land use
- Balance operability improvements, the assets have to utilized to add value

Map 7-2 Truck Routes from the LRTP depicts the designated truck routes through the area.



Map 7-3 Potential Strategic Regional Arterials from the LRTP complements the dedicated and signed routes to indicate the roads with capacity and geometric characteristics generally supportive of freight movement to industrial sites. Generally, the RMAP area is well served by arterial roadways. Several industrial areas have developed and remained over time in the region. Employment in the individual areas may fluctuate and still be anchored by key industries that can be seen to remain. Examples include South Main Street and South Kishwaukee and more recent developments such as along Springfield Avenue and Riverside Boulevard / Jane Addams Memorial Tollway interchange.



The RMAP area public agencies have taken the additional step to form an even greater regional cooperation and consensus by forming and participating in the Tri-State cooperation for transportation network and freight movement that involves representatives from Wisconsin and Iowa. The I-39, I-90 and US 20 highway corridors are dominant connectors for this mix of urban and rural geographies. The forum creates the opportunity to discuss shared interests and transportation priorities to enhance the economic and industrial supply chains operating across the region's freight transportation infrastructure. Figure 3 below depicts the railroad connections at Davis Junction, a railroad crossroads that may serve to add greater connectivity across the three states in the future.



Figure 3 Davis Junction, Ogle County

5.0 Policy and Program Recommendations

The work undertaken for the RMAP regional freight study identified and characterized several policy and program recommendations that followed upon our observations of freight transportation and the operability of industrial supply chains in the region. The overall management of freight across North

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America is receiving greater attention in response to the rising costs of increased congestion and the potential expense and time required to develop and implement solutions. The National Cooperative Freight Research Program continues to examine freight on a regional and national basis. The emphasis on US exports and the revitalization of the manufacturing sector are also contributing to the increased emphasis on effective freight transportation.

Freight has traditionally been captured as a portion of the overall transportation planning process. The growth in freight transportation and complexity of commercial and industrial supply chains has ushered in the need for sustained policies and programs. The value of a regional consensus with the supporting regional coalitions is more important with the competition for scarce resources and the complexity of programs with private and public sector elements involved.

Industry decisions about the form and function of their supply chains, and the resultant freight flows are a result of their assessments of risk and quantified performance metrics, all the while being influenced by the global marketplace. Transportation providers and logistics firms become strategic participants as industries turn to outside vendors for the expertise and resources to achieve greater performance and reliability. Industry continues to evaluate the effectiveness, Caterpillar, Inc., recently reduced (May 2012) their holdings to 35% of their formerly wholly-owned Cat Logistics Division.

The public sector, be it represented at a municipal, regional or state level, will need to sustain initiatives through adaptation and strategic alignment of the infrastructure supporting industrial supply chains. The public sector has additional tools available in controlling the complementary land use and urban form that reflect the legacies and future directions for the respective jurisdictions. As one example, RMAP, together with the City of Rockford and Winnebago County, have taken steps to sustain RFD as a catalyst for industrial growth and development by enhancing the linkage to other modes of transportation. These efforts have taken advantage of the region's highway and railroad assets in relation to national interstate and railroad networks. Transportation investments will aid in industry attraction by providing improved access for industrial operations.

Policy and Program Recommendations

First and foremost, the Consensus of Stakeholders is imperative going forward, scarce public sector dollars will flow to an area where broad public support already exists, across multiple levels of government and jurisdictions. The private sector will also invest where conflicts and uncertainty are minimized, thereby ensuring the effectiveness of their complementary investments.

The public sector focus shifts from a planning process to a continual update of Industry decisions. The public sector will monitor and track supply chains, freight flows and outcomes from the global marketplace to identify how each of the elements interact. This extension will also stretch across public sector agencies to see if the expansion of other programs and ideas, eg., Rockford Sustainable Community Grant, can take place in a supporting and complementary role. Further, the region has a chance to combine events and trends, The internet and the many forms of increasingly diversified electronic communications and data management raises the need for bandwidth. Bandwidth becomes an abundant strategic resource where the region needs to stay within the top 25% of bandwidth available to industry, generally perceived to be 1 gigabit per second. The Illinois Fiber Resources Group, ifiber, is an

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organizational alignment to sustain the RMAP study area's connections, as well as the remainder of northern Illinois, to the steadily changing bandwidth speeds and volumes to stay competitive especially along the major transportation corridors in region at: <http://www.ifiber.org/ifiber/>.

Complementing the electronic communications, higher education is increasingly important attracting 50% or more of the students from secondary education. It is a double edged quandry, manufacturing industries need highly skilled trades and crafts that reflect skill sets developed outside of a classroom alone.

6.0 Management

Transportation infrastructure planning and investment, as well as the operational characteristics of freight movement, cross the many administrative and functional responsibilities for the governmental units of northern Illinois. The private sector decisions surrounding freight movement are centered on cost, schedule and risk, each more narrowly defined and more readily quantifiable than objectives and performance metrics for the public sector. Successful freight operations result from these far different sectors aligning as necessity and opportunities arise.

6.1 Alignment of Governmental Units in Illinois

North-central Illinois is home to a wide number of diverse governmental units on a local, regional and state level. Further, there are special purpose authorities and jurisdictions such as the Illinois State Toll Highway Authority whose mandates extend beyond the RMAP region yet have a significant influence on local events and freight movement decisions. The Greater Rockford Airport Authority (RFD) was established in 1946 and continues to support the growth of air freight for the Rockford area.

The first two units of government are the City of Rockford, by virtue of its population, and Winnebago County, by virtue of its size, have a major role in shaping freight movement through land use decisions and transportation investments. Other municipal governments are involved in complementary decisions for their jurisdictions, such as Cherry Valley, Loves Park, Machesney Park, Rockton, Roscoe, South Beloit and Winnebago. The Winnebago County Rail Authority was established in 2007 to aid in the growth of freight rail traffic from railroad operations in part derived from RFD and the intermodal center in Rochelle. RMAP is the officially designated metropolitan planning organization (MPO) for the region and is responsible for long range transportation planning for the region, as well as identifying the short and long range transportation projects. The Rockford Area Economic Development Council (RAEDC) is focused on industrial development and company attraction and retention for the region. They created a strategic plan for the 2008 to 2012 period.

6.2 Complexities across Governmental Units

The multitude of governmental units does create complexities and raises challenges to coordination and consensus building. At the same time the complexity brings forward a wide array of program areas and resources that may be aligned and integrated in support of freight transportation development for the region. The Illinois Department of Transportation (IDOT) has renewed their focus on freight

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transportation in the state by more closely examining the specific drivers associated with freight transportation. The RMAP areas proximity to the Chicagoland area adds the same types of complexities and resources. The Chicago Metropolitan Agency for Planning (CMAP) and governmental / administrative units such as the Regional Transportation Authority (RTA) and the Will County Center for Economic Development (Will County CED) support programs and projects that affect the RMAP area.

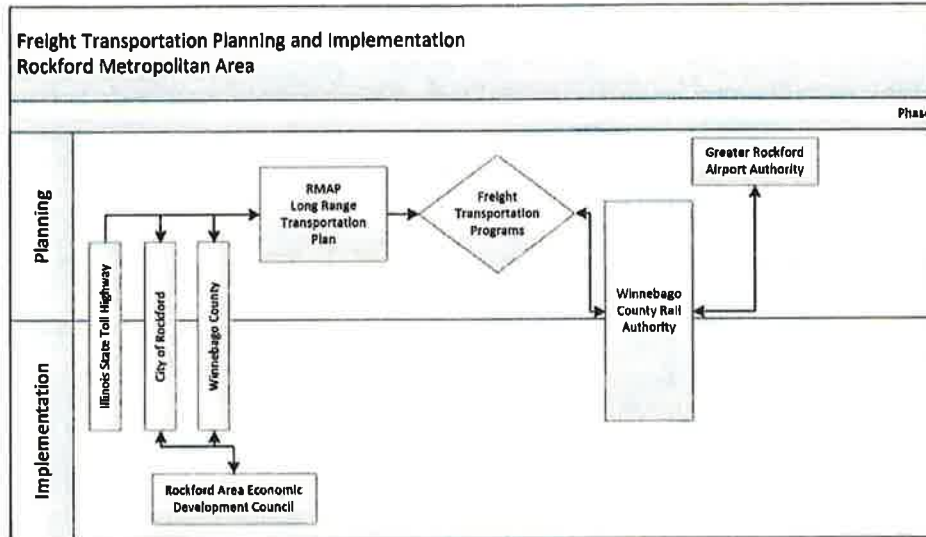
6.3 Expanded Role for the Winnebago County Rail Authority

Public sector agencies have been more successful in addressing the needs and opportunities associated with freight transportation where there is a consistent involvement with specific events and trends that take place over several years and jurisdictions. It is imperative to track and monitor freight flow changes over a minimum of three years to identify changes in supply chains and assess the implications for changes within industry supplier – customer relationships. Further, it remains important to develop specific performance metrics that can be tracked over time. Such measures may include congestion delays during peak periods, freight ton-miles travelled or the number of trucks on a roadway segment, and number of railcars per month reflecting both specific and trend measurements. The metrics will also demonstrate the importance of select corridors and geographic areas for industrial and commercial firms in the RMAP area.

Logistics industry infrastructure is most effective when it is linked with a coordinated, engaged planning effort involving partnerships between public and private sector stakeholders and the extended community. One avenue to increase the effectiveness of freight transportation in the greater Rockford area is to structure the Winnebago County Rail Authority as an agency to accomplish the freight transportation objective identified for the region. The agency would have the ability to permit activities consistent with its mission, recover charges and costs and own property. It would be able to support railroad freight projects, a key mode of transportation that is has been historically outside of the regional freight transportation planning and implementation process. RMAP would maintain the planning function and examine issues such as the mitigation of traffic/congestion impacts, as they may arise on local and regional transportation networks. The two agencies would meet as an important planning factor.

The aligned functions of the Airport and Rail Authorities would foster the freight linkages while examining areas of overlap and complementary purposes. Logistics industry infrastructure is most effective when it is linked with a coordinated, broadly engaged planning effort that involves partnerships between public and privates stakeholders and the community. The Winnebago County Rail Authority would be able to link long range planning with local implementation. The implementation step would enable mitigation of traffic/congestion impacts in a more timely manner and is an important planning factor with significant economic and community benefit. Significant land use changes, such as the contemplated Rockford Global TradePark, which surrounds RFD, brings together a multitude of economic development tools such as Foreign Trade Zone #176, US Customs Port of Entry, three economic recovery TIF districts and a planning area of over 6,600 acres in support for industrial and commercial projects. The Rail Authority – RMAP linkage could provide the multimodal dimension to the development efforts.

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Chicago Rockford International Airport



Land Development at the Airport

7.0 Industry Supply Chains

The study team recognized the importance of establishing targeted industry interviews to identify key operations of industrial supply chains in the region while maintaining the confidential nature of the information obtained. Meetings were held during the course of the project as well as capturing information on freight transportation development in other regions of North America. Meetings were held with the following organizations, with the insights from the meetings captured in the body of this report.

- ABC Rapid Delivery
- Behr Iron and Steel

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- Canadian National Railway
- Canadian Pacific Railway
- Chicago Rockford International Airport
- Chrysler Group LLC
- Clinkenbeard Associates
- DM& E / ICE Railroad
- E. D. Etnyre & Co
- Gunit Corporation
- Haldex Hydraulics
- Illinois State Toll Highway Authority
- Kaney Aerospace
- Kraft Foods
- Liebovich Steel
- OmniTRAX Railway
- Port of Milwaukee
- R. L. Leek Industries, Inc.
- Tandem Development
- Target Laser & Machining
- Watco Transload & Intermodal Services
- Woodward Governor

7.1 Local Industry Alignment with Transportation

Freight movement over the transportation network responds to the cost and the physical attributes of the shipping movement: travel time, modal choice, congestion delays, etc. Further, individual industries will make decisions based on the management control and integration with their overall supply chain. For example, a company may purchase steel coils from one supplier over another based on the speed and dependability of the order, as well as the supplier's ability to ship based on the specific plant material requirements. The vast array of details for individual movements and the aggregated mix of freight movements on any given day may appear to create a significant volume of data.

Freight transportation success arises from the respective private and public sector elements working together well. The important aspect for a regional and metropolitan planning / transportation agency is to track the freight system's performance and assemble relevant metrics where possible. The information will arise from multiple sources over staggered time periods. The number of trucks traveling on roadway segments, ramp volumes and time of day travel are indicative of how freight moves through the region. The number of railcars traveling through the RMAP region and the number of cars delivered to area industries are suggestive of the supply chain structure that is essential for sustainable industries.

RMAP, and its collaborative agencies, will need to develop and align the relevant freight transportation data to identify and implement the necessary freight transportation improvements over time. A shift in modes for steel plate and coils to arrive by truck instead of rail car delivery may be indicative of new suppliers, importance of roadway weight limits or reflect challenges in availability for freight rail cars. The sustained focus to assemble the strategic freight transportation information on movements and infrastructure characteristics will be essential going forward. RMAP may be aided by the closer

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correspondence with city and county colleagues, the private sector and other organizations. The positive working relationships with other agencies often address a number of mutual issues and concerns. The unique aspects of freight transportation and the joint public-private sector roles and responsibilities may lead to requirements for a more dedicated effort to focus on freight movement and transportation infrastructure. RMAP may work with the Winnebago County Rail Authority, RAEDC, Growth Dimensions, Boone County, Winnebago County and others to identify the most effective means to maintain and track this information.

7.2 Targeted Industries

Focused efforts for supporting and attracting targeted industries is and remains a core planning strategy for transportation, industrial development, employment growth and public sector returns on investment. While remaining opportunistic for new developments and innovations, the targeted industries approach enable the RMAP area to concentrate on key attributes of innovation and technology for mechanical, hydraulic, aviation, automobile and control systems for industries in the region.

Industry sectors favorably situated within the Rockford MSA, or could be attracted, include aerospace production and research & development, warehouse / distribution centers, industrial machinery manufacturing, metals manufacturing, chemicals and plastics manufacturing, food processing, transportation equipment manufacturing, as well as green technology and alternative energy development and production. These industry sectors arise in part due to the inherent and legacy services of the RMAP region, as well as its proximity to regional centers such as Chicago, Madison, Minneapolis, and St. Louis and other areas along the Mississippi River. The targeted industry approach will be more successful where the region is able to maintain a focus on supply chain integration. Regional connections and cohesion are important, as well as being able to demonstrate where there are successful logistics centers.

7.3 Approach to Market Services

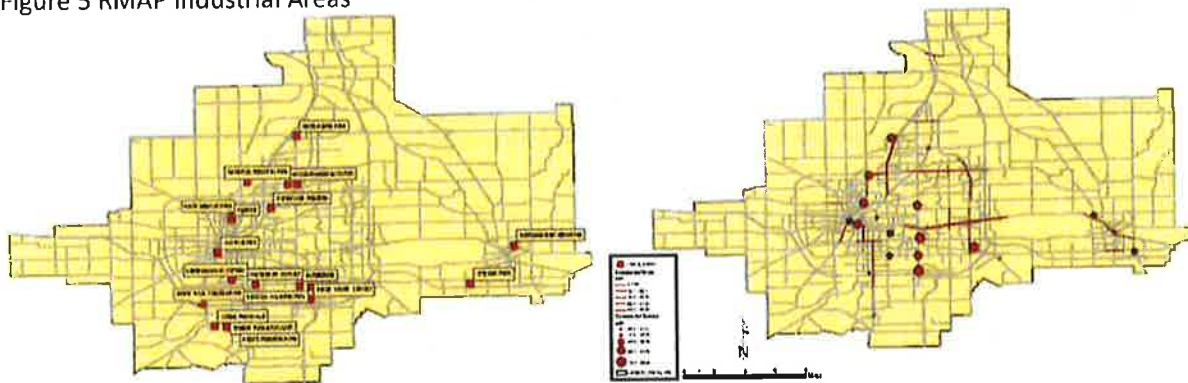
Access to multiple transportation modes provides companies with options on how to transport their goods while taking advantage of near term changes in transportation prices and capacity. The trade-off for shipment costs is often longer transit time that may introduce less predictability in shipping product via truck vs. rail. Over time, market changes may affect the attractiveness of one method of moving goods when compared to other modes. These changes may increase or decrease the relative advantages between methods and may reflect local aspects of changes in national freight transportation systems. Close proximity and easy access to trucking and rail provides companies with a wider opportunity to react and respond to market fluctuations.

Simply put, a supply chain is the process of storing and moving product, such as the products for the industries identified above, to market. Storage will be dictated, to a large extent, by production considerations and how much inventory is required to accommodate fluctuating demand and the requirements of shipping. The RMAP region's success in freight transportation planning and implementation will be enhanced by the ability to integrate the broader planning concepts with the detailed operational characteristics that shape strategies. For example, rail operations move loaded

cars and allow for the movement and storage of empty cars as well as creating windows of time to perform the necessary scheduled track maintenance and the ability to recover from unforeseen events should they occur in the future. In the case of a multi-purpose transload facility, the transportation infrastructure and facilities can be adapted to alternative freight movement based on the aggregated shipping needs of area industries. Recent developments in the transload business, together with the greater diversity of products handled, are indicative of this expanding freight sector.

The critical differentiator with the movement of many of these freight products is supply chain efficiency. RMAP and the complementary agency with freight responsibilities will need to work closely within the region to ensure the respective industries' long term competitive position within the community and regional setting. In the current economic climate, rapid change will occur and the anticipation of these game changers is crucial to demonstrating the region's infrastructure and freight service position. Further, it may be advantageous for the region to determine the nature and magnitude, as well as the means to enhance benefits and mitigate the impacts associated with the collective freight development effort. The approach is focused on identifying the transportation impacts and operating program based on existing and planned infrastructure conditions, as well as industrial and commercial supply chains. In many regional areas with remote industrial sites, redeveloping abandoned and under-used industrial sites for freight purposes is often desirable and may rely on public sector support for the transportation system to work well.

Figure 5 RMAP Industrial Areas



L RTP Map 10-6A identifies the significant industrial areas with the study area

7.4 Industry Village concept

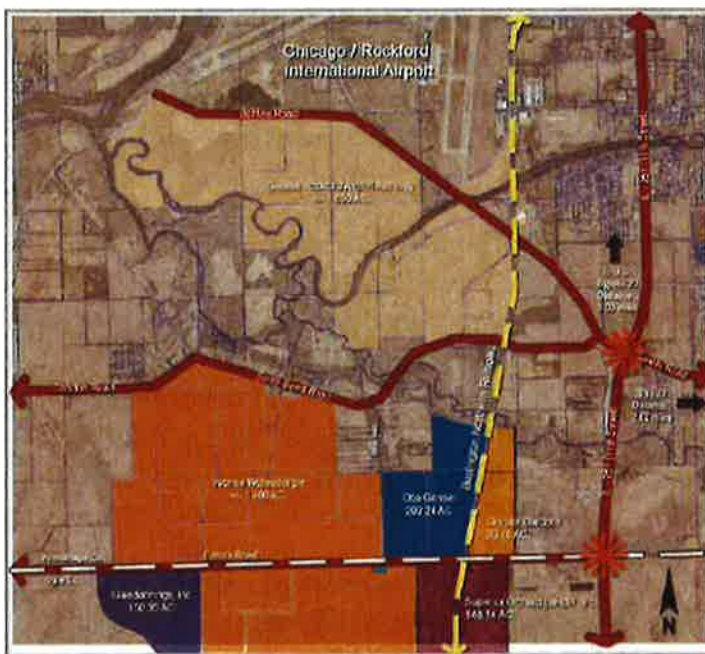
As discussed above, close proximity and easy access to trucking, rail and air provides companies with a wider opportunity to react and respond to market fluctuations. Equally important is access to the workforce necessary for industry, including the correctly aligned skill sets and training programs to enable the company to grow and respond to its unique market conditions. Trucking is the most flexible option when compared with alternate modes. It is often used for the first mile, last mile and transfers between freight modes (i.e. transition between rail and air). The New Jersey Turnpike Authority is planning a connector road linking the Turnpike with Tremley Point and the Carteret International Trade

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and Logistics Center. One of the intentions of the project is to support the potential development of the Tremley Point as a multimodal freight village.

Chicago is one of three places where all seven Class I railroads meet. A discussion paper on the city of Melbourne, Australia reviewed the United States (US) freight system and noted that intermodal rail has been the fastest growing major segment of the US rail industry for many years. The paper also identified the extensive and growing use of intermodal rail in the US to move containerized international freight through port cities to distant inland and trans-continental destinations and for long haul domestic. With a global market, have commodities can have widely different origin and destination points. Within the Midwest, Chicago is a hub for cargo entering/exiting the region and cargo moving from one coast to the other. The efficiency of freight goods to move through and around Chicago is important. Bensenville's location provides access to multiple interstates and to the national railroad system. However, trucks moving through the Chicagoland region are exposed to high levels of congestion.

Figure 6 South Winnebago County Land Use



8.0 Examples of Strategic Private Sector Supply Chains of Regional Significance

Several recent projects within the RMAP area, undertaken to improve or replace basic transportation infrastructure, have succeeded in enhancing the effectiveness of industrial supply chains operating within the region. The design for the Morgan Street Bridge Replacement Project was improved by

eliminating the railroad line below the bridge on the east side of the Rock River. In order to remove the railroad line segment the at-grade railroad crossing between the Canadian National Railway (CN) and the OmniTRAX Railroad was modified to allow the OmniTRAX trains to cross the Rock River on the existing CN railroad bridge. The traffic will remain on the bridge following the Morgan Street construction. The improved asset utilization and consolidated rail service freed up underutilized rail property and provide future public uses of the rail corridor in the future.

Similarly, the weight limits and potential replacement cost for the Seminary Bridge over the Union Pacific Railroad (UP) tracks led to a revised entrance for Behr Metals located on Kishwaukee Street in the vicinity of 11th Avenue. In both instances industrial freight traffic movement was improved as part of other transportation projects.

8.1 Rockford Railroad Relocation and other Railroad Studies

In September 2003, the City of Rockford Department of Public Works completed the Rockford Railroad Consolidation Study that examined the alignment of railroad infrastructure, freight traffic and access to industrial sites within the greater Rockford area. The study obtained information on the alignment conditions that existed in the area following the changes in industrial land use and railroad ownership within the region. At the time of the study four to six trains per day, averaging between ten and forty cars, ran across the three bridges over the Rock River. Physical constraints include low vertical clearances and narrow lateral clearances for vehicles, such as the 20th Street underpass below the UP rail line in southeast Rockford.

The study identified alternatives to align rail traffic and maintain access to industries, each reflecting various land use and public infrastructure investment strategies. The existing UP bridge over the Rock River maintains a grade separation across South Main Street while the CN bridge has the potential to be double tracked in the future and has an at-grade crossing. The only access to the KD Spur and rail-served industries in northeast Rockford is via the UP line. The former Illinois Railnet / OmniTRAX line underpass has width restrictions in relation to current design standards. The information from the report was maintained as a ready inventory of information as opportunities and requirements in the greater Rockford area unfolded.

The Morgan Street Bridge Replacement Project was the first Rockford project where changes in railroad infrastructure had the potential to influence transportation infrastructure in the region. The bridge passes above the OmniTRAX line on the east bank of the Rock River and has an at-grade crossing with the CN on the west bank of the Rock River 350 ft. from the end of the existing approaches. The value engineering study for the Bridge replacement project identified the alternative from the Rail Consolidation Study to shift the OmniTRAX traffic to the CN line to cross the Rock River. The traffic shift would enable the bridge gradient and eastern approach heights to be reduced, with the unexpected benefit of removing the bridge piers from being in the River. The alignment was accomplished by replacing the at-grade railroad diamond between the CN and OmniTRAX with a full switch and restoring

a connection in the South Main Street railyard. The rail project complementing the roadway project, as well as improving rail asset utilization in the Rockford area began construction in 2011.

A subsequent effort was undertaken to evaluate the condition of the OmniTRAX line from Airport Drive south to Davis Flag Center, including the Davis Junction crossing. The study also evaluated potential service to RFD as a complementary benefit for industry and freight logistics. The study identified the existing conditions and costs to bring the line service up to 186,000# and Class II service, as well as an industrial village concept for property on the east side of the airport and Falcon Drive. Figure 7 is a characterization of a potential rail served industrial site in close proximity to the RFD facility.

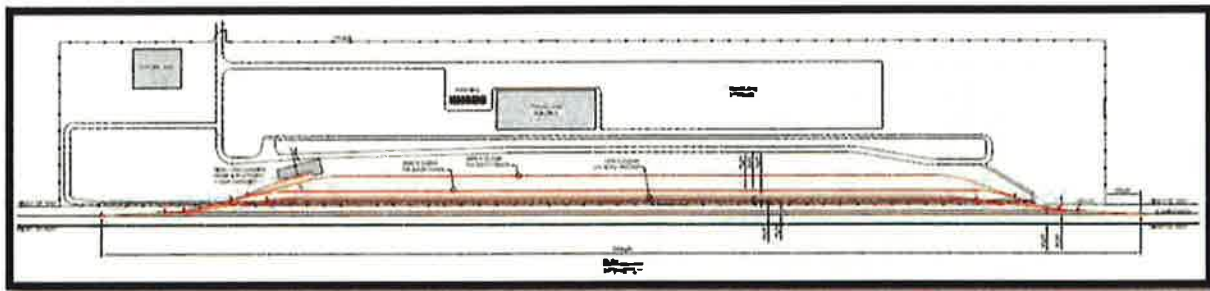


Figure 7 An Industrial Center served by Rail and Air Transportation

8.2 Specific Strategies to Enhance Industry Connections and Supply Chains

Ongoing industrial development efforts by stakeholders in the region continue to bring opportunities to the region with varying implications for land use and infrastructure investment. RFD continues to be a strength for the region and one that receives attention from industries positioned to take advantage of the locational advantages represented by the area. The Blackhawk Road / Samuelson Road portion of the Global Trade Park continues to receive attention as an expanding industrial zone in close proximity to key elements for the region's transportation infrastructure.

The pending South Main Street Reconstruction Project / Illinois Route 2 Project to be undertaken by IDOT in 2013/2014 brings a similar opportunity to region as seen in the Morgan Street Project, with the additional potential impacts for the land use in the South Main Street Railyard. The two at-grade crossing of the OmniTRAX line are only used infrequently to exchange cars with the UP from their storage tracks at their siding between Winnebago and Cedar Streets. The CN has already conveyed land in the railyard to the City of Rockford. Additional parcels owned by the CP and OmniTRAX may also serve functions that could be better performed in other areas of the region. A focused study of alternatives that would complement the South Main Street Reconstruction Project can potentially save project costs and create greater opportunities for more effective land use and growth in regional employment.

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The regional freight transportation infrastructure is more effectively understood when the region is able to identify how freight is able to move within concentric rings. The ring dimensions can be seen as extending between the following dimensions: 0 to 120 mi, 120 to 360 mi, 360 to 500 mi, and more than 500 mi. Industries and industry sectors will take maximum advantage of their respective supply chains, and modify them over time. Figure 8 is a visual presentation of the automotive industries assembly and supplier plants as of 2008 (Thomas Klier, Federal Reserve Bank of Chicago, presentation to the NASCO 2009 Annual Meeting). The sale of the vehicles, the other side of the supply chain from the assembly plants, most closely corresponds to population centers. The importance of the Interstate Highway system is readily apparent, as well as the typical location of assembly plants within clusters of supplier facilities around all points of the compass.

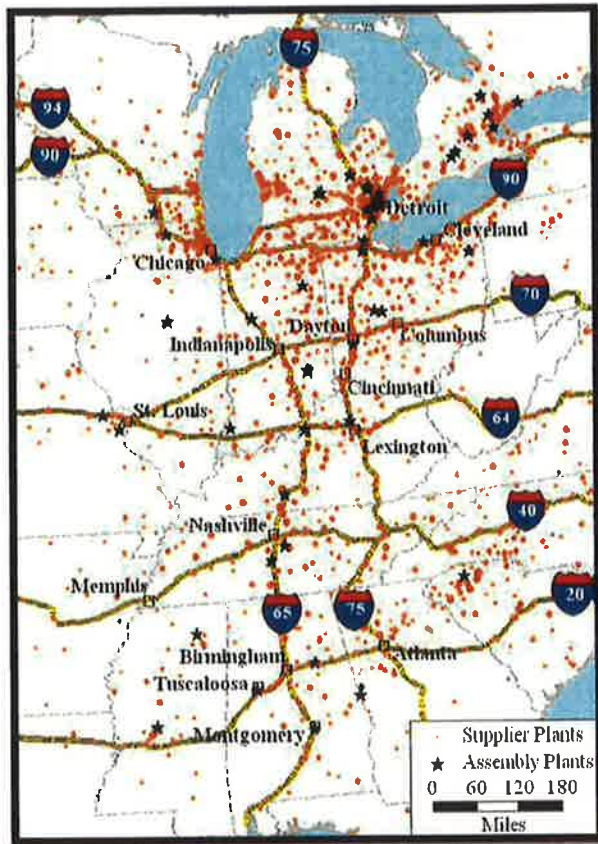


Figure 8 Automotive Industry Supplier and Assembly Plants

Machine parts and machines, foodstuffs, drinks and pharmaceuticals, building materials, and specialty chemicals and petroleum are industrial sectors present in the Rockford area with their respective supply chain requirements. Fiat Chrysler is one example where the industry has continuously developed and striven to make their overall performance, including the supply chain infrastructure, work more effectively over time.

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Each success simply turns the hourglass and reinforces the need to track the continually changing characteristics of freight movement and transportation network configurations. The Wisconsin & Southern Railroad to the north of the RMAP area with connections to the areas railroads is now aligned with the Watco Companies. The CP has recently changed the composition of their Board of Directors and senior management team with pending implications for service configurations and asset ownership. The region's success in meeting the physical plant and logistics need of the Loews Corporation site along Route 20 is one that needs to be revisited in ongoing discussions with other area industries and traffic generators like Woodward Governor, W.A. Whitney (Esterline Technologies Corporation), Carrier Commercial and United Technologies (United Technologies Corporation) are each examples of industries with extended supply chains whose performance may vary over time.

Figure 9 Railroads in the Rockford Area

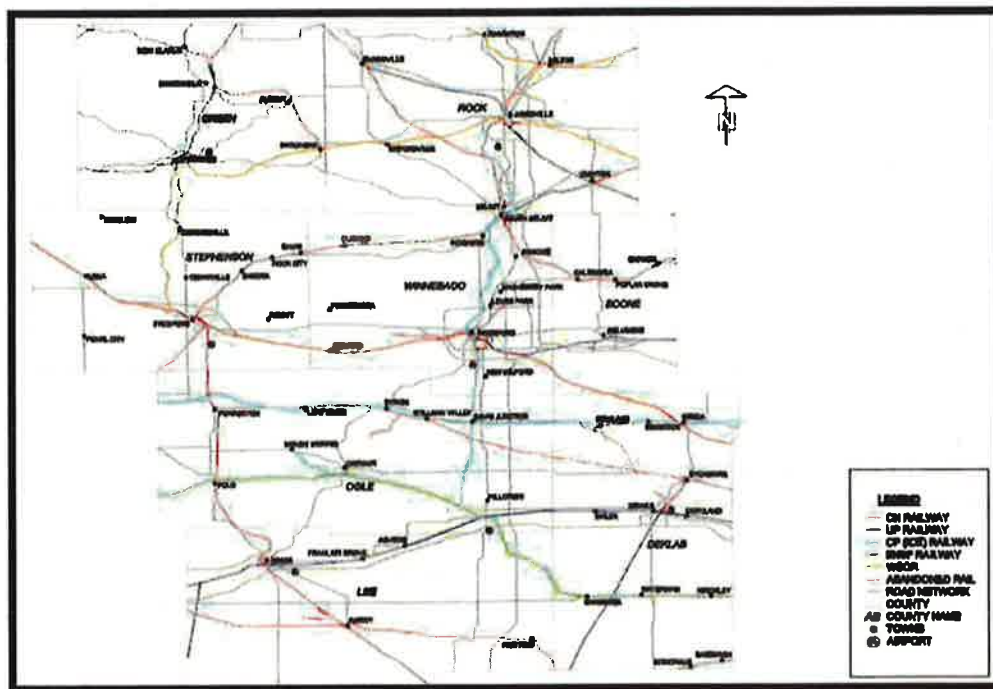


Figure 10 Winnebago Street and the South Main Street Railyard

9.0 Regional Land Use and Freight Transportation Infrastructure

Freight transportation serves the industrial and commercial land uses on the adjacent properties, as well as through traffic making use of the transportation network. Interstate roadways often carry significant percentages of through traffic, usually lower percentages for state roadways and local / county roads. The same is true for the railroad network, where OmniTrax, UP and CP have largely served local area industries while the CN has more of a mix of local and through traffic. The economic linkages analysis conducted as part of this study, included as Appendix A, has shown that industries in the state are considered well-integrated in select sectors. However, it could be an indication that further economic integration may be possible which would likely increase the efficiency of the goods movement system and decrease the costs to shippers and consumers, and may foreshadow a growth in local employment. The freight management function for the region would be well served to build origin - destination and through traffic tables as a means to accumulate strategic information for the region. The length of the supply chain, risks and uncertainty for freight movement constitute key elements of industry's decision factors.

9.1 Regional Land Use Contributing to Freight Movement

The region's location relative to a number of industries and the transition zone of agricultural to metropolitan development help shape opportunities that can translate to favorable economic outcomes and contribution for the area. Agriculture processing is one such potential due to Rockford's placement between agriculture production and consumption areas with a strong transportation network. A multipurpose warehousing center would be well served by the combination of Interstate and state roadways.

The environmental evolution of green technology, emphasis on accounting and reductions in Greenhouse Gas (GHG) emissions may become future areas of expertise for Rockford industries, leveraging their existing expertise in process control, instrumentation, and precision manufacturing. Industries with technologies supporting stormwater management and water quality, areas of increasing interest with existing infrastructure that is rapidly aging, may see similar opportunities in the global marketplace.

The top twelve overall industry purchasers of rail transportation in the area include the following sectors: candy manufacturers; cookie, cracker, and pasta manufacturers; snack food manufacturers; and dog and cat food manufacturers. Paint and coating manufacturers are also a key customer of the rail transportation industry in the greater Rockford area.

9.2 Transportation Infrastructure in Support of Freight Movement

The freight transportation infrastructure needs to reach several recognizable performance metrics in support of freight movement in the region. The on-time reliability, cost, and transit time critical to successfully moving freight. The inherent quality aspect of the freight movement is affected by descriptors such as damaged goods, security and integrity, as well as service flexibility, contribute to the

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overall effectiveness of the industrial supply chain. Service frequency, the freight transport systems resilience for disruptions when conducted on a regional scale must be managed to be less daunting. Freight volumes move a pound at a time where the details matter significantly. The size/volume, origin/destination, schedule, route, freight shipment frequency and velocity shape the success for the current shipment and the potential for the next shipment.

Freight differs strategically from passenger travel in having not only alternate routes but also alternate origins and destinations for the supply chains to work. As an example, an outdoor garden center and lumber yard was contacted about the importance of rail service to their site as a part of the Rockford Rail Consolidation Study. Rail service was important when they purchased landscape paving bricks from a supplier in Ohio with nearby access to rail. They received the same material by truck if they purchased the material from a supplier in Pennsylvania at approximately the same distance who was further from a rail connection point.

For highways in the Rockford area the Illinois State Toll Highway Authority has improved freight movement into and through the RMAP study area with their recent upgrade projects. Removing the Cherry Valley Toll Plaza, I-Pass and the upgraded I39 – I90 interchange have contributed to the improvements in traffic flow at this critical and often congested interchange. The Tollway's connections to other interstates and railroad terminals are important to sustain regional industries. Many industries have commented about their sources of supply and customers in the region lie within the greater Northern Illinois and Northwest Indiana area. Trucks and truck traffic are supply chain sensitive and can be shifted if price and service characteristics are too unpredictable or rapidly changing.

RMAP, together with complementary agencies within the regional study area and peer agencies across the state and industry, will need to maintain an active dialogue with the freight transportation sector in order to assemble effective plans and programs over time. It will be imperative to track and modify road segments that restrict truck movements and sustain the dialogue with transportation providers. There may be ways to capitalize on improved technology to track highway performance: GPS data acquisition and trucking; WISDOT and IDOT for I 39, the Tollway for I 90 and highway performance monitoring. On a more local level, signalization and signage for local truck routes need to be continuous to not strand drivers too far from industrial facilities.

Similarly for the railroad freight service, RMAP and the appropriate agencies must track and monitor the operations and infrastructure of the rail network serving Rockford. It becomes more critical due to the potential for service and infrastructure changes that may take place outside the region yet have a significant bearing of rail freight traffic in Rockford. It will be necessary to monitor and maintain characterization of the rail service model to verify if it is remaining supply chain sensitive. Through industry contacts RMAP will be able to track distance effects and approximate the effect of railroad rates on the cost and availability of service.

For railroads and roadways taken together, it has become increasingly more expensive to add container terminal capacity and mitigate congestion at existing ports in China and in the United States. These results plus the renewed emphasis on exports favor a return of manufacturing to legacy centers where labor, industries and freight transportation infrastructure remain. Major investments such as the Panama Canal may not affect the trade very much. Exclusive truck facilities where appropriate may

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improve safety and mobility, minimize infrastructure cost and increase productivity. Modest passenger traffic improvements may lead to significant truck improvements. Where technologies and data sources are available, technology for external transportation management and the business environment may assist plan development and implementation.

10.0 Regional Freight Development Alternatives

There are five potential land use developments in the RMAP area that may see renewed interest and build upon previous planning efforts in the region as freight transportation and industrial developments unfold. The proactive efforts within the region, as undertaken by county, municipal and special purpose governmental units and economic development agencies position the region to take advantage of these emerging opportunities. The five major facilities with the potential to impact the study area include

- South Main Street Railroad Yard
- Wolfenberger and Gensler Properties
- Global Trade Park and RFD Parcels
- Belvidere-Boone County - Tollway Station Point and the Agriculture Technology Park
- Rockton – South Beloit Enterprise Zone



Figure 11 South Main Street Yard



South Main Street Railroad Yard Redevelopment

Additional individual properties and commercial / industrial areas will remain important within the region as well. Other developments may arise and be needed in conjunction with development on these five sites and for transportation infrastructure investments within the RMAP study area.

The RMAP LRTP is a continuation of smart growth initiatives and projects that set the stage and context for sustained industrial activity. The region has striven to maintain a state of good repair of existing transportation assets where possible in order to leverage and link existing and underutilized land use. On a regional level the effectiveness and balance of operability improvements necessitates the assets have to be utilized to add value even though they may be owned and operated by different stakeholders. At times it is also important to examine freight and passenger transportation models to examine network performance. Figure 12 shows the railroad at-grade crossing diamond between the

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CN and OmniTRAX. Its replacement has improved the effectiveness of the Morgan Street Bridge Replacement and helped to improve the potential benefits for land use in the South Main Street Railroad Yard and the industrial land use along the Seminary to Kishwaukee industrial corridor south of Buckbee Street to Harrison Avenue.



Figure 12 Railroad Diamond Replacement at Buckbee Street

Freight transportation projects of regional significance as listed in the RMAP 2040 LRTP, including their respective project numbers (#) are listed as follows.

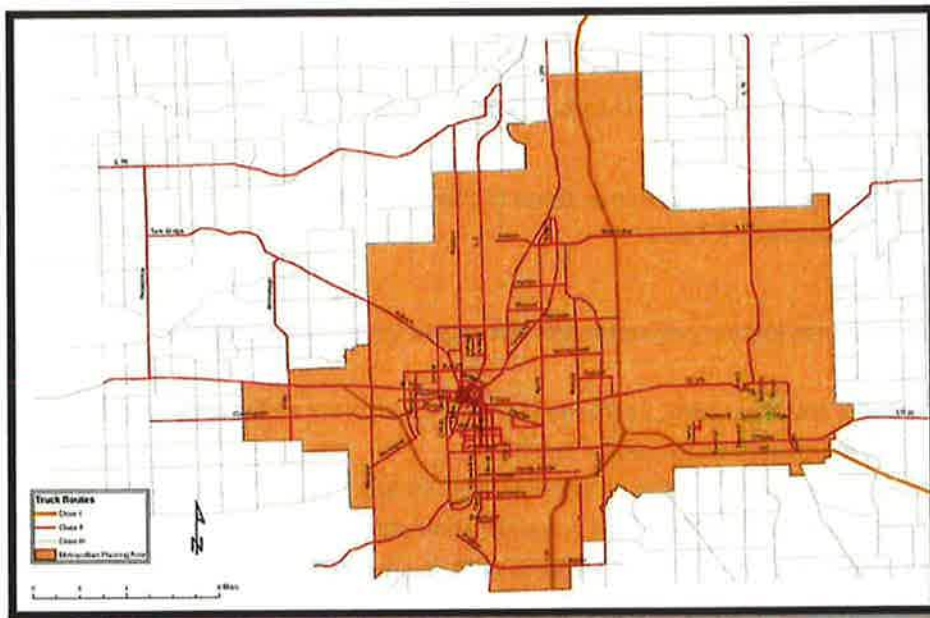
- Continuation of railroad consolidation projects as the the region develops and replaces infrastructure
 - Canadian National and OmniTRAX Railroads Diamond change-out at Buckbee Street for the Morgan Street Bridge Replacement Project
 - 20TH Street and the Railroad Viaduct – transition from freight to community use / priority (#1), linked to area land use and transportation alternatives
 - Sustain the reuse of the former Canadian National Railway South Main Street Yard
- Airport Drive – Industrial village (#5)
- Spring Creek Road & I – 90 Interchange (#16) together with I-90 and Perryville and Spring Creek Roads (#60), linked to land use and zoning
- Edson Road (#23)
- Edson / Friday Roads (#24), pending Wolfenberger Property development
- Falcon Road (#25)
- I-39 (#32)
- I 90 & Irene Road (#33), pending future needs and development
- I – 90 & I – 39 (#34), link with State of Wisconsin programming for interstate roadway development
- IL – 173 (#36)
- IL – 2 / South Main Street (#40)
- Mulford Road (#51), railroad consolidation to free up the Union Pacific ROW
- Newburg Road (#54), pending
- Jane Addams Tollway (#56), independent project with impacts for access to the Chicago region

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- Poplar Grove Road Bridge (#63)
- Rockton Road (#67)
- Sandy Hollow Road (#70)
- South Bend Road (#71)
- US 20 By-pass (#79)
- Morreim Road (#82)

Figure 13 is a presentation of the RMAP LRTP truck routes for the region (LRTP Figure 7-2).

Figure 13 RMAP LRTP Truck Routes



RMAP Regional Freight Study

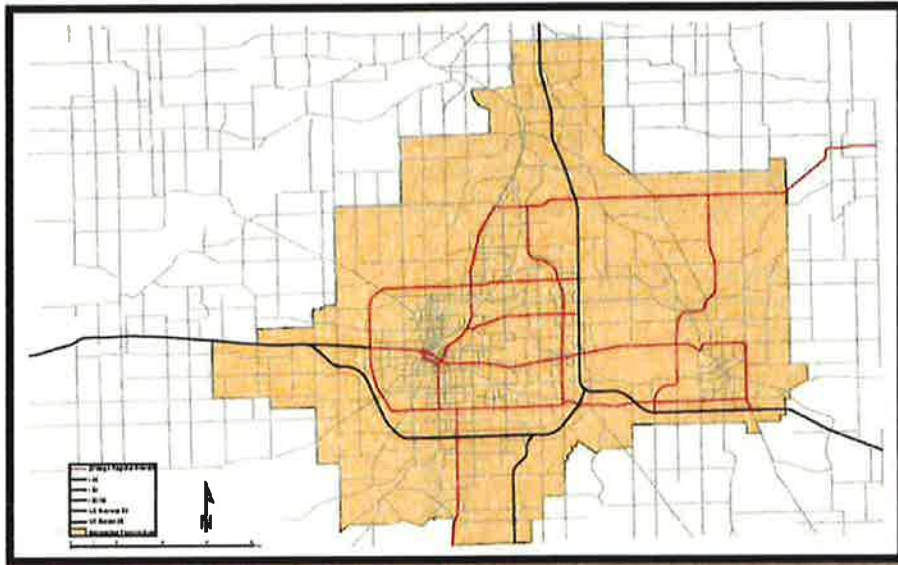
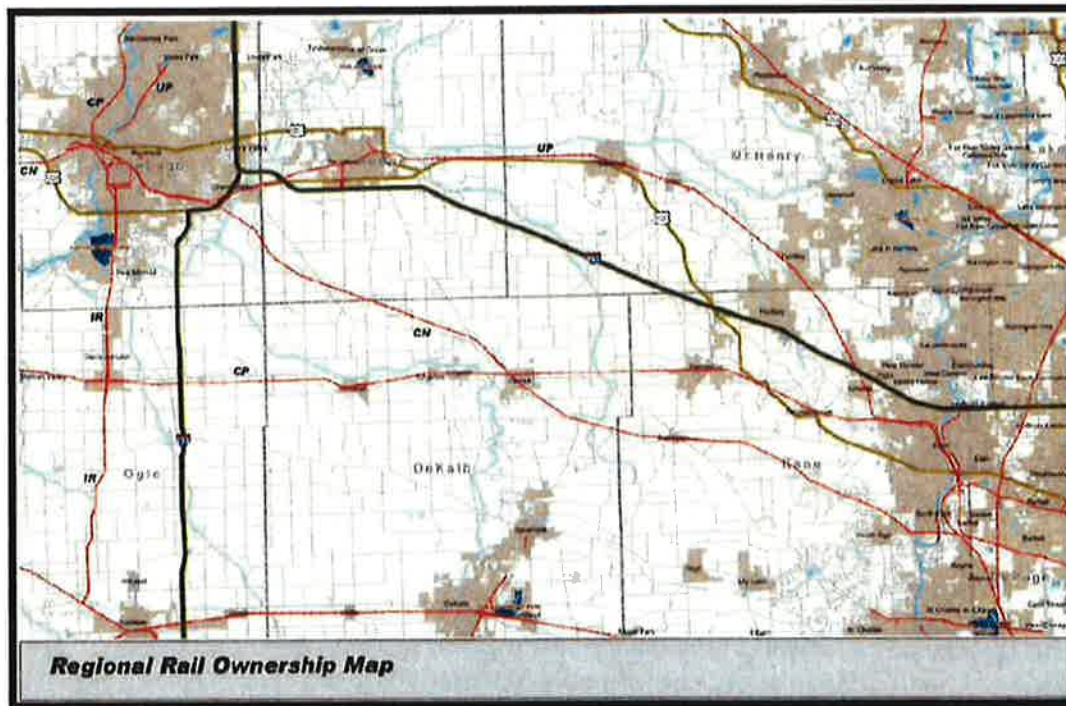


Figure 14 RMAP LRTP Potential Strategic Regional Arterials (LRTP Map 7-3)

Figure 15 RMAP LRTP Regional Rail Ownership (LRTP Map 3-1)

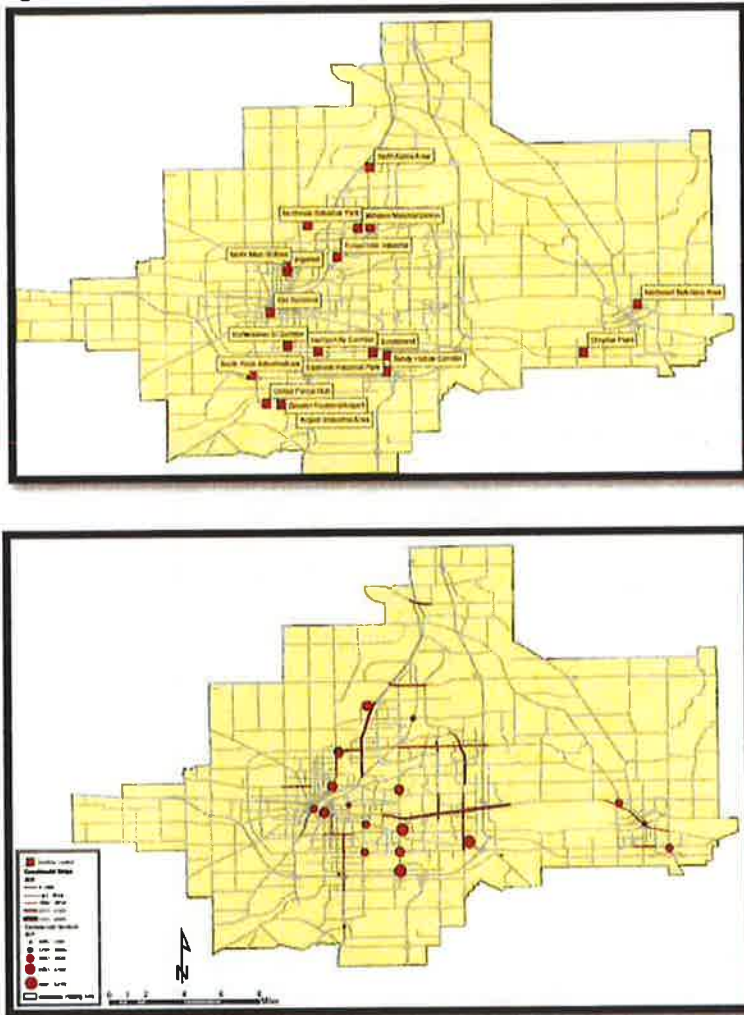


Figures 14 and 15 complete the regional nature of freight transportation by identifying the strategic regional arterials and the railroad network for the region. The first mile and last mile of the freight trip

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are very important and reflect local and site conditions. Public participation at a regional and local level remains important to address and sustain neighborhoods and local area accessibility while being able to see how well the freight transportation system is actually working. The local / neighborhood infrastructure, the streets, stormwater sewers and utilities contribute to the overall effectiveness of the site use within the region. Current and prospective developments are in part, shaped by the alignment of legacy private and public sector resources, for example the urban area railroads that shaped building footprints and road layouts. Figure 16 identifies the industrial areas for the region.

Figure 16 Industrial Areas (RMAP LRTP Map 10-6A)



As land use and the transportation networks have changed the region is in a position to continue revising the land use and transportation balance based on the collective vision and opportunities going forward. Municipal grade crossing closures, such as the potential OmniTRAX and South Main Street crossing removal, have the potential to improve the private and public sector transportation network while maintaining access to industrial sites and regional / national freight rail networks. These assets

connect land use to transportation networks, often integrating different modes to support industrial supply chains. These networks connect regions through select corridors: Kansas City, Chicago, and the Illinois River Valley to St. Louis (I-39/55) for railroad and roadway networks. RMAP's continued coordination with regional peers such as Chicago, Madison and Dubuque, will remain important as the local attributes of industrial supply chains need to work well over their entire length to remain viable.

11.0 Conclusions

Over the last ten years, RMAP and key regional stakeholders have individually and collectively worked to sustain industrial retention and development in the region. Plans and projects have responded to existing conditions and opportunities by proactively evaluating freight transportation networks and industrial land use to improve the economic and quality of life attributes for the region. Constructing the appropriate transportation performance metrics for the region that blend attributes from the public and private sector will be necessary to track progress and adapt strategies as current activities unfold.

RFD will remain a strategic asset for the region with its key function of air freight movement and growing market presence for passenger air travel. Linking air freight with the railroad and roadway modes of freight transportation and industrial supply chains will remain a challenge. The Kingman Airport Authority (AZ), Lambert Airport Authority (St. Louis MO), Charlotte-Douglas International Airport and CentrePort Canada (Winnipeg, AB) are each working with industries to align traditionally separate industrial supply chains with air freight. The RMAP region is well positioned to leverage the existing airport infrastructure with select transportation and site investments to improve the effectiveness of supply chains for industry in the area. Figure 17 is a presentation of the industrial areas in the vicinity of RFD.

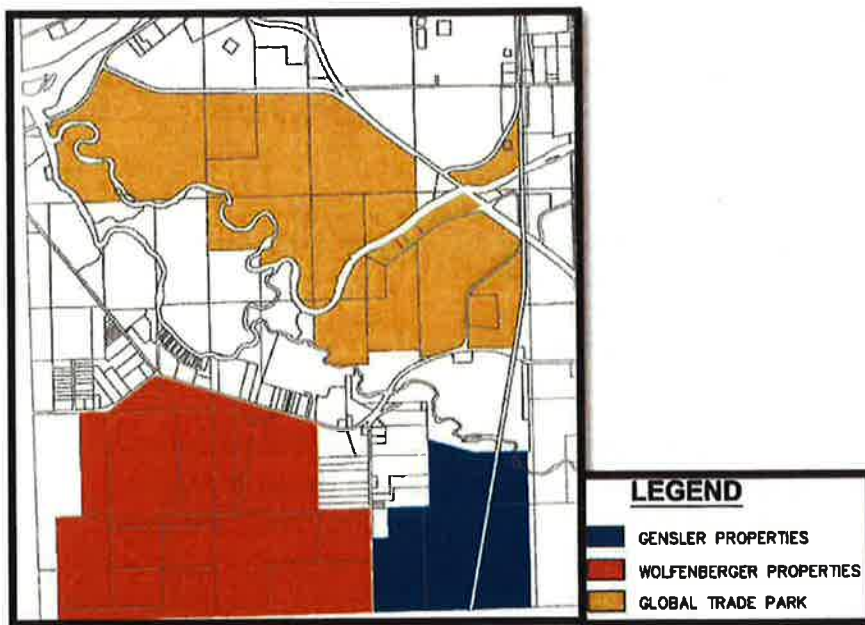


Figure 17 Industrial Properties in South Winnebago County

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The Rail Engineering and Planning Study was the first formal extension of the Rockford Rail Consolidation Study completed in 2003. The railroad realignment in support of the Morgan Street Bridge Replacement Project was the second step taken, building upon the consensus build between the private and public sector within the region. Continuation of the rail consolidation efforts will need to track the ongoing development of rail service in northern Illinois and Southern Wisconsin together with the respective railroad interests for the Rockford region.



Davis Junction, Ogle County



Railroad Service Track in Rockford

The efforts to enhance the manufacturing viability of the region have endured the worst aspects of the recent economic cycle during the 2008 to 2011 time period. Industries continue to seek out the most effective locations for their operations and alignment with their respective supply chains. It will remain important for the public sector stakeholders in the RMAP study to retain the connectivity of clustered sites in the industrial areas across the planning area. Firms such as Specialty Screw Corp. and Target Laser have developed business relationships within the dispersed areas of the Rockford region, such as Willoughby and North Main Street in Rockford.

Broader strategies may include adaptations of the following measure for the individual company combinations of land use and transportation.

- Reinforce industry's supply chain connections
- Align global and domestic supply chains
- Balance the infrastructure needs for imports and exports across the region
- Accumulate strategic and potentially sensitive anecdotal data on labor and material
- Track mode choice factors imbedded in the supply chain
- Supply chain's structure and mode selection factors
- Length of supply chain, understanding the risks and uncertainty

RMAP's peer agencies, as well as state and federal transportation planning organizations, are each placing a renewed emphasis on the planning for freight transportation and its linkage to industrial development. One challenge has been the ability to track industries directly participating in global industrial supply chains where much of the private sector information is confidential and comprises part of the industry's competitive advantage. The private sector has come to realize that the public sector decisions about their complementary transportation investment decisions, land use and zoning practices and other infrastructure elements such as utilities and communications, are improved by the

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appropriate joint strategies. Governmental units are also extending their reach, as seen in the March 2011 announcement by Manitoba Premier Greg Selinger and Illinois Governor Pat Quinn in signing a memorandum of understanding (MOU) designed to foster co-operation in several areas, including trade and inland port development.

Transportation development issues affecting freight transportation are intrinsic to the freight transportation system and may also include other modes and land use considerations such as:

- Rail Passenger Transportation
- Regional Interconnections
 - Chicago, Kansas City, St. Louis, Dubuque and Madison
 - Tri-State Area
- I-39 / I-90 in Wisconsin
- Actively sustain cohesion within the region on at least a quarterly basis

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RMAP Regional Freight Study

Appendix A

Task Report Logistics Industry Economic Linkage Analysis

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General & Limiting Conditions

Every reasonable effort has been made to ensure that the data contained in this report are accurate as of the date of this study; however, factors exist that are outside the control of Economics Research Associates, an AECOM company (ERA) and that may affect the estimates and/or projections noted herein. This study is based on estimates, assumptions and other information developed by Economics Research Associates from its independent research effort, general knowledge of the industry, and information provided by and consultations with the client and the client's representatives. No responsibility is assumed for inaccuracies in reporting by the client, the client's agent and representatives, or any other data source used in preparing or presenting this study.

This report is based on information that was current as of August, 2009 and Economics Research Associates has not undertaken any update of its research effort since such date.

Because future events and circumstances, many of which are not known as of the date of this study, may affect the estimates contained therein, no warranty or representation is made by Economics Research Associates that any of the projected values or results contained in this study will actually be achieved.

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This study is qualified in its entirety by, and should be considered in light of, these limitations, conditions and considerations.

I. Summary of Findings

The AECOM Transportation team has completed this economic linkage analysis for the northern Illinois freight transportation network to better understand industry relationships as part of the overall regional freight transportation study. This document aims to clarify two main freight study goals:

- 1) To describe the current economic linkage between transportation industries and the broader economy, as well as show how these ties have evolved over the recent past
- 2) To highlight potential areas for strategic investment in freight transportation infrastructure within the region, with a focus on transportation support services and business linkages which have either the potential to grow stronger, or have been successful in areas with similar situations to Rockford.

As part of the overall analysis scope, the AECOM team evaluated agreed upon economic development metrics to investigate the linkages between transportation industry segments and the broader economy centered upon Rockford, Illinois. This effort included a detailed analysis of the IMPLAN economic impact model system, a review of Rockford area transportation infrastructure and shipper locations, and a case study analysis of three major domestic logistics hubs with comparable characteristics to Rockford. A summary of core findings is presented in this section of the report with supporting documentation described in subsequent sections.

The area of concentration for the study effort in this report is the Rockford global inland port area. The Rockford inland port consists of infrastructure from three major freight modal alternatives: airport, railroad, and highway systems. Geographically, the main focus of the regional freight transportation study encompasses transportation infrastructure and facilities including the Rockford airport, proposed rail consolidation to the east of the airport and track systems within 3 to 5 miles, and major arterial highway connections to I-39, I-90, Highway 20, and Illinois Route 251. Furthermore, business locations and access to these locations are important features within the context of the overall system.

Analysis of Rockford Area Transportation Sector Economic Linkages

AECOM examined the economic linkages between select transportation sectors in the Rockford area and the broader economy to understand the interdependence between industries. Using IMPLAN economic impact model data from years 2001 and 2007, AECOM analyzed these linkages within the local economy for the air transportation, rail transportation, truck transportation, warehousing and storage, water transportation, and courier and messenger industries. The metrics investigated during this portion of the analysis include the following:

- Total output

- Total commodity supply and demand
- Regional purchase and sales coefficients
- Domestic and foreign exports
- Indirect and induced economic multipliers (economic growth measures related to industries buying from other industries, as well as induced household spending derived from household income generated from a development)
- Commodity demand

Rockford Logistics Industry Growth, 2001-2007

The examination of the above listed metrics showed significant growth, measured in output dollar value, in overall logistics industry sectors between 2001 and 2007. This finding was also supported by a subsequent employment growth analysis. The following table shows growth in total output for selected transportation sectors for Winnebago and Boone counties, as well as the State of Illinois which is used here as a benchmark. Over the study period, total output grew significantly across logistics sectors in Winnebago County including a 20% annual growth rate for air transportation industry output, a 12% annual growth rate for rail transportation industry output, and a 15% annual growth rate in warehousing and storage industry output. Boone County also saw increases in logistics industry output, especially in the warehousing and storage industry, which grew at a 36% annual rate over the period.

Table 1. Change in Industry Total Output, 2001-2007 (Values in \$ millions)

	Winnebago County		Boone County		Both Counties		State of Illinois	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Air Transportation	32.1	20%	0.5		32.5	20%	1,914	3%
Rail Transportation	3.5	12%	0.6	2%	4.1	6%	2,565	13%
Water Transportation	0.9		0.0		0.9		131	2%
Truck Transportation	57.8	4%	14.2	6%	72.1	5%	3,259	5%
Support activities, etc.	10.0	5%	32.0		42.1	16%	272	1%
Couriers and Messengers	-3.2	0%	0.3		-2.8	0%	-271	-2%
Warehousing & Storage	34.5	15%	8.7	36%	43.2	16%	1,297	8%
All Industries	4,343	4%	1,171	5%	5,514	4%	318,316	5%

Source: IMPLAN, AECOM

In addition to growth in output for logistics industries within the region, other core findings from the analysis of economic linkages within the Rockford area include:

- Transportation investments will aid in industry attraction by providing improved access for industrial operations
- Logistics sectors grew at a faster pace than the overall economy across all three study areas including notable Winnebago County growth in air transportation, rail transportation, and warehousing and storage sectors.

- The ratio of total commodity supply to total commodity demand, a metric gauging how fully the local market satisfies local demand, increased for air transportation and warehousing and storage sectors in Winnebago County from 2001 and 2007. This is a sign that local suppliers have been attracted to the area as a result of local transportation demand levels.
- Supply-demand ratio levels in the Rockford area are generally lower than those at the state level indicating less economic industry integration in Rockford compared with the state benchmark. This is not surprising considering the state is considered well-integrated in these sectors. However, it could be an indication that further economic integration may be possible which would likely increase the efficiency of the goods movement system and decrease the costs to shippers and consumers, and may foreshadow a growth in local employment.
- Total import levels for logistics industries decreased over the study period, another indication of a regional trend towards greater integration.
- Logistics industries within the study area currently import a significant quantity of commodity inputs from other regions including management and administrative resources, manufactured products, and contract employment. Some of these identified import sectors may be strategic areas of focus for company recruitment in the future.
- Expenditures on transportation and logistics services in the Rockford area come from a variety of local, regional, and external industries – one notable industry that purchases transportation services is the motor vehicle parts manufacturing industry.
- Power generation, motor vehicle parts manufacturing, and food production companies are both significant purchasers of rail and other modal forms of transportation within the study area. Specific to the air freight industry, pharmaceutical/biotech/healthcare businesses are major purchasers as well.
- Intermodal linkages between truck and rail transportation modes have increased over the study period, where modal investments complement the connecting transportation assets.

Logistics Metrics for the Rockford MSA

The analysis of key logistics metrics contained in this report provides a view of recent area growth in the logistics industry as a whole, as well as a set of measurable impacts to monitor moving forward with the planning and economic development efforts underway. As such, the following key metrics are highlighted for the region:

- Logistics industries grew at a much faster rate than the broader economy at all three study area levels (Boone and Winnebago counties, and the State of Illinois).
- The state's rail transportation industry experienced strong growth, doubling over the time period studied (2001-2007). Winnebago County's rail transportation industry fared almost as well, increasing from \$3.7 million in total output to over \$7 million. This measurement only includes the

output generated based on area industry employment activity and is probably under-represented as an economic benefit because of the nature of the rail industry (employment concentrated in major origin and destination areas such as Chicago).

- Warehousing and Storage was a growth sector for each study area. Boone County's industry blossomed from \$1.6 million in 2001 to over \$10 million in 2007. The industry more than doubled in Winnebago County as well.
- Boone County's primary contribution to the logistics industry is in trucking, and more recently, support activities for transportation.
- Almost every logistics sector gained relative importance in both Winnebago and Boone counties.

Rockford Rail and Air Industry

The importance of the freight transportation industry to Rockford businesses is significant, and rail and air freight industries within the region contribute to the economic competitiveness of local businesses. Some highlights of the linkage analysis specific to rail and air freight include:

- In both 2001 and 2007, power generation is the number one customer of rail transportation firms – by a wide margin. In 2001, the power generation industry accounted for one-quarter of business spending on rail transportation, or three times higher than any other single industry. The second largest customer in 2001 was the motor vehicle parts manufacturing industry. Power generation companies in the area purchase goods such as oil, natural gas, coal, petroleum, and wind turbines. These firms spend most of their dollars on rail and pipeline transportation.
- From 2001 to 2007, motor vehicle parts manufacturers went from representing 8 percent of rail firms' business revenues to 3 percent. These businesses decreased from the second-largest source of rail revenue to the seventh-largest, and the total output contributed fell from \$2.2 million to \$1.5 million.
- Truck transportation firms are significant customers of rail transportation firms in the area, representing a portion of the region's intermodal linkages. In 2007, truck transportation firms represented 6.6 percent of rail firms' business inputs, up from 4 percent in 2001.
- The food production industry is a key customer of rail transportation firms. The top twelve overall industry purchasers of rail transportation in the area includes: candy manufacturers; cookie, cracker, and pasta manufacturers; snack food manufacturers; and dog and cat food manufacturers. Paint and coating manufacturers are also a key customer of the rail transportation industry.
- The air transportation industry has also seen revenues from the motor vehicle parts manufacturing industry decline since 2001. In 2001, motor vehicle parts manufacturers were the biggest industry customer of the air transportation industry, representing 7 percent of its business

revenues. By 2007, this spending level fell 60 percent to represent only 2 percent of the air transportation industry's revenues. Supplier parks may be one contributing factor.

- Hospitals, health care providers, the US Postal Service, directory and mailing list vendors, wholesalers, and restaurants were among the largest industry customers of area air transportation businesses in both years.
- Petroleum refineries are among the largest recipients of the air transportation industry's expenditures – obviously, spending on fuel is a key input to the process of air transportation. In 2001, such expenditures represented 17 percent of the industry outlays to other firms; by 2007, it became 38 percent. (Note that this is a percentage of spending on goods and services, and excludes labor.) Very little of that spending stays in Winnebago County. It is no surprise to see, then, that the indirect multiplier has fallen for the air transportation industry, as so much more business spending has been going toward fuel from outside of the county.

Lessons Learned from Other Logistics Hubs

AECOM reviewed employment metrics and conducted interviews of stakeholders at three major US logistics hubs to understand the economic development implications related to public and private investments in freight transportation infrastructure the three hubs include. Factors which were considered when choosing case study development areas include the ability to maximize freight industry infrastructure asset value and to maximize access to industry facilities in an effort to promote efficient and economic shipper freight movements. Key points developed during the analysis include:

- Logistics industry infrastructure is most effective when it is linked with a coordinated, broadly engaged planning effort involving partnerships between public and private stakeholders and the community.
- Funding for transportation infrastructure development is generated from private sources as well as federal, state, and local public stakeholders – often times the privately funded portion includes support from railroads and air logistics companies. Commonly, incentive packages from public sources include tax credits, complementary road and rail access and infrastructure improvements, and job training/educational options for company employees.
- The freight logistics industry is competitive, and each of the profiled case study developments is seen to be proactive and innovative when considering strategic investments.
- The logistics industry, area businesses/shippers, and the community as a whole each benefit from a more geographically integrated infrastructure, focused on providing efficient multi-modal transportation alternatives.
- The mitigation of traffic/congestion impacts, as they may arise on local and regional transportation networks, is an important planning factor, economic, and community benefit.

- Warehousing and storage firms and employment experienced consistent high growth rates across all of the case study areas, resulting from efforts to expand freight transportation infrastructure and support capacity.
- Winnebago County exhibited the lowest number of transportation employees per thousand total employees compared with the case study counties. This could be an indication that increased freight transportation industry integration is achievable in the near-term and could have significant positive efficiency and economic results.

Opportunities for the Rockford MSA

- The Rockford MSA demonstrates industry sectors with strong inter-industry relationships, where supply chains are closely connected and investments for transportation infrastructure will resonate throughout the supply chain
- Industry sectors favorably situated within the Rockford MSA, or could be attracted, include aerospace production and research & development, warehouse / distribution centers, industrial machinery manufacturing, metals manufacturing, chemicals and plastics manufacturing, food processing, transportation equipment manufacturing, as well as green technology and alternative energy development and production
- The Rockford MSA demonstrates attributes that are found in the evolving definition of an inland port, an area of significant transportation assets linked across modes and logistics functions
- The value of existing transportation and industrial assets is maximized by transportation investments that increase access to area industries

II. Rockford Economic Linkage Analysis

This section examines the economic linkages between select transportation sectors and the local economies in Boone and Winnebago Counties. Specifically, this analysis will show the extent to which transportation sectors—air, water, truck, freight rail, and related support industries—are integrated with other firms in the local marketplace. We compare economic data from 2001 and 2007. We examine several economic metrics that approach this question in different ways. By comparing several metrics over this time period, we will be able to show the ways in which the industries have shaped and potentially deepened their connections with other local industries.

IMPLAN Social Accounting Matrices (SAM)

The primary tool for this analysis is the IMPLAN economic impact model. Widely used to gauge the economic impact of new local demand, such as a new factory or government spending, the IMPLAN model contains extensive data regarding how well firms are linked to others in a local economy. Its system of social accounts show how dollars flow among various institutions: firms, households, government agencies, and exports and imports.

IMPLAN Social Accounting Matrices (SAM) estimate the trade flows among businesses and other institutions in an economy. These matrices take into account businesses (arranged by industry), households, government agencies, new investment capital, and foreign and domestic trade.

A social accounting matrix can be constructed for any study area. Many of the data sources that are used to construct the matrices are reported by various U.S. government agencies on the county level. Therefore, the smallest advisable study area is the county. In this report, ERA uses study areas for Boone County, Winnebago County, and the entire state of Illinois.

The SAM estimates dollars flowing among institutions in the economy. The following are examples of institutions, as we use the term in this report:

- **Firms.** Business firms are an institution; in turn, they are divided into over 400 different industries, representing types of firms. These are based on the NAICS code; the industries used in the IMPLAN SAM generally correspond to three-digit NAICS codes. (For example, the "truck transportation" sector corresponds with NAICS 484.) This institution covers local firms only.
- **Households.** Consistent with the conventions in economics, the "household" is considered the functional economic unit of individuals. Households act as suppliers of labor (individuals work) and as consumers, as individuals buy things from firms. The institution covers local households. Households of different income levels spend their money in different ways, so the SAM groups them into nine income categories. They are arranged by total household income category. The nine household income categories range from Less Than \$10,000 to Over \$150,000.

- **Government.** In the IMPLAN model, government institutions are broken down into several different categories. Examples include Federal Government (excluding defense), Federal Government Defense, State & Local Government (excluding public schools), Public Schools, and the like.
- **Domestic Trade.** Any dollar flows that go into or out of the local study area (the county or the state) are considered domestic trade. A household buying consumer goods from the adjacent county or the business employing workers from another state would all be included in "domestic trade."
- **Foreign Trade.** Similar to domestic trade, any dollar flows going out of the U.S. or coming into the U.S. from abroad are counted as foreign trade.
- **Other.** Other institutions, less important to our analysis, include capital, additions to inventory, and commodities.

The SAM also estimates how these institutions interact with each other. The following are some examples of how funds flow among these institutions:

- **Firms to firms:** Business firms buy materials to produce their product. Restaurants buy food and supplies. Hotels buy linens and cleaning supplies. Manufacturers buy raw materials. A portion, though never all, of a firm's revenue goes toward buying things from other firms.
- **Firms to households:** This is primarily employee compensation. The social accounts consider a household to be a functioning economic unit providing labor to firms in exchange for dollars.
- **Households to firms:** Households take some of the money they earn from labor and spend it on goods and services provided by firms—groceries, supplies, entertainment, and services.
- **Firms to domestic trade:** When firms make a product that is purchased by households or other firms outside the local study area, this is considered domestic trade and leaves the local economy.

And so forth. When put completely together, the SAM will account for all the ways in which these institutions shuffle money from one to another—as well as dollars new to the study area and dollars leaving the study area.

The next section shows a simple example of a SAM.

SAM Example

The social accounting matrix is a square matrix, with equal numbers of rows and columns. This structure allows for any institution to send money to any other. Columns show institutions sending money to others; rows show them receiving money. The following is a simple example of a SAM:

		This Institution SENDS dollars...			Subtotal
		1 - Firms	2 - House-holds	3 - Domestic Trade	
This institution RECEIVES dollars....	1 - Firms	\$100 [3]	\$200 [1]	\$300 [2]	\$600
	2 - Households	\$500 [4]			\$500
	3 - Domestic Trade		\$300 [5]		\$300
	Subtotal	\$600	\$500	\$300	

In this over-simplified account, firms receive \$600 total—\$200 from households buying their products [1], \$300 from domestic trade [2]; and \$100 from other firms [3]. In turn, these firms send \$500 to households [4], buying their labor, and \$100 to other firms [3]. After that, households take their \$500 and send them to firms (\$200 worth) [1] and domestic trade (the remaining \$300) [5].

Note that the social accounts balance—that is, firms receive \$600 and send \$600 to other institutions.

The real social accounting matrix is much larger: there are hundreds of rows and columns. The line above called “1-Firms” is expanded into over 400 categories (rows and columns). Households are divided into nine income categories. There are also lines for government, capital, inventory, and other institutions.

Insights from the SAM

Among the 400 categories of firms are several related to transportation. One, for example, is truck transportation. It has its own row and column in this expansive matrix, and the contents of these lines can lend several insights into what happens with the dollars flowing through this industry. For example:

- It is possible to determine how much the industry spends on goods and services in order to produce its product. Some of these will be from local firms, others from outside the study area, and still others from foreign sources. Among local purchases, it is possible to see in what proportions the industry buys goods and services from each of the over 400 categories of firms.
- The supply and demand balance in a local study area can also be studied. For example, the trucking industry based in the study area will do a certain amount of business—some of it satisfied by local clients, others by clients outside the study area. Conversely, local firms and

households will spend money on trucking industry. It is possible to tell how much of the trucking product is bought locally and how much of the trucking demand is sourced locally.

- It is also possible to determine how much the industry pays to households in employee compensation.

These examples show how the social accounting matrix can be used to gain specific insights into the practices of firms, households, and other institutions in the local study area. The specific metrics that we examine are set out in detail in the next section.

Throughout the analysis, it is important to keep in mind that all the data are estimates and aggregates of observed conditions and activity. SAMs do not attempt to explain or even estimate the behavior of individual firms or households; only the household category or entire industries of firms. Moreover, many government data are self-reporting, and thus, may not be captured in the same manner as private industries.

Industries

ERA has identified several industries of interest to track in this analysis. Because our primary data source is IMPLAN's social accounting matrix, we are restricted to using industries tracked in this particular model. They roughly align with three-digit NAICS codes. It is also important to note that data are collected by firm, and each firm belongs to one industry. Therefore, although a firm may provide many different services, it is classified in only one industry category. The following are industries we examined in their evaluation.

Air Transportation (NAICS 481). This industry is comprised of air transportation for passengers and cargo on both scheduled and non-scheduled routes. Scheduled air transportation covers the largest part of the industry, including air cargo operations. Non-scheduled service can include both cargo and passengers and comprises general aviation for special, corporate, personal or other unscheduled aviation. This industry does NOT include courier services; see below.

Rail Transportation (NAICS 482). This industry includes both short line and line haul railroads. Line haul railroads operate networks over wide geographic areas with multiple facilities throughout the U.S. Short line railroads are often confined to a small geographic area. This industry also includes passenger rail service.

Truck Transportation. (NAICS 484). The truck transportation industry includes firms that provide over the road freight transportation, usually in a trailer or standard shipping container. This includes local pickup and delivery, sorting, line haul, and terminal operations. It also includes specialized freight trucking, which would be freight that has specialized requirements—whether from a large size to refrigeration requirements, tankers, or other type of special equipment.

Warehousing & Storage (NAICS 493). Firms in this industry primarily provide warehousing and storage to other firms: they do not sell goods to consumers or other businesses. Specialized warehousing is also included (such as refrigeration). These firms can sometimes provide a range of warehouse-related services, such as sorting, packing, order fulfillment, and other logistical services.

Water Transportation (NAICS 483). This industry includes firms that provide deep sea, great lakes, intracoastal, and inland water transportation, including freight.

Couriers and Messengers (NAICS 492). These firms provide delivery of parcels, whether in one city or among different cities. A courier service primarily handles small parcels that can be picked up and delivered by hand—large shipments of commodities, for example, would be handled by a truck or freight rail industry, or by some specialized shipper. Firms in this industry can range from a messenger on bicycle in one city to a large international shipping network like UPS or FedEx. It does not include the postal service.

Metrics of Interest

The metrics that we examine in our analysis are all derived from the social accounting matrix. The simple example should help frame some of the metrics that are below. Many of the metrics we examine arise from ratios and other simple manipulations of the social accounting matrix.

Total Output

These metrics describe the size of the industry. Total output is the value of all goods and services provided by the industry—it is akin to GDP or total revenue for the firm.

Total Commodity Supply, Demand, and Supply-Demand Ratio

These metrics describe how much of a given commodity is made in the local area (very closely related to total output) and compares it to how much is demanded in the local area. These can then be used to create a ratio of supply to demand. This shows whether a region has more or less of a given commodity than its firms and households are demanding. A low ratio shows that there is more demand than local businesses can supply. A high ratio shows there is more supply than the local area demands.

Regional Purchase Coefficient & Regional Sales Coefficient

The previous metrics do not say anything about whether local buyers and local sellers actually meet in the marketplace: it only shows how much is supplied and how much is demanded. The regional purchase coefficient estimates how much of local purchases are indeed sourced by local sellers. Conversely, the regional sales coefficient estimates how much of a local seller's revenues come from local buyers. (Even if the market is in balance, local buyers may choose to buy from out of the region; local sellers may find customers elsewhere, as well.)

Domestic Exports and Foreign Exports

These two metrics quantify the value of goods and services that are exported to other regions or outside the U.S. by local sellers.

Multipliers

The indirect multipliers show how additional dollars in a given industry reverberate throughout the rest of the economy. A high indirect multiplier indicates that the industry has a high level of local suppliers; a low multiplier suggests the opposite. Induced impacts show how additional dollars in an industry reverberate via the spending by employees of the firms.

Commodity Demand

Each of the preceding metrics has a single value per industry. For example, truck transportation has a single dollar amount for value added, a single regional purchase coefficient, and so on. The commodity demand is a list of things that a given industry buys; it expands the "intermediate gross outlay." The intermediate gross outlay shows how much of a firm's dollars go to other businesses; the commodity demand expands that to specify exactly where those dollars go. Due to the size of the SAM, it is possible to show hundreds of different inputs that firms buy. In our analysis, we present the top commodities that firms buy. Therefore, for each industry we study, we will provide a list of the top commodities the firm buys in the local study area. This will show the types of local firms that are most affected by the presence of the industries we are considering.

SAM Results

Total Output

Total output is the total value of goods and services produced in a given industry. It is akin to GDP. Essentially, the tables below show GDP by industry by group:

Table 2. Total Output (\$ millions)

	<u>Winnebago County</u>		<u>Boone County</u>		<u>State of Illinois</u>	
	2001	2007	2001	2007	2001	2007
Air Transportation	16.2	48.2	0.0	0.5	9,038	10,953
Rail Transportation	3.7	7.3	5.5	6.1	2,408	4,973
Water Transportation	0.0	0.9	0.0	0.0	1,179	1,310
Truck Transportation	202.8	260.7	31.6	45.9	10,678	13,938
Support activities, etc.	28.8	38.8	0.0	32.0	3,360	3,632
Couriers and Messengers	112.2	109.1	0.0	0.3	2,061	1,790
Warehousing & Storage	27.4	61.9	1.6	10.3	2,295	3,592
All Industries	16,558	20,901	3,330	4,501	841,659	1,159,975

Table 3. Change in Total Output (\$ millions)

	Winnebago County		Boone County		Both Counties		State of Illinois	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Air Transportation	32.1	20%	0.5		32.5	20%	1,914	3%
Rail Transportation	3.5	12%	0.6	2%	4.1	6%	2,565	13%
Water Transportation	0.9		0.0		0.9		131	2%
Truck Transportation	57.8	4%	14.2	6%	72.1	5%	3,259	5%
Support activities, etc.	10.0	5%	32.0		42.1	16%	272	1%
Couriers and Messengers	-3.2	0%	0.3		-2.8	0%	-271	-2%
Warehousing & Storage	34.5	15%	8.7	36%	43.2	16%	1,297	8%
All Industries	4,343	4%	1,171	5%	5,514	4%	318,316	5%

- Logistics industries grew at a much faster rate than the economy at large in all three study areas. Air Transportation in Winnebago tripled its total output from 2001 to 2007, compared to statewide industry growth of 21 percent.
- The state's rail transportation industry experienced strong growth, doubling over the time period studied. Winnebago County's rail transportation industry fared almost as well, increasing from \$3.7 million in total output to over \$7 million.
- Warehousing & Storage also was a growth industry for each study area. Boone County's industry blossomed from \$1.6 million of business in 2001 to over \$10 million in 2007. The industry in Winnebago County also more than doubled.
- Boone County's primary contribution to the logistics industry is in truck transportation, and, more recently, support activities for transportation.

Total Output as a Percentage of the Economy

The table below shows that transportation industries are between 2.0 and 2.5 percent of their respective economies in Winnebago, Boone, and the state:

Table 4. Transportation as a Share of the Economy (Geographically centered)

	Winnebago County		Boone County		Both Counties		State of Illinois	
	2001	2007	2001	2007	2001	2007	2001	2007
Air Transportation	0.10%	0.23%	0.00%	0.01%	0.08%	0.19%	1.07%	0.94%
Rail Transportation	0.02%	0.03%	0.17%	0.13%	0.05%	0.05%	0.29%	0.43%
Water Transportation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.11%
Truck Transportation	1.22%	1.25%	0.95%	1.02%	1.18%	1.21%	1.27%	1.20%
Support activities, etc.	0.17%	0.19%	0.00%	0.71%	0.14%	0.28%	0.40%	0.31%
Couriers and Messengers	0.68%	0.52%	0.00%	0.01%	0.56%	0.43%	0.24%	0.15%
Warehousing & Storage	0.17%	0.30%	0.05%	0.23%	0.15%	0.28%	0.27%	0.31%
Transportation Industries	2.36%	2.52%	1.16%	2.11%	2.16%	2.45%	2.36%	2.52%

- Almost every sector gained relative importance in the economy in Winnebago and Boone County.
- The transportation industries as a group gained as a percentage of the state economy, but gains in warehousing and rail transportation were offset by losses in the five other sectors.

Total Commodity Supply & Total Commodity Demand

Total Commodity Supply refers to the production of a given commodity (good or service) in the study area. It is very similar to total output, and indeed we see that it is similar to total output. Total Commodity Demand shows how much of a given good or service is purchased by other firms or households in the given study area. Neither of these metrics makes any comment on whether the buyers and sellers meet in the marketplace—it only measures what firms and households are buying and what they are producing.

Table 5. Total Commodity Supply (\$ millions)

	Winnebago County		Boone County		State of Illinois	
	2001	2007	2001	2007	2001	2007
Air Transportation	19.0	50.5	0.0	2.3	9,369	11,164
Rail Transportation	4.4	8.3	5.5	6.9	2,482	5,076
Water Transportation	0.2	1.5	0.0	0.5	1,200	1,364
Truck Transportation	204.2	265.8	31.6	50.1	10,834	14,421
Support activities, etc.	27.5	34.9	0.6	25.5	3,106	3,035
Couriers and Messengers	112.2	109.1	0.0	0.3	2,069	1,790
Warehousing & Storage	27.5	61.9	1.6	10.3	2,301	3,592
All Industries	16,928	21,418	3,368	4,577	856,494	1,186,320

Table 6. Total Commodity Demand (\$ millions)

	Winnebago County		Boone County		State of Illinois	
	2001	2007	2001	2007	2001	2007
Air Transportation	106.9	115.3	18.7	19.6	5,789	6,872
Rail Transportation	34.4	55.3	6.5	16.1	1,698	3,451
Water Transportation	23.1	17.9	2.6	3.4	1,168	1,375
Truck Transportation	194.3	234.5	46.1	59.6	9,068	11,913
Support activities, etc.	26.0	33.1	2.9	4.2	2,532	2,615
Couriers and Messengers	55.3	51.7	6.0	6.8	3,051	3,022
Warehousing & Storage	43.8	57.8	7.5	7.8	1,708	2,581
All Industries	16,680	21,323	5,067	6,677	839,607	1,171,099

Table 7. Commodity Supply-Demand Ratio

	Winnebago County		Boone County		State of Illinois	
	2001	2007	2001	2007	2001	2007
Air Transportation	0.2	0.4	0.0	0.1	1.0	1.0
Rail Transportation	0.1	0.1	0.7	0.4	1.0	1.0
Water Transportation	0.0	0.1	0.0	0.1	0.8	0.7
Truck Transportation	1.0	1.0	0.6	0.8	1.0	1.0
Support activities, etc.	0.9	0.9	0.2	1.0	1.0	1.0
Couriers and Messengers	1.0	1.0	0.0	0.0	0.7	0.5
Warehousing & Storage	0.6	1.0	0.2	1.0	1.0	1.0

The supply-demand ratio is an indicator of how well balanced, locally, a given industry is. The closer to 1.0, the closer the market is to well-satisfied. (Values where supply exceeds demand are shown as 1.0.) The table above shows that, particularly in the case of air transportation, logistics industries

moved toward satiating local demand more fully. Shortened and more efficient supply chains can lead to local employment growth, e.g., the Chrysler Supplier Park.

In this ratio, supply is the numerator and demand is the denominator. Therefore, if much more product is demanded than is supplied, the ratio will be low. A low ratio in this table means that local firms must look elsewhere to buy their products.

ERA notes that air transportation and warehousing & storage made gains in this ratio Winnebago County. This means that local suppliers are likely to have been attracted to the county as a result of the local demand. As one would expect, the larger the study area, the closer the markets are to being balanced. The state has many more values closer to 1.0.

Regional Purchase Coefficient & Regional Sales Coefficient (RPC & RSC)

The metrics above compared the total amount of supply and the total amount of demand, but RPC and RSC measure whether the buyers and sellers actually met in the marketplace.

The regional purchase coefficient and regional sales coefficient describe the extent to which local buyers and sellers (respectively) buy and sell products with other local firms. High values for the RPC and RSC indicate that industries are well-integrated with each other. The RPC and RSC are scaled from 0 to 1.

Table 8. Regional Purchase Coefficient

	<u>Winnebago County</u>		<u>Boone County</u>		<u>State of Illinois</u>	
	2001	2007	2001	2007	2001	2007
Air Transportation	0.15	0.38	0.00	0.12	0.46	0.46
Rail Transportation	0.11	0.14	0.73	0.40	1.00	1.00
Water Transportation	0.01	0.07	0.00	0.14	0.82	0.67
Truck Transportation	0.97	1.00	0.63	0.80	1.00	1.00
Support activities, etc.	0.70	0.70	0.20	0.70	0.70	0.70
Couriers and Messengers	0.70	0.70	0.00	0.04	0.68	0.52
Warehousing & Storage	0.62	1.00	0.22	1.00	1.00	1.00

In the table above, air transportation had a RPC of 0.15 in 2001 and 0.38 in 2007. This means that local buyers who required these services spent 15 percent of their dollars locally in 2001 and 38 percent of their dollars locally in 2007. Again, one expects the RPC to be higher with larger study areas, and they often are.

Table 9. Regional Sales Coefficient

	<u>Winnebago County</u>		<u>Boone County</u>		<u>State of Illinois</u>	
	2001	2007	2001	2007	2001	2007
Air Transportation	0.85	0.87	0.00	0.97	0.29	0.28
Rail Transportation	0.88	0.94	0.86	0.94	0.68	0.68
Water Transportation	1.00	0.79	1.00	1.00	0.80	0.67
Truck Transportation	0.93	0.88	0.93	0.95	0.84	0.83
Support activities, etc.	0.66	0.66	1.00	0.12	0.57	0.60
Couriers and Messengers	0.34	0.33	1.00	0.88	1.00	0.88
Warehousing & Storage	0.99	0.93	0.99	0.76	0.74	0.72

Why are regional sales coefficients higher than regional purchase coefficients? The RSC corresponds with sellers (or, supply). The RPC corresponds with buyers (or, demand). Recall from previous tables that supply is much lower than demand: that is, firms and households want more of these commodities than what is produced there. It is only logical to expect that sellers, who face a very large pool of buyers, can satisfy many of their sales locally. By contrast, buyers, who all compete for relatively small pool of suppliers, must look elsewhere. And in fact it is true: the RSC is higher than the RPC in most industries. The exceptions are the industries that have a supply-demand ratio near or equal to 1.0, namely couriers and support activities.

Table 10. Domestic Exports (\$ millions)

	<u>Winnebago County</u>		<u>Boone County</u>		<u>State of Illinois</u>	
	2001	2007	2001	2007	2001	2007
Air Transportation	0.0	0.0	0.0	0.0	5,116	6,543
Rail Transportation	0.0	0.0	0.0	0.0	457	1,280
Water Transportation	0.0	0.0	0.0	0.0	0	0
Truck Transportation	0.0	16.3	0.0	0.0	966	1,702
Support activities, etc.	6.0	6.9	0.0	18.6	945	756
Couriers and Messengers	73.5	59.9	0.0	0.0	0	0
Warehousing & Storage	0.0	3.4	0.0	2.4	562	970
All Industries	6,090	7,507	1,367	1,597	221,907	312,197

Table 11. Foreign Exports (\$ millions)

	<u>Winnebago County</u>		<u>Boone County</u>		<u>State of Illinois</u>	
	2001	2007	2001	2007	2001	2007
Air Transportation	2.8	6.4	0.0	0.1	1,578	1,446
Rail Transportation	0.5	0.5	0.7	0.4	327	344
Water Transportation	0.0	0.3	0.0	0.0	238	445
Truck Transportation	15.2	15.1	2.4	2.7	799	806
Support activities, etc.	3.3	4.8	0.0	4.0	389	449
Couriers and Messengers	0.0	12.9	0.0	0.0	0	212
Warehousing & Storage	0.4	0.7	0.0	0.1	31	42
All Industries	1,346	1,657	243	572	47,846	73,692

Table 12. Total Imports (\$ millions)

	Winnebago County		Boone County		State of Illinois	
	2001	2007	2001	2007	2001	2007
Air Transportation	90.7	71.2	18.7	17.4	3,114	3,697
Rail Transportation	30.5	47.5	1.7	9.6	0	0
Water Transportation	22.9	16.7	2.6	2.9	206	456
Truck Transportation	5.2	0.0	16.8	12.1	0	0
Support activities, etc.	7.8	9.9	2.3	1.3	760	785
Couriers and Messengers	16.6	15.5	5.9	6.5	982	1,444
Warehousing & Storage	16.7	0.0	5.8	0.0	0	0
All Industries	7,189	9,069	3,308	4,269	252,866	370,668

Table 13. Change in Total Imports (values in \$ millions)

	Winnebago County		Boone County		Both Counties		State of Illinois	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Air Transportation	-19.5	-4%	-1.3	-1%	-20.8	-3%	583	3%
Rail Transportation	16.9	8%	7.9	33%	24.8	10%	0	
Water Transportation	-6.1	-5%	0.4	2%	-5.8	-4%	250	14%
Truck Transportation	-5.2	-100%	-4.8	-5%	-10.0	-10%	0	
Support activities, etc.	2.1	4%	-1.0	-9%	1.1	2%	25	1%
Couriers and Messengers	-1.1	-1%	0.5	1%	-0.6	0%	462	7%
Warehousing & Storage	-16.7	-100%	-5.8	-100%	-22.5	-100%	0	
All Industries	1,880	4%	960	4%	2,840	4%	117,802	7%

Total imports in logistics, over this period, went down in general, consistent with our existing findings that supply and demand are, in general, becoming more balanced in these industries.

Multipliers

Many of the above metrics are indicators of how the industries interact with each other and with other counties in the U.S. The economic impact multiplier is the most succinct summary of this indication. In general, a higher multiplier means that new business to firms in a given industry has a higher effect on the local economy than it would have previously. However, it should be noted that a smaller multiplier over time may simply represent a variety of factors, observable and not observable, and can be caused by things entirely out of control of the policymakers or even the business leaders in the area. (Think of an industry that is somewhat in balance. Then, suppose the industry expands its production in the market area, but must source many of its inputs from outside the study area. The multiplier would probably decrease—but it's still better than not having the industry expand at all.)

Below we present indirect and induced multipliers. The indirect multiplier indicates the extent to which firms buy from other firms in the local study area. These rise in three of seven industries in Winnebago County and in six of seven in Boone County. The induced multipliers indicate the extent to which the economy benefits by the employees of these firms having higher incomes—which they re-spend in the economy on goods and services. The induced multipliers rise in six of seven industries in Winnebago County and five of seven industries in Boone County.

Table 14. Indirect Multipliers (Measured as indirect impact for each \$1 direct impact)

	Winnebago County		Boone County		State of Illinois	
	2001	2007	2001	2007	2001	2007
Air Transportation	0.39	0.27	0.00	0.20	0.54	0.59
Rail Transportation	0.18	0.27	0.10	0.16	0.46	0.51
Water Transportation	0.00	0.43	0.00	0.00	0.68	0.52
Truck Transportation	0.37	0.33	0.16	0.18	0.58	0.53
Support activities, etc.	0.28	0.24	0.00	0.14	0.41	0.27
Couriers and Messengers	0.37	0.12	0.00	0.07	0.48	0.24
Warehousing & Storage	0.16	0.29	0.10	0.17	0.24	0.31

Table 15. Induced Multipliers (Measured as induced impact for each \$1 direct impact)

	Winnebago County		Boone County		State of Illinois	
	2001	2007	2001	2007	2001	2007
Air Transportation	0.28	0.30	0.00	0.06	0.47	0.41
Rail Transportation	0.33	0.26	0.11	0.11	0.45	0.39
Water Transportation	0.00	0.23	0.00	0.00	0.33	0.31
Truck Transportation	0.30	0.36	0.10	0.15	0.44	0.51
Support activities, etc.	0.37	0.46	0.00	0.21	0.55	0.64
Couriers and Messengers	0.27	0.42	0.00	0.26	0.46	0.62
Warehousing & Storage	0.41	0.42	0.16	0.19	0.57	0.62

Commodity Inputs & Imports

For four industries, we detail the commodity inputs and commodity imports. The tables below refer to Winnebago County in the year 2007.

Commodity inputs are the goods and services the industry buys in order to produce its product. (These are all part of the social accounting matrix.) The industries we have considered have about one hundred to 150 commodity inputs. In the tables below, we choose the top twelve industries for each category. The metrics included in this table are the following:

- **Gross absorption coefficient.** This is the percentage of each \$1 in industry outlay that is dedicated to a given input. Recall that not all of an industry's dollar goes toward other firms: some portion goes toward employee compensation, dividends, taxes, etc. Therefore, the gross absorption coefficients usually add up to .25 or .75.
- **Gross inputs.** Based on the size of the industry, this is the amount, in millions of dollars, that the entire industry spends on a given commodity. Whereas the gross absorption coefficient measures how much of each dollar goes to a certain commodity, the gross input says how many dollars that is. For example, if an industry spends \$1 million in total outlay, and the gross absorption coefficient for a given commodity is .02, then the gross input is \$20,000. In other words, the industry spends 2 percent of its dollars on this commodity, and it adds up to \$20,000 in total spending.

- **Regional absorption coefficient.** Similar to the gross absorption coefficient, this describes the percentage of one dollar spent on a given commodity in the local study area. It will be some portion of the gross absorption coefficient. In the example above, if an industry's gross absorption coefficient is .02 and it spends half of that in the local study area, then its regional absorption coefficient is .01.
- **Regional inputs.** Regional inputs describe the dollar amount of spending on a given commodity in the local study area. It is derived by multiplying the regional absorption coefficient by the industry's total output. Again, in the example above, the regional input would be \$10,000; that is, the industry in question spends \$20,000 on a given commodity, \$10,000 of which is spent in the local study area.

Table 16. Commodity Inputs, Warehousing

NAICS	Commodity	Gross Absorption Coefficient	Gross Inputs (\$ millions)	Regional Absorption Coefficient	Regional Inputs (\$ millions)
531	Real Estate	0.070	4.32	0.041	2.56
493	Warehousing and Storage	0.047	2.93	0.047	2.93
2211	Electric power generation, transmission, and distribution	0.025	1.58	0.019	1.2
491	U.S. Postal Service	0.013	0.8	0.010	0.6
55	Management of companies and enterprises	0.012	0.74	0.001	0.06
492	Couriers and messengers	0.011	0.71	0.008	0.5
5613	Employment services	0.010	0.63	0.008	0.5
5241	Insurance carriers	0.009	0.56	0.006	0.38
3363	Motor vehicle parts manufacturing	0.009	0.55	0.005	0.3
32411	Petroleum Refineries	0.009	0.54	0.000	0
42	Wholesale trade	0.009	0.54	0.008	0.51
5617	Services to buildings and dwellings	0.008	0.51	0.006	0.39
	Total Commodity Demand	0.369	22.816	0.234	14.51

Table 17. Commodity Inputs, Air Transportation (Inputs in \$ millions)

NAICS	Commodity	Gross Absorption Coefficient	Gross Inputs	Regional Absorption Coefficient	Regional Inputs
32411	Petroleum Refineries	0.234	11.31	0.001	0.03
487, 488	Scenic and sightseeing transportation and support activities for transportation	0.078	3.75	0.054	2.62
5324	Commercial and industrial machinery and equipment rental and leasing	0.043	2.06	0.020	0.99
722	Food services and drinking places	0.037	1.8	0.031	1.51
5615	Travel arrangement and reservation services	0.034	1.66	0.011	0.54
531	Real Estate	0.024	1.16	0.014	0.69
5241	Insurance carriers	0.018	0.85	0.012	0.58
517	Telecommunications	0.012	0.6	0.006	0.3
42	Wholesale trade	0.012	0.56	0.011	0.53
336411	Aircraft manufacturing	0.011	0.54	0.000	0
336413	Other aircraft parts and auxiliary equipment manufacturing	0.010	0.49	0.007	0.33
5418	Advertising and related services	0.010	0.46	0.008	0.37
Total Commodity Demand		0.616	29.713	0.209	10.08

Table 18. Commodity Inputs, Truck Transportation (Inputs in \$ millions)

NAICS	Commodity	Gross Absorption Coefficient	Gross Inputs	Regional Absorption Coefficient	Regional Inputs
484	Truck transportation	0.048	12.5	0.048	12.5
491	U.S. Postal Service	0.040	10.49	0.030	7.87
492	Couriers and messengers	0.036	9.31	0.025	6.52
5241	Insurance carriers	0.035	9.17	0.024	6.25
5613	Employment services	0.024	6.35	0.019	5.08
42	Wholesale trade	0.015	3.85	0.014	3.66
487, 488	Scenic and sightseeing transportation and support activities for transportation	0.016	4.28	0.011	2.99
3363	Motor vehicle parts manufacturing	0.020	5.14	0.011	2.76
493	Warehousing and Storage	0.009	2.27	0.009	2.27
531	Real Estate	0.014	3.77	0.009	2.23
5617	Services to buildings and dwellings	0.007	1.93	0.006	1.47
81111-2, 811191, 811198	Automotive repair and maintenance, except car washes	0.006	1.64	0.005	1.4
Total Commodity Demand		0.499	130.144	0.262	68.16

Table 19. Commodity Inputs, Courier Services (Inputs in \$ millions)

NAICS	Commodity	Gross Absorption Coefficient	Gross Inputs	Regional Absorption Coefficient	Regional Inputs
32411	Petroleum Refineries	0.077	8.4	0.000	0.03
491	U.S. Postal Service	0.014	1.49	0.010	1.12
55	Management of companies and enterprises	0.013	1.41	0.001	0.12
492	Couriers and messengers	0.012	1.32	0.008	0.93
487, 488	Scenic and sightseeing transportation and support activities for transportation	0.012	1.31	0.008	0.92
531	Real Estate	0.012	1.26	0.007	0.75
5613	Employment services	0.010	1.04	0.008	0.83
42	Wholesale trade	0.008	0.9	0.008	0.85
5611	Office administrative services	0.006	0.64	0.001	0.06
5241	Insurance carriers	0.006	0.63	0.004	0.43
53221-2, 53229, 5323	General and consumer goods rental except video tapes and discs	0.005	0.54	0.004	0.4
5617	Services to buildings and dwellings	0.005	0.54	0.004	0.41
Total Commodity Demand		0.237	25.855	0.098	10.72

Table 20. Top Commodity Inputs, Rail Transportation (Inputs in \$ millions)

NAICS	Commodity	Gross Absorption Coefficient	Gross Inputs	Regional Absorption Coefficient	Regional Inputs
32411	Petroleum Refineries	0.059	0.43	0.000	0
23*	Maintenance and repair construction of nonresidential	0.054	0.39	0.054	0.39
5324	Commercial and industrial machinery and equipment rental and leasing	0.051	0.37	0.024	0.18
3365	Railroad rolling stock manufacturing	0.050	0.36	0.000	0
5222-3	Nondepository credit intermediation and related activities	0.044	0.32	0.023	0.17
523	Securities, commodity contracts, investments, and related activities	0.039	0.28	0.017	0.13
3211	Sawmills and wood preservation	0.013	0.1	0.002	0.01
42	Wholesale trade	0.013	0.1	0.012	0.09
541512	Computer systems design services	0.012	0.09	0.002	0.01
5411	Legal services	0.010	0.08	0.008	0.05
5412	Accounting, tax preparation, bookkeeping, and payroll services	0.010	0.07	0.008	0.06
5615	Travel arrangement and reservation services	0.009	0.07	0.003	0.02
Total Commodity Demand		0.481	3.492	0.213	1.54

Commodity imports are related. In these tables, we present the goods and services that each industry imports in the largest quantities. That is, the industries are sorted by external input, which is gross

input minus regional input. This table describes the production inputs that are sourced mainly from outside the study area. All figures in these tables are in millions of dollars.

Table 21. Top Commodity Imports, Warehousing (\$ millions)

NAICS	Commodity	Gross Inputs	Regional Inputs	External Inputs
531	Real Estate	4.32	2.56	1.76
55	Management of companies and enterprises	0.74	0.06	0.68
32411	Petroleum Refineries	0.54	0	0.54
5611	Office administrative services	0.45	0.04	0.41
2211	Electric power generation, transmission, and distribution	1.58	1.2	0.38
3363	Motor vehicle parts manufacturing	0.55	0.3	0.25
32592, 32599	All other chemical product and preparation manufacturing	0.28	0.04	0.24
54161, 54163	Management, scientific, and technical consulting services	0.33	0.1	0.23
492	Couriers and messengers	0.71	0.5	0.21
491	U.S. Postal Service	0.8	0.6	0.2
517	Telecommunications	0.39	0.19	0.2
333921-4	Material handling equipment manufacturing	0.3	0.11	0.19

Table 22. Top Commodity Imports, Air Transportation (\$ millions)

NAICS	Commodity	Gross Inputs	Regional Inputs	External Inputs
32411	Petroleum Refineries	11.31	0.03	11.28
487, 488	Scenic and sightseeing transportation and support activities for transportation	3.75	2.62	1.13
5615	Travel arrangement and reservation services	1.66	0.54	1.12
5324	Commercial and industrial machinery and equipment rental and leasing	2.06	0.99	1.07
722	Food services and drinking places	0.54	0	0.54
531	Real Estate	1.16	0.69	0.47
517	Telecommunications	0.6	0.3	0.3
722	Food services and drinking places	1.8	1.51	0.29
5241	Insurance carriers	0.85	0.58	0.27
55	Management of companies and enterprises	0.25	0.02	0.23
336413	Other aircraft parts and auxiliary equipment manufacturing	0.49	0.33	0.16
33271	Machine shops	0.34	0.24	0.1

Table 23. Top Commodity Imports, Truck Transportation

NAICS	Commodity	Gross Inputs	Regional Inputs	External Inputs
32411	Petroleum Refineries	27.27	0.08	27.19
5611	Office administrative services	3.85	0.35	3.5
5241	Insurance carriers	9.17	6.25	2.92
492	Couriers and messengers	9.31	6.52	2.79
55	Management of companies and enterprises	2.99	0.26	2.73
491	U.S. Postal Service	10.49	7.87	2.62
	333 Transport by rail	3.02	0.42	2.6
3363	Motor vehicle parts manufacturing	5.14	2.76	2.38
531	Real Estate	3.77	2.23	1.54
487, 488	Scenic and sightseeing transportation and support activities for transportation	4.28	2.99	1.29
5613	Employment services	6.35	5.08	1.27
32621	Tire manufacturing	1.18	0	1.18

Table 24. Top Commodity Imports, Courier Services

NAICS	Commodity	Gross Inputs	Regional Inputs	External Inputs
32411	Petroleum Refineries	8.4	0.03	8.37
55	Management of companies and enterprises	1.41	0.12	1.29
5611	Office administrative services	0.64	0.06	0.58
531	Real Estate	1.26	0.75	0.51
492	Couriers and messengers	1.32	0.93	0.39
487, 488	Scenic and sightseeing transportation and support activities for transportation	1.31	0.92	0.39
491	U.S. Postal Service	1.49	1.12	0.37
517	Telecommunications	0.53	0.26	0.27
32621	Tire manufacturing	0.23	0	0.23
5613	Employment services	1.04	0.83	0.21
5241	Insurance carriers	0.63	0.43	0.2
336411	Aircraft manufacturing	0.18	0	0.18

Table 25. Top Commodity Imports, Rail Transportation

NAICS	Commodity	Gross Inputs	Regional Inputs	External Input
32411	Petroleum Refineries	0.43	0	0.43
3365	Railroad rolling stock manufacturing	0.36	0	0.36
5324	Commercial and industrial machinery and equipment rental and leasing	0.37	0.18	0.19
523	Securities, commodity contracts, investments, and related activities	0.28	0.13	0.15
5222-3	Nondepository credit intermediation and related activities	0.32	0.17	0.15
3211	Sawmills and wood preservation	0.1	0.01	0.09
541512	Computer systems design services	0.09	0.01	0.08
33151	Ferrous metal foundries	0.06	0	0.06
5615	Travel arrangement and reservation services	0.07	0.02	0.05
541513,	Other computer related services, including facilities	0.04	0.01	0.03
541519	management	0.04	0.01	0.03
482	Rail Transportation	0.03	0	0.03
3311	Iron and steel mills and ferroalloy manufacturing	0.02	0	0.02

Industry Expenditures

The tables below show the various industries that buy the services of our select transportation industries. Whereas above, the tables showed where transportation industries sent their dollars, the tables below show where they get their dollars. The industries listed below are the customers of the logistics industry in Winnebago County. As above, there are usually over one hundred industries that buy the services of any given transportation industry. For convenience, we list the top twelve, sorted by "Gross Input," which is the amount spent by the industry listed.

Table 26. Industry Expenditures on Warehousing (Inputs in \$ millions)

NAICS	Sector	GAC	Gross Inputs	Regional Inputs
42	Wholesale Trade	0.010	10.58	10.58
333995-6	Fluid power process machinery	0.003	2.96	2.96
493	Warehousing and storage	0.047	2.93	2.93
484	Truck Transportation	0.009	2.27	2.27
445	Retail - Food and beverage	0.011	2.12	2.12
453	Retail - Miscellaneous	0.012	2.11	2.11
452	Retail - General merchandise	0.011	2.08	2.08
33272	Turned product and screw, nut, and bolt manufacturing	0.003	1.45	1.45
444	Retail - Building material and garden supply	0.010	1.20	1.20
3363	Motor vehicle parts manufacturing	0.002	0.93	0.93
33271	Machine shops	0.004	0.85	0.85
623	Hospitals	0.001	0.84	0.84
	Total Industries	0.717	54.13	54.13

Table 27. Industry Expenditures on Air Transportation (Inputs in \$ millions)

NAICS	Sector	GAC	Gross Inputs	Regional Inputs
42	Wholesale Trade	0.002	1.94	0.74
5613	Employment services	0.006	1.16	0.44
6211-3	Offices of physicians, dentists, and other health practitioners	0.002	1.07	0.41
5619	Other support services	0.004	1.02	0.39
722	Food services and drinking places	0.002	0.97	0.37
33271	Machine shops	0.004	0.89	0.34
5614	Business support services	0.008	0.89	0.34
51114, 51119	Directory, mailing list, and other publishers	0.008	0.85	0.32
491	Postal Service	0.010	0.84	0.32
33272	Turned product and screw, nut, and bolt manufacturing	0.002	0.83	0.32
521, 5221	Monetary authorities and depository credit intermediation	0.002	0.82	0.32
3363	Motor vehicle parts manufacturing	0.002	0.75	0.29
	Total Industries	0.607	35.91	13.74

Table 28. Industry Expenditure on Truck Transportation (Inputs in \$ millions)

NAICS	Sector	GAC	Gross Inputs	Regional Inputs
484	Truck Transportation	0.048	12.50	12.50
334111	Fluid power process machinery	0.010	10.38	10.38
23	Construction of new residential permanent site single- and multi-family structures	0.020	7.11	7.11
3363	Motor vehicle parts manufacturing	0.012	5.94	5.94
333515	Cutting tool and machine tool accessory manufacturing	0.026	5.24	5.24
311511-2	Fluid milk and butter manufacturing	0.028	5.04	5.04
42	Wholesale trade	0.004	4.07	4.07
33272	Turned product and screw, nut, and bolt manufacturing	0.009	4.02	4.02
31191	Snack food manufacturing	0.030	3.64	3.64
32732	Ready-mix concrete manufacturing	0.102	3.58	3.58
722	Food services and drinking places	0.007	3.23	3.23
23	Construction of new nonresidential commercial and health care structures	0.009	3.09	3.09
	Total Industry	2.698	158.41	158.41

Table 29. Industry Expenditure on Courier Services (Inputs in \$ millions)

NAICS	Sector	GAC	Gross Inputs	Regional Inputs
42	Wholesale Trade	0.013	13.27	9.29
484	Truck Transportation	0.036	9.31	6.52
51114, 51119	Directory, mailing list, and other publishers	0.019	2.03	1.42
5614	Business support services	0.014	1.59	1.12
487488	Scenic and sightseeing transportation and support activities for transportation	0.037	1.45	1.01
5619	Other support services	0.006	1.44	1.01
492	Couriers and messengers	0.012	1.32	0.93
445	Retail - Food and beverage	0.005	1.04	0.73
442	Retail - Motor vehicle and parts	0.006	1.04	0.73
452	Retail - General merchandise	0.006	1.02	0.71
51112	Newspaper publishers	0.015	0.90	0.63
8134, 8139	Grantmaking, giving, and social advocacy organizations	0.010	0.76	0.53
	Total Industries	0.532	48.91	34.24

Table 30. Industry Expenditure on Rail Transportation (Inputs in \$ millions)

NAICS	Sector	Gross Absorption Coefficient	Gross Inputs	Regional Inputs
2212	Electric power generation, transmission, and distribution	0.022	8.50	1.20
484	Truck Transportation	0.012	3.02	0.43
31134	Nonchocolate confectionery manufacturing	0.011	2.48	0.35
32551	Paint and coating manufacturing	0.013	1.77	0.25
32221	Paperboard container manufacturing	0.016	1.76	0.25
333995-6	Fluid power process machinery	0.002	1.68	0.24
3363	Motor vehicle parts manufacturing	0.003	1.46	0.21
32561	Soap and cleaning compound manufacturing	0.008	1.37	0.19
311111	Dog and cat food manufacturing	0.022	1.23	0.17
31182	Cookie, cracker, and pasta manufacturing	0.014	1.07	0.15
31191	Snack food manufacturing	0.008	0.98	0.14
23	Construction of new residential permanent site single- and multi-family structures	0.002	0.84	0.12
	Total Industries	0.747	46.00	6.47

In many cases, the industry listed above roughly corresponds to the good or service being transported. For example, "Motor Vehicle Parts Manufacturing" industry is a key customer in several industries. This likely indicates that the product being shipped or stored is motor vehicle parts. A key exception is the top customer of rail transportation, Electric Power Generation. This energy-intensive

industry, in turn, buys (and likely requires shipment of) significant amounts of petroleum, coal, natural gas, and similar energy products.

Rail & Air Industry Notes

AECOM has been able to make some limited comparisons of the inputs and outputs of the air transportation and rail transportation sectors from 2001 to 2007 for the geographic area. We should caution here that economies are consistently in flux and the changes we observe can be due to a variety of factors beyond our current understanding. Even so, we can draw some broad conclusions about how the industry has changed over that period.

Rail

- In both 2001 and 2007, power generation is the number one customer of rail transportation firms—by a wide margin. In 2001, it represented 25 percent of intermediate (business) spending on rail transportation, or three times higher than the next-nearest industry, motor vehicle parts manufacturing. Power generation firms in this county consume goods such as oil, natural gas, coal, petroleum, and wind turbines. These firms spend most of their transportation dollars on pipeline and rail transportation.
- From 2001 to 2007, motor vehicle parts manufacturers went from representing 8 percent of rail firms' business revenues to 3 percent. They went from the second-largest source of rail revenue to the seventh-highest, as they contributed just \$1.5 million in output in 2007, as compared with \$2.2 million in 2001.
- Truck transportation firms are customers of rail transportation firms. This relationship is part of the region's intermodal linkages. In 2001, truck transportation firms represented about 4 percent of the rail firms' business inputs; by 2007, that had risen to 6.6 percent.
- The food production industry is a key customer of rail transportation firms. The top twelve industries for rail transportation firms include candy (nonchocolate confectionary) manufacturers; cookie, cracker, and pasta manufacturers; snack food manufacturers; and dog and cat food manufacturers. Paint and coating manufacturers are also a key customer of this industry.

Air

- The air transportation industry has also seen revenues from motor vehicle parts manufacturers decline. In 2001, motor vehicle parts manufacturers were the biggest industry customer of the air transportation industry, representing 7 percent of its business revenues. By 2007, the spending by motor vehicle parts manufacturers on air transportation fell by 60 percent and represented just 2 percent of the air transportation industry's business revenues. Supplier parks may be one contributing factor.

- Hospitals, health care providers, the U.S. Postal Service, directory and mailing list vendors, wholesalers, and restaurants were among the largest customers of air transportation in both years.
- Petroleum refineries are among the largest recipients of the air transportation industry's expenditures—obviously spending on fuel is a key input to the process of air transportation. In 2001, such expenditures represented 17 percent of industry outlays to other firms; by 2007, it became 38 percent. (Note that this is a percentage of spending on goods and services and excludes labor.) Very little of that spending stays in Winnebago County. It is no surprise to see, then, that the indirect multiplier has fallen for the air transportation industry, as so much more business spending has been going toward fuel from out of the county.

III. Logistics Hub Case Studies

Employment Growth Comparison

This section describes employment in select logistics industries for the following counties:

- Jefferson County, Kentucky (Louisville)
- Franklin County, Ohio (Columbus)
- Tarrant County, Texas (Fort Worth)
- Dallas County, Texas (Dallas)
- Winnebago County, Illinois (Rockford)

The purpose of this section is to compare Winnebago County with the other case study cities to gauge the relative prominence of logistics industries here, as compared with other cities known to be intermodal hubs. The beginning of the section includes charts that depict the overall trends. More specific tables are included in the appendix.

Data Source

The data source for this section is the Bureau of Labor Statistics. The Covered Employment and Wages (CEW) is a quarterly report that shows the number of employees in a given industry, by county. The source of the data is from state unemployment insurance. The data are collected consistently across all geographies and are arranged by NAICS code. In this section, we detail five NAICS codes:

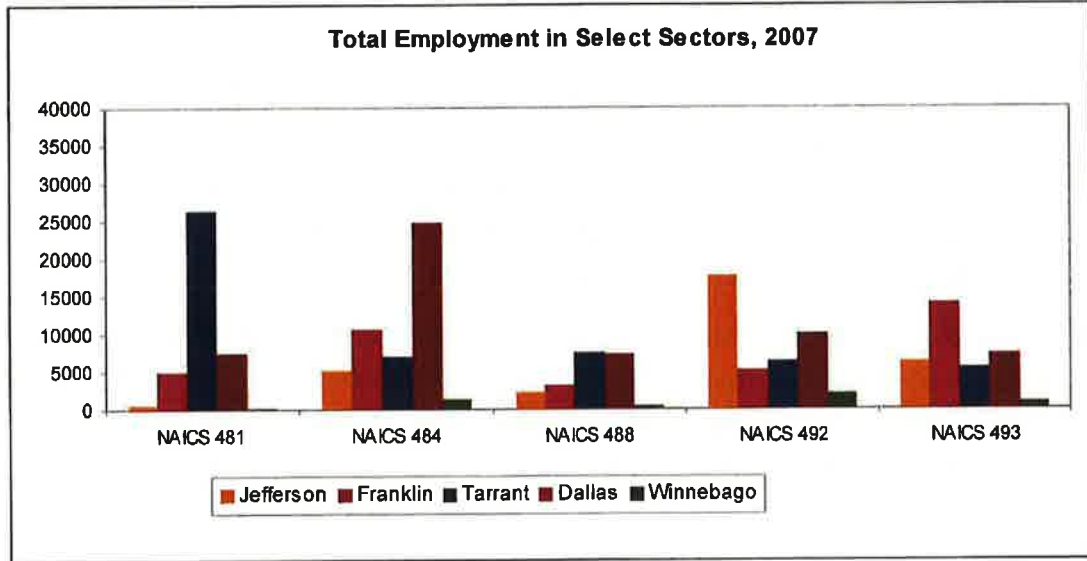
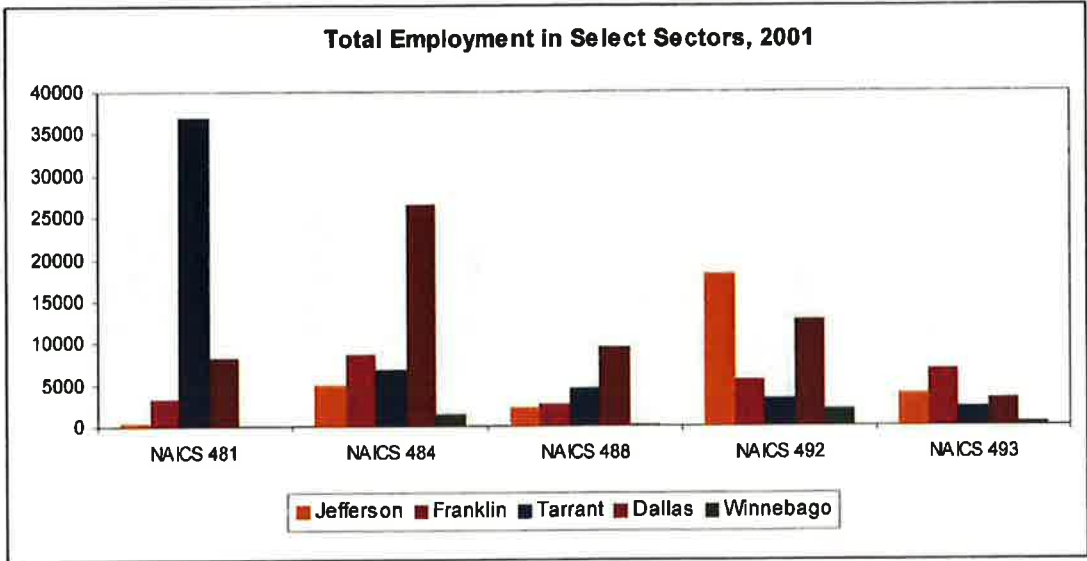
- NAICS 481 is Air Transportation
- NAICS 484 is Truck Transportation
- NAICS 488 is Support Activities for Transportation
- NAICS 492 is Couriers and Messengers
- NAICS 493 is Warehousing and Storage

Data for rail industry employees is not available with this data source because rail industry employees have their own pension and unemployment programs administered.

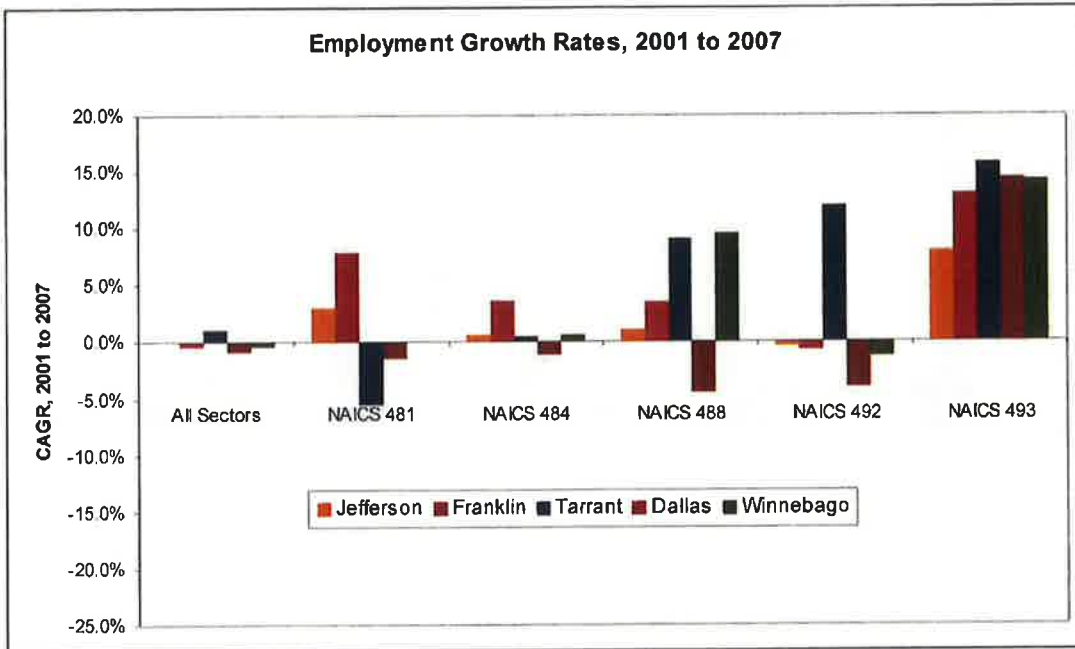
The measure we use for growth is the compound annual growth rate, or CAGR. It measures the rate of annual growth, compounded year by year. (Like compound interest, it measures growth upon previous growth.)

Summary of Employment

The two charts below show the absolute levels of employment for the select transportation sectors in the counties studied.

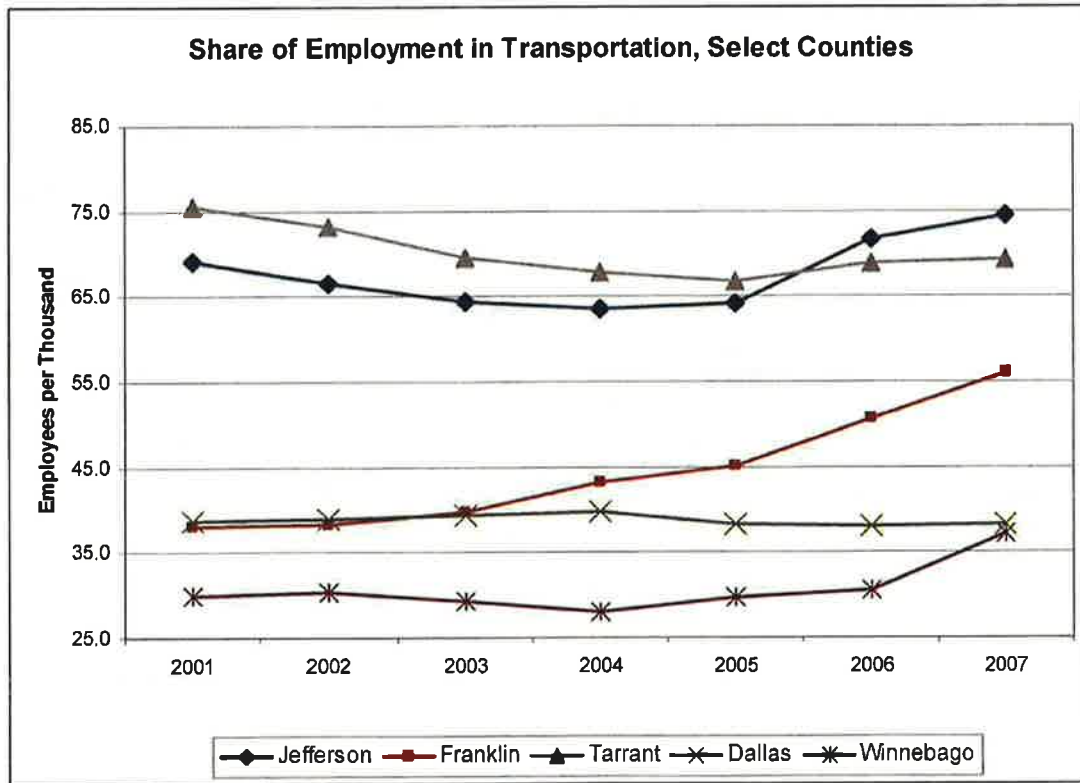


In most cases, the general relationship among the industries is the same in 2007 as it was in 2001. NAICS 493 as an industry is much larger. Tarrant lost about 10,000 jobs in air transportation. The chart below shows the growth rate of the different industries by county:



The chart above sheds some more light on the changes in the industry. NAICS 493 Warehousing and Storage gained jobs in every county. Growth in NAICS 493 was faster than growth in any other sector, for each county. Across all transportation industries studied, Franklin County grew jobs by 6.2 percent per year, compounded annually; Winnebago by 3.4 percent; Jefferson by 1.3 percent. The other counties, Dallas and Tarrant, lost small numbers of jobs from 2001 to 2007.

The chart below shows the employment in all logistics industries (NAICS 481, 484, 488, 492, and 493 put together) in relationship with employment as a whole. The chart shows the number of employees in these industries per 1,000 employees overall. A high level indicates that the logistics industries make up a *high percentage* of local jobs; a low level indicates a low percentage of local jobs.



Winnebago County is at the bottom, with between 29 and 37 jobs per 1,000 being in the logistics industries covered, as compared with about 63 to 75 per 1,000 in Jefferson County. Franklin County showed the highest growth in this measure—that is, logistics became relatively more important at a faster pace in Franklin than in other counties studied. The only other significant change over this period is the change from 2006 to 2007 in Winnebago County.

Detailed Charts

The tables that follow provide the background data from the CEW analysis:

Table 31. Total Employment, All Sectors

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	431,347	420,812	416,429	416,405	422,090	427,519	432,745	0.1%
Franklin	702,628	695,970	685,061	684,527	681,167	681,289	688,252	-0.3%
Tarrant	709,162	699,411	689,291	698,067	714,342	738,810	758,236	1.1%
Dallas	1,550,835	1,484,479	1,438,514	1,433,214	1,422,252	1,456,811	1,480,465	-0.8%
Winnebago	139,815	137,735	135,668	136,620	135,789	135,943	137,087	-0.3%

Table 32. Employment, NAICS 481-Air Transportation

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	474	513	496	554	587	602	570	3.1%
Franklin	3,243	3,996	3,934	3,839	4,263	4,718	5,109	7.9%
Tarrant	36,966	34,590	31,157	29,668	24,708	26,346	26,283	-5.5%
Dallas	8,265	7,967	7,990	8,260	7,507	7,149	7,608	-1.4%
Winnebago		146					283	14.2%

Table 33. Employment, NAICS 484-Truck Transportation

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	4,956	4,734	4,692	4,785	4,951	5,112	5,157	0.7%
Franklin	8,675	8,881	9,124	8,983	8,912	8,790	10,772	3.7%
Tarrant	6,766	6,703	6,606	6,319	6,106	6,473	6,966	0.5%
Dallas	26,396	24,346	23,350	23,723	24,807	25,332	24,718	-1.1%
Winnebago	1,338	1,357	1,268	1,294	1,305	1,360	1,397	0.7%

Table 34. Employment, NAICS 488-Support Activities for Transportation

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	2,235	1,986	1,930	2,024	1,986	2,161	2,384	1.1%
Franklin	2,617	2,604	2,846	3,118	3,368	3,196	3,235	3.6%
Tarrant	4,414	4,409	4,723	5,083	6,935	7,138	7,427	9.1%
Dallas	9,508	8,727	7,819	8,064	6,423	7,248	7,203	-4.5%
Winnebago	274	225	309	302	518	449	476	9.6%

Table 35. Employment, NAICS 492-Couriers and Messengers

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	18,182	16,229	15,189	14,587	14,984	17,217	17,825	-0.3%
Franklin	5,476	5,187	4,968	4,841	4,769	5,064	5,240	-0.7%
Tarrant	3,254	3,178	3,229	3,338	6,323	6,418	6,447	12.1%
Dallas	12,648	11,804	11,969	11,651	9,530	9,882	9,897	-4.0%
Winnebago	2,111	1,947	1,825	1,867	1,768	1,878	1,954	-1.3%

Table 36. Employment, NAICS 493-Warehousing and Storage

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	3,974	4,558	4,480	4,517	4,595	5,609	6,336	8.1%
Franklin	6,792	5,978	6,355	8,750	9,485	12,856	14,196	13.1%
Tarrant	2,253	2,338	2,293	2,953	3,689	4,561	5,407	15.7%
Dallas	3,263	4,841	5,569	5,458	6,033	5,896	7,333	14.4%
Winnebago	449	511	568	373	441	477	997	14.2%

Table 37. Employment, Sum of Logistics Sectors

	2001	2002	2003	2004	2005	2006	2007	CAGR
Jefferson	29,821	28,020	26,787	26,467	27,103	30,701	32,272	1.3%
Franklin	26,803	26,646	27,227	29,531	30,797	34,624	38,552	6.2%
Tarrant	53,653	51,218	48,008	47,361	47,761	50,936	52,530	-0.4%
Dallas	60,080	57,685	56,697	57,156	54,300	55,507	56,759	-0.9%
Winnebago	4,172	4,186	3,970	3,836	4,032	4,164	5,107	3.4%

Table 38. Employees in Logistics Industry, Per 1,000 Total Employees

	2001	2002	2003	2004	2005	2006	2007
Jefferson	69.1	66.6	64.3	63.6	64.2	71.8	74.6
Franklin	38.1	38.3	39.7	43.1	45.2	50.8	56.0
Tarrant	75.7	73.2	69.6	67.8	66.9	68.9	69.3
Dallas	38.7	38.9	39.4	39.9	38.2	38.1	38.3
Winnebago	29.8	30.4	29.3	28.1	29.7	30.6	37.3

Table 39. Compound Annual Growth Rate by Sector, 2001 to 2007

	All Sectors	NAICS 481	NAICS 484	NAICS 488	NAICS 492	NAICS 493
Jefferson	0.1%	3.1%	0.7%	1.1%	-0.3%	8.1%
Franklin	-0.3%	7.9%	3.7%	3.6%	-0.7%	13.1%
Tarrant	1.1%	-5.5%	0.5%	9.1%	12.1%	15.7%
Dallas	-0.8%	-1.4%	-1.1%	-4.5%	-4.0%	14.4%
Winnebago	-0.3%		0.7%	9.6%	-1.3%	14.2%

Review of Selected Logistics Hub Developments

Rickenbacker Intermodal Terminal

Rickenbacker Intermodal Terminal is a new intermodal facility operated by Norfolk Southern Railroad, adjacent to the Rickenbacker Airport in Columbus, Ohio. It is a rail-to-truck intermodal facility that can accommodate 250,000 containers per year (and can be expanded to accommodate 400,000 in later phases). The facility replaces Norfolk Southern's Discovery Park Terminal, which had been built to accommodate 140,000, but was operating over capacity. Plans for re-use of the Discovery Park Terminal call for a Triple Crown Road Railer operations which would require little if any capital investment and conversion cost.

The Rickenbacker terminal is a key part of two strategies: Norfolk Southern's Heartland Corridor strategy, developing links between Norfolk, Virginia and the Midwest; and Columbus, Ohio's regional strategy to support its logistics and transportation industries.

Heartland Corridor Strategy

Norfolk Southern railroad responded to high demand for shipping containers by adopting a Heartland Corridor Strategy to accommodate double-stacked trains on a popular route from Norfolk, through West Virginia and Ohio, and to Chicago. Various bridge tunnels along this route could not accommodate trains with intermodal containers stacked two high; therefore, any double stacked trains had to take a circuitous route through Toledo, a route that added hundreds of miles. The Heartland Strategy renovates these bridge tunnels to accommodate double-stacked trains. It also required more intermodal capacity in Columbus, as the existing facility, the Discovery Park Terminal, was operating above capacity.

Therefore, a new intermodal yard in Columbus made business sense for Norfolk Southern. The first phase of the project can accommodate 250,000 containers per year in its 175 acres, with the ability to expand to 300 acres and 400,000 containers. The railroad contributed \$20 million toward the \$68 million total cost to develop the intermodal terminal. The entire Heartland Corridor strategy is scheduled to be completed in 2010.

Columbus Regional Strategy

At the same time, the Columbus region was able to see a strategic opportunity to expand the Rickenbacker Airport area into an even greater logistics hub. Already a Foreign Trade Zone, which allows companies operating within the area to escape customs on imported goods, the area had seen some growth in warehousing and other logistics companies. The Columbus Regional Airport Authority, the holder of the FTZ, was the main public-sector driver of the project. It worked closely with Norfolk Southern to build public support, gain regulatory approvals, and apply for federal funding.

(There was over \$30 million in federal participation under SAFETEA-LU, the 2005 federal transportation bill, and Rickenbacker is applying for stimulus funding.)

The regional leaders also recognized the real estate and economic development opportunities that would arise from an even more integrated Rickenbacker. Already a warehousing and air shipping hub, Rickenbacker would become a tri-modal facility—with plenty of available land for economic development. (CSX also serves Rickenbacker, but not with an intermodal terminal.) The Columbus airport authority partnered with a real estate firm and a local construction firm to develop Rickenbacker Global Logistics Park, a 1,500-acre development that can potentially see up to 29 million square feet of warehouse or industrial space. (It is currently developing the third of 30 potential buildings, spread over five campuses.)

In what is known as the Rickenbacker Area, there are 38 million square feet of existing industrial development, 23 million of which are in the Foreign Trade Zone. Many of the companies in the area are e-commerce firms that take advantage of the airport to ship high-value products to their customers in a short time period.

Other Project Metrics

The project broke ground in 2005 and was completed in 2008. State highway funding was available for ancillary—off-campus—improvements in roadways and traffic, the so-called "last mile." Six Norfolk Southern trains serve the Intermodal Terminal today—four between Columbus and Chicago; two between Norfolk and Columbus. The terminal is located 18 miles from downtown Columbus, so it is able to draw on the region's labor force, but avoids many of the costly land and (roadway) traffic congestion issues that come with being closer to a city center. The land for the Rickenbacker Terminal was owned primarily by the Columbus airport authority; some small parts had to be acquired from private land owners by Norfolk Southern. This type of flexibility allowed Norfolk Southern to build an intermodal terminal that could be expanded from 175 to 300 acres and also plan for a potential trucking yard nearby.

Hurdles to Funding

Any freight rail transportation project necessarily affects a lot of stakeholders and likely requires some type of government participation in funding. The Rickenbacker Intermodal terminal was no different, as it involved funding from the city of Columbus, the state, and the federal government. Norfolk Southern invested \$20 million. In addition, it required participation from various civic organizations to build public support—not just support for funding, but also for the regulatory changes and approvals that would be necessary.

Advisory committees and meetings with a number of stakeholders helped build public consensus: governments at the city, county and state level; metropolitan planning agencies; and key private sector leaders, including the railroad and surrounding businesses.

In addition, the project involved an economic impact assessment that quantified the regional economic benefit, including the potential for job creation in higher wage industries. The study prepared for Rickenbacker estimated over 20,000 jobs, 34 million square feet of potential warehouse development, and \$800 million in additional tax revenue over a 30 year time period. It quantified the potential cost savings to local shippers, a reduction in truck-miles on state highways, and environmental benefits of more efficient logistics. These reports helped build the fiscal case for public involvement in the project.

UPS Worldport & Louisville-Area Logistics

The centerpiece of Louisville, Kentucky's logistics industry is the UPS Worldport, the shipping giant's main U.S. shipping hub and the centerpiece of its global shipping network. The 5.2 million square-foot complex sorts hundreds of thousands of packages per hour.

Capacity & Recent Expansion

UPS has recently completed the second stage of a three-stage expansion at Louisville, estimated at \$1 billion in construction costs. The space expanded from 4 million square feet to 5.2 million square feet. There are now 70 aircraft on-wing parking spots, up from 26, cutting critical costs and minutes in the process of loading airplanes. The hourly sorting capacity expanded from 304,000 to 350,000 and will expand further to 416,000 packages per hour.

The recent expansions have taken place due to the demand for international and domestic express business shipments. The third phase was estimated to be completed in May 2010, but it will be delayed until the economy turns around and demand picks up again.

The partnership between UPS and Greater Louisville Inc. included several government incentives for the recent \$1 billion expansion. The state provided \$51 million in incentives, whereby the firm can recapture individual income taxes paid to employees for a limited period. The corporate income tax has been credited for a period of 10 years, and UPS can recoup the sales tax paid on construction materials.

In addition, the city agreed to extend the "Metro College" program. Employees of UPS—including part time employees—are eligible for full tuition reimbursement at the University of Louisville or Jefferson Community & Technical College. It is funded by UPS, the state, and the Louisville metro government. Both the state and city guaranteed continued participation in Metro College as part of the incentives for the expansion.

Economic Development

With over 20,000 employees, UPS is by far the region's biggest employer. It is also a unique employer, insofar as it employs a very high ratio of part time employees, mainly college students, to work overnight hours. The recent expansion was estimated to add about \$100 million in payroll, split among 1,300 new full time employees and 3,700 part time employees.

Greater Louisville Inc. the organization that includes the chamber of commerce and the economic development corporation, estimates that 135 companies with \$400 million in payroll have located to Louisville because of the UPS presence. These include traditional retailers (Guess, Ann Taylor, Linens N Things), e-commerce (Zappos, Cafepress.com), technology (Acer, Asus, Toshiba, Best Buy's Geek Squad City computer repair), and biosciences companies (Genentech, Amgen, Johnson & Johnson). These biosciences companies have used their proximity to UPS to ship highly time-sensitive and patient-customized drugs.

The next three largest employers are all in health care: Humana, Norton Healthcare, and Jewish Hospital combine to employ 24,000. The region's manufacturing economy is dominated by two major companies: Ford has two plants that produce its pickup trucks and SUVs and employ almost 6,000; and GE Consumer Products produces large home appliances in the region, employing about 5,00.

Logistics Industry

The Louisville region is served by CSX and Norfolk Southern, but there is no intermodal component in the region. Greater Louisville Inc. is in the process of commissioning an economic study to bring to the railroads to demonstrate potential capacity; however, there have been no serious talks of an intermodal investment.

UPS itself has been an innovator in logistics with its Supply Chain solutions. This business line has become a vendor for many consumer goods companies, fulfilling duties that had traditionally been the responsibility of a retailer or manufacturer. For example, it fills online orders for a clothing company and it handles all repairs for Toshiba computers. (Many companies do not disclose that UPS fills these roles for them.)

The proximity of UPS also attracts companies with special shipping requirements—whether it would be time-sensitive or temperature-controlled. (These often include pharmaceutical or biosciences companies.) Ford is in the process of adapting its assembly facility to produce smaller cars with alternative fuels, so the region is looking forward to new types of suppliers. It already has a number of Tier 1 suppliers that supports Ford.

Greater Louisville Inc also facilitates a Manufacturing & Logistics Network, which has 120 member firms, and lobbies for the industry in Louisville metro government, Frankfort, and Washington. The

network is also a business networking effort. The most recent legislative victory for the logistics industry in the region is the series of bridges approved over the Ohio River, connecting Indiana and Kentucky.

Alliance Airport

Alliance Airport is a city-owned airport in Fort Worth, Texas, that had been built as a partnership between the city of Fort Worth, the FAA, and the Hillwood Development Company. For Hillwood, the airport was the first piece of a multi-decade development plan that would turn the Alliance airport area into a regional center for logistics, a major employment node, a shopping destination, and even the site of thousands of residential homes. For the city of Fort Worth, it promised significant economic benefits in a part of the city where there was abundant land for development even outside the boundaries of the Hillwood project. After 18 months of construction, Alliance Airport opened in December 1989.

Hillwood has been credited with devising a development plan and, by and large, sticking to it. The 17,000-acre master planned development known as Alliance includes:

- An inland port, called Alliance Global Logistics, billed as the world's first "inland port." It includes Fort Worth Alliance Airport, FedEx's Southwest sorting hub, an American Airlines Maintenance Facility, and BNSF Railway's Alliance Intermodal center. The airport, which already is billed as the largest industrial airport with 220 operations per day, is getting a runway expansion to 11,000 feet. (Its two runways are 9,600 and 8,220 feet now.)
- 29 million square feet of commercial real estate, including office, data centers, destination retail, community retail, and entertainment.
- 7,000 single family homes and 288 apartments.

Employment in Alliance

With all the companies included, the Alliance development is home to 28,000 employees and over 200 companies. It boasts twelve 3PL or freight forwarding companies within its boundaries. Office development includes both corporate campuses (dozens of Fortune 500 companies are located there), data centers, and multi-tenant buildings. There has been significant build-to-suit industrial development, but tenants can lease buildings as well. Smaller developments within Alliance cater to the needs of specific companies:

- Large-scale industrial and distribution users that require rail access and easy access to I-35. (Union Pacific also serves Alliance.)
- Distribution centers with direct access to BNSF intermodal yard and the future transloading and container storage facilities.
- A light manufacturing development for high-tech and aviation support industries.

- The airport includes cross-dock capabilities and direct runway access.

There is also a 75,000 square foot development with retail, restaurants, and small office space. The Cabela's on site draws 4 million visitors, the most popular location in the chain. Alliance Town Center offers 625,000 square feet of lifestyle center shopping.

Outside the boundaries of Alliance, the "Gateway Corridor" along I-35 includes more industrial, distribution, and office space.

Economic Development

There are several tax incentive and abatement programs in place for the Alliance Area, though local officials note that the Alliance developers often recruit companies without benefit of any public assistance. The land assembly was done privately by Hillwood. Tax increment financing has been used on occasion (including Cabelas) and public agencies have invested in infrastructure; however, that is viewed as the exception.

There are several standing tax provisions that make the area advantageous to logistics businesses:

- It is in a Foreign Trade Zone, with a US Customs Centralized Examination Station on site.
- There is a state "Freeport Tax Exemption," which allows companies to avoid paying tax on inventory that leaves the site within 175 days. This exemption applies to city, county, and school district tax.
- The airport is owned by the city and all on-airport operations (including the American Airlines maintenance facility) are exempt from city tax.
- Texas has no tax on personal income.

BNSF Intermodal Terminal

Shortly after the airport opened, the Santa Fe railway built an automotive yard near Alliance Airport. By 1994, it built a 150,000-lift intermodal facility, considered large for the time. As intermodal container traffic grew, so did the demand for services at Alliance. In 2007, BNSF launched a \$32 million expansion at its Alliance Yard. The project introduced the Automated Gate System (AGS) for processing intermodal trains, as well as additional staging areas; there are now six 8,000-foot storage tracks. It added several new trucking lanes and the lift capacity expanded significantly. Its current capacity is 600,000 lifts per year (usage reached 540,000 last year) and it can be expanded to accommodate 2 million lifts. It currently serves 13 double-stacked trains per day. A transloading facility is planned immediately adjacent to the intermodal yard. In addition, a container storage facility is also planned for nearby.

The intermodal terminal has attracted retailers like J.C. Penney and Michaels Stores, which have a significant distribution presence nearby.

IV. The Auto Industry Summary

Employment Growth

The Rockford area has historically had a significant automobile manufacturing industry presence, largely driven by the Belvidere Chrysler plant and its network of suppliers. The automobile parts manufacturing industry declined significantly during the study period from 2001 through 2007. Total industry output fell from \$873 million in 2001 to \$642 million in 2007. Furthermore, regional industry employment decreased at an even more significant level, from 3,699 employees to 2,003 in 2007. This represented nearly a 50% drop in regional industry employment over a six-year period.

While the dramatic decrease in parts manufacturing has certainly hurt the Rockford area's economy overall, efforts are ongoing to re-position the regional economy with the purchase and reopening of the Chrysler Belvidere plant, supporting the assumption the plant will remain in operation. The region's supplier network is in transition, focusing more on greater value-added goods and services which still fit within the historic regional areas of expertise, including automobile hydraulic systems, aircraft engines, etc. These industries are even more dependent on the region's transportation system to acquire material inputs and export finished products economically, reliably, and on a just-in-time basis.

There is an opportunity for Rockford to assist the regional supplier network in the future by facilitating competitive positioning. In addition to the auto manufacturing industry, the significant concentration of other manufacturing industries in the Rockford area also rely on the area transportation system. These industries include food manufacturing, aerospace manufacturing, and biotechnology/pharmaceuticals.

Looking at the logistics framework for the region, industry linkage analysis revealed under-developed rail and air freight industries within the region with businesses needing to source transportation services outside of the area. Many of these industries are essential to the re-positioning of the regional economy. Furthermore, a query of industrial properties in the Rockford area revealed only 9% of total industrial square footage had direct rail access, and many of these buildings were older. In comparison, in the Chicago metro area, an estimated 13.9% of total industrial square footage was rail-served. Experience indicates that improvement of industrial access to rail infrastructure, effective consolidation of transportation/logistics support services, and the facilitation of multi-modal transfer of goods will improve the economic competitiveness of the major regional industry concentrations.

