

# Champaign-Urbana Region **FREIGHT PLAN**

October 2019



CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION







## Plan funded by



Illinois Department of Transportation (IDOT)

## Plan prepared by



CUUATS Staff at the Champaign Urbana Urbanized Area Transportation Study (CUUATS)



a program of the Champaign County Regional Planning Commission (CCRPC)

## In cooperation with



Champaign County



Champaign County Chamber of Commerce



Champaign County Economic Development Corporation



City of Champaign



City of Urbana



Federal Highway Administration (FHWA)



IDOT Central Office, IDOT District 5



Mid-West Truckers Association



University of Illinois



Village of Savoy



CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION

**RESOLUTION TO APPROVE  
CHAMPAIGN-URBANA REGION FREIGHT PLAN  
FOR THE  
CHAMPAIGN-URBANA URBANIZED AREA TRANSPORTATION STUDY (CUUATS)**

WHEREAS, the Champaign-Urbana Urbanized Area Transportation Study, in cooperation with the Illinois Department of Transportation, has a continuing, comprehensive, and cooperative (3C) planning process for transportation planning in compliance with Federal regulations for the urbanized area and the metropolitan planning area;

NOW, THEREFORE, BE IT HEREBY RESOLVED, that the Policy Committee of the Champaign-Urbana Urbanized Area Transportation Study approves the Champaign-Urbana Region Freight Plan for the Champaign-Urbana Urbanized Area Transportation Study.

Passed and approved this 16<sup>th</sup> day of October 2019.

ATTEST:

Giraldo Rosales, Champaign County  
Chair, CUUATS Policy Committee



Champaign County Urbanized Area Transportation Study  
A program of the Champaign County RPC

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REGIONAL PLANNING  
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Passed and approved this 16<sup>th</sup> day of October 2019.

ATTEST: \_\_\_\_\_

A handwritten signature in black ink, appearing to read 'Jay Rank', is written over a horizontal line.

Jay Rank, MTD

Chair Proxy, CUUATS Technical Committee



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# Executive Summary

The Champaign-Urbana region is a growing metropolitan area located in east-central Illinois. Businesses, residents, developers, and freight carriers rely on a multimodal transportation system of roads, railroads, airports, and pipelines for safe, efficient, and reliable movement of goods to, from, and within the region (Chapter 1).

Freight is critical to the economic success of the Champaign-Urbana region. The primary freight-intensive sectors in the region include agriculture, manufacturing, wholesale and retail, construction and utilities, and transportation and warehousing. Freight-intensive sectors account for one-third of the businesses and employment in the region (Chapter 2).

The efficiency of the freight transportation system affects the competitiveness and growth potential of the region. An estimated 20.7 million tons of goods, valued at about \$20.9 billion, were moved on the region's freight system by trucks and trains in 2017. Eighty-five percent of the total goods tonnage, accounting for 94 percent of total goods value, were moved by trucks on the region's roadway network. Approximately 30 million tons of goods are projected to be moving on the region's freight system by trucks and trains in 2045, which represents a 43 percent increase from 2017. The total value of these commodities is projected to be approximately \$30.2 billion in 2045, a 45 percent increase from 2017 (Chapter 3).

The Champaign-Urbana region is served by three interstates, four state highways, around 70 miles of railroads, one commercial airport, and 63 miles of major pipelines. It is a one-hour drive to the nearest intermodal freight facility in Decatur on the interstate (I-72), and approximately 40 minutes by train (Chapter 4).

The efficient and reliable movement of goods on the transportation system is critical to the success of the businesses in the region. Crashes on roadways are a type of non-recurring congestion that impedes freight traffic flows. To better understand the truck crashes in the region, crash data from 2005 to 2016 was obtained and analyzed. Of the average of 120 truck crashes that occur in the region each year, sideswipe collisions between vehicles going in the same direction and rear end collisions were the top crash types. Driver reasons (e.g. improper lane usage, exceeding speed limit or failing to reduce speed, and failing to yield right-of-way) accounted for the majority of the truck crashes. In order to

## Plan Vision

The Champaign-Urbana Region Freight Plan envisions the Champaign-Urbana area as a vibrant region with a thriving economy connecting people and goods to regional, national, and global markets by providing safe, efficient, and reliable transportation connections.

understand how trucks travel on the region's roadway network, from the perspectives of truck route choice and slow speed segments, about 26 million truck GPS records were obtained and analyzed. In addition to the interstates, the U.S. routes, and the state routes, trucks also traveled heavily on major and minor arterials in the region. Nine areas of interest, covering major industrial areas, logistics and distribution centers, major grocery stores, and community commercial areas, were analyzed in detail (Chapter 5).

A number of stakeholder engagement activities were implemented to provide opportunities for area businesses and industry associations to provide input and feedback on freight system needs and opportunities. Freight stakeholders indicated that traffic congestion and poor roadway pavement condition are the top challenges affecting freight movements in the region. Other transportation concerns include roadway and bridge geometry issues, truck routing and signage issues, and at-grade rail crossing issues. Stakeholders also expressed the need for a transloading facility and expanded air cargo service in the region (Chapter 6).

A freight travel demand model was developed to forecast regional freight activities in the future and analyze their implications on the transportation system (Chapter 7).

The Champaign-Urbana Region Freight Plan identified a vision and five goals that reflect the freight stakeholder needs and desired outcomes of freight infrastructure investment and non-infrastructure programs in the region. Objectives and performance measures were developed around the vision and goals to measure the implementation progress of the recommendations proposed in the plan (Chapter 8).

The 25-year vision for the freight infrastructure system in the Champaign-Urbana region is defined, in part, by how much money there is to fund the recommended projects and programs. The plan ends with outlining the steps to move forward with implementing the recommendations and identifying the responsible parties, anticipated timeline, and potential funding sources (Chapter 9).

*The Champaign-Urbana Region Freight Plan is a project funded by the Illinois Department of Transportation and developed by the staff at the Champaign-Urbana Urbanized Area Transportation Study (CUUATS). CUUATS is the transportation entity of the Champaign County Regional Planning Commission (CCRPC), the Metropolitan Planning Organization (MPO) responsible for administering federally mandated transportation planning processes for the Champaign-Urbana Metropolitan Planning Area (MPA).*

## Plan Goals

-  Improve safety
-  Preserve existing infrastructure
-  Improve efficiency
-  Expand freight-supporting services and grow the economy
-  Improve quality of life

# Why plan for freight?

Champaign-Urbana is a growing metropolitan area located in Champaign County, Illinois. Businesses and residents rely on the multimodal transportation system for the movement of goods to, from, and within the region. This chapter details the stakeholders that participate in the different stages of freight activities, the objectives of the Champaign-Urbana Region Freight Plan, and the plan outline.





Figure: Freight Train going through Champaign County

Source: City of Champaign<sup>1</sup>

# 1. Why plan for freight?

The Champaign-Urbana region is a growing metropolitan area, located in Champaign County, the fifth-largest county in Illinois in population (Figure 1-1). Businesses and residents rely on the multimodal transportation system of roads, railroads, airports, and pipelines for efficient, predictable, and sustained movement of goods to, from, and within the region.

## 1.1. What motivated the Plan?

“Freight” or “goods movement” on the transportation system means different things to different stakeholders, who participate in the different stages of freight activities, fulfilling roles of attracting, generating, carrying, managing, and regulating freight movements (Figure 1-2). However, no single freight participant (stakeholder) is able to provide information that yields a complete picture of how the entire system functions<sup>2,3</sup>.

### Businesses

Businesses that rely on for-hire carriers to transport their products or services are typically aware of the characteristics of the cargo they receive and/or ship. However, they are usually uninformed about what happens once the freight vehicles leave their facilities. A business that operates its own fleet for carrying products or services may have more knowledge or control over the freight movements, but would depend heavily on a reliable transportation network for seamlessly integrated transactions, and may not be fully aware of how the larger freight system might change in the future. Whether or not they manage their own fleet, businesses expect urban transportation systems to work well with limited engagement on their part. Businesses generally consider transportation options in terms of transfer time, reliability/risk, logistics costs, and level of service, depending on variables such as production processes or customer needs.

### Freight carriers

To a carrier or freight service provider (e.g., trucking firm, railroad company, package courier, etc.), the metropolitan region is a highly competitive market. Carriers know the details of their operations, including the loaded and empty trips produced. Quite frequently, however, the carriers are not aware of the attributes of the cargo they transport.



Figure 1-1: Regional Overview

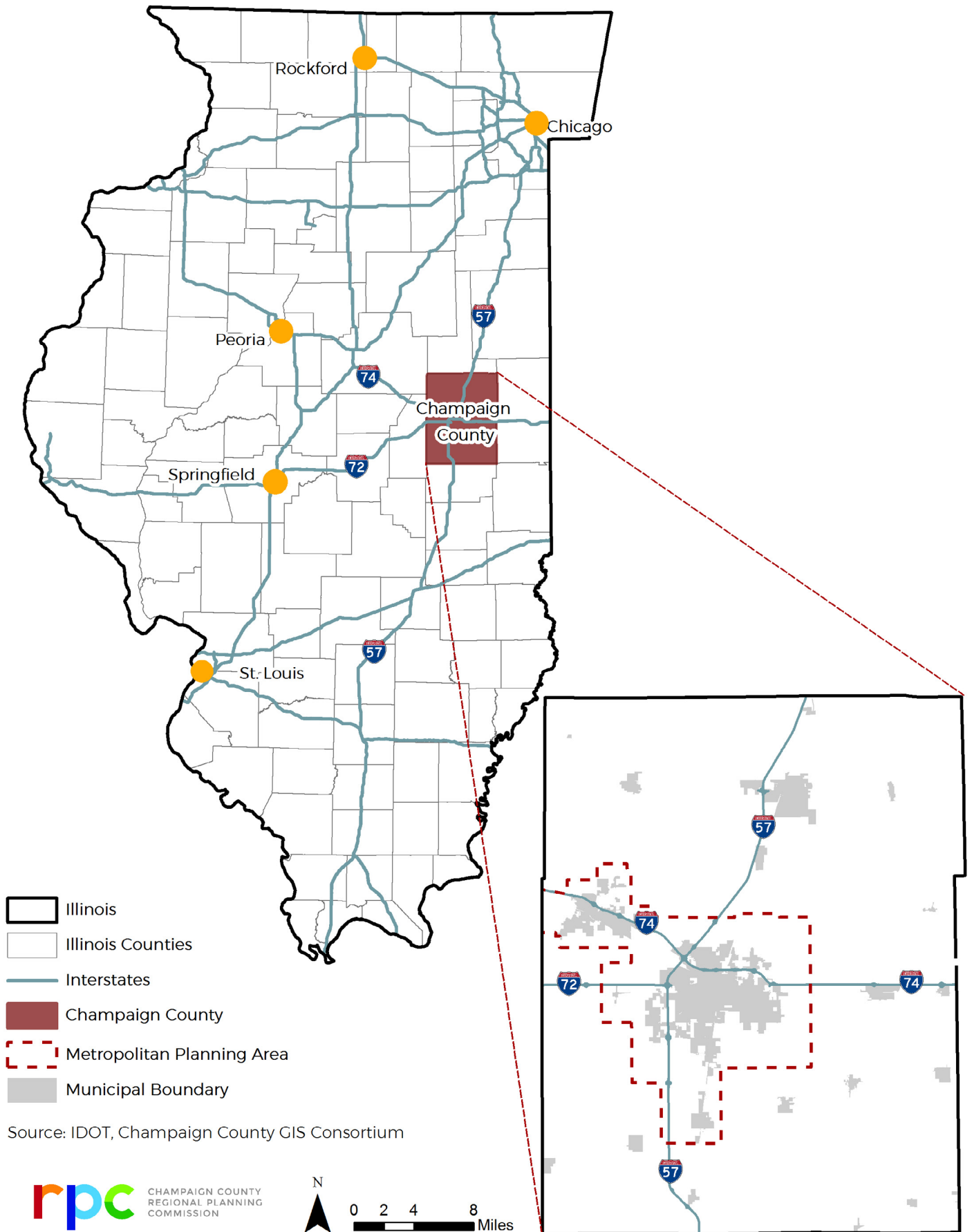
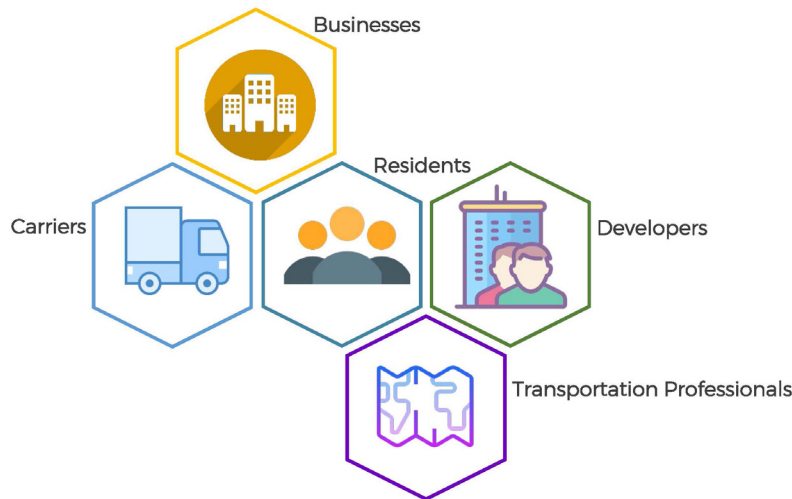


Figure 1-2: Freight Stakeholders



Carriers also know who their clients are, though they do not necessarily know who else is delivering to that particular client. Since trucks are the most prominent carriers of goods within the urban environment, trucking companies' success and profitability are dependent on the performance and reliability of the roadway system. However, they often need to use facilities that are seldom designed for the operating requirements of modern trucking equipment.

### Private developers and commercial property owners

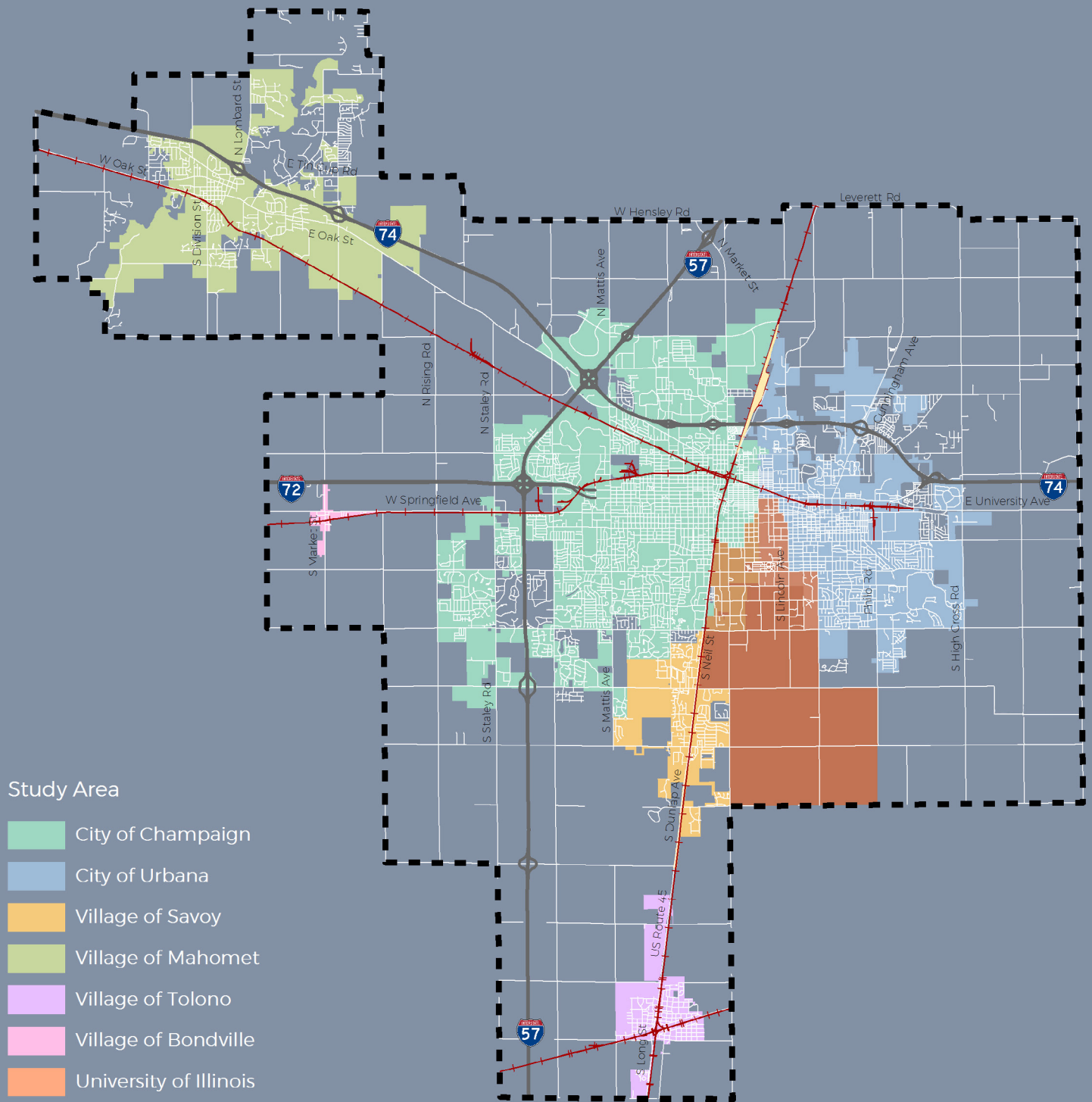
Private land developers or commercial property owners often consider accommodating the movement of goods as an afterthought and a cost that should be borne by others. As a result, freight deliveries can be challenging in commercial districts with limited loading and storage spaces.

### Residents

To the residents of a region, freight can be an impediment to a fast, safe commute home. Freight vehicles compete for lane space and freight trains impose long waits at railroad grade crossings. In short, residents view freight operations as a nuisance and a potential threat to their health and safety.

However, with the growth of e-commerce over the past two decades, more and more people begin to recognize the importance of the freight system. The benefits from moving goods efficiently and reliably are no longer invisible.

Figure 1-3: Study Area



### Study Area

- City of Champaign
- City of Urbana
- Village of Savoy
- Village of Mahomet
- Village of Tolono
- Village of Bondville
- University of Illinois

- Roadway
- Interstate
- Railroad
- Railyard

Metropolitan Planning Area

Source: IDOT, Champaign County GIS Consortium



0 0.5 1 2 Miles

**rpc** CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION

## Transportation professionals

Freight represents a portion of the traffic volume that transportation professionals must accommodate in the network. Transportation professionals see freight activity as economic activity in motion, and consider freight traffic when making roadway policies and budgeting for improvements. However, they may have limited information on the flows of commodities that initially generated truck trips in their jurisdiction. Oftentimes, commercial truck traffic also means higher maintenance costs, specialized enforcement requirements, noise, and airborne emissions.

---

The different understandings about freight and the challenges imposed by freight movements motivated staff at the Champaign-Urbana Urbanized Area Transportation Study (CUUATS) to conduct a regional freight plan and invite representatives who participate in the different stages of freight activities to the same table and share their perspectives. A Freight Advisory Group, comprised of key representatives from the public and private sectors, was established to guide the planning process.

---

CUUATS is the transportation entity of the Champaign County Regional Planning Commission (CCRPC), the Metropolitan Planning Organization (MPO) responsible for administering federally mandated transportation planning processes for the Champaign-Urbana Metropolitan Planning Area (MPA). There are six municipalities partially or wholly within the MPA: the Cities of Champaign and Urbana, the Villages of Savoy, Tolono, Bondville, and Mahomet. Also included in the MPA is the University of Illinois flagship campus, with a student population of approximately 44,000. This plan focuses on the MPA as the study area (Figure 1-3) which also includes some rural areas of Champaign County. However, this plan collected data and developed a freight travel demand model for the entire Champaign County.

### Freight Advisory Group

**Jeff Blue**  
Champaign County Highway  
Department

**Brandon Boys**  
City of Urbana

**Tom Caldwell**  
IDOT Central Office

**Dave Clark**  
City of Champaign

**John Collins**  
City of Urbana

**Stacey DeLorenzo**  
University of Illinois

**Bev Ehler**  
D&B Trucking

**Dick Helton**  
Village of Savoy

**Bradley Ingram**  
Canadian National  
Railway

## 1.2. Plan objectives

Through data collection and analysis, stakeholder surveys and interviews, and freight travel demand modeling, the Champaign-Urbana Region Freight Plan aims to paint a relatively comprehensive and accurate picture of regional freight movements, identify freight stakeholder needs, and proposes recommendations that will enhance the movement of both people and goods while mitigating the negative impacts of freight on mobility, safety, environment, and quality of life in the Champaign-Urbana MPA. Specifically, the Freight Plan strives to:

- » Build awareness on the linkage between the region's economy and key infrastructure components.
- » Identify freight movement patterns (trucks and trains) throughout the region.
- » Establish an understanding of how the transportation system is utilized by freight generators and carriers.
- » Develop a commodity flow database and a regional freight model.
- » Identify current and future freight needs and challenges in the transportation system.
- » Develop freight system goals and objectives and identify performance measures to track the progress toward reaching the goals.
- » Identify and prioritize opportunities to improve freight transportation through infrastructure projects and planning and policy decisions.

The Freight Plan will also provide regional planning and economic development partners with a means of leveraging freight transportation data to help them make better, more informed investment decisions beyond this plan.

### Freight Advisory Group

**Levi Kopmann**  
Village of Savoy

**Rob Kowalski**  
City of Champaign

**Carly McCrory**  
Champaign County Economic  
Development Corporation

**Bob Nelson**  
IDOT District 5

**Don Schaefer**  
Mid-West Truckers Association

**Dalitso Sulamoyo**  
Champaign County Regional  
Planning Commission

**Betsy Tracy**  
FHWA

**John Walden**  
FedEx

**Laura Weis**  
Champaign County Chamber of  
Commerce

## 1.3. Plan outline

The Champaign-Urbana Region Freight Plan starts with an inventory on the freight intensive sectors by answering the question of who generates, attracts, and carries freight in the region (Chapter 2). The plan then discusses what is transported on the freight system by analyzing regional commodity flows for the baseline year of 2017 and the horizon year of 2045 (Chapter 3). The plan then provides an overview of the regional freight infrastructure assets (Chapter 4) and discusses the performance of these facilities from safety and mobility perspectives (Chapter 5), analyzing 10 years of traffic crash data and 38 million truck GPS records.

The Freight Plan has engaged freight stakeholders through the Freight Advisory Group meetings and outreach efforts with assistance from the Champaign County Economic Development Corporation (EDC) and the Champaign County Chamber of Commerce. The plan includes interviews and surveys conducted to collect input from the businesses on the challenges they face when moving freight in the region, needed improvements to the transportation system, existing freight activities, and possible future changes to supply chain decisions (Chapter 6).

In addition, the plan uses a freight travel demand modeling software, Cube Cargo, to forecast regional freight activities in the future and analyze their implications on the transportation system (Chapter 7).

Finally, by combining data analysis and feedback from the stakeholders, the plan develops regional freight transportation system goals, objectives, and performance measures (Chapter 8), and identifies and prioritizes opportunities to improve the regional freight transportation system through infrastructure projects and planning and policy decisions (Chapter 9).

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### Endnotes

1. City of Champaign, Train Access. Retrieved from <http://champaignil.gov>
2. Rhodes, S. S. (2012). Guidebook for understanding urban goods movement (No. 14). Transportation Research Board.
3. Holguín-Veras, J., Lawson, C., Wang, C., Jaller, M., González-Calderón, C., Campbell, S. & Ramirez-Ríos, D. (2017). *Using Commodity Flow Survey Microdata and Other Establishment Data to Estimate the Generation of Freight, Freight Trips, and Service Trips: Guidebook* (No. Project NCFRP-25 (01)).
4. Moul, Rhys. Kalari to Olympic Dam. Retrieved from <https://unsplash.com/photos/7eaFIKeo1MQ>





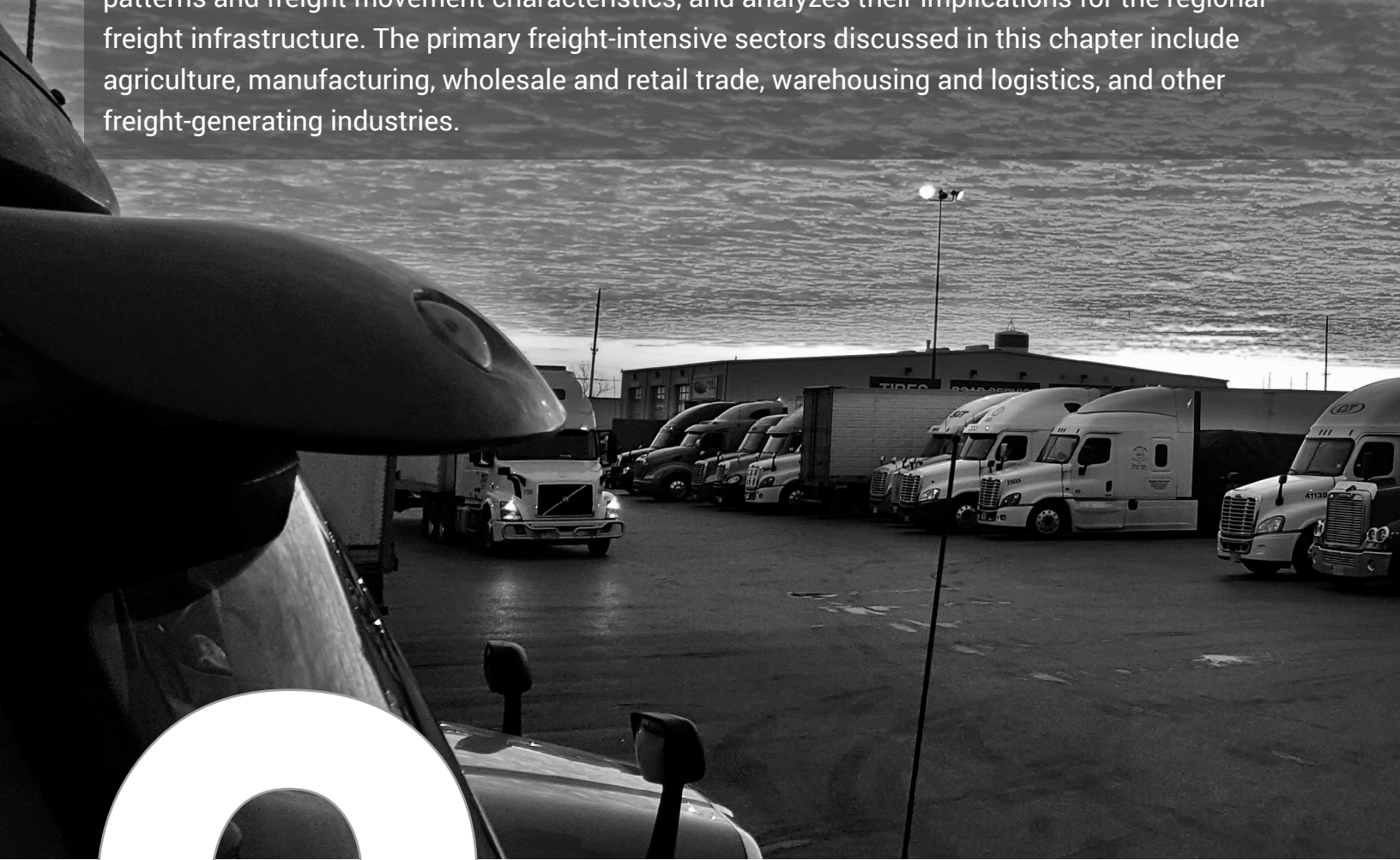
Figure: A Freight Truck

Source: Moulton, Rhys<sup>4</sup>



# Who generates, attracts, and carries freight?

This chapter defines regional freight-intensive industry sectors, summarizes their land use patterns and freight movement characteristics, and analyzes their implications for the regional freight infrastructure. The primary freight-intensive sectors discussed in this chapter include agriculture, manufacturing, wholesale and retail trade, warehousing and logistics, and other freight-generating industries.



# 2



Figure: A Truck Parking Lot

*Source: Roger Andersen<sup>1</sup>*



## 2. Who generates, attracts, and carries freight?

In order to examine the main generators and carriers of freight in the region, this chapter starts by defining freight-intensive industry sectors and summarizes their land use patterns (Section 2.1). Then, this chapter reviews the size, key companies, freight activity characteristics, and implications for the regional freight infrastructure for each freight-intensive sector, including agriculture (Section 2.2), manufacturing (Section 2.3), wholesale and retail trade (Section 2.4), other freight generating industries (Section 2.5), and warehousing and logistics (Section 2.6).

### 2.1. Freight-intensive sectors and land uses

The region's primary industrial sectors include manufacturing and distribution, medical and biotech, and technology services<sup>2</sup>. All sectors of the economy demand freight and goods services. The efficiency of the freight transportation system affects the competitiveness and growth potential of the region.

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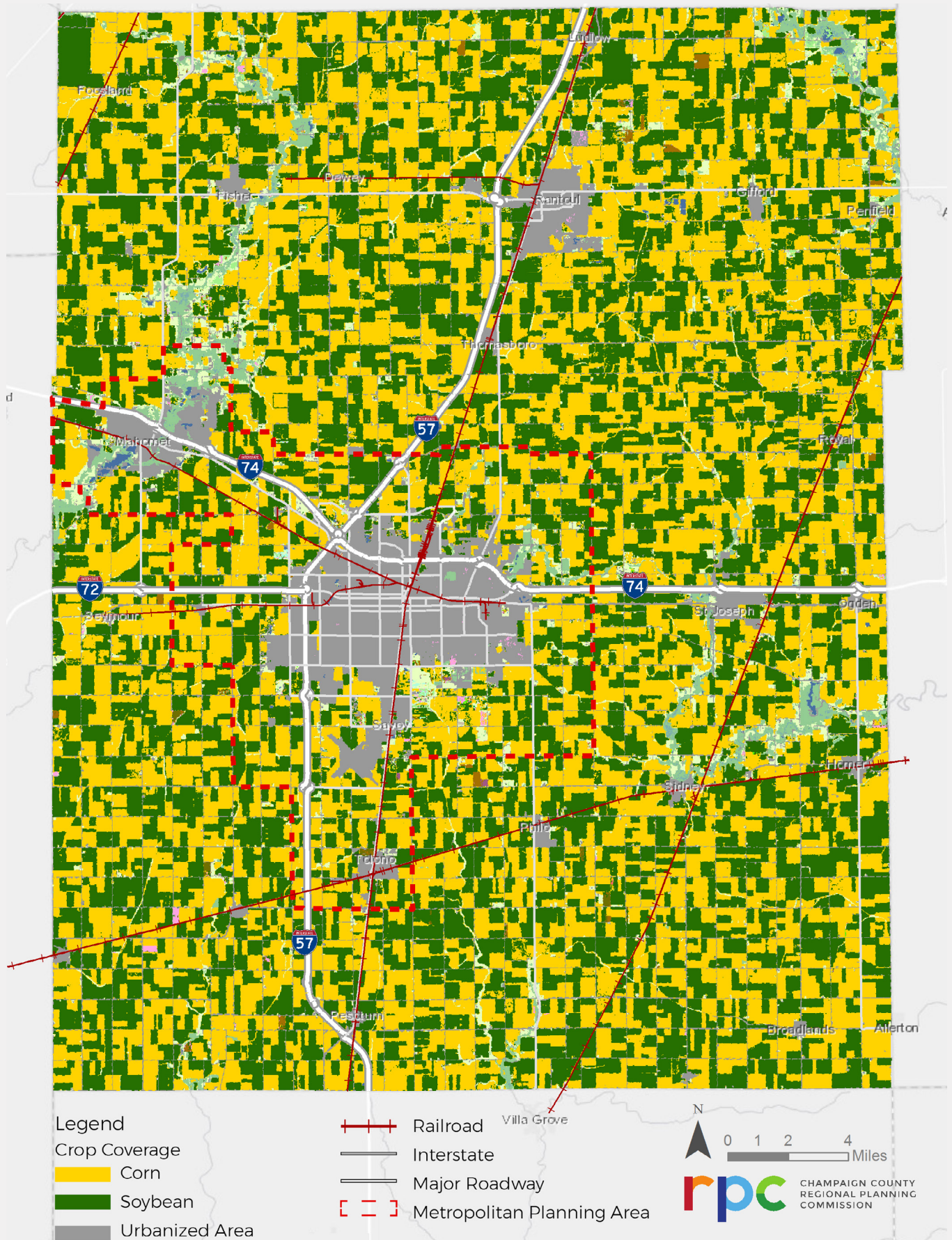
This study defines freight intensive sectors as industries that rely heavily on the shipment of physical goods to support their operation. Consumption and production of cargo is central to their activities.

---

The freight-intensive sectors in the Champaign-Urbana region include agriculture, manufacturing, wholesale and retail, construction and utilities, and transportation and warehousing. Even though health and education sectors have a strong presence in the region, since they are not heavily dependent upon the shipment of cargo as the center of their operations, they will not be the focus of our discussion.

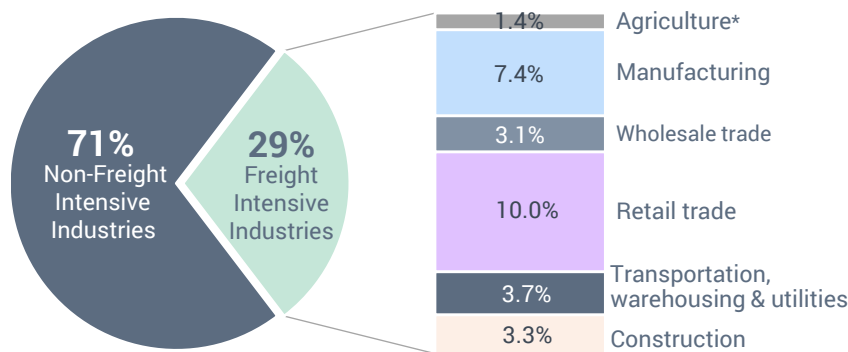
Thirty-three percent of the business establishments<sup>3</sup> and 29 percent of the employment<sup>4</sup> in Champaign County fall into the category of freight-intensive sectors, as shown in Figure 2-2.

Figure 2-1: Agricultural Land Use



Source: Esri, U.S. Department of Agriculture, Champaign County GIS Consortium

Figure 2-2: Freight Intensive Sectors and Employment



\*Includes agriculture, forestry, fishing and hunting, and mining

Source: 2011-2015 American Community Survey 5-year Estimates, US Census Bureau.

### 2.1.1 Agricultural land use

Champaign County is home to 270,000 acres of cornfields<sup>5</sup> and 257,000 acres of soybeans<sup>6</sup>, as shown in Figure 2-1. Combined, these two agricultural uses covered 825 square miles, or 83 percent of the County's land area. In 2012 (the most recent year with available data), the region had around 1,300 farms, which employed about 1,400 people<sup>7</sup>.

### 2.1.2 Industrial and commercial land uses

Industrial and commercial land uses in Champaign County are mainly located in the Champaign-Urbana Metropolitan Planning Area (MPA). In 2008, industrial and commercial land uses were concentrated along I-74 between I-57 and U.S. 45/ Cunningham Avenue; in areas along the Canadian National Railroad lines and U.S. 45/Neil Street; near the intersection of Springfield Avenue and Staley Road; near the intersection of I-74 and I-57; along Mattis Avenue between Bradley Avenue and Springfield Avenue; along U.S. 45/Cunningham Avenue in Urbana; along University Avenue from downtown Champaign to I-74 interchange; and along Philo Road south of Florida Avenue (Figure 2-3). Commercial land uses in Mahomet were clustered along I-74 and Oak Street.

From 2008 to 2017, industrial and commercial land uses in the MPA expanded mainly along I-74, along U.S. 45/ Neil Street/Dunlap Avenue south of Kirby Avenue, near the I-57 and I-72 interchange, in southeast Urbana, and in east Champaign (Figure 2-4).

Regional economic development organizations like the Champaign County Economic Development Corporation (EDC)<sup>8</sup> and the Champaign County Chamber of Commerce<sup>9</sup> maintain databases on available industrial and commercial sites for businesses looking to expand in the region.



Increased industrial and commercial land uses in the region means more goods movements and freight activities on the transportation system. A 2017 research paper that uses the U.S. Commodity Flow Data (2012) estimated the amount of freight (in pounds per employee per year, *FP*) generated from each freight-intensive sectors (not including agriculture)<sup>10</sup>, based on the size of the businesses (*E*). Using different modeling methods, the freight generation rates ( $\beta$ ) vary. Table 2-1 shows the freight generation rates (in pounds per employee per year,  $\beta$ ) using simple linear regression ( $FP_i = \beta E_i$ ) modeling for all modes (water, pipelines, etc. in addition to truck and rail) and truck and rail combined.

Mining (NAICS code 21) has the highest freight generation rates. Focusing on truck and rail modes only, transportation and warehousing (NAICS code 49) has the second-highest freight generation rate, followed by wholesale trade (NAICS code 42), manufacturing (NAICS code 31, 32, 33), and retail trade (NAICS code 45).

The rest of this chapter will review each freight-intensive sector in the region in detail, focusing on their importance to regional employment and the regional economy, their freight activity characteristics, and their implications for the freight infrastructures in the region.

Table 2-1: Industry Freight Generation Rate  $\beta$  (pounds per employee per year)

NAICS	Description	$\beta$ All Modes	$\beta$ Truck and Rail	Number of Observations
21	Mining	30,950,434	7,745,393	1,550
31	Food, Beverage, Tobacco, Textile, Apparel, Leather and Allied Product Manufacturing	506,712	438,112	4,480
32	Wood, Paper, Printing, Petroleum and Coal Products, Chemical, Plastics, Nonmetallic and Mineral Product Manufacturing	1,021,071	400,204	12,310
33	Metal, Machinery, Computer, Electronics, Electrical Equipment, Transportation, Furniture and Misc. Manufacturing	153,426	96,430	12,700
42	Wholesale Trade	787,685	634,793	20,065
45	Sporting Goods, Hobby, Books and Music Stores	55,970	55,162	1,225
49	Postal Service, Couriers and Messengers, Warehousing and Storage	792,551	776,337	1,245

Figure 2-3: Industrial and Commercial Land Use (2008)

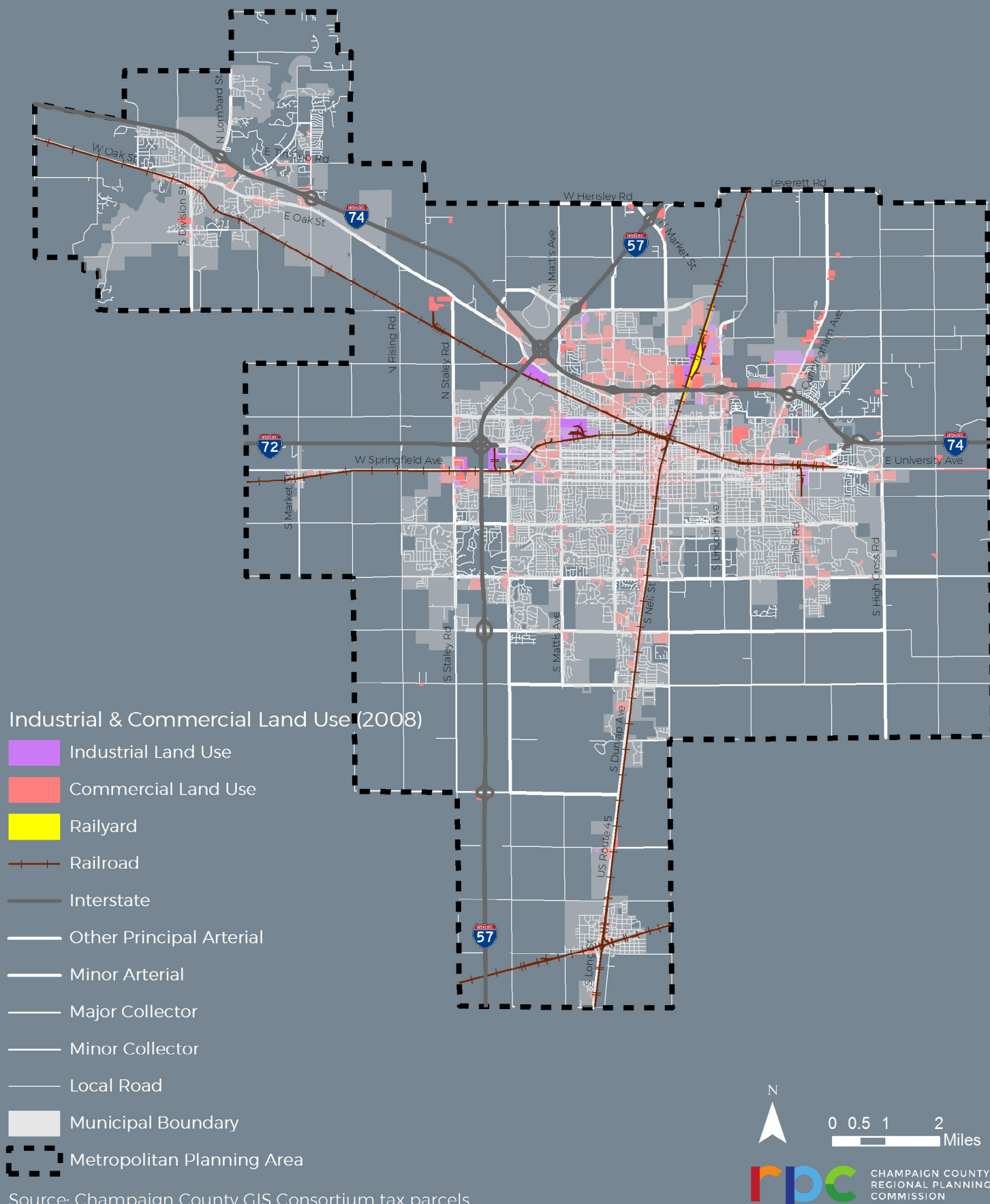
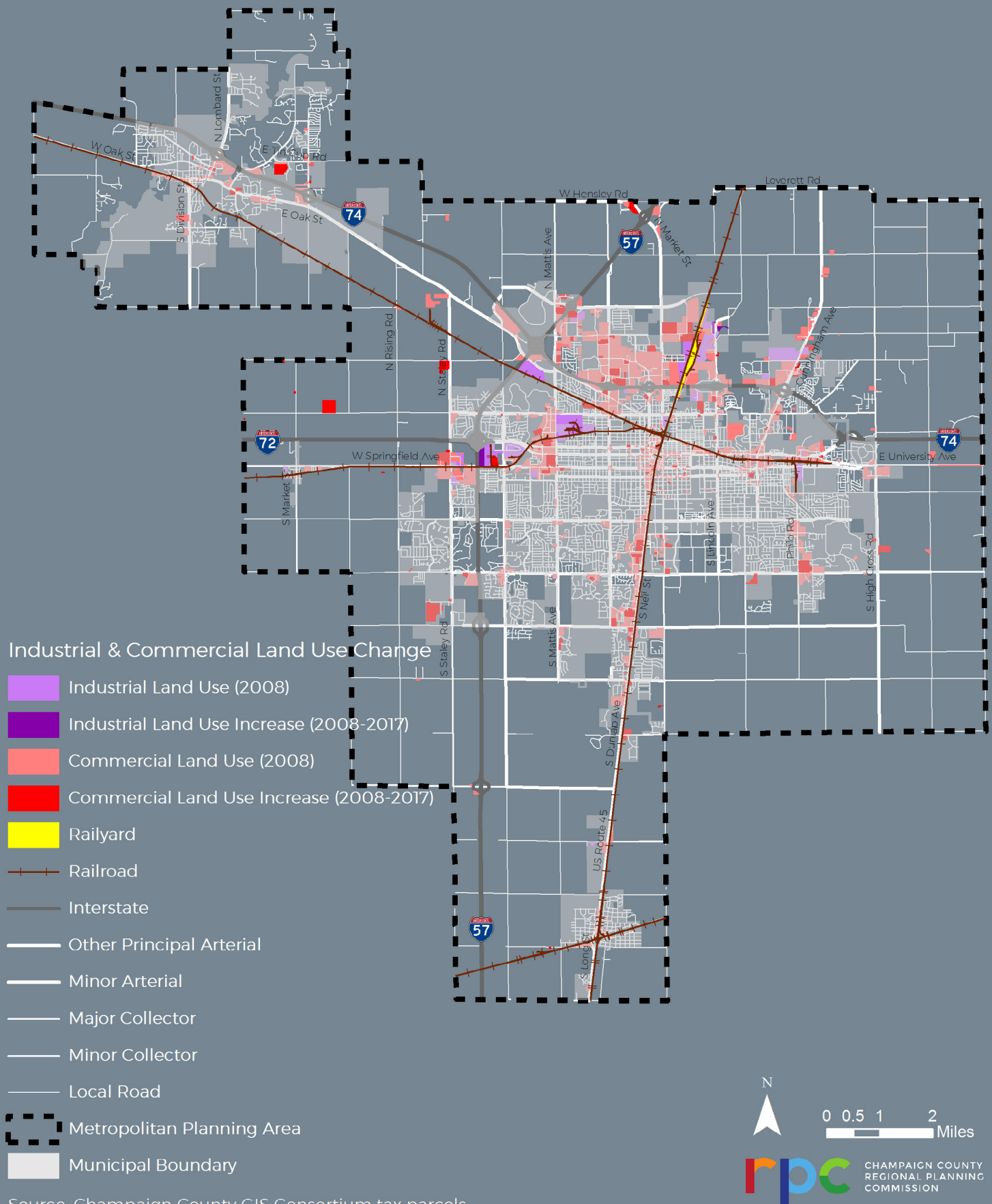




Figure 2-4: Industrial and Commercial Land Use Change (2008-2017)

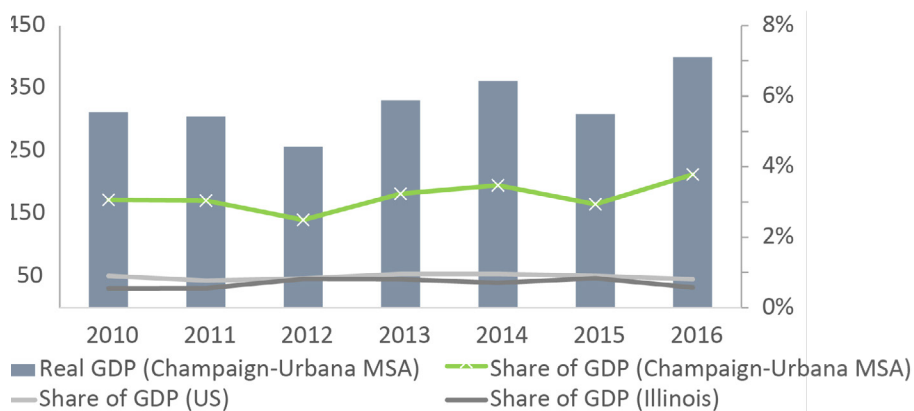


## 2.2. Agriculture sector

Agriculture is a key industry in the Champaign-Urbana region, accounting for a relatively high share of the inflation-adjusted Gross Domestic Product (real GDP), compared with Illinois and the U.S. (Figure 2-5).

**Figure 2-5: Agriculture Real GDP**

Millions of chained 2009 dollars



*Source: 2010-2016 Regional Economic Accounts. Bureau of Economic Analysis.*

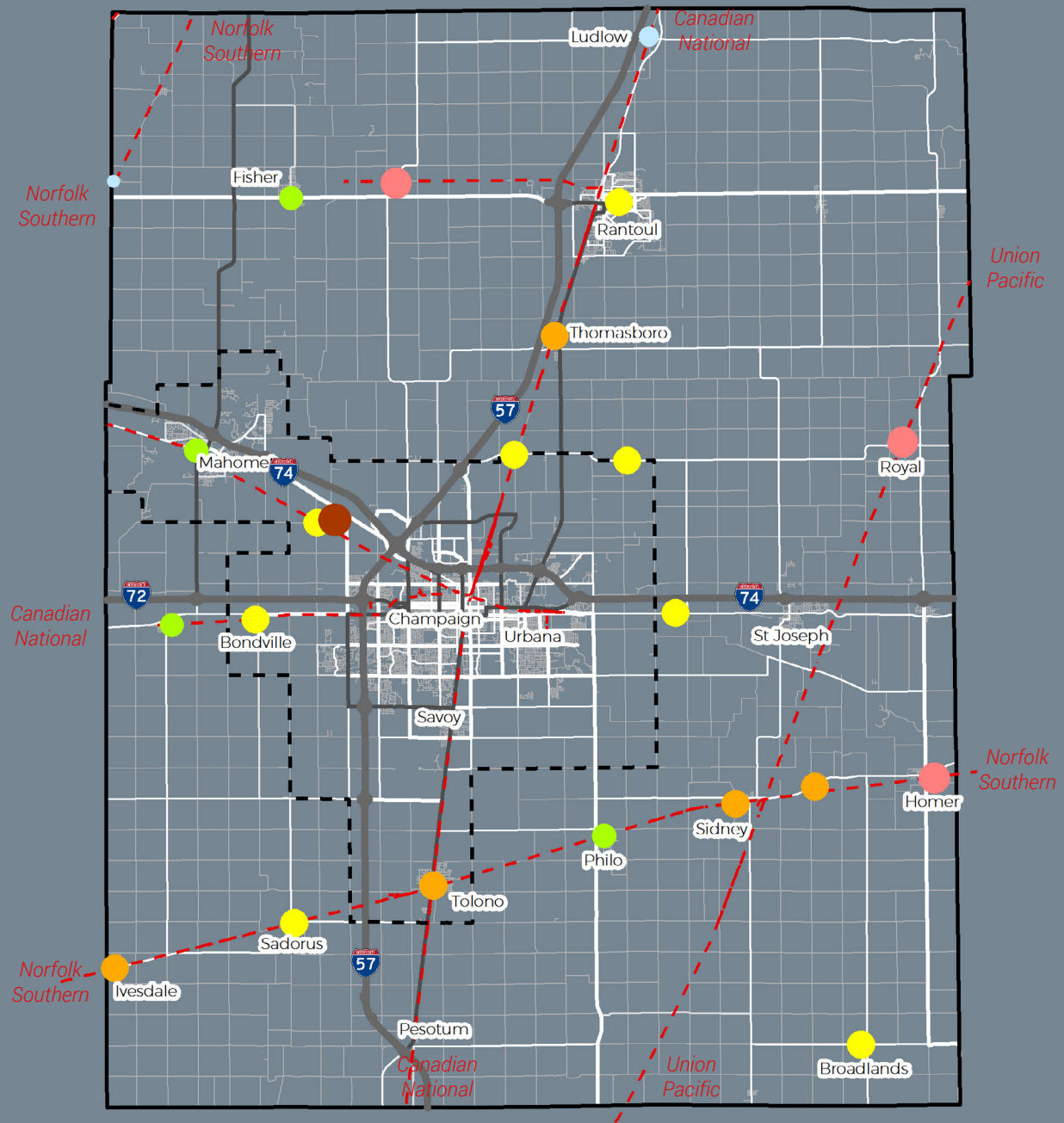
*GDP by industry data is only available at the Metropolitan Statistical Area (MSA) level, according to the Bureau of Economic Analysis, U.S. Department of Commerce. Champaign-Urbana, IL MSA is composed of Champaign County, Ford County, and Piatt County.*

Lower transportation cost is a major variable in keeping U.S. agriculture competitive<sup>11</sup> as transportation makes up a significant portion of the landed cost\* of agricultural products, compared to other high-value and low-weight commodities<sup>12</sup>. Farmers usually use trucks to move crops to regional elevators and feedlots. A grain cart for a combine or a semi can handle approximately 850 to 900 bushels of grain, weighing more than 50,000 pounds<sup>13</sup>.

Champaign County farmers also rely on a reliable and efficient transportation system as the critical link between crop fields and consumers. Grain elevators of larger capacities in the region are located along Norfolk Southern and Union Pacific Railroad lines, as shown in Figure 2-6. This is because “truck-in, truck-out” is not as price effective as rail shipments for crops. Therefore, producers sometimes expand their truck fleets and bypass nearby elevators in favor of larger, more distant consolidation points<sup>11</sup>.

\* Landed cost is the total price of a product or shipment once it has arrived at a buyer’s doorstep. The landed cost includes the original price of the product, transportation fees (both inland and ocean), customs, duties, taxes, tariffs, insurance, currency conversion, crating, and handling and payment fees.

Figure 2-6: Grain Elevators in the Region



### Grain Elevators in the Region

Capacity (Million Bushels) Functional Classification

● <1.00

● 1.01 to 3.00

● 3.01 to 5.00

● 5.01 to 7.00

● >12.00

● Unknown

— Interstate

— Other Principal Arterial

— Minor Arterial

— Major Collector

— Minor Collector

— Local Road

- - - Railroad

  Metropolitan Planning Area

  County Boundary



0 1 2 4 Miles

**rpc** CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION

Source: Champaign County EDC, IDOT, Champaign County GIS Consortium

The Champaign-Urbana regional freight infrastructure system has experienced increasing responsibilities to connect farmers to the marketplace in the past few years. In 2017, Champaign County produced 55.8 million bushels of grain corn, the fifth highest of all counties in Illinois<sup>14</sup>, and 16.5 million bushels of soybeans, the fourth highest of all counties in Illinois<sup>15</sup>. Since 2010, corn production in Champaign County has increased by 22 percent (14 percent yield increase, Figure 2-7) and soybean production has increased by 14 percent (20 percent yield increase, Figure 2-8). These productivity and yield increases place additional demand on the region's freight infrastructure system, adding to the wear-and-tear of rural roads and major highway connectors.

At the same time, total demand for industrial use of corn surpassed feed use as the largest source of domestic consumption<sup>16</sup>. Corn grown in Illinois is used to produce 15 percent of the ethanol consumed in the U.S. (2010)<sup>17</sup>. During the 2011-2012 growing season, the use of corn for ethanol and byproducts (including distillers' grains, corn gluten feed and meal, and corn oil) accounted for 40 percent of total corn production<sup>18</sup>. Thirteen ethanol plants in Illinois (Figure 2-9) produce 1.7 billion gallons of ethanol each year utilizing 670 million bushels of Illinois corn<sup>15</sup>, with Champaign County among the top providers of raw materials. While ethanol plants are mainly located along the Mississippi River and Illinois River and are equipped with rail-serving capabilities, refineries also rely on steady shipments of corn feedstock carried via trucks<sup>11</sup>.

Figure 2-7: Grain Corn Production

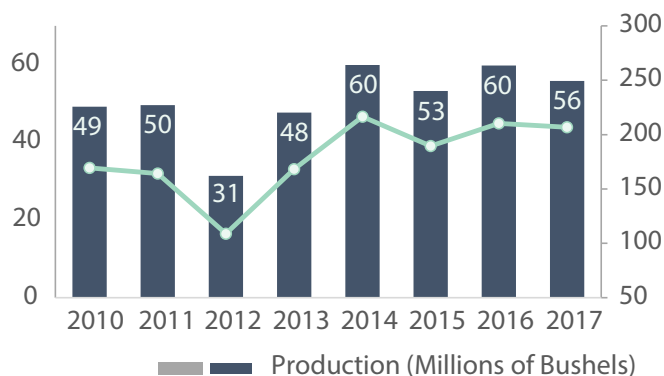
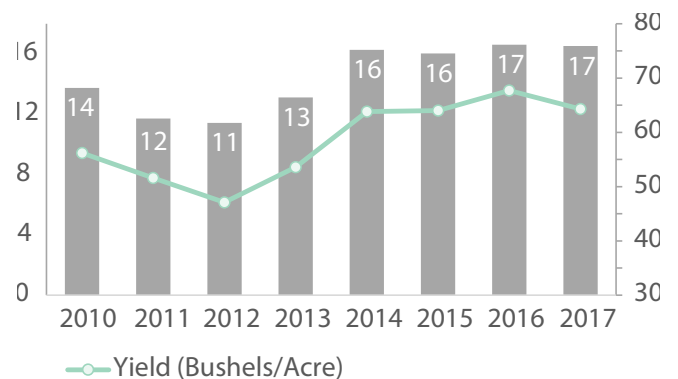


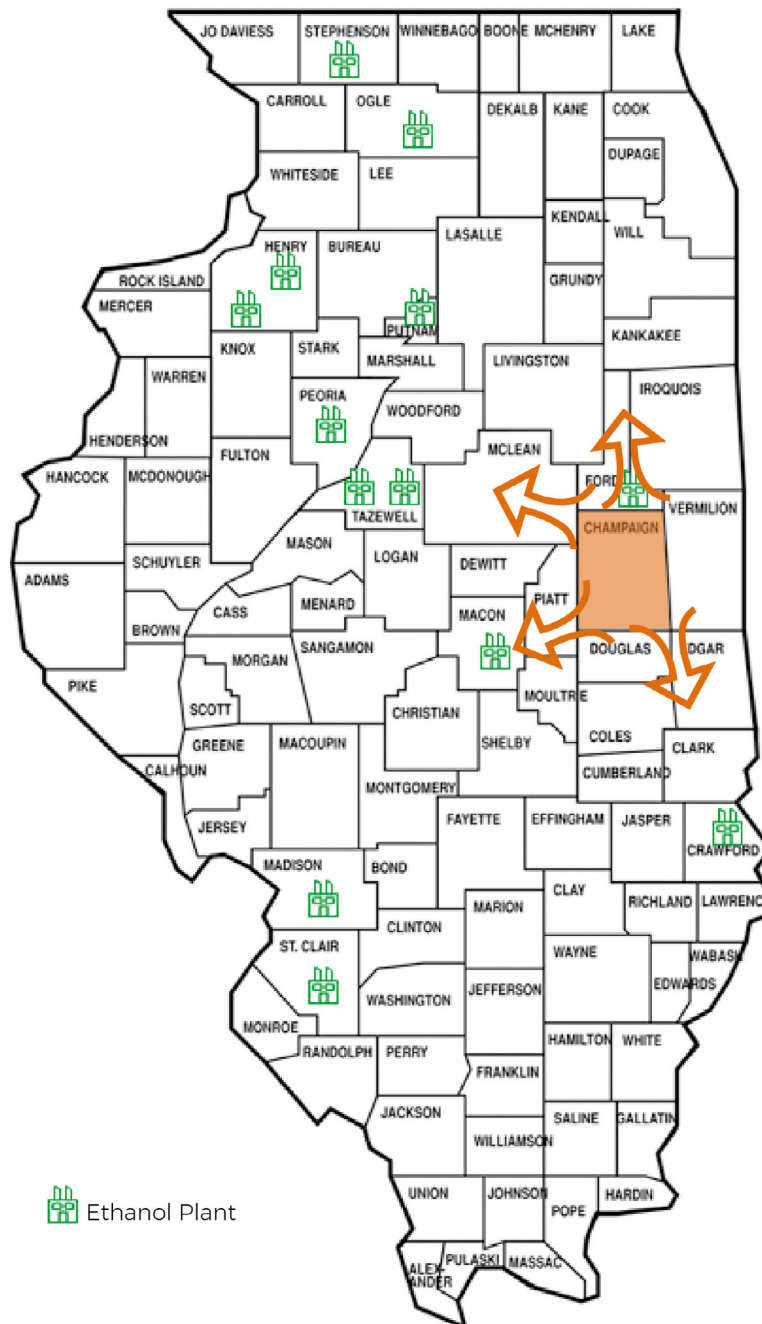
Figure 2-8: Soybean Production



Source: United States Department of Agriculture; National Agriculture Statistics Survey; Heartland Regional Field Office; Illinois Field Office; Illinois Corn County Estimates 2010-2017. The dip in production and yield in 2012 was caused by a severe drought<sup>19</sup>. Lower production and yield in 2015 was caused by heavy rains<sup>20</sup>.

The seasonal nature of agricultural operations also requires flexibility on the transportation system management policies, through measures such as exemptions or exceptions to weight limits. In 2017, Illinois declared a harvest emergency for 45 days beginning November 5 to permit drivers of trucks carrying agricultural commodities on state highways to obtain a free permit to exceed gross vehicle weight limits by 10 percent<sup>21</sup>. Further, local authorities may waive the permit requirement at their discretion.

Figure 2-9: Regional Ethanol Plants



Source: The Illinois Renewable Fuels Association. (2017). *Illinois Ethanol Fact Sheet*. Retrieved from <http://illinoisrfa.org/wp-content/uploads/2017/06/2017-Illinois-Ethanol-Fact-Sheet-final2.pdf>



## 2.3. Manufacturing sector

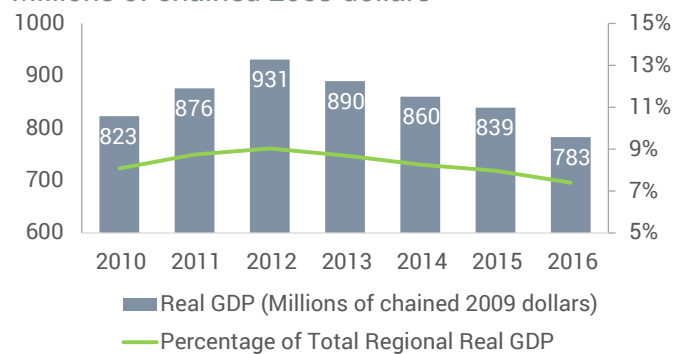
Manufacturing activities are essential for regional economies. Since manufacturers work with physical goods, they are major users of the freight system. Manufacturing sites tend to receive and send large shipments of goods, usually using large trucks or rail cars, but their specific freight needs vary based on the weight and value of their inputs and finished goods. For example, a manufacturing facility that uses Just in Time (JIT) manufacturing methods has low inventory to both save money and free capital. However, JIT requires a transportation mode and supply chain that is very reliable and offers a high level of service, otherwise there is a risk of shutting production down while waiting for inputs<sup>22</sup>.

The importance of manufacturing in the Champaign-Urbana MSA appears to be decreasing since 2013, after a period of recovery from the recession between 2010 and 2012. Both real GDP of the manufacturing sector and its share of the region's total real GDP has been decreasing since 2012 (Figure 2-10). From 2010 to 2016, the number of manufacturing establishments in Champaign County dropped by eight percent (Figure 2-11). However, the number of manufacturing employees has been stable at about 7,500 (Figure 2-13). Figure 2-12 shows the distribution of major manufacturing companies in the region.

The region has a strong food production industry, with a location quotient of 1.68 in 2017<sup>23,\*</sup>. Kraft Foods is the

**Figure 2-10: Manufacturing Real GDP**

Millions of chained 2009 dollars



Source: 2010-2016 Regional Economic Accounts. Bureau of Economic Analysis.

**Figure 2-11: Manufacturing Establishments**

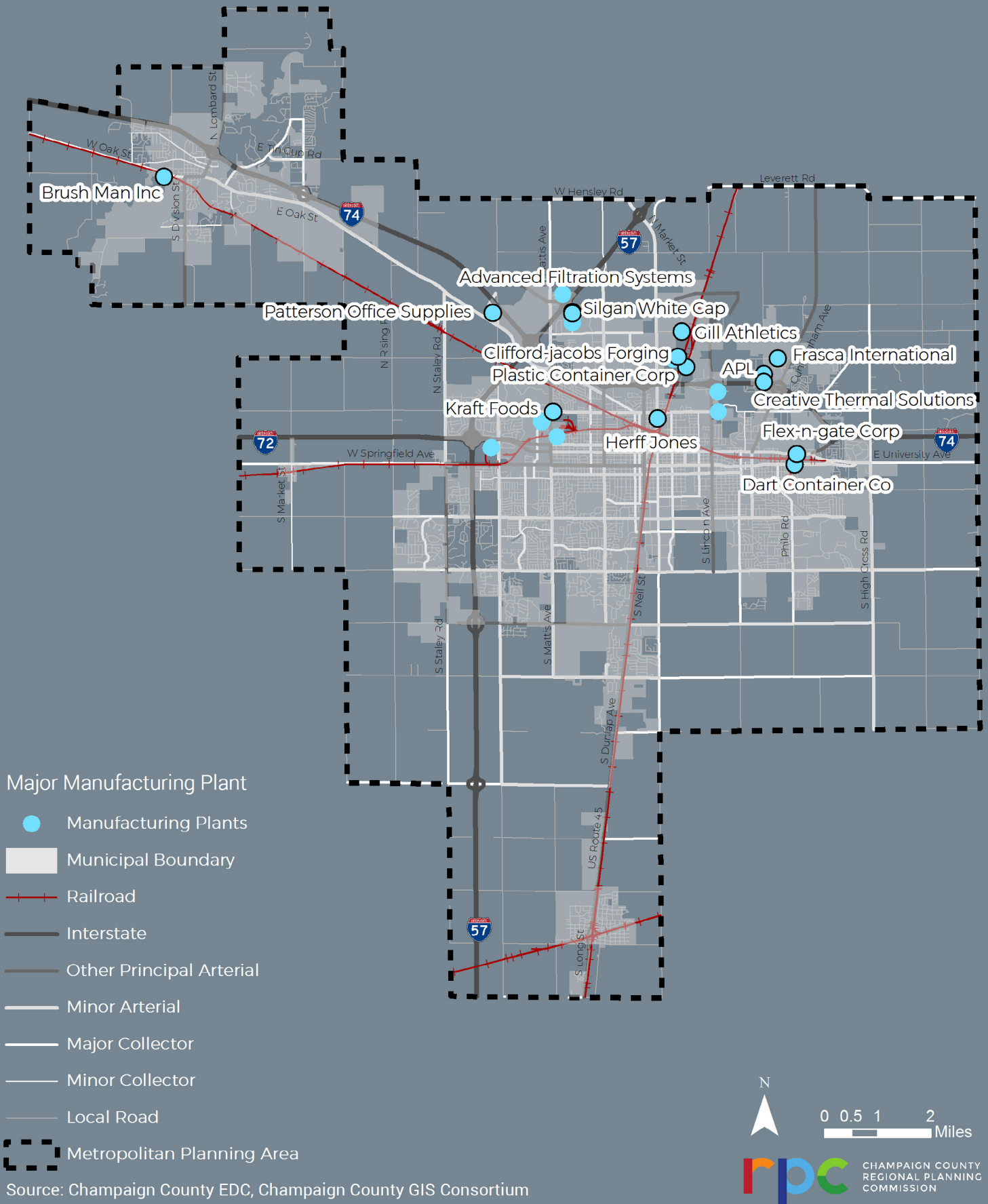


Source: 2010-2016 American Community Survey 5-year Estimates, US Census Bureau.

\* Location quotient measures how concentrated a particular industry is in a region as compared to the nation. It can reveal what makes a particular region “unique” in comparison to the national average.

The region's location quotient for food production is 1.68, meaning that the food production industry is 1.68 times more concentrated in the Champaign-Urbana region than the national average.

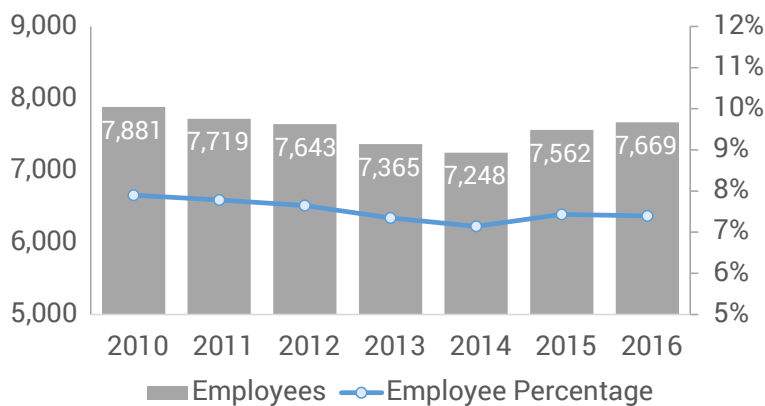
Figure 2-12: Major Manufacturing Plants



fourth largest employer in the county with more than 900 employees in 2018. It produces half the country's Kraft Macaroni & Cheese, as well as Kraft dressings, mayonnaise, Miracle Whip and A 1 Sauce<sup>24</sup>. The Champaign plant was constructed in 1963<sup>25</sup>. The transport facility houses the company's largest private fleet of trucks<sup>25</sup> in this region. As of 2013, Kraft had grown to a 1.2 million-square-foot plant and 430,000-square-foot distribution center<sup>25</sup>. In 2015, Kraft merged with Heinz and announced that it was moving cheese production from the Champaign location with potential job cuts, and plans to make Champaign a center in dry and sauce production<sup>26</sup>, with the installation of a new pasta dryer currently underway<sup>27</sup>. The plant receives and ships 1.2 billion pounds of freight annually with more than 300 trucks going in and out from the plant daily.

The region also has a strong plastic industry, with a location quotient of 2.6, an increase from 2.3 in 2007<sup>28</sup>. This indicates a strong presence of this industry in the region: 2.6 times more concentrated in Champaign County than average. Dart Container Corporation, which acquired Solo Cup in 2012, makes plastic cups, lids, and containers at its 269,000-square-foot plant on East Main Street in Urbana, employing about 350 personnel<sup>28</sup>. Some of the products are sold to grocery stores and mass retailers, while others are used by some of the nation's biggest fast-food chains<sup>29</sup>. Silgan Closures, which has a 254,616-square-foot plant in the Interstate Research Park in Champaign, makes plastic caps and closures for a variety of consumer products, such as sports drink bottles. The company recently leased a rail site near its facility to bring in plastic resin, rather than bringing it by truck. This has allowed the company to move its off-site warehousing within the site in an effort to cut waste and energy consumption<sup>30</sup>.

**Figure 2-13: Manufacturing Employees**



Source: 2010-2016 American Community Survey 5-year Estimates, US Census Bureau.





Figure: Satellite View of I-74 west of Lincoln Avenue

Source: Google Earth Pro for Desktop



The region is also home to automotive suppliers and heavy machinery manufacturers. Flex-N-Gate, based in Urbana, makes bumpers, radiators, hinges, and a variety of other automotive equipment. Its Guardian West auto parts manufacturing plant sits just north of University Avenue and west of I-74 in Urbana. Frasca International, with more than 180 employees<sup>31</sup>, is located on Airport Road west of Cunningham Avenue in Urbana, and specializes in manufacturing flight simulators.

The region also has an advanced machining and metal stamping industry. Advanced Filtration Systems, located in the Interstate Research Park in Champaign, designs and manufactures high-efficiency fluid filters used in Caterpillar machinery worldwide. Clifford-Jacobs was founded in Urbana in 1919 and moved to its current site, along the Canadian National Railroad tracks, north of I-74, in 1923<sup>32</sup>. The company keeps an inventory of die-block material on hand<sup>33</sup>, and creates parts for a variety of commercial, industrial, military, and mining applications. It also supplies components for making C-U MTD buses<sup>34</sup>. APL Engineering Materials, located on Willow Drive north of I-74 and west of Cunningham Avenue in Urbana, produces materials including metals for lighting industries at its 29-acre site. Creative Thermal Solution, located just south of APL, develops air-conditioning and refrigeration technologies for residential, commercial, and industrial use at its 100,000-square-foot plant<sup>35</sup>.

Apparel and sport goods manufacturing also has a relatively higher location quotient in the region (1.13). Herff Jones, with a plant on North Market Street in Champaign, produces and

**Figure 2-14: A Freight Train Standing at a Station**



*Source: Ziegenbein, K. (n.d.) Ken's Weather and Railroad Page. Retrieved from <http://thundertrain.org/trains-122610.html>*

distributes graduation caps, gowns, and tassels to high schools and colleges nationwide. Because of the concentration of commencement dates, May to July is the busiest season for shipping rental gowns and receiving returns following ceremonies. About 220 full-time employees work at Herff Jones in Champaign year-round, and the plant adds 60 to 80 seasonal workers during the busy period for a total employment of 280 to 300<sup>36</sup>. Litania Sports Group (Gill Athletics), located in the Apollo Industrial Subdivision off North Market Street just west of the Canadian National Railroad tracks, manufactures track and field equipment at its 200,000-square-foot facility.

Champaign County also has a concentrated printing and packaging industry (location quotient of 1.18), with companies including DSC Packaging Services, Plastic Packaging, and Omegatype Typography located southeast of the I-57 and I-72 interchange, and Premier Print Group, located south of Olympian Drive, east of I-57 in Champaign. Patterson Companies, a medical and office supplies company, will convert their plant located near the intersection of U.S. 150 and Duncan Road in Champaign to a customer service center<sup>37</sup>, which may impact their freight activities.

Brush Man, located on Oak Street in Mahomet, is a manufacturer and distributor of consumable and accessory items. Rantoul Foods, a meat processor located west of I-57 in the Village of Rantoul, has more than 500 employees. Jeld Wen, a manufacturer of windows and doors, employs over 400 workers in the Village of Rantoul.

Figure 2-15: A Silgan Closures Freight Truck



Source: Featherstone, C. (2017) XPOLogistics Silgan Closures. Retrieved from <https://www.flickr.com/photos/74356787@N05/38972585035/in/pool-2039319@N24/>

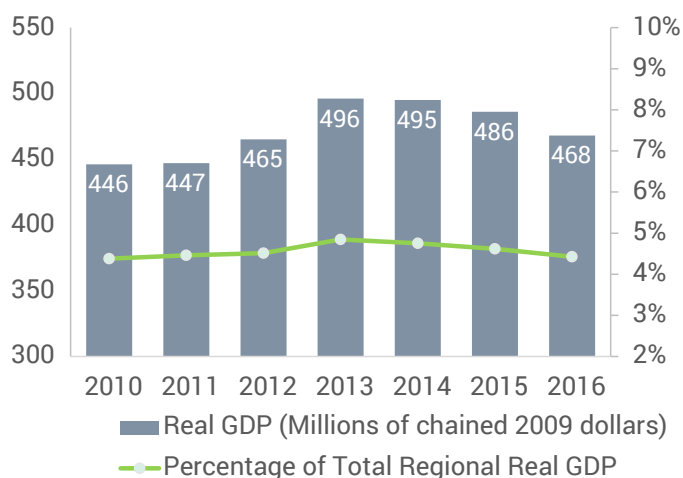
## 2.4. Wholesale and retail sectors

Combined, wholesale and retail sectors employ 13.1 percent of the workers in Champaign County (Figure 2-2). Different from the agriculture and manufacturing sectors that rely mainly on the railroads and the interstate system for freight movements, wholesale and retail sectors require a wide range of freight facilities down to arterials and collector roads for their daily operations.

Wholesale trade's share of the region's total real GDP has been relatively steady since the recession at around 4.5 percent, with about 125 stores employing a number of employees in Champaign County that has increased from around 2,000 in 2010 to more than 3,000 in 2016, as shown in Figure 2-17.

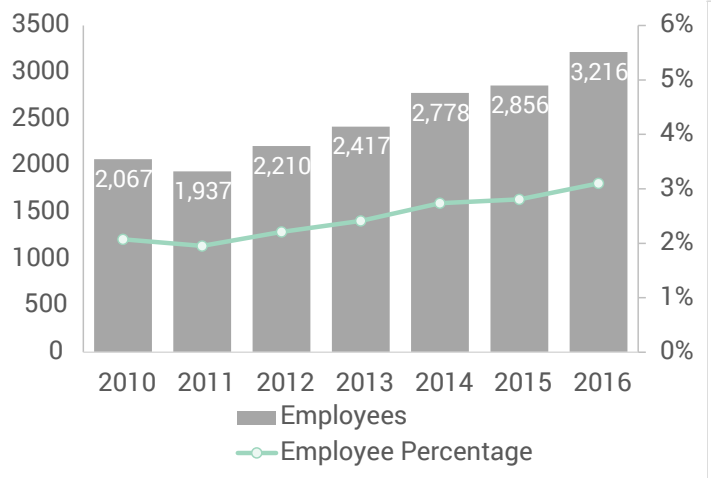
The region has a location quotient of 1.13 in the hobby-product wholesale and distribution industry. Horizon Hobby, with more than 340 employees at its Champaign location<sup>38</sup>, is a wholesale radio control distributor. Its Champaign headquarters, located at the southwest side of the I-57 and I-72 interchange, also has one of the industry's most modern distribution facilities to ensure fast and accurate delivery of products<sup>39</sup>. Hobbico, a hobby-product distributor and once a major employer in the region with 332 employees in 2017, filed for bankruptcy protection in January 2018<sup>40</sup>. Horizon Hobby has bought several units of Hobbico<sup>41, 42</sup>. Supervalu, a grocery wholesaler and retailer, has two wholesale distribution centers located along the railroad tracks north of I-74. The company employs more than 500 workers<sup>43</sup>.

**Figure 2-16: Wholesale Trade Real GDP**  
Millions of chained 2009 dollars



Source: 2010-2016 American Community Survey 5-year Estimates, US Census Bureau.

**Figure 2-17: Wholesale Trade Employees**



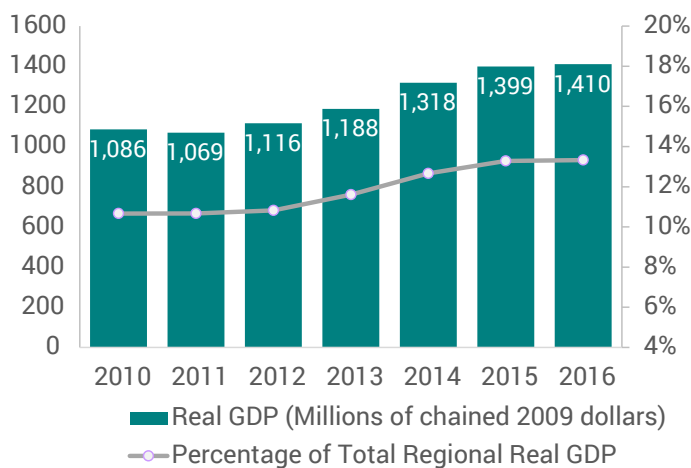
Source: 2010-2016 American Community Survey 5-year Estimates, US Census Bureau.

Retail's share of the region's total real GDP increased since the recession, from 10 percent in 2010 to more than 13 percent in 2016 (Figure 2-18). Employment in the retail sector has been accounting for about 10 percent to 11 percent of total employment in the region, while the number of retail employees fluctuated between 10,000 to 11,000 from 2010 to 2016 (Figure 2-19).

While the retail sector has been growing in the region, challenges remain. Since fiscal year 1988-1989, retail sales tax revenue for Champaign and Urbana has grown about 4 percent per year on average. However, in the last 10 years, the average annual increase has dropped to 3 percent, according to the Illinois Department of Revenue<sup>44</sup>. One of the reasons for the slower increase in local retail industry sales is that more customers are turning to online sellers like Amazon, which offer added convenience with one-click purchasing, and, more importantly, fast delivery. After opening a pickup location at the Illini Union bookstore where certain items can be delivered the same day they were ordered<sup>44</sup> in 2016, Amazon has deployed Amazon-branded vans for deliveries in the Champaign-Urbana area in 2018<sup>45</sup>.

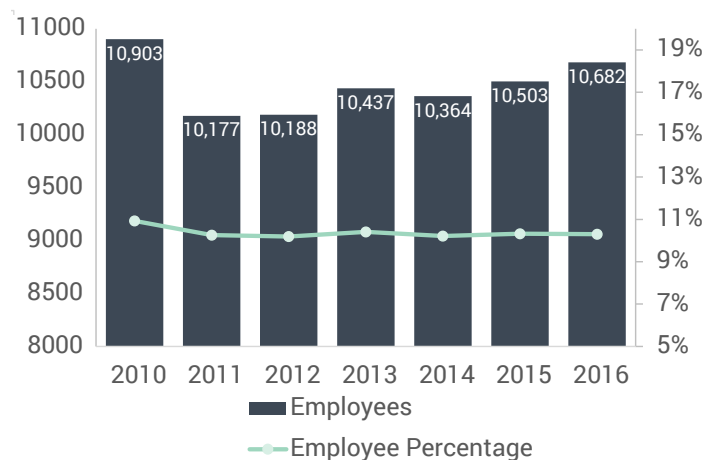
Figure 2-20 shows the distribution of the major wholesalers in the Champaign-Urbana MPA. They tend to locate along the rail lines or major highways. Figure 2-21 shows the distribution of the major retailers in the Champaign-Urbana MPA. They tend to locate along arterial roadways.

**Figure 2-18: Retail Trade Real GDP**  
Millions of chained 2009 dollars



Source: 2010-2016 American Community Survey  
5-year Estimates, US Census Bureau.

**Figure 2-19: Retail Trade Employees**



Source: 2010-2016 Regional Economic Accounts.  
Bureau of Economic Analysis.



Figure 2-20: Major Wholesalers

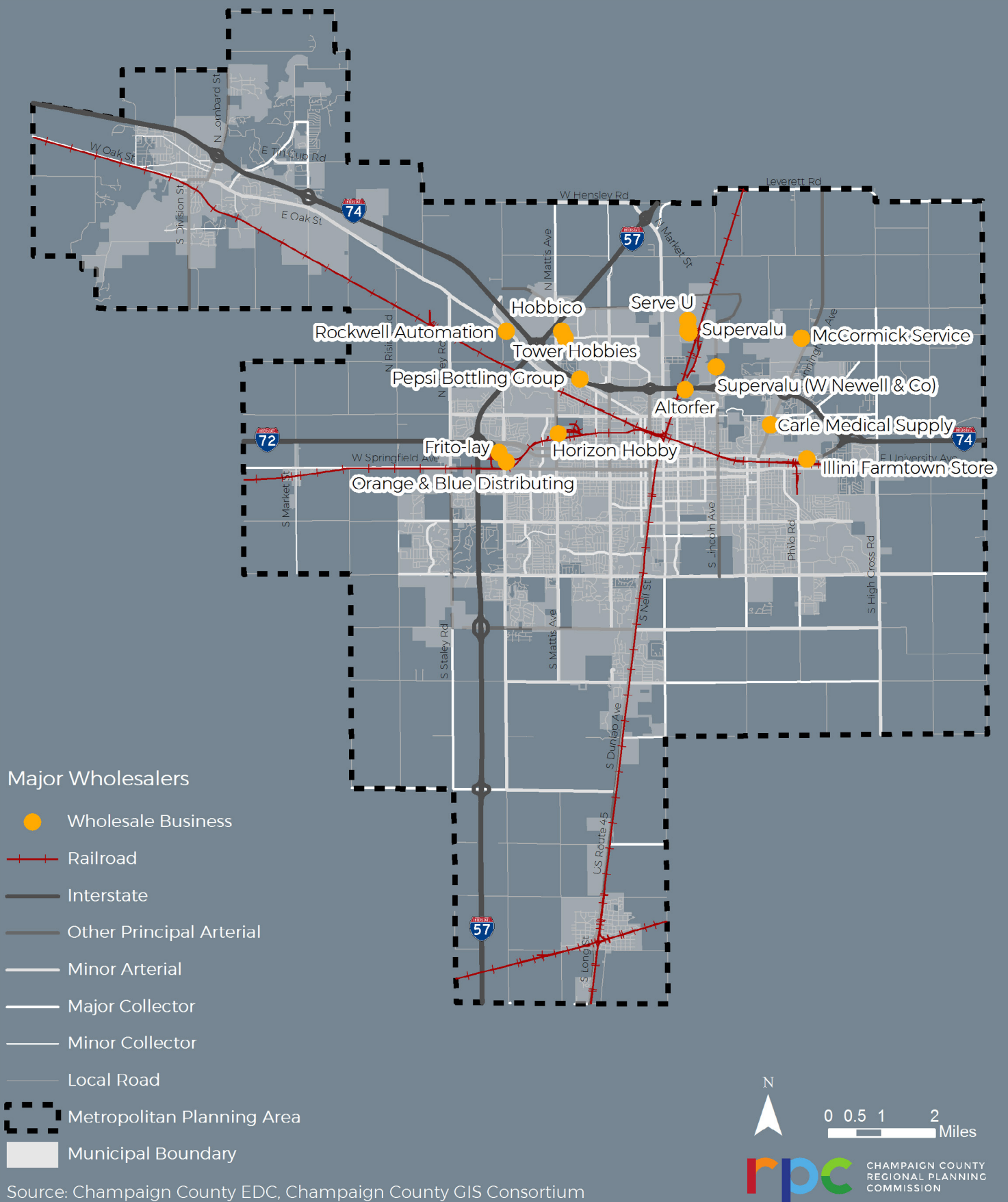
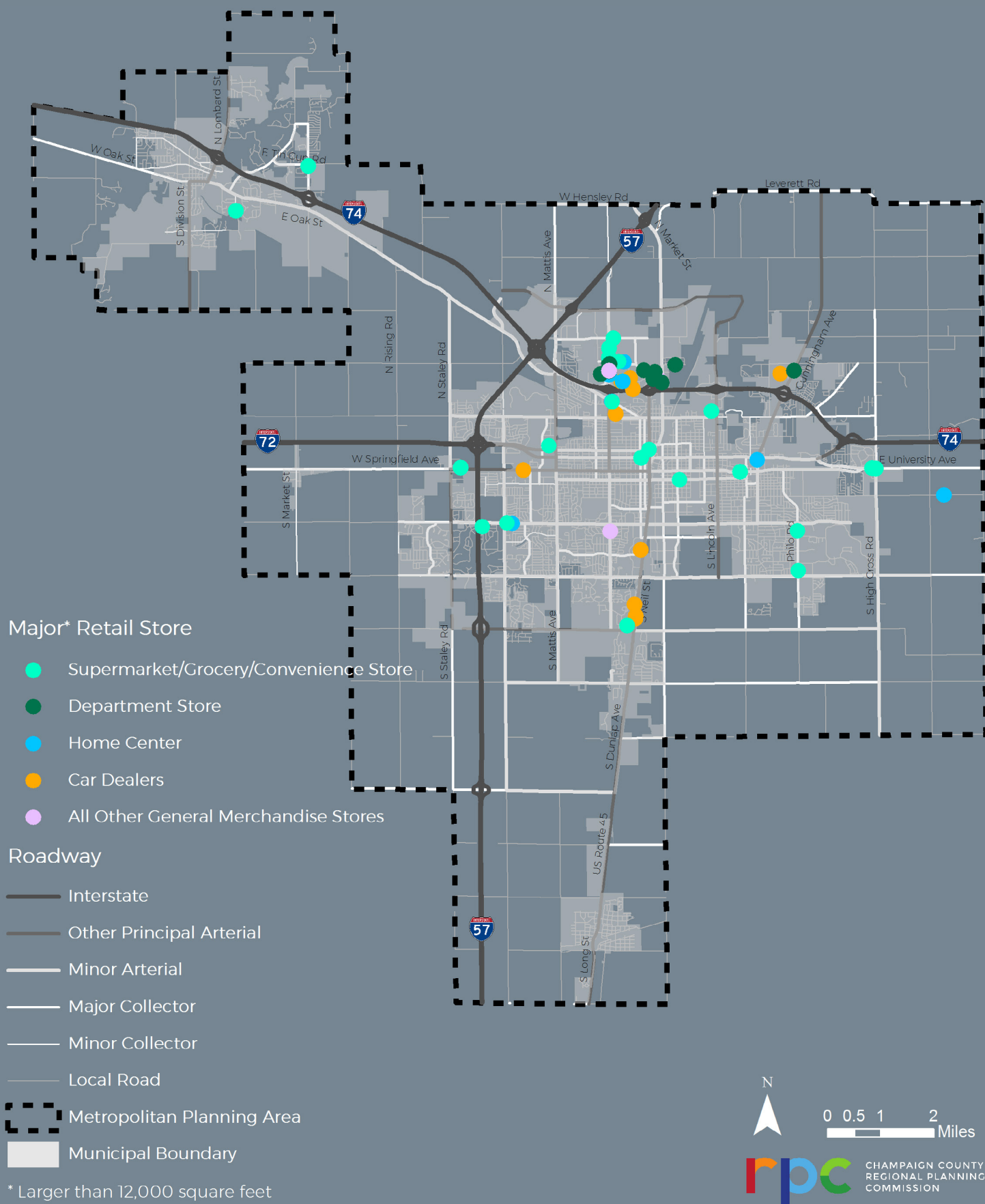


Figure 2-21: Major Retail Stores



\* Larger than 12,000 square feet

Source: Champaign County EDC, Champaign County GIS Consortium

## 2.5. Other freight generators

Mining operations have the highest freight generation rates for all modes, as shown in [Table 2-1](#). Therefore, a functioning and adequate freight infrastructure network is vital for this type of businesses. Vulcan Materials and Sport Redi-Mix are the major building material suppliers in the region. They are located along the railroad tracks and adjacent to the railroad yards with short distance to both the interstates and local arterials.

Petroleum products transportation is another major freight generator. [Figure 2-22](#) shows the petroleum product pipelines and major storage facilities in Champaign County. People's Gas Manlove Field in Newcomb Township, a natural gas storage area with an onsite liquefied natural gas plant, is an underground facility opened in 1966 capable of storing approximately 150 billion cubic feet of natural gas for delivery to the Chicago area via connected pipelines<sup>46</sup>. The Marathon Terminal, located on Staley Road south of Springfield Avenue in Champaign, is another major storage facility.

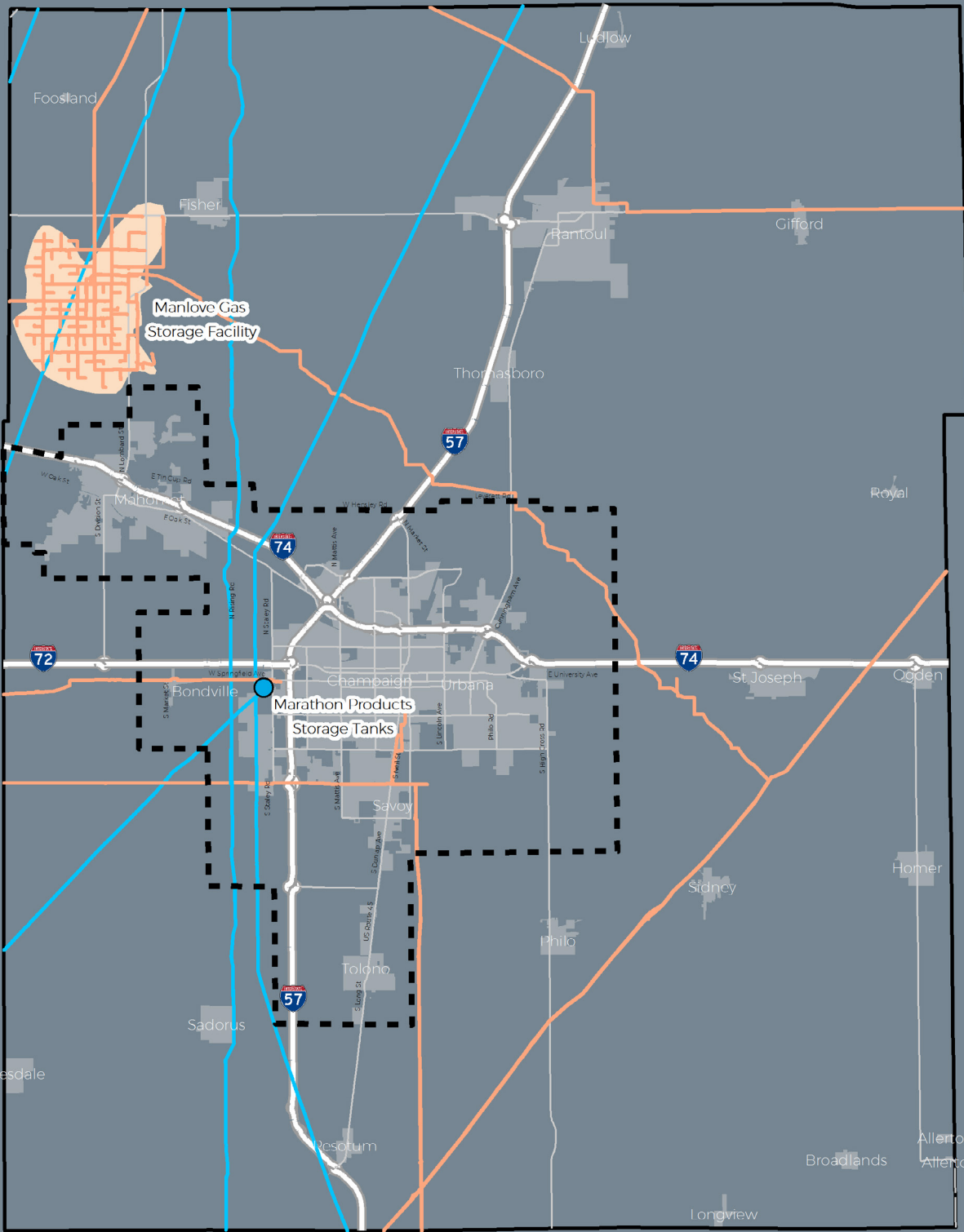
Other sectors and services, including restaurants, construction companies, and sanitary/recycling services, also generate and attract freight. Urban deliveries and service activities produce vast amounts of freight trips, sometimes even larger than the amounts produced by manufacturing and large facilities like airports<sup>10</sup>.

What distinguishes the freight movement generated by these types of services from other goods movement is that restaurants or other urban deliveries often experience the "last 50 feet" problem<sup>46</sup>, which refers to the difficulty when trucks have to maneuver on narrower streets with limited loading space.

In most cases, deliveries to urban areas are made using delivery vans and small trucks. These trips deliver small shipments with a relatively high frequency, because most commercial establishments in urban areas tend to have limited storage space. Moreover, these establishments produce waste and "reverse logistics" of returns and exchanges, generating additional truck traffics. At the same time, e-commerce also has brought a surge in deliveries to dense neighborhoods that were infrequently designed for trucks.



Figure 2-22: Petroleum Product Pipelines and Major Storage Facilities



Petroleum Product Pipelines & Major Storage Facilities

- Gas
- Manlove Gas Storage Facility
- Interstate
- Liquid
- Marathon Products Storage Tanks
- Arterial

Source: IDOT, Champaign County GIS Consortium, USDOT, Pipeline and Hazardous Materials Safety Administration (PHMSA)



## 2.6. Warehousing and logistics

Warehousing and logistics industries serve as the bridge between producers and consumers, making sure that goods are transported where and when they are needed. While manufacturers and wholesalers often have their own warehouses and sometime operate their own fleets, this section focuses on businesses that specialize in warehousing and delivery services as their main field of operation. [Figure 2-23](#) shows the location of some of the major warehousing and logistics companies in the region.

Champaign County has a location quotient of 2.13 in couriers and express delivery services, meaning this sector is two times more concentrated in Champaign County than the national average. There are about 120 businesses identified as Transportation and Warehousing<sup>47</sup> with a total real GDP of 200 million chained 2009 dollars<sup>48</sup>, accounting for between three and four percent of employment in the region<sup>49</sup>.

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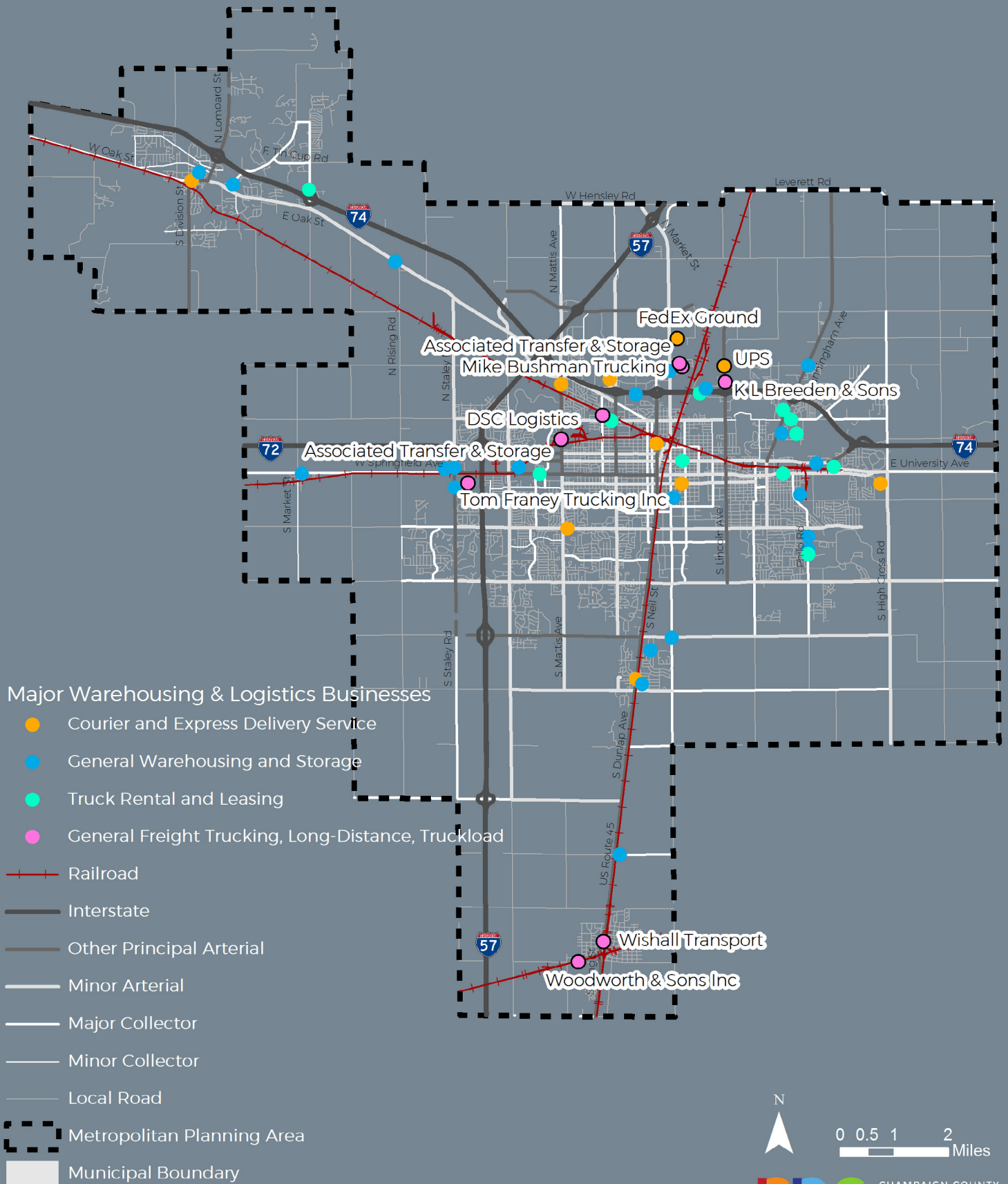
**Warehousing and logistics industries serve as the bridge between producers and consumers, making sure that needed goods are transported where and when they are needed.**

---

FedEx Ground has one of its 32 regional hubs located in the Apollo Subdivision in the City of Champaign. The facility, located on the 42-acre site at the northeast corner of North Market Street and Mercury Drive, began operations in June 1999. According to FedEx Ground, “the proximity to large regional markets such as Chicago was a primary reason the delivery firm chose to build a distribution center here”<sup>50</sup>. From 2003 to 2011 alone, package volume has grown from 2.1 million packages per day to more than 3.6 million per day<sup>51</sup>. In 2012, FedEx made a major expansion to its Champaign hub to about 250,000 square feet<sup>51</sup>. According to Champaign County EDC, employment at the hub stood at 681 in 2017<sup>52</sup>. Across the railroad tracks from FedEx is a UPS distribution center located along Lincoln Avenue.

DSC logistics, located just south of Kraft Foods on Mattis Avenue in the City of Champaign, is a major third-party logistics (3PL) service provider for local businesses.

Figure 2-23: Major Warehousing and Logistics Business



Source: Champaign County EDC, Champaign County GIS Consortium

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Figure: A Freight Truck

Source: J. Pachy Sr. National Truckers Association<sup>1</sup>

# 3. What is transported on the freight system?

Freight activity is economic activity in motion, and the freight system is where economic transactions take place. The primary objective of this chapter is to develop a better understanding of the commodity flows on the multimodal freight system in the Champaign-Urbana region and to use this information to better inform infrastructure policy and programming decisions. Using the Federal Highway Administration's Freight Analysis Framework (FAF) database (version 4, [Section 3.1](#)), Chapter 3 provides a comprehensive picture of the region's commodity flows, and answers the following questions:

- What are the leading modes and directions of trade? ([Section 3.2.1](#))
- What are the primary commodity flows to, from, and within Champaign County? ([Section 3.2.2](#))
- Who are Champaign County's key trading partners? ([Section 3.2.3](#))
- How are the commodity flow patterns likely to change in the future? ([Section 3.3](#))

## 3.1. FAF4 data and disaggregation

FAF is a free public data model produced by the U.S. Department of Transportation to assist freight planning. FAF uses Commodity Flow Survey and other federal information to provide estimates on freight tonnage and freight value for 42 broad commodity groups and different transportation modes. The latest FAF database (FAF4) has 2012 as the base year with forecasts to 2045 and commodity truck-trips assigned to highway networks and major routes.

Although FAF4 data is the most comprehensive and accurate data regarding freight movement that is available in the field, it has a few limitations. FAF4 data is limited to 50 states and 132 "business economic area" zones, as shown in [Figure 3-1](#). Champaign County data is combined with data for other non-Chicago-area counties and non-St. Louis-area counties in Illinois in the original FAF4 database.

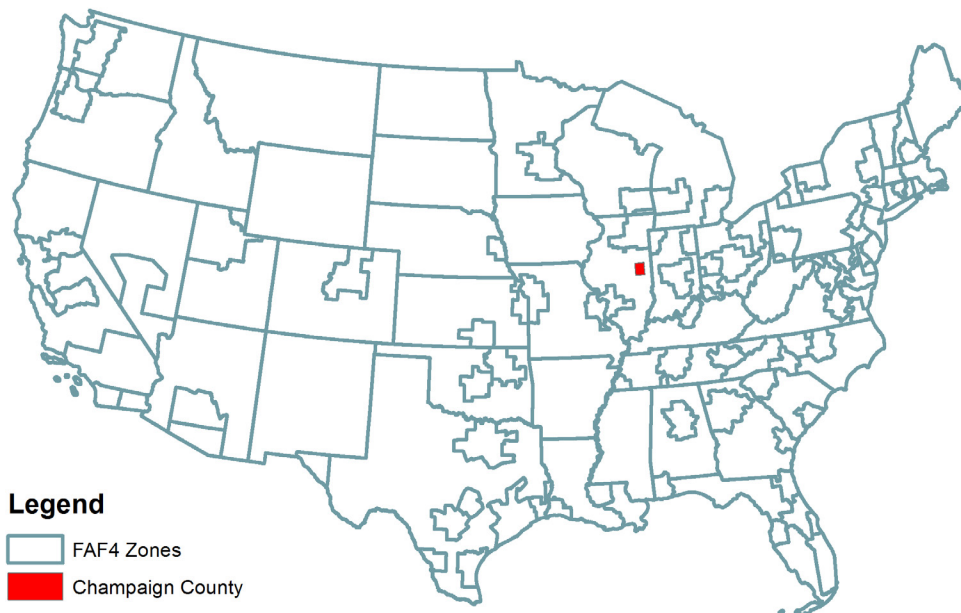
For Champaign County truck commodity flows, this chapter utilizes a modified version of the FAF4 database developed for IDOT by transportation consultant WSP, which breaks down the FAF4 truck commodity flows to the county level, for analysis years 2017 (extrapolated from 2012) and 2045.

For Champaign County rail commodity flows, this chapter developed a disaggregation method that uses variables including population, employment by industry, and land use to break down the FAF4 national rail commodity flow database to the county level for Illinois and the state level for the rest of the country for each commodity type. Staff used IDOT's county level tonnage by directions information, which is based on Surface Transportation Board's Confidential Waybill Sample<sup>2</sup>, to validate the disaggregation results.

The disaggregated data can be used to calculate inbound, outbound, and internal freight tonnage and value, but not for pass-through freight activities. In addition, FAF4 data cannot capture all freight movements, such as those conducted by in-house fleet. Many commodities such as timber, some farm products, fisheries products, or solid waste cannot be completely calculated either.

With the limitations of the FAF4 database in mind, this chapter examines commodity flows coming in Champaign County (inbound), generated from Champaign County (outbound), and within Champaign County (internal), from the perspectives of tonnage and value.

Figure 3-1: FAF4 Analysis Zones



Source: FHWA

## 3.2. Commodity flows today

### 3.2.1. Regional commodity flow overview

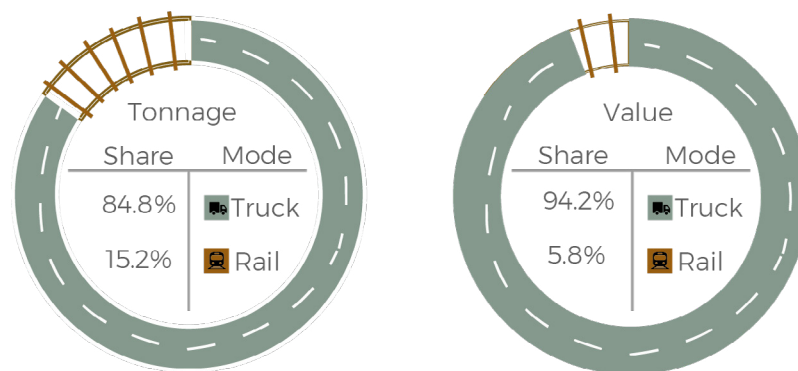
An estimated 20.7 million tons of goods, valued at about \$20.9 billion, were moved on the region's freight system by trucks and trains in 2017\*. The figures underestimate the total amounts actually shipped, because they do not include pipeline and air transporters.

#### a) Total tonnage and value by mode

Eighty-five percent of the total goods tonnage (17.7 million tons), accounting for 94 percent of total goods value (\$19.7 billion), were moved by trucks on the county's roadway network. The rest of the total tonnage and value were moved by trains<sup>2</sup> (Figure 3-2). The share of freight value carried by trucks (94 percent) was greater than the share of tonnage carried by trucks (85 percent), suggesting that trucks were used to carry the region's relatively higher-value, lower-weight goods<sup>†</sup>.

Compared with outbound movements, a higher percentage of inbound goods were moved by trucks. Specifically, 92 percent of the inbound goods by tonnage (95 percent of inbound goods by value), 78 percent of the outbound goods by tonnage (94 percent of outbound goods by value), and 100 percent of the internal freight activities were moved by trucks<sup>2</sup>.

Figure 3-2: Total Commodity Tonnage and Value by Mode, 2017



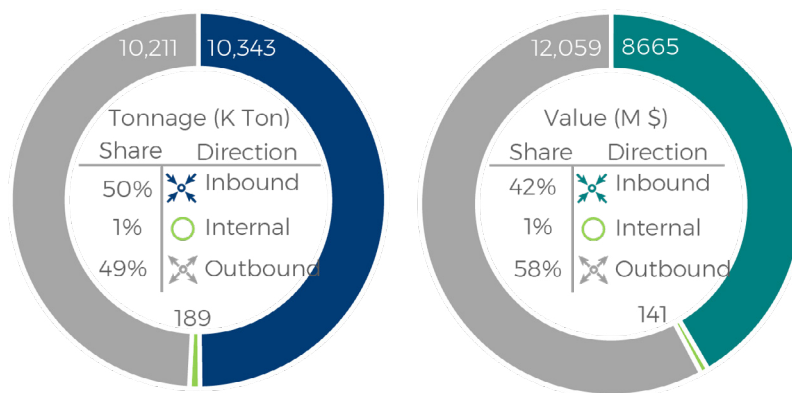
\* A simple linear extrapolation method is used to calculate 2017 commodity flow data.

† The fact that the FAF4 data does not include pass-through traffic also contributes to the lower percentage of train freight.

## b) Total tonnage and value by direction

Commodity flows (truck and rail combined) in Champaign County were fairly balanced between inbound and outbound directions in terms of tonnage in 2017, as shown in Figure 3-3. Outbound commodity flows, accounting for a lower percentage of total tonnage (49 percent), generated a higher percentage of total value (58 percent). This indicates that Champaign County, compared with its goods consumption, produces commodities that are lower in weight but higher in value. The tonnage and value moving within Champaign County (Internal) was a very small share of total commodity movements, indicating Champaign County's economy is largely "outward facing."

Figure 3-3: Total Commodity Tonnage and Value by Direction, 2017



### 3.2.2. Leading commodity types

This section discusses the leading FAF4 commodity types by tonnage and value for truck and rail commodity flows for Champaign County.

Table 3-1 lists the major commodity types in detail, categorized by Standard Classification of Transportation Goods (SCTG).

Table 3-1: Details of Leading Commodity Groups

Commodity Name	SCTG Code	Description
Cereal Grains	02	Wheat, corn, rye, barley, oats, sorghum, rice and other cereal grains.
Other Agricultural Products	03	Soybeans; vegetables, fruit and nuts (fresh, chilled, or dried), other agricultural product.
Animal Feeds	04	Eggs, cereal straw or husks, forage products, residues and waste from the food industries used in animal feeding, and other products of animal origin not elsewhere classified.
Milled Grain Products	06	Milled or otherwise worked grain products; bakery products and food preparations of cereals, flour, starch or milk; baked products, including frozen.
Other Prepared Foodstuffs, and Fats and Oils	07	Dairy products, processed or prepared vegetables, fruit, or nuts, juices, coffee, tea, spices, animal or vegetable fats, oils and products (edible fats, waxes), flours, meals of oil seeds, sugar confectionery, cocoa preparations, other edible preparations, non-alcoholic beverages, ice.
Natural Sands	11	Silica sands and quartz sands for construction, industrial and other use.
Gravel	12	Salt and clays, construction material (cement, gypsum, anhydrite, asbestos, leucite, nepheline, ceramics, glass), agricultural limestone, limestone flux, crushed or broken limestone, crushed stone.
Nonmetal Mineral Products	31	
Petroleum Products	17/18	Gasoline including aviation, fuel oils including diesel.
Basic Chemicals	20	Inorganic chemicals, organic chemicals, paints and varnishes, and other chemical products and preparations for various chemical processes.
Other Chemical Products	23	
Plastics and Rubber	24	Plastics and rubber in primary forms, articles of plastics and/or rubber.
Wood Products	26	Various treated and untreated wood products in different forms.
Base Metal	32	Base metal in primary or demi-finished forms and in finished basic shapes.
Machinery	34	Agricultural, mining, forestry, and poultry or beekeeping machinery, and other non-electric motors, engines, and mechanical machinery.
Electronic and Electrical Equipment and Components	35	Electro-thermic or electro-mechanical domestic appliances, and other electronic equipment.
Motorized Vehicles	36	Motor vehicles and motor vehicle parts.
Miscellaneous	40	Toys, sporting equipment, brooms.
Waste and Scrap	41	Metal slag, ash, residues, other waste and scrap of ferrous metals, non-ferrous metals, sawdust, wood, paper, paperboard, glass.
Mixed Freight	43	Supplies for grocery stores, restaurants, hardware stores, and offices.

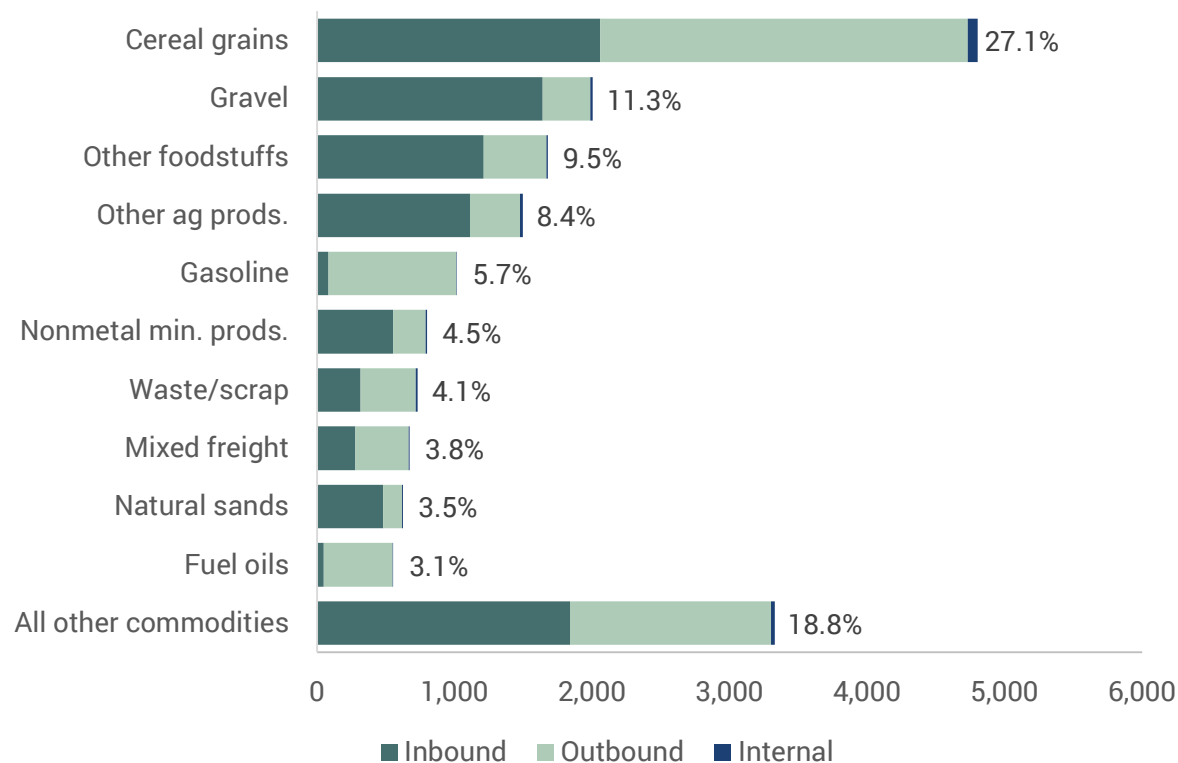
### a) Leading truck commodity types by tonnage

The leading truck commodity types for Champaign County in 2017, in terms of tonnage, were cereal grains, gravel, other foodstuffs, and other agricultural products. Combined, these four commodity types represented 56 percent of the total truck commodity tonnage. Other high-volume commodity types included gasoline, nonmetallic minerals, waste/scrap, mixed freight, natural sands, and fuel oils. The top 10 commodity types accounted for more than 81 percent of all truck commodity tonnage in 2017. Table 3-2 and Figure 3-4 show the leading truck commodity tonnage by direction.

Figure 3-5 shows the leading truck commodity types and trading partners. The larger the rectangle, the larger the volume of the commodity traded between Champaign County and the partner specified on the square.

Corns and soybeans combined accounted for the largest truck tonnage share, for both inbound and outbound directions. Champaign County is among the top five counties in Illinois in corn and soybean production (Section 2.2), which explains the high outbound truck flows of these two commodity types. Grains transported into Champaign County

Figure 3-4: Leading Truck Commodity Types by Tonnage and Direction, 2017 (1,000 tons)





for planting, as well as grains produced by surrounding Illinois counties and states, such as Indiana and Iowa, transported into Champaign County for processing or storage, likely explain the high inbound truck flows for these two commodity types.

Gravel and non-metallic minerals combined accounted for the second-largest truck commodity tonnage, particularly for the inbound direction. This commodity group is important for a variety of uses, including residential and commercial construction, particularly as foundation materials, highway construction and repair; and as an input for other industries such as concrete plants. It should be noted that FAF4 database counts agricultural limestone as one type of gravel. Gravel coming into Champaign County is mainly from Hardin County (Cave-In-Rock Quarry), Adams County (Mill Creek Quarry), Winnebago County (Porter Quarry), and Ogle County (Oregon Stone Quarry) in Illinois.

The strong food manufacturing sector in Champaign County explains the high volume of foodstuff movement by trucks, as discussed in [Section 2.3](#). Iowa, Missouri, Georgia, Indiana, and Cook County, IL (Chicago) are the major trading partners for this type of commodity.

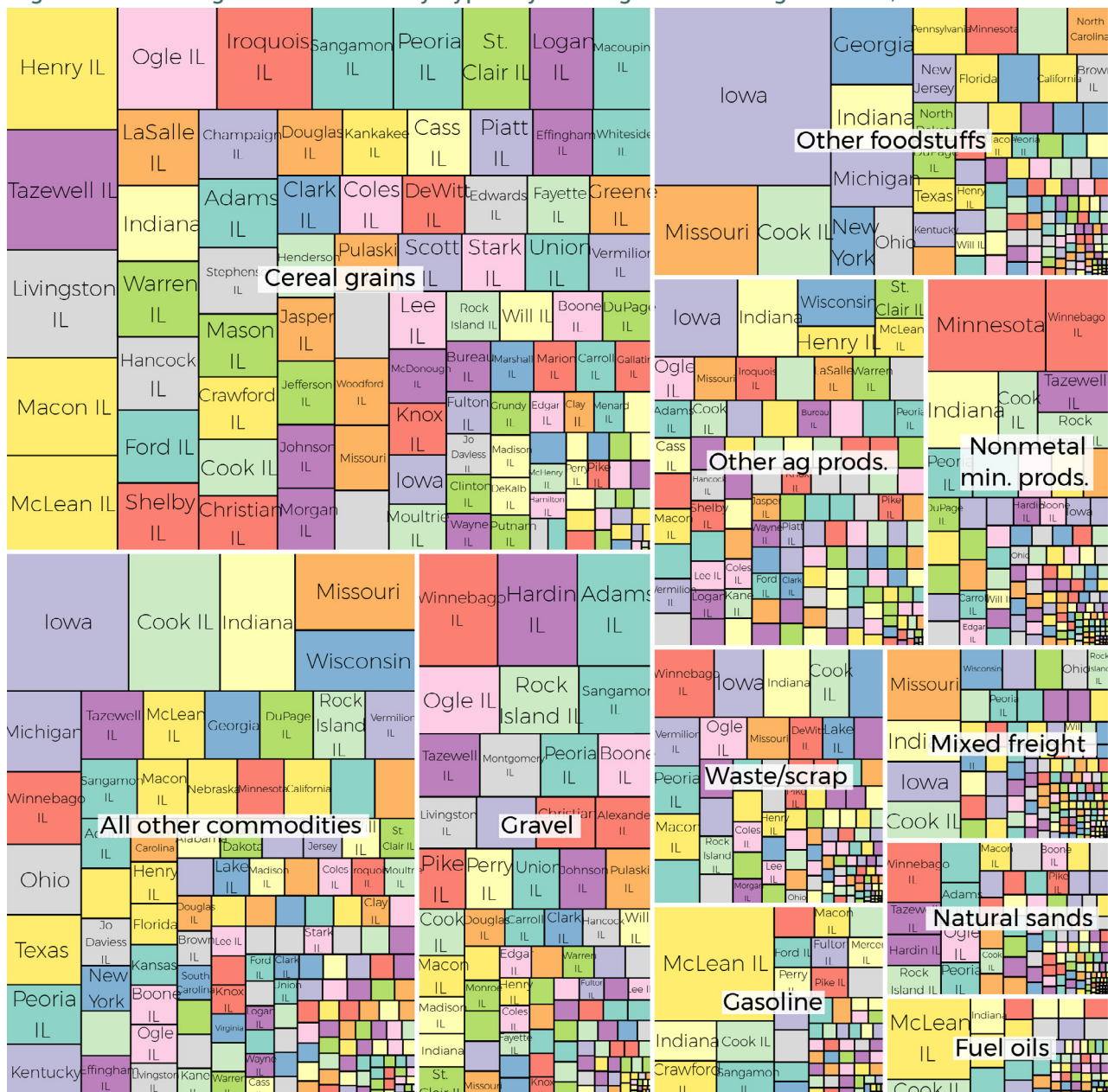
**Table 3-2: Leading Truck Commodity Types by Tonnage and Direction, 2017 (1,000 tons)**

Commodity Name	Inbound	Outbound	Internal	Total	Percentage
Cereal Grains	2,059	2,675	71	4,805	27.1%
Gravel	1,640	348	16	2,004	11.3%
Other Foodstuffs	1,212	456	11	1,680	9.5%
Other Agriculture Products	1,112	365	19	1,496	8.4%
Gasoline	82	931	4	1,017	5.7%
Nonmetal Mineral Products	552	238	9	800	4.5%
Waste/Scrap	316	400	16	732	4.1%
Mixed Freight	277	390	6	673	3.8%
Natural Sands	480	138	8	626	3.5%
Fuel Oils	50	501	2	553	3.1%
<b>All other commodities</b>	<b>1,841</b>	<b>1,461</b>	<b>25</b>	<b>3,327</b>	<b>18.8%</b>
<b>Total</b>	<b>9,621</b>	<b>7,902</b>	<b>189</b>	<b>17,712</b>	<b>100%</b>

Petroleum products are the main drivers of agriculture, manufacturing, and energy. Their distribution is central to a strong economy. Petroleum products usually arrive by pipeline and are stored in onsite tanks or at nearby storage facilities. Trucks then move them from storage facilities to gas stations and agricultural sites within Champaign County as internal flows, as well as to adjacent counties.

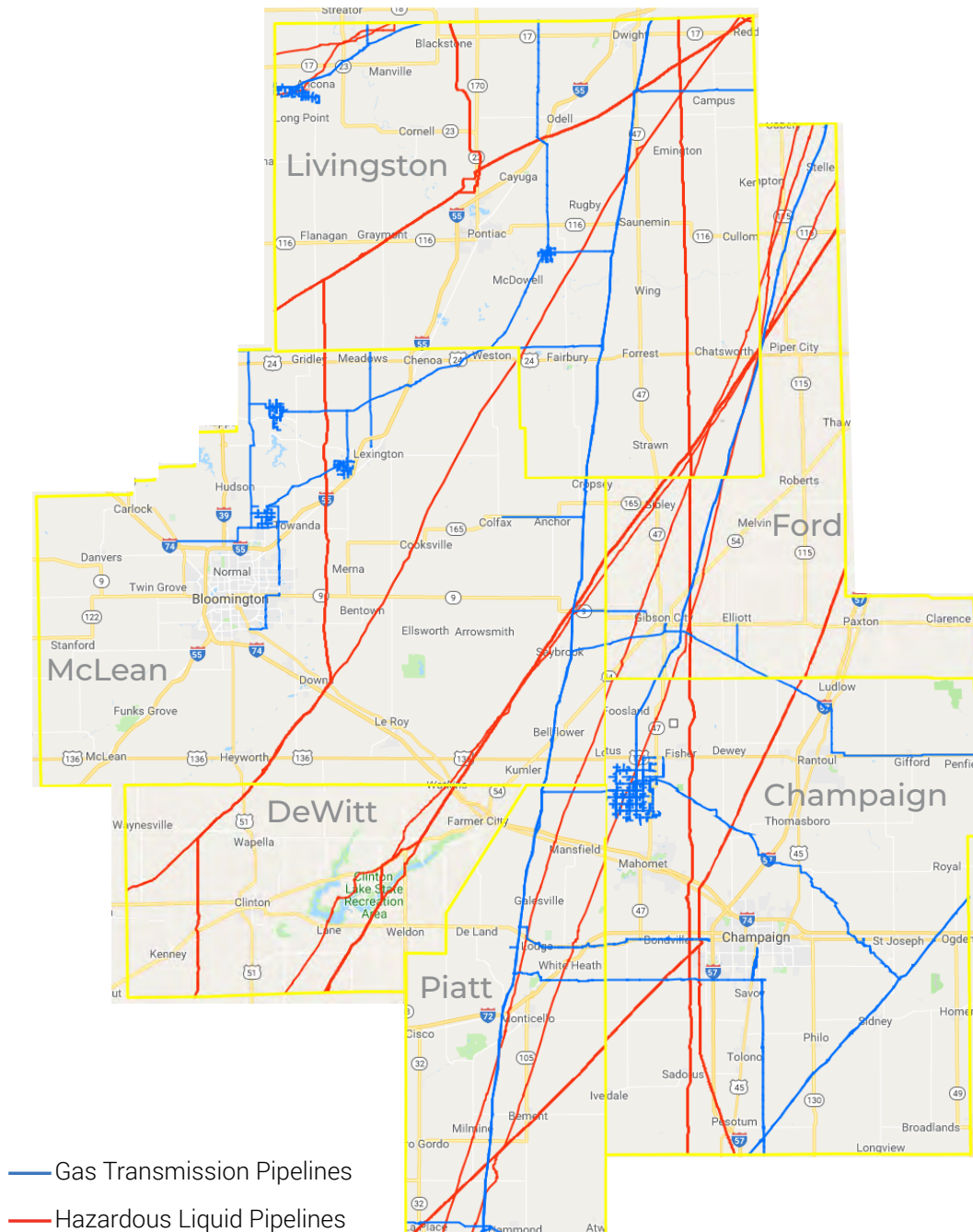
A large portion of the outbound petroleum product truck flows from Champaign County, likely stored at the People's Gas Manlove Field in northwest Champaign, to McLean County, IL (Bloomington). Figure 3-6 shows that there are no direct pipeline connections between McLean County and the People's Gas Manlove Field, which has a substantial storage

**Figure 3-5: Leading Truck Commodity Types by Tonnage and Trading Partners, 2017**



capacity and serves as a major storage farm delivering to the Chicago area and central Illinois. This likely explains the high truck volumes transporting gasoline and fuel oils to McLean County reflected in the FAF4 database. In addition, the increased demand for industrial use of corn for biofuels (ethanol) and byproducts (including distillers' grains, corn gluten feed and meal, and corn oil) is likely another reason, as refineries also rely on steady shipments of corn feedstock carried via trucks, as discussed in Section 2.2.

**Figure 3-6: Regional Pipelines**



By value, a largely varied group of commodities in Champaign County took the top 10 slots in 2017. The leading truck commodity types were mixed freight, other foodstuffs, electronics, cereal grains, and motorized vehicles. Combined, these five commodity types represented almost 50 percent of total truck commodity value.

Figure 3-7: Leading Truck Commodity Types by Value and Trading Partners, 2017



Figure 3-8: Leading Truck Commodity Types by Value and Direction, 2017 (million dollars)

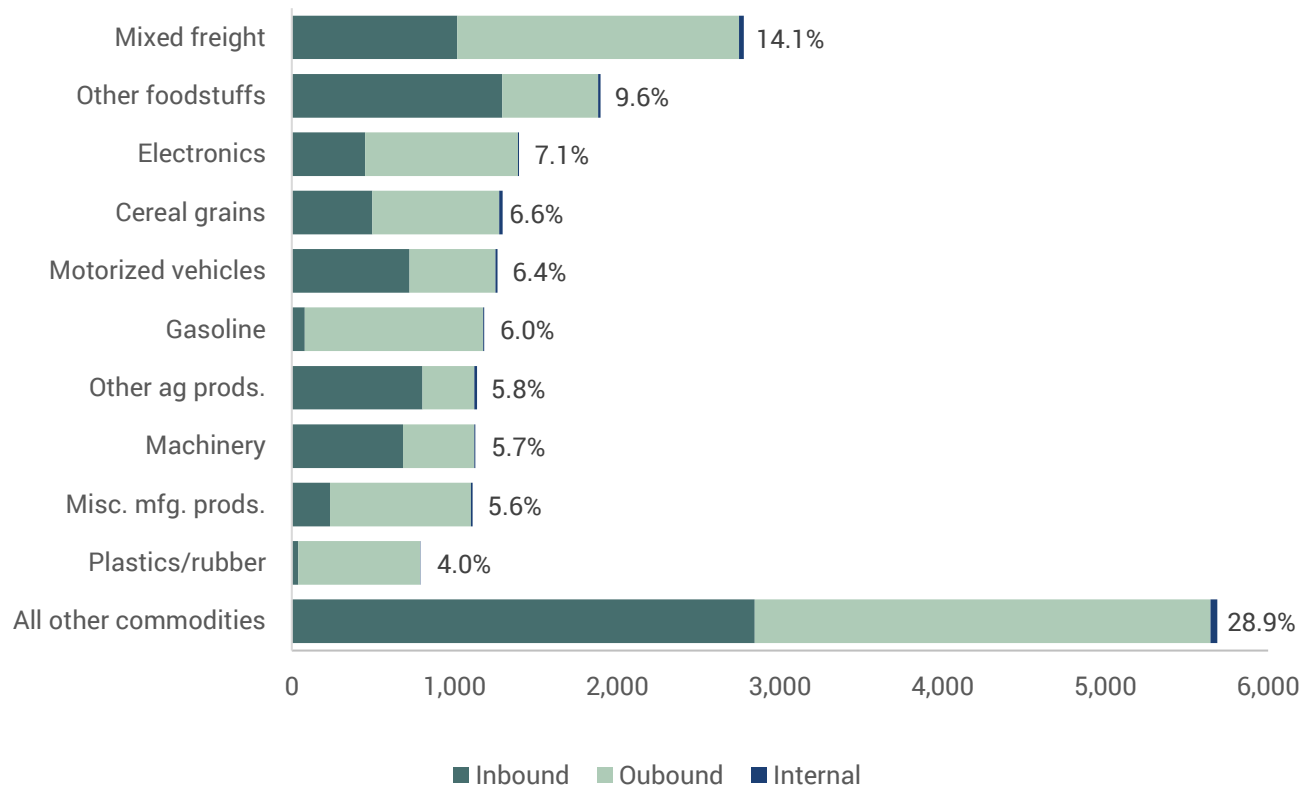


Table 3-3: Leading Truck Commodity Types by Value and Direction, 2017 (million dollars)

Commodity Name	Inbound	Outbound	Internal	Total	Percentage
Mixed freight	1,015	1,733	28	2,776	14.1%
Other foodstuffs	1,293	589	15	1,896	9.6%
Electronics	449	940	6	1,395	7.1%
Cereal grains	495	779	21	1,295	6.6%
Motorized vehicles	723	529	12	1,263	6.4%
Gasoline	79	1,097	5	1,181	6.0%
Other ag prods.	802	319	17	1,138	5.8%
Machinery	682	439	6	1,128	5.7%
Misc. mfg. prods.	234	865	11	1,110	5.6%
Plastics/rubber	39	748	2	789	4.0%
All other commodities	2,844	2,800	43	5,687	28.9%
<b>Total</b>	<b>8,654</b>	<b>10,839</b>	<b>164</b>	<b>19,658</b>	<b>100.0%</b>



The top 10 truck commodity types accounted for almost 81 percent of all truck commodity value in 2017. Cereal grain, other foodstuffs, other agriculture products, mixed freight, and gasoline are among the top 10 commodity types transported by trucks by both tonnage and value. Figure 3-8 and Table 3-3 shows the leading truck commodity types by direction. Figure 3-7 shows the leading truck commodity types and trading partners. The larger the rectangle, the larger the total value of the commodity traded between Champaign County and the partner specified on the square by trucks.

Mixed freight accounted for the highest percentage of truck commodity value for Champaign County in 2017, particularly for the outbound direction. Besides the fact that commodities in this category have a higher market price in general, they were also of high volume, likely attributed to the strong wholesale, packaging, and printing industries in Champaign County, as discussed in Section 2.3 and Section 2.4. Missouri, Iowa, and Indiana were the major trading partners for mixed freight transported by trucks with Champaign County. As mentioned earlier in this chapter, the strong food-manufacturing sector in Champaign County explains the high total value of foodstuffs movement by trucks.

**Figure 3-9: Corn Harvested through a Combine on a Family Farm**



Source: David. P. (2018). *Daily Herald*. Retrieved from <http://www.dailyherald.com/article/20180329/business/303299924>

The electronics commodity type includes computers, components, and software, to electric motors and generators, appliances, televisions, and telephones, excluding cell phones. Electronic products usually have relatively lower weight but higher market price, which is why electronics ranked third in terms of total value transported by trucks for Champaign County in 2017. There are several electronic product manufacturers in the region, such as Frasca International, that likely contributed to the high outbound truck flows, as discussed in [Section 2.3](#). The major destinations for electronic products made in Champaign were South Carolina, California, Maryland, and Indiana.

Motorized vehicles include cars and trucks, trailers, tractors, and auto parts. The high total value of motorized vehicles transported by trucks, with Michigan and Indiana being the major trading partners, is consistent with the fact that the region is competitive in manufacturing automotive parts ([Section 2.3](#)).

The region's competitive advantage in the advanced machining, plastic, and sporting equipment manufacturing sectors likely explains the high total value of commodities, including miscellaneous manufacturing products, machinery, and plastic/rubber, transported by trucks.

### **c) Leading rail commodity types by tonnage**

The leading rail commodities for Champaign County in 2017, in terms of tonnage, were cereal grains, basic chemicals, motorized vehicles, and milled grain products. Combined, these four commodity types represented about 50 percent of the total rail commodity tonnage. Other high-volume commodities included other food stuffs, animal feed, other agricultural products, chemical products, wood products, and base metals.

The top 10 commodity types accounted for almost 80 percent of all rail commodity tonnage in 2017. [Figure 3-10](#) and [Table 3-4](#) show the leading rail commodity types by tonnage and direction.



Figure 3-10: Leading Rail Commodity Types by Tonnage and Direction, 2017 (1,000 tons)

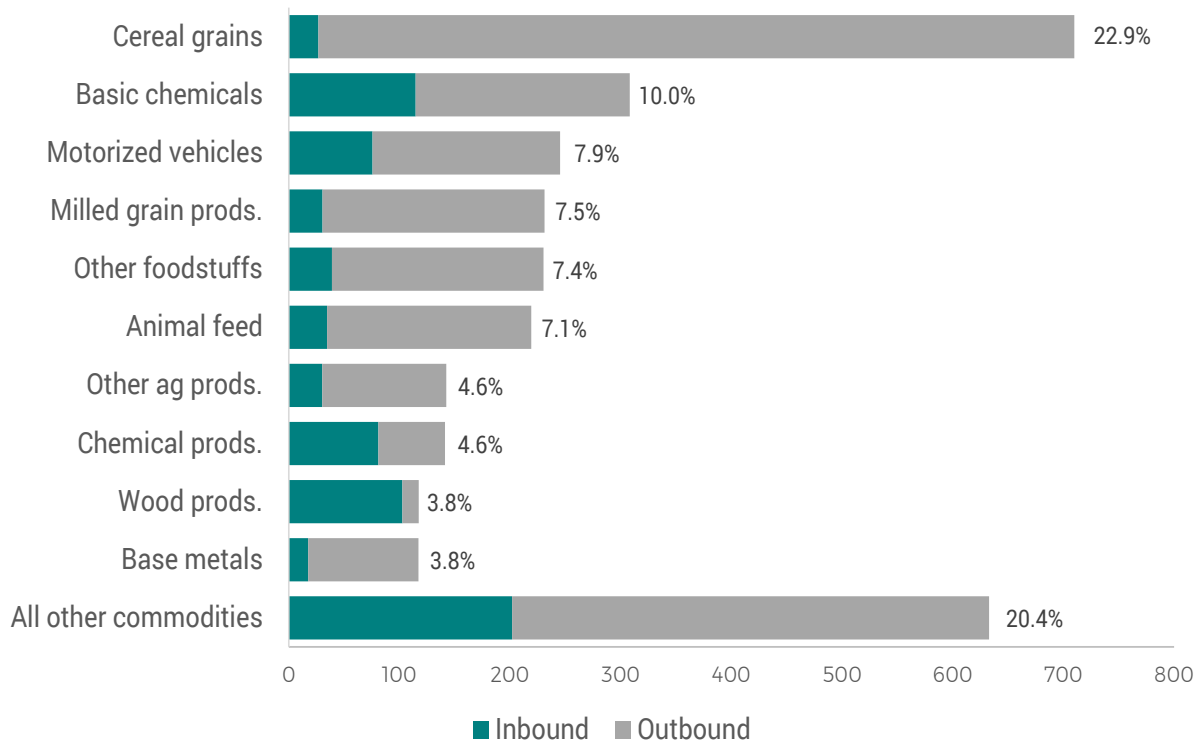


Table 3-4: Leading Rail Commodity Types by Tonnage and Direction, 2017 (1,000 tons)

Commodity Name	Inbound	Outbound	Total	Percentage
Cereal grains	27	683	710	22.9%
Basic chemicals	115	194	308	10.0%
Motorized vehicles	76	170	245	7.9%
Milled grain prods.	30	201	231	7.5%
Other foodstuffs	39	191	230	7.4%
Animal feed	35	185	219	7.1%
Other ag prods.	30	112	142	4.6%
Chemical prods.	81	60	141	4.6%
Wood prods.	103	15	117	3.8%
Base metals	17	100	117	3.8%
All other commodities	202	431	633	20.4%
<b>Total</b>	<b>754</b>	<b>2,340</b>	<b>3,094</b>	<b>100.0%</b>

### 3.2.3. Top trading partners

#### a) Truck trading partners by tonnage

Truck trade for Champaign County is largely dominated by movements to and from other Illinois counties and surrounding states (Figure 3-11).

The top 20 trading partners by trucks accounted for 47 percent of all commodity tonnage coming into or generated from Champaign County in 2017. Iowa, McLean County,

Figure 3-11: Top 10 Truck Trading Partners by Tonnage, 2017 (1,000 tons)

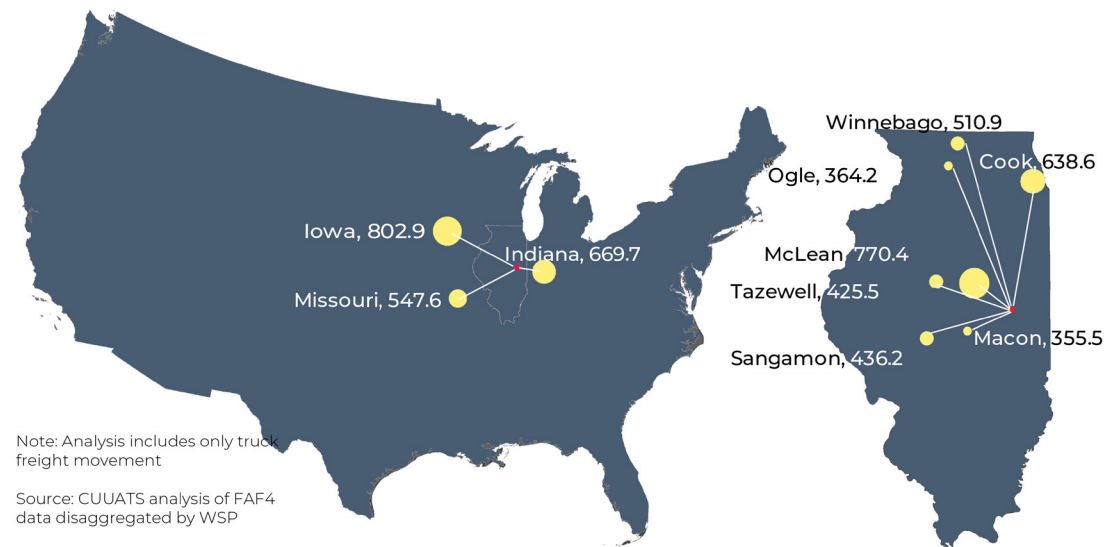
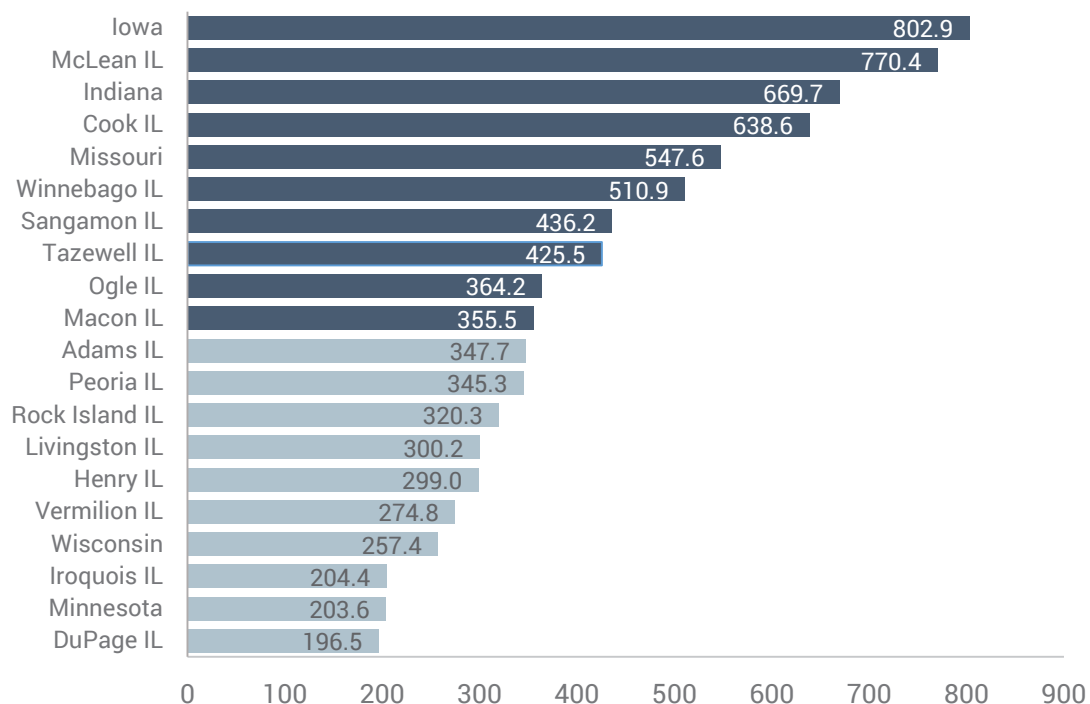


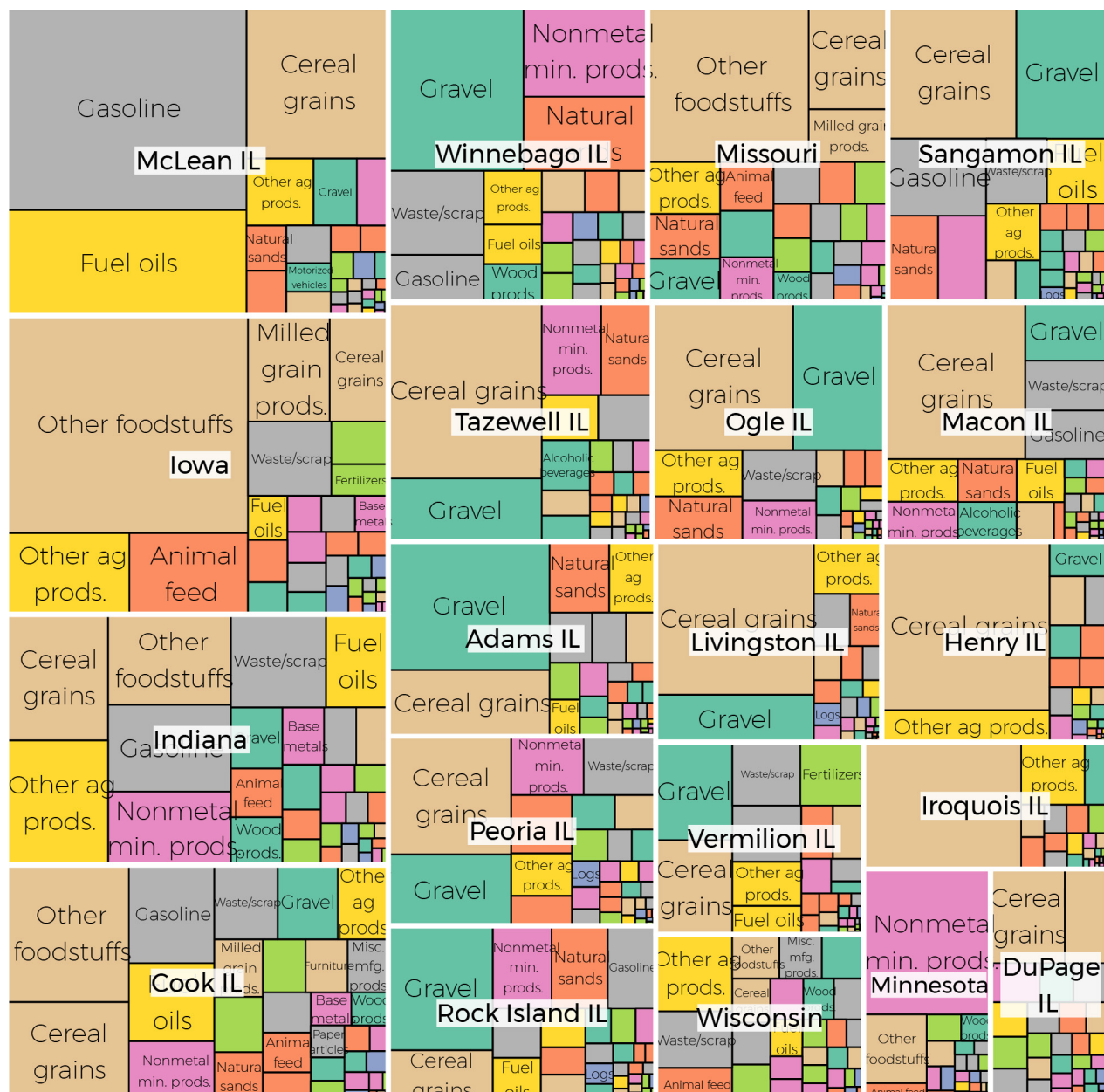
Figure 3-12: Top 20 Truck Trading Partners by Tonnage, 2017 (1,000 tons)



Indiana, Cook County (Chicago), and Missouri had the closest trading relationships with Champaign County, accounting for almost 20 percent of all commodity tonnage (Figure 3-12).

Figure 3-13 shows the major commodity types traded with Champaign County's top partners by trucks in 2017. Cereal grains was the most important commodity Champaign County traded with nearly every partner by trucks. Iowa, Indiana, and Cook County were the major trading partners for other prepared foodstuff and other agriculture products by trucks. Gravel flows made several Illinois counties top truck trading partners with Champaign County. As discussed earlier, the high tonnage of gasoline and fuel oil flows made McLean County another major truck trading partner.

**Figure 3-13: Top Truck Trading Partners by Tonnage and Commodity Types, 2017**



## b) Truck trading partners by value

The top 20 trading partners that had the greatest value of traded goods with Champaign County by trucks accounted for 55 percent of all commodity value in 2017 (Figure 3-15). Iowa, Indiana, Missouri, Cook County, and McLean County not only had the most goods traded with Champaign County by trucks in terms of tonnage, but also in terms of commodity value (26%). Wisconsin, Michigan, Ohio, and Texas also stood out as top 10 truck trading partners by commodity value (Figure 3-14). Other longer distance truck trading partners included Georgia and California.

Figure 3-14: Top 10 Truck Trading Partners by Value, 2017 (million dollars)

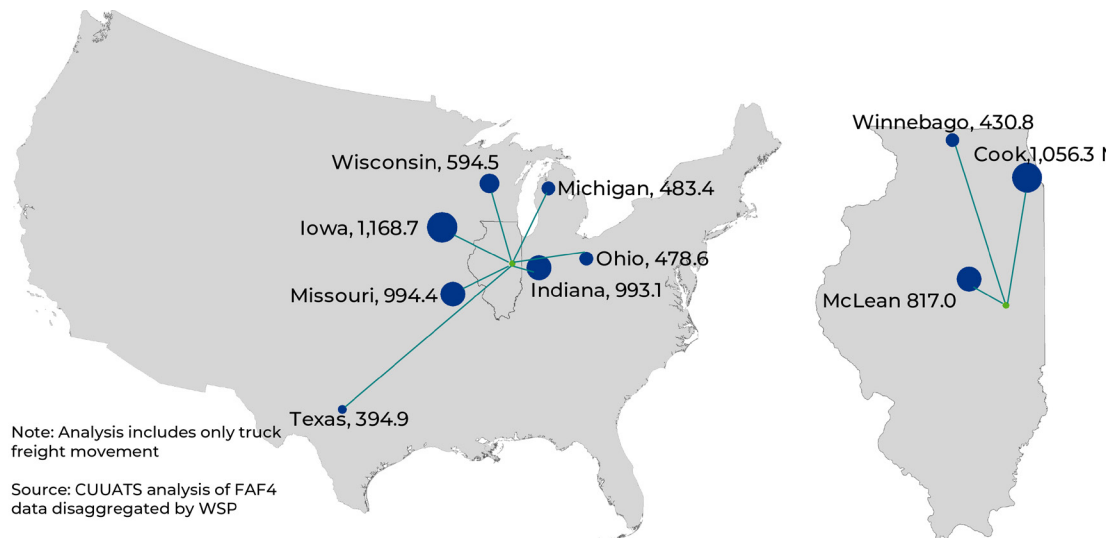


Figure 3-15: Top 20 Truck Trading Partners by Value, 2017 (million dollars)

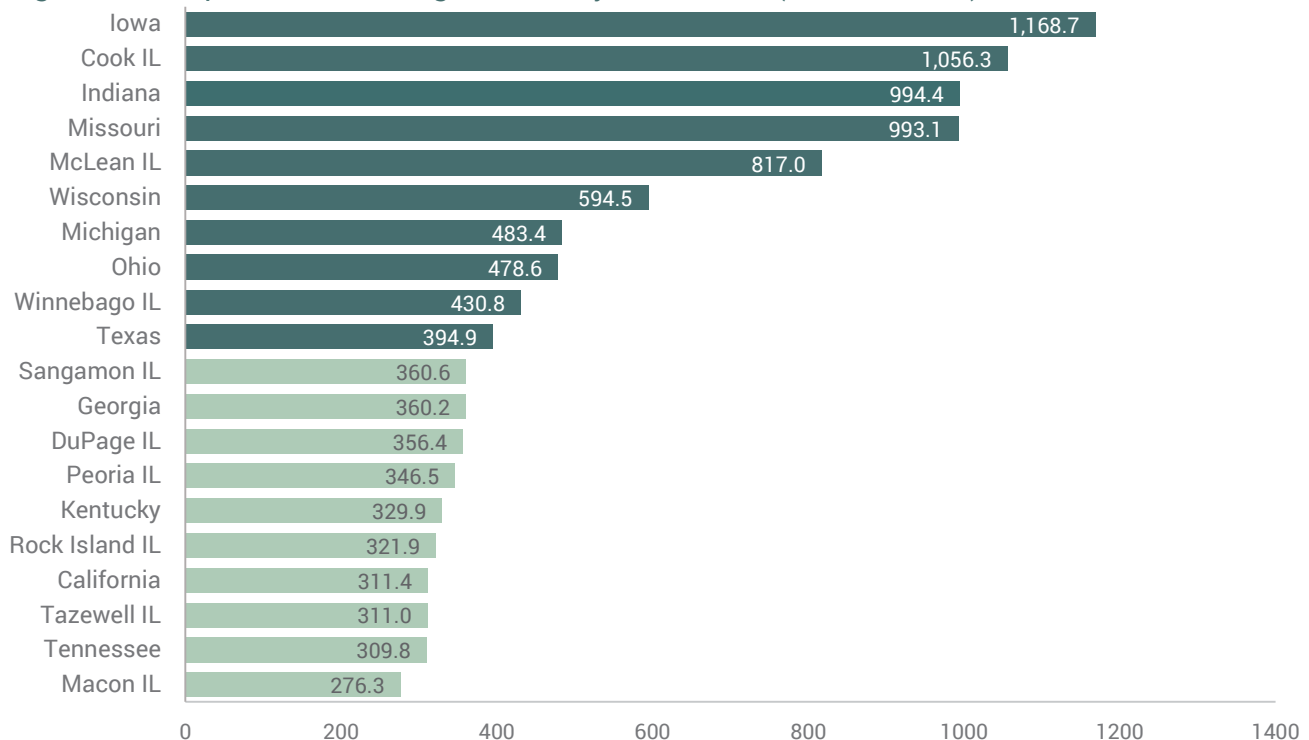
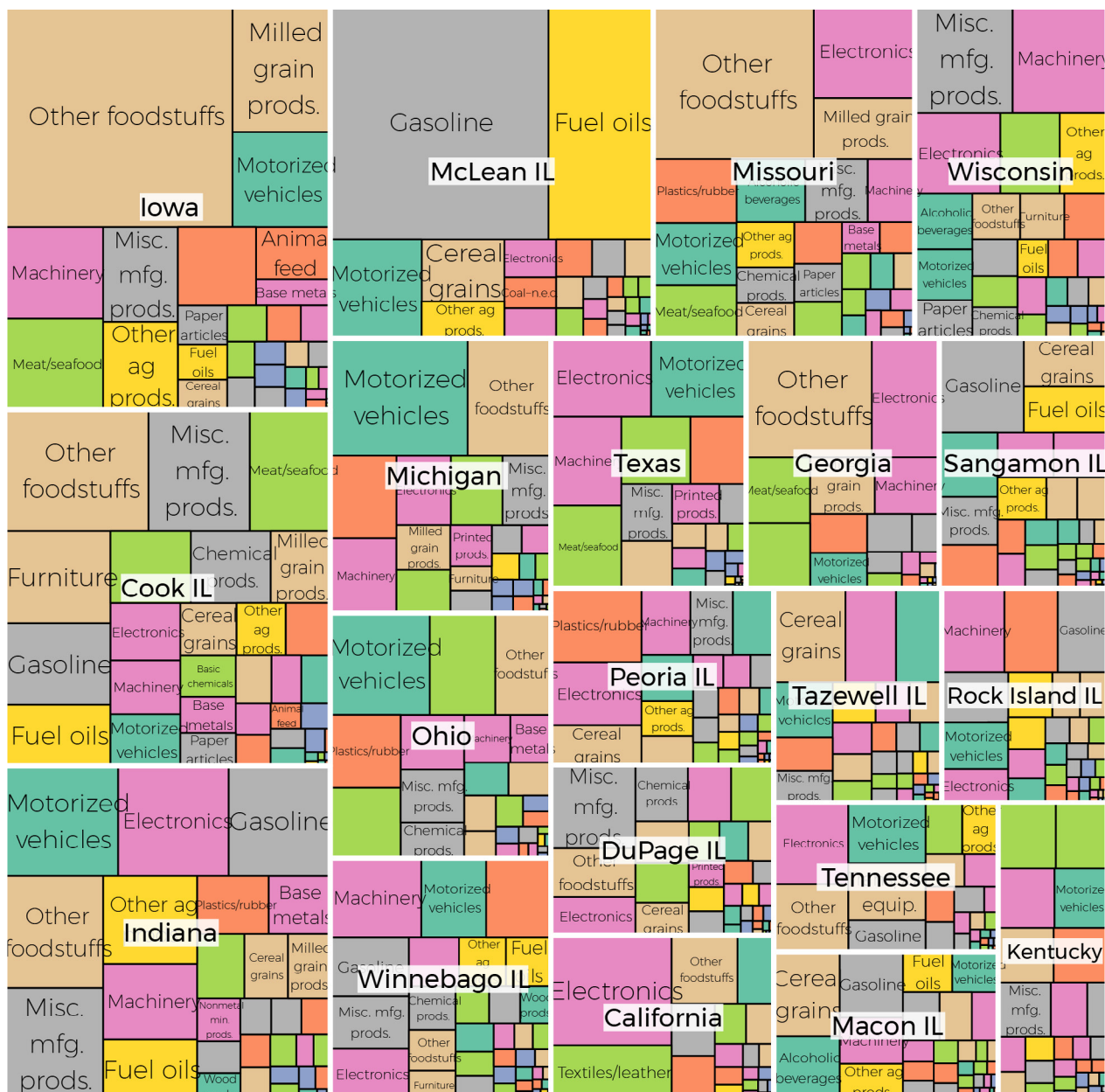




Figure 3-16 shows the major commodity types that each top partner traded with Champaign County by trucks in 2017. High-value commodity types that are often moved by trucks, including motorized vehicle parts, electronic products, and machinery, contributed to the strong connection between Champaign County and long distance partners like Michigan, Ohio, Texas, California, and Tennessee. Georgia is a top truck trading partner with regards to the commodity "other foodstuffs". This is likely due to the fact that Kraft foods has a major distribution center in Norcross, Georgia, and the company sends a steady flow of trucks between the distribution center and the Champaign plant<sup>3</sup>.

Figure 3-16: Top Truck Trading Partners by Value and Commodity Types, 2017



### c) Rail trading partners by tonnage

Different from truck commodity flows, Champaign County's rail commodity flows are mainly with other states, including Texas, Louisiana, Mississippi, and Georgia (Figure 3-17). These top four trading partners accounted for more than 30 percent of all rail commodity tonnage coming into or generated from Champaign County in 2017. The top 20 trading partners by rail accounted for more than three quarters of all rail commodity tonnage (Figure 3-18).

Figure 3-17: Top 10 Rail Trading Partners by Tonnage, 2017 (1,000 tons)

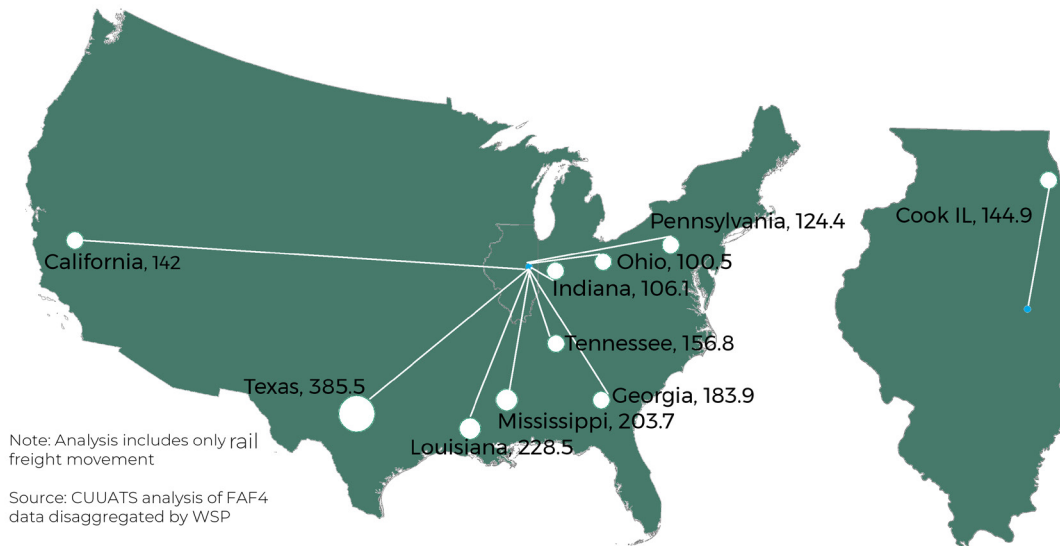


Figure 3-18: Top 20 Rail Trading Partners by Tonnage, 2017 (1,000 tons)

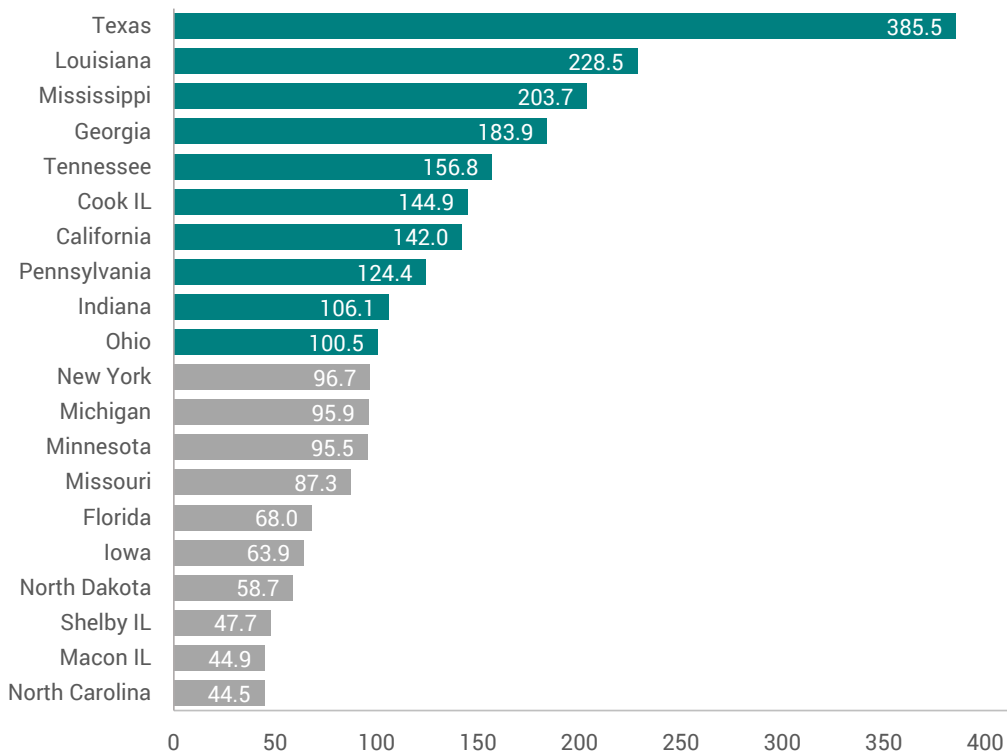






Figure: Rail lines in west Champaign looking east from Mattis Avenue south of Bradley Avenue

Source: Google Maps Aerial View



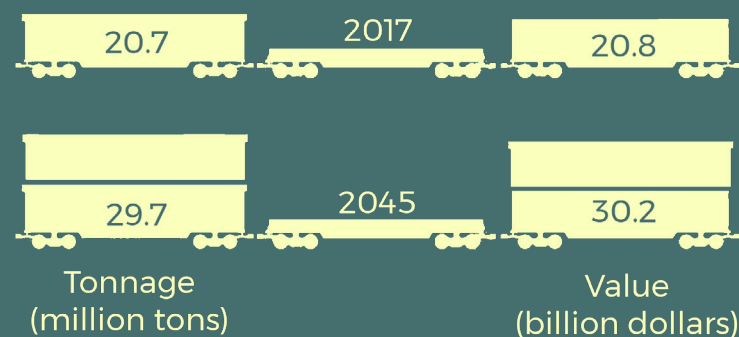


### 3.3. Future commodity flows

As part of the FAF4 database, the USDOT developed commodity-flow growth forecasts through the year 2045, based on macroeconomic forecasts provided by IHS Global Insight. The forecasts consider changes in demand for produced and consumed commodities, changes in the location of production and consumption, and changes in international trade. The forecasts do not consider the effects of changes in logistics, such as shipper decisions to shift freight from truck to other modes, local or regional changes in transportation system capacity or efficiency, such as improved highways or new intermodal facilities; or local or regional economic development activities, leading to greater or lesser attraction of freight users<sup>4</sup>. In other words, these forecasts reflect econometric projections of the commodity demand for freight transportation, and not changes in the supply of freight transportation services, either from certain modes improving their service or other modes seeing deteriorations in service. Thus the mode share for any origin-destination-commodity combination does not change in these forecasts, and modal shifts overall are caused by varying growth rates in commodity flows producing change in the commodity composition of traffic<sup>2</sup>.

The FAF4 forecast produces one possible future scenario for the freight activity in the region, with the assumption that the region and the rest of the country continue to follow historical growth trends. In other words, these forecasts are baseline projections that do not model the effects of some major trends described in [Chapter 7](#), or policy actions and investment decisions that may impact the actual movement of freight. This section takes a closer look at this scenario and provides an overview of the USDOT projected commodity flows, focusing on leading commodity types and trading partners.

**Figure 3-19: 2017-2045 Commodity Flow Increase in Champaign County**





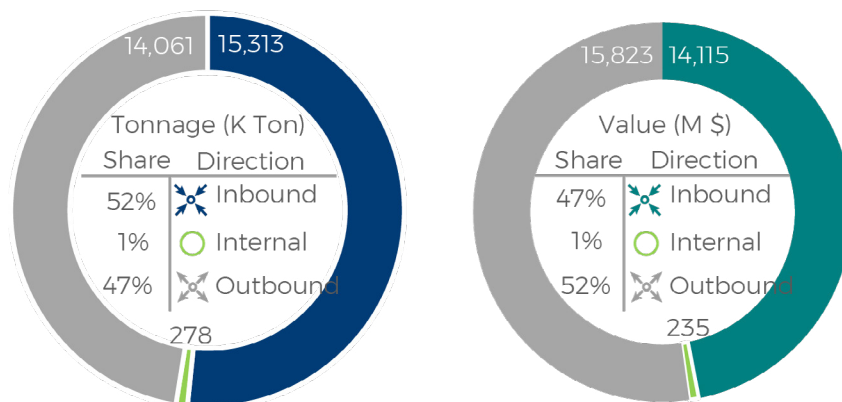
### 3.3.1. Regional commodity flow overview

An estimated 29.7 million tons of goods are projected to be moving on the region's freight system by trucks and trains in 2045, which represents a 43 percent increase from 2017. The total value of these commodities is projected to be approximately 30.2 billion dollars in 2045, a 45 percent increase from 2017 (Figure 3-19). It is important to point out that the commodities transported through pipeline and air transporters are not included in these projections.

#### a) Total tonnage and value by direction

Commodity flows (truck and rail combined) in Champaign County are projected to remain fairly balanced between inbound and outbound directions in 2045, as shown in Figure 3-20. The tonnage share of inbound commodity flow is projected to increase by 2 percent from its 2017 share. Similar to 2017, freight movements within Champaign County (Internal) is projected to account for a very small share of total commodity movements, indicating a continuing "outward facing" economy.

Figure 3-20: Total Commodity Tonnage and Value by Direction, 2045



#### b) Total tonnage and value by mode

Trucks will continue to carry the majority of the commodities coming to and generated from Champaign County in 2045 (25.4 million tons, 85.7 percent of the total tonnage<sup>2</sup>). Trucks will move approximately 7.7 million of the 8.9 million additional tons of freight on Champaign County's roadways. This equates to an average growth rate of 1.3 percent per year, faster than that of trains, which are prospected to see an average annual growth rate of 1.2 percent. Trucks will also continue to carry commodities that are relatively higher in value and lower in weight (28.4 million dollars), accounting for 94.2 percent of the total commodity value<sup>2</sup>. The rest of this chapter focuses on future leading commodity types and partners by trucks because of the projected small share of tonnage by rail and limited change of rail commodity types.

### 3.3.2. Leading commodity types

#### a) Leading truck commodity types by tonnage

The leading truck commodity types for Champaign County in 2045 are projected to be largely the ones leading in 2017 (Table 3-5 and Figure 3-21). They are cereal grains, gravel, other foodstuffs, and other agricultural products. Combined, these four commodity types (15,000 tons) are projected to represent almost 59 percent of the total commodity tonnage in 2045.

Table 3-5 and Figure 3-22 show the changes in tonnage for the top commodity types transported by trucks from 2017 to 2045. The top four commodity types are projected to account for 64 percent of the tonnage increase from 2017 (4.9 million tons out of 7.7 million tons). Nonmetallic minerals, waste/scrap, mixed freight, and natural sands are projected to continue to be on the top 10 truck commodity list in 2045, accounting for 20 percent of the additional truck tonnage increase from 2017. Gasoline and fuel oils tonnage, however, is projected to decrease from 2017 to 2045, presumably reflecting changes in fuel efficiency and engine types<sup>2</sup>. Trading partners of the leading truck commodities are projected to remain to be largely similar to those in 2017.

**Table 3-5: Leading Truck Commodity Types by Tonnage, 2045 (1,000 tons)**

Commodity Name	Inbound	Outbound	Internal	Total	Percentage	Growth from 2017
Cereal grains	3,280	4,049	114	7,444	29.3%	55%
Gravel	2,221	460	22	2,703	10.6%	35%
Other foodstuffs	1,944	666	16	2,626	10.3%	56%
Other agricultural products	1,587	507	27	2,121	8.3%	42%
Nonmetal mineral products.	1,010	403	16	1,429	5.6%	79%
Waste/scrap	595	635	27	1,256	4.9%	72%
Gasoline	79	868	4	951	3.7%	-6%
Mixed freight	375	528	9	912	3.6%	36%
Natural sands	550	175	10	736	2.9%	17%
Fuel oils	46	439	2	487	1.9%	-12%
<b>All other commodities</b>	<b>2,602</b>	<b>2,103</b>	<b>34</b>	<b>4,740</b>	<b>18.7%</b>	<b>42%</b>
<b>Total</b>	<b>14,290</b>	<b>10,835</b>	<b>281</b>	<b>25,406</b>	<b>100.0%</b>	<b>43%</b>

Figure 3-21: Leading Truck Commodity Types by Tonnage and Direction, 2045 (1,000 tons)

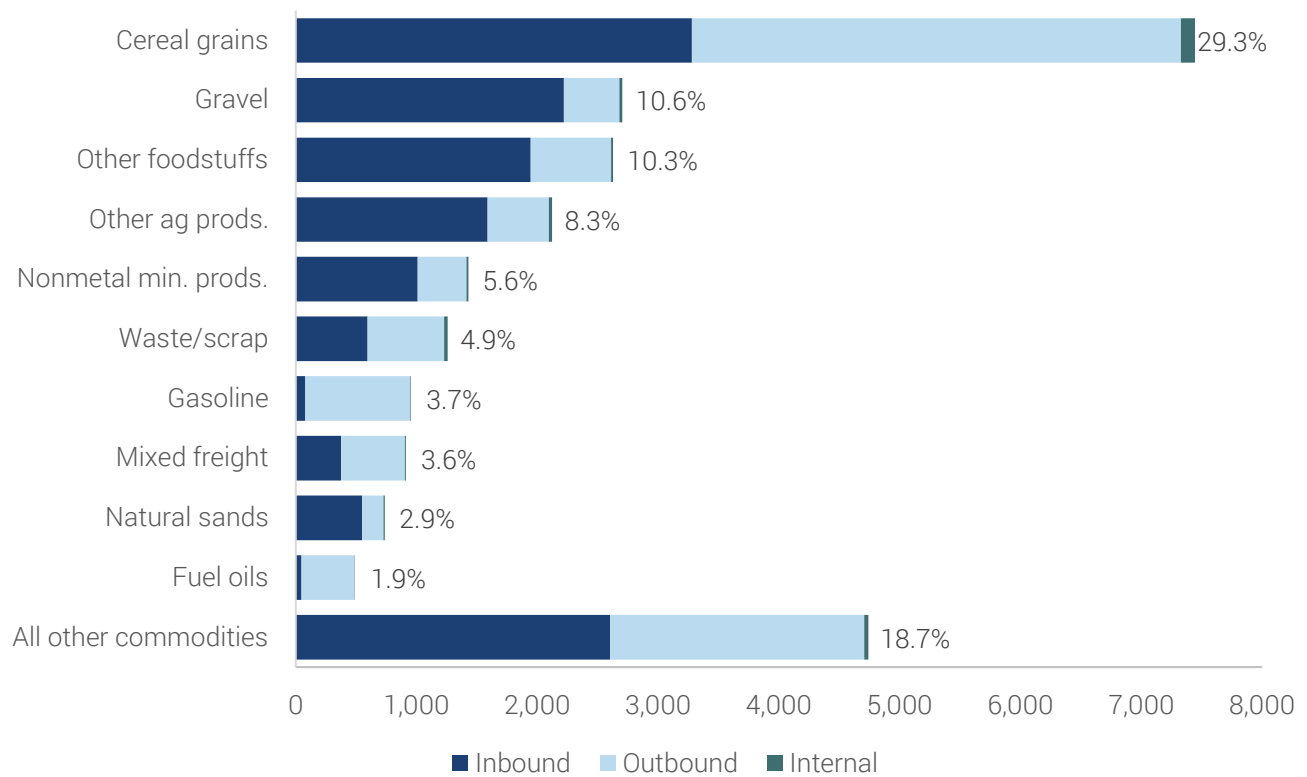
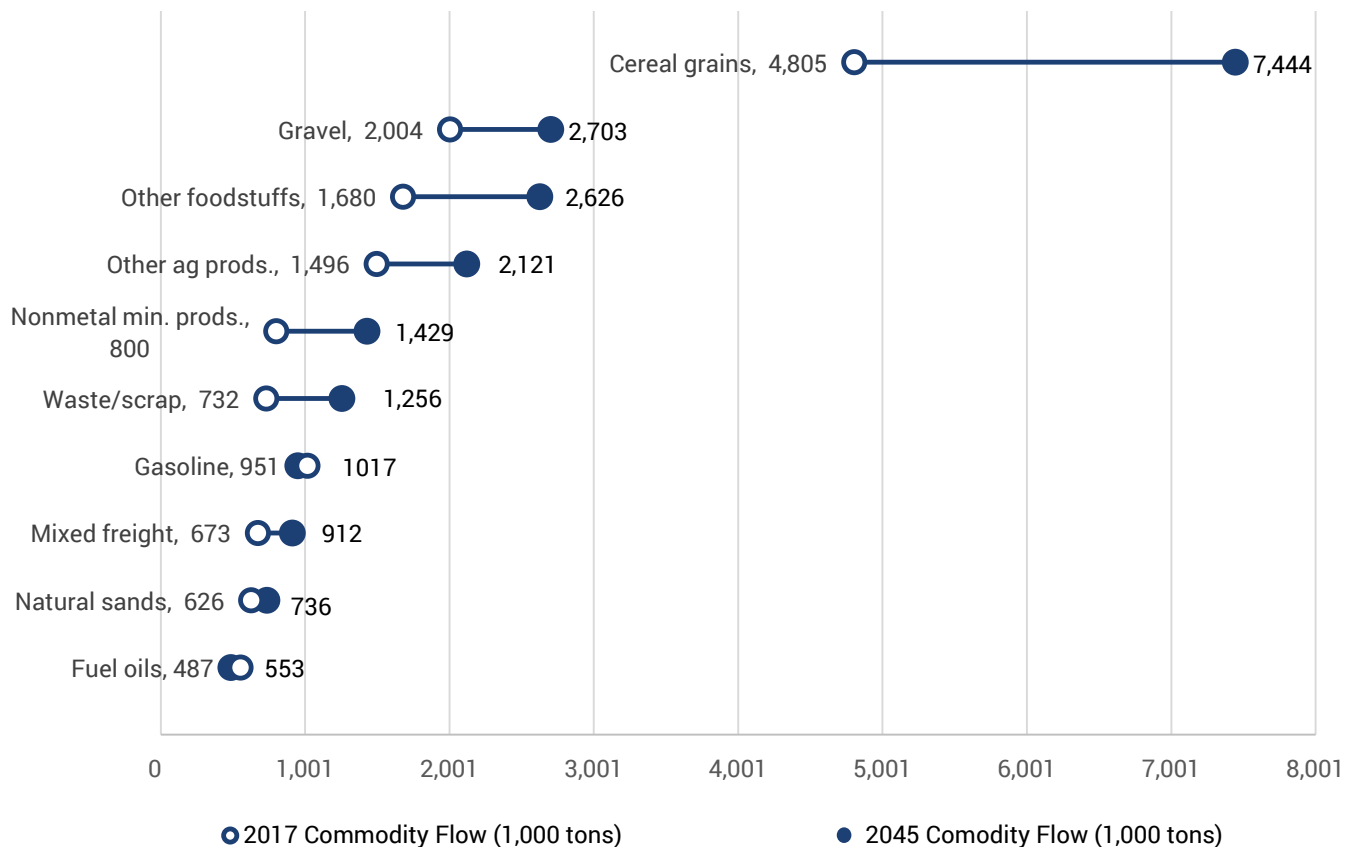


Figure 3-22: Leading Truck Commodity Types Tonnage Change, 2017-2045 (1,000 tons)



## b) Leading truck commodity types by value

The leading truck commodity types in 2017 are projected to continue to have the greatest commodity value in 2045, with the exception of gasoline (Figure 3-23). The top three commodity types transported by trucks are mixed freight, other foodstuffs, and electronics. Combined, these three commodity types, with a value of 9.1 million dollars, are projected to represent almost 30 percent of the total truck commodity value in 2045.

Table 3-6 and Figure 3-24 show the changes in total value for the top commodity types transported by trucks from 2017 to 2045. The top three commodity types are projected to account for around one third of total value increase from 2017 (3.1 out of 11.6 million dollars). Electronics and machinery products are projected to have the biggest percentage increase, more than 85 percent, in total value. The rest of the leading commodities transported by trucks are projected to increase from six million to more than nine million dollars in 2045. Gasoline is projected to fall out of the top 10 commodity value list, with an estimated eight percent decrease in total value, consistent with the trend of decreasing tonnage. Trading partners of leading truck commodities are projected to remain the same.

**Table 3-6: Leading Truck Commodity Types by Value, 2045 (million dollars)**

<b>Total Commodity Value (M \$)</b>	<b>Inbound</b>	<b>Outbound</b>	<b>Internal</b>	<b>Total</b>	<b>Percentage</b>	<b>Growth from 2017</b>
Mixed freight	1,343	2,318	38	3,698	13.0%	33.2%
Other foodstuffs	2,023	849	20	2,892	10.2%	52.5%
Electronics	927	1,645	10	2,583	9.1%	85.1%
Machinery	1,360	740	11	2,110	7.4%	87.2%
Cereal grains	770	1,164	33	1,967	6.9%	51.9%
Misc. mfg. prods.	420	1,311	19	1,750	6.2%	57.6%
Motorized vehicles	954	713	16	1,683	5.9%	33.3%
Other ag prods.	1,117	438	23	1,578	5.5%	38.7%
Plastics/rubber	61	1,193	3	1,256	4.4%	59.2%
Meat/seafood	329	782	3	1,114	3.9%	53.6%
<b>All other commodities</b>	<b>4038</b>	<b>3704</b>	<b>60</b>	<b>7802</b>	<b>27.4%</b>	<b>37.2%</b>
<b>Total</b>	<b>13,340</b>	<b>14,856</b>	<b>235</b>	<b>28,432</b>	<b>100.0%</b>	<b>44.6%</b>

Figure 3-23: Leading Truck Commodity Types by Value and Direction, 2045 (million dollars)

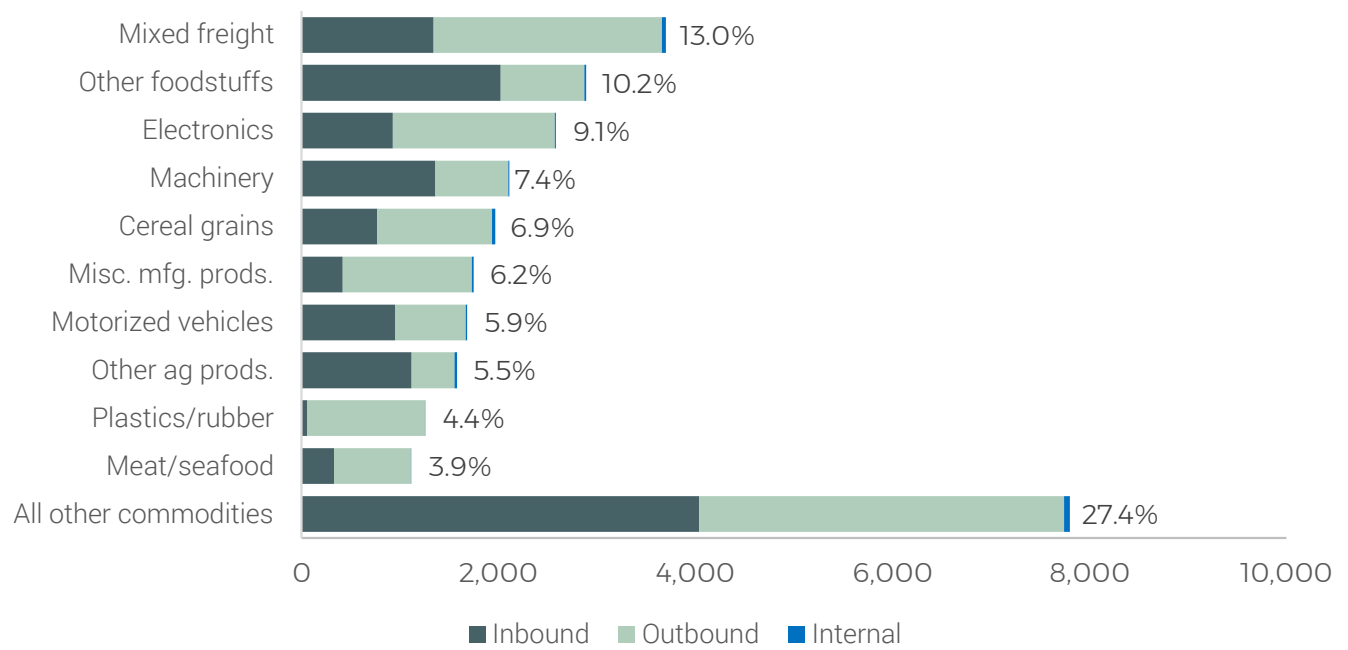
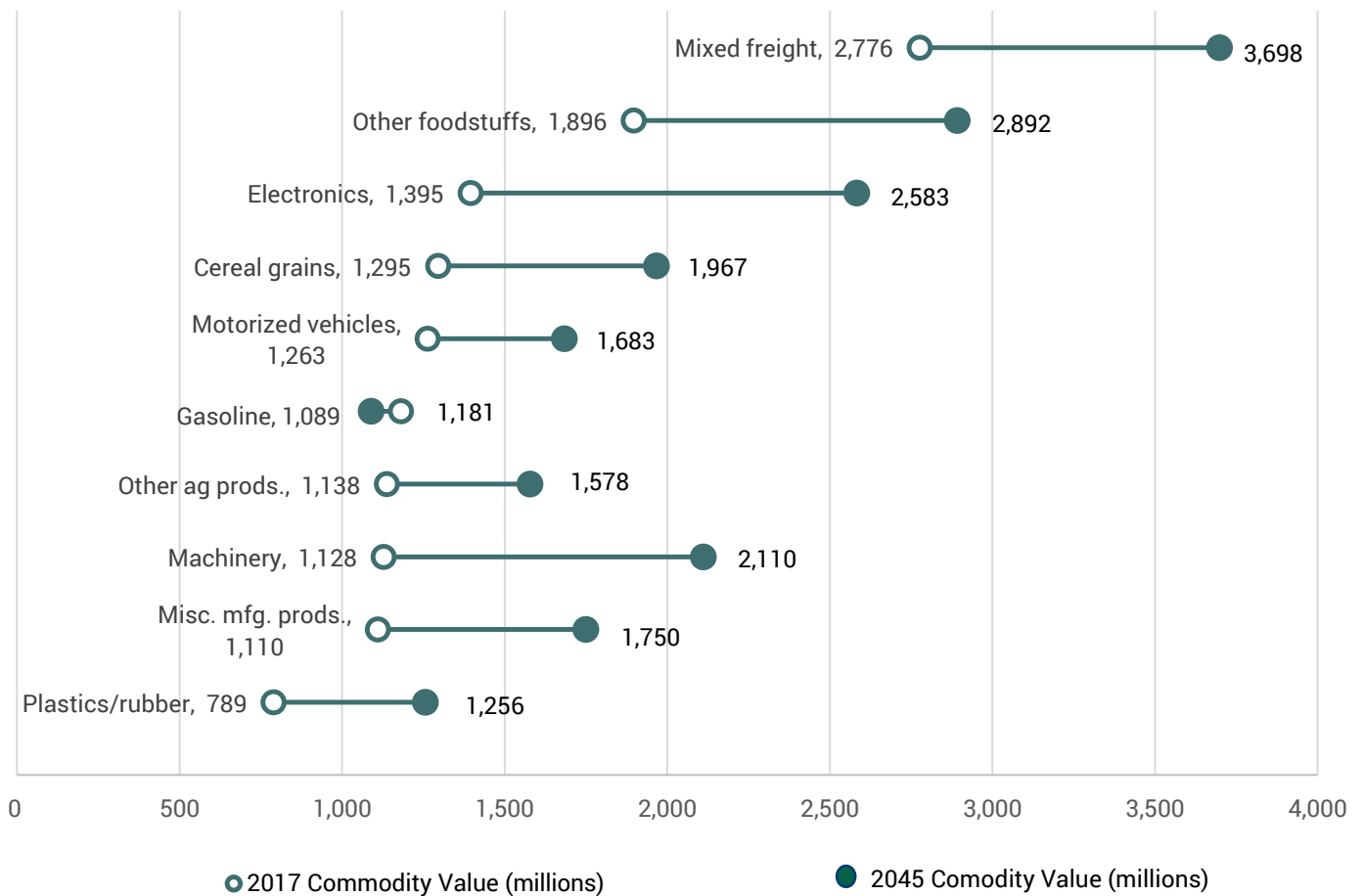


Figure 3-24: Leading Truck Commodity Types Value Change, 2017- 2045 (million dollars)





### 3.3.3. Top trading partners

#### a) Truck trading partners by tonnage

USDOT's projection of the 2045 commodity flows indicates that states and Illinois counties surrounding Champaign County would continue to dominate truck flows to and from Champaign County (Figure 3-25). The top 20 trading partners are projected to account for around half of all commodities coming to or generated from Champaign County transported by trucks in 2045. Iowa, Indiana, McLean County, Cook County (Chicago), and Missouri would continue to have the closest trading relationships with Champaign County, accounting for more than 22 percent of all truck commodity tonnage. The major commodity types each top partner traded with Champaign County by trucks in 2045 are projected to remain largely the same as those of 2017.

Figure 3-25: Top 20 Truck Trading Partners by Tonnage, 2045 (1,000 tons)

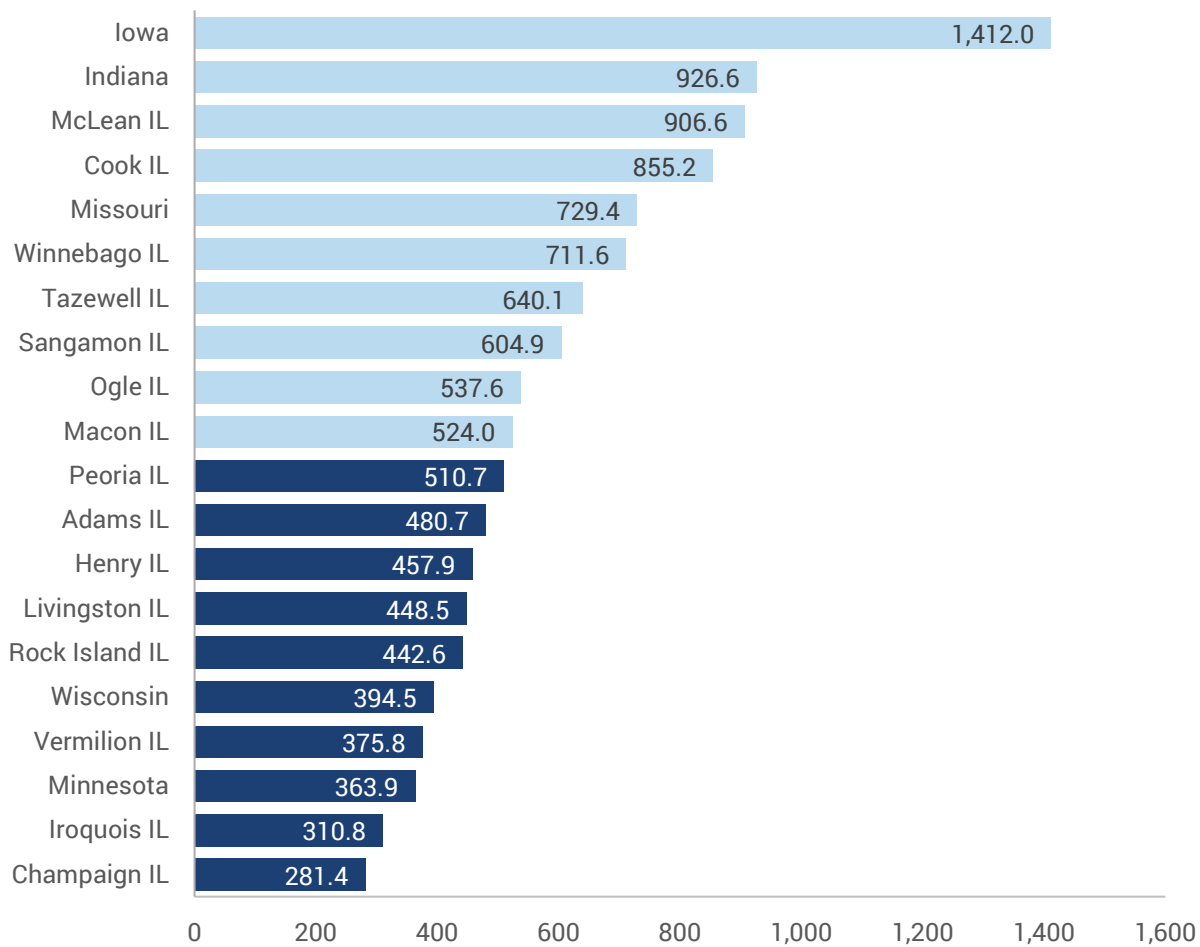
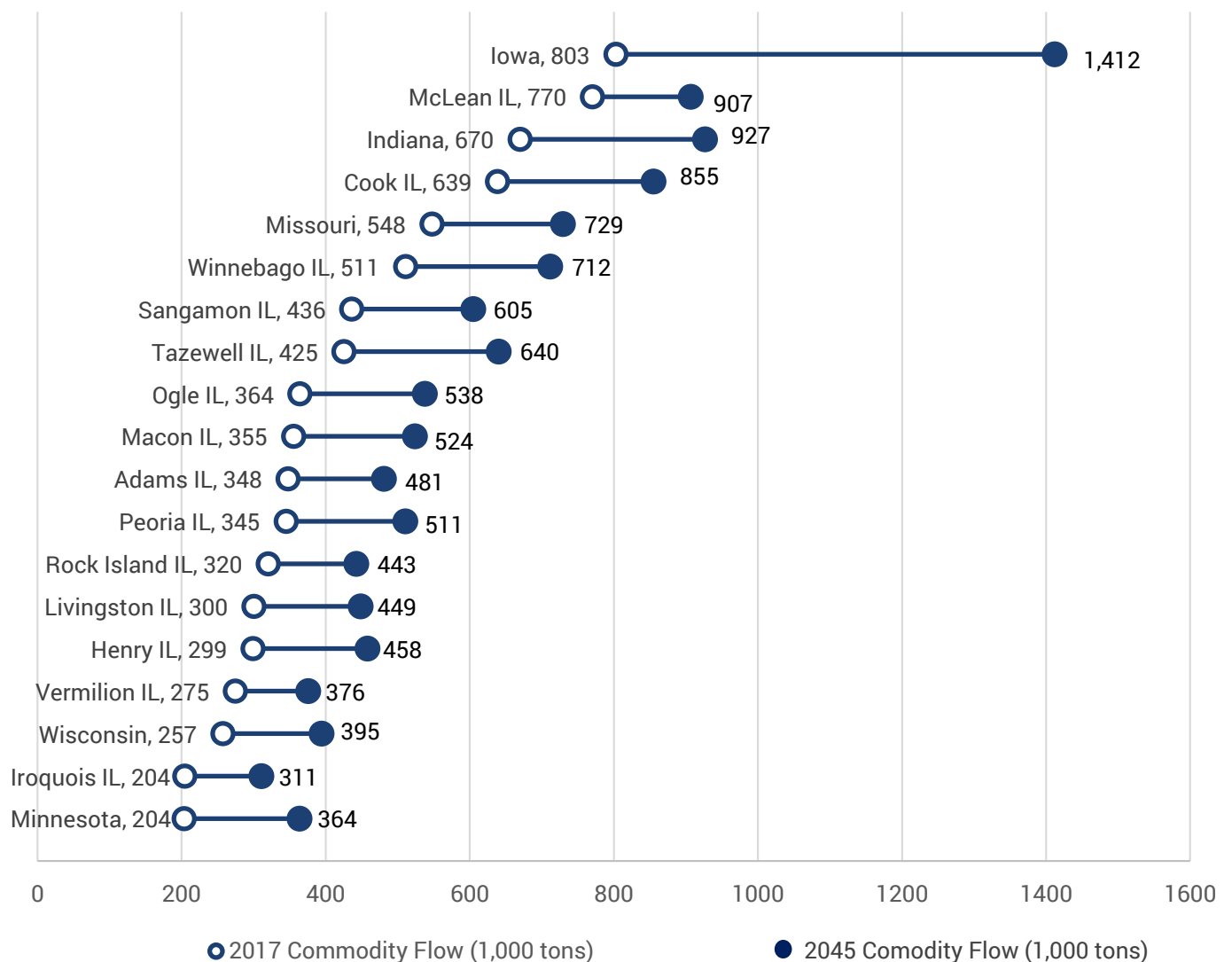


Figure 3-26 shows that, of all trading partners, the State of Iowa is projected to have the biggest increase in the total commodity tonnage traded with Champaign County by trucks (76 percent), likely due to the increase of commodities including foodstuffs and other agricultural products. McLean County is projected to have the smallest increase in the total commodity tonnage transported by trucks (18 percent), as USDOT projects that gasoline and fuel oil products tonnage would decrease in 2045 compared with 2017. Furniture and foodstuffs would likely contribute to the increased truck commodity tonnage traded between Cook County and Champaign County. Commodity types including mixed freight and foodstuffs would likely explain the increased trading activities between Missouri and Champaign County by trucks. Cereal grains, gravels, foodstuffs, nonmetal mineral products, and waste/scrap would likely contribute to the increase in total commodity tonnage traded between Champaign County and the rest of the top trading partners by trucks.

**Figure 3-26: Top 20 Truck Trading Partners Tonnage Change, 2017-2045 (1,000 tons)**



## b) Truck trading partners by value

USDOT's projection of the commodity flows indicates that top trading partners by value in 2017 would continue to have the strongest relationship with Champaign County in 2045, accounting for more than 55 percent of all truck commodity value (Figure 3-27). Iowa, Indiana, Missouri, Cook County, and McLean County would continue to account for more than a quarter of total truck commodity value. The major commodity types each top partner traded with Champaign County by trucks in 2045 are projected to remain largely the same as those of 2017.

Machinery, electronics, miscellaneous manufacturing products, and mixed freight would likely contribute to the increase in total commodity value traded between Champaign County and all the top trading partners by trucks. Figure 3-28 shows that, of all trading partners, Texas is projected to have the biggest increase in the total commodity value traded with Champaign County (85 percent), likely resulting from the increase of commodities including cereal grains, foods and beverages, plastic/rubber, machinery, as well as electronics. Similar with tonnage changes, McLean County is projected to have the smallest increase in the total commodity value (12 percent) transported by trucks.

Figure 3-27: Top 20 Truck Trading Partners by Value, 2045 (million dollars)

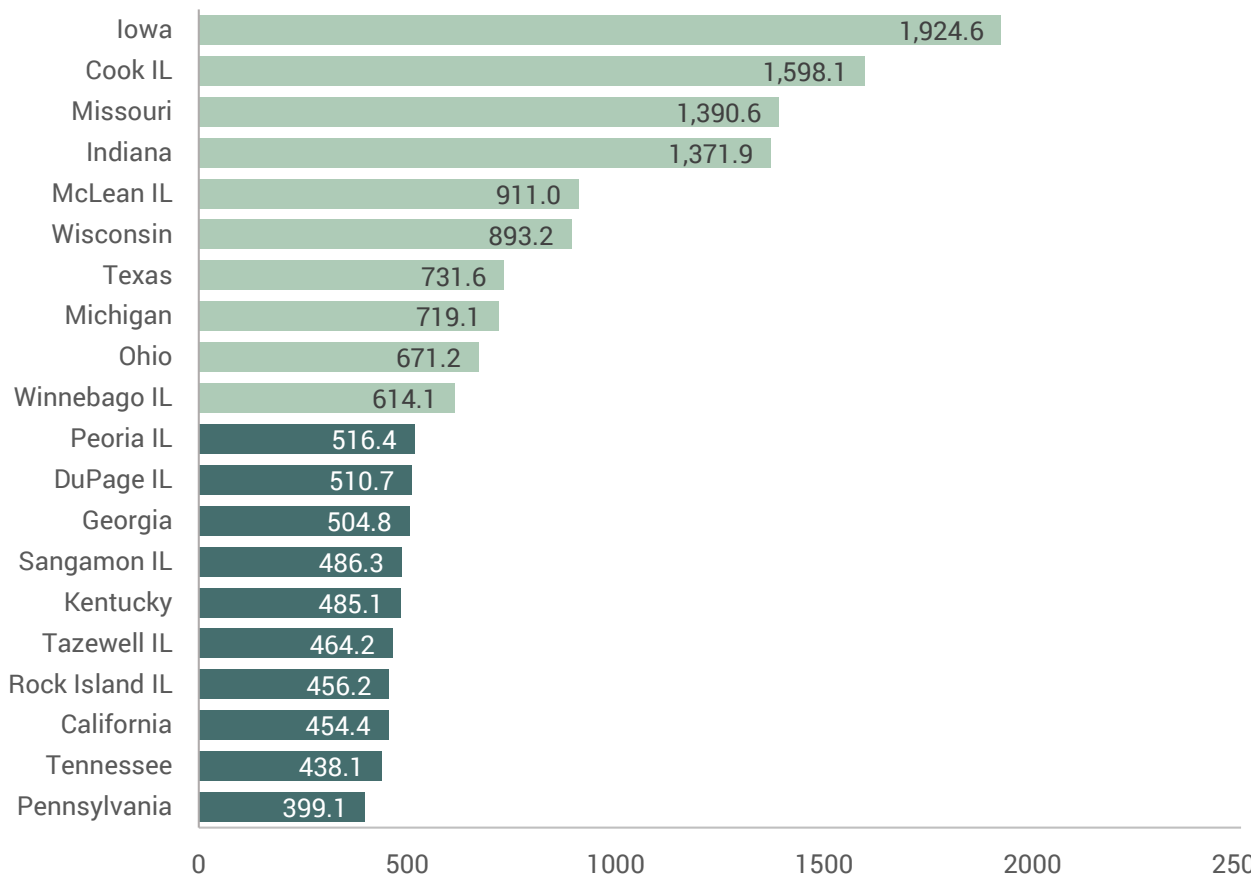
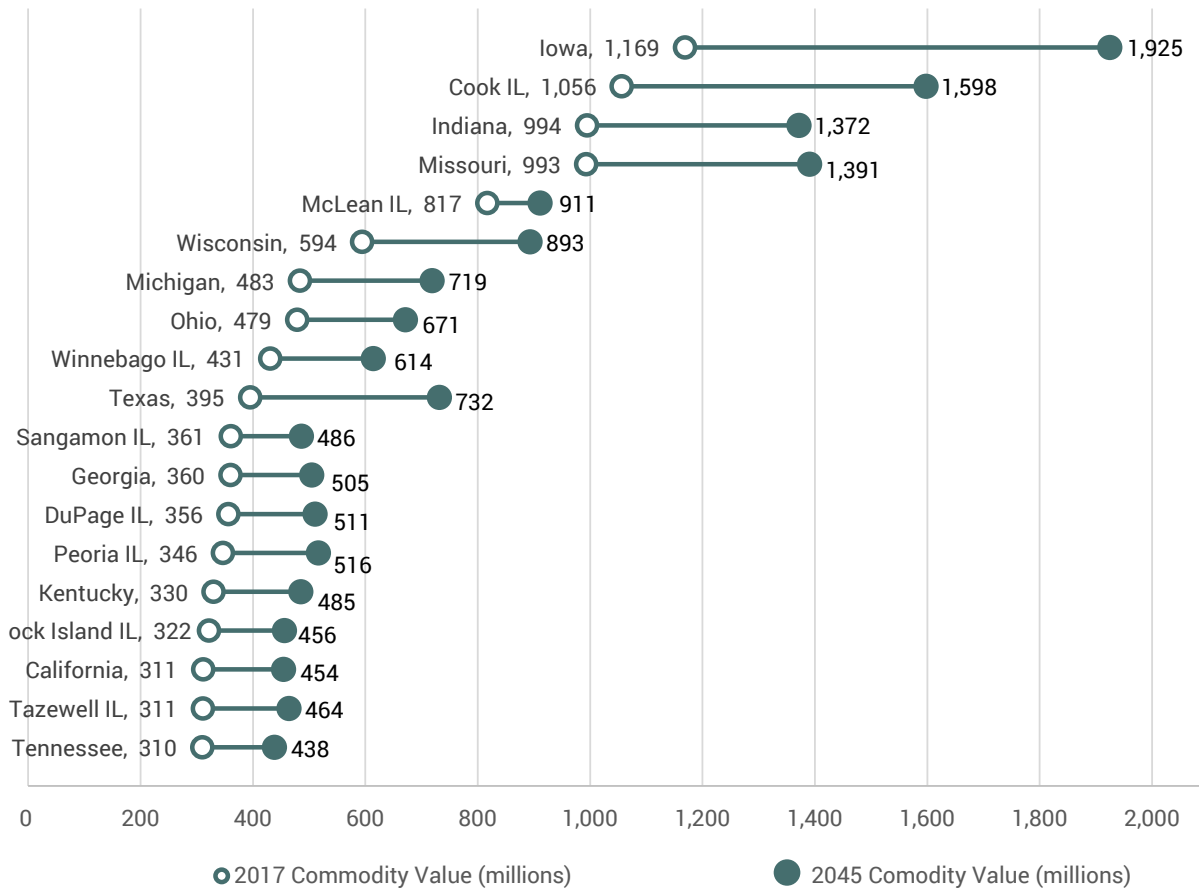


Figure 3-28: Top 20 Truck Trading Partners Value Change, 2017- 2045 (million dollars)



## Endnotes

1. J. Pachy Sr. National Truckers Association. Retrieved from <http://www.nationaltruckers.com/blog/ID/20/Survey-Results-Highlight-Long-Haul-Truck-Driver-Safety-Issue>
2. Illinois Department of Transportation. Illinois State Freight Plan. Retrieved from [http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/OP&P/ILFreightPlan\\_FINAL.pdf](http://www.idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/OP&P/ILFreightPlan_FINAL.pdf)
3. Dodson, D. (2013, July 27). Home » News » Local Champaign's Kraft plant celebrates half-century mark. The News-Gazette. Retrieved from <http://www.news-gazette.com/news/local/2013-07-27/champaigns-kraft-plant-celebrates-half-century-mark.html>
4. Eight County Transportation Plan (2017), Dubuque Metropolitan Area Transportation Study & Regional Affiliation 8. Retrieved from <http://www.eciatrans.org/projects/freightstudy.cfm>

# What are the region's freight infrastructure assets?

Transportation infrastructure is critical to support freight logistics and shipping. This chapter inventories the region's freight infrastructure assets, including roadways, bridges, truck parking, railroads, airports, and pipelines.



# 4





Figure: Westbound traffic on I-74

Source: AARoads.com<sup>1</sup>

## 4. What are the region's freight infrastructure assets?

Freight shipments and the transportation network have a symbiotic relationship. Freight movements are affected by the configuration, condition, and performance of the transportation system, while the presence of freight movements affects both the condition and the performance of the transportation system itself.

This chapter inventories the region's freight infrastructure assets, including roadways (Section 4.1), bridges (Section 4.2), truck parking (Section 4.3), railroads (Section 4.4), airports (Section 4.5), and pipelines (Section 4.6). The next chapter (Chapter 5) looks closely at the performance of these facilities.

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The Champaign-Urbana Metropolitan Planning Area (MPA) is served by three interstates, four state highways, around 70 miles of railroads, one commercial airport, and 63 miles of major pipelines. It is a one-hour drive to the nearest intermodal freight facility in Decatur on the interstate (I-72), and approximately 40 minutes by train (from Tolono with 50 mph speed).

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Figure 4-1: Interstate Connections to Regional Major Cities



Source: [AARoads.com](http://AARoads.com)<sup>1</sup>

## 4.1. Roadway

Trucks carry the majority of the commodities coming into and generated from the region, both in terms of tonnage (94 percent, 17.7 million tons in 2017), and value (85 percent, 19.7 billion dollars in 2017), as discussed in [Section 3.2](#). Compared to the share of freight carried by trucks in the State of Illinois (54 percent)<sup>2</sup>, this shows significant reliance on the roadway system for goods movement in the Champaign-Urbana area.

Compared to passenger cars, trucks have a higher impact on the capacity, pavement, and safety of the roadway system due to their length, weight, and operating characteristics. Likewise, the availability, configuration, and condition of the roadway network have a high impact on truck movements.

### 4.1.1. Roadway network

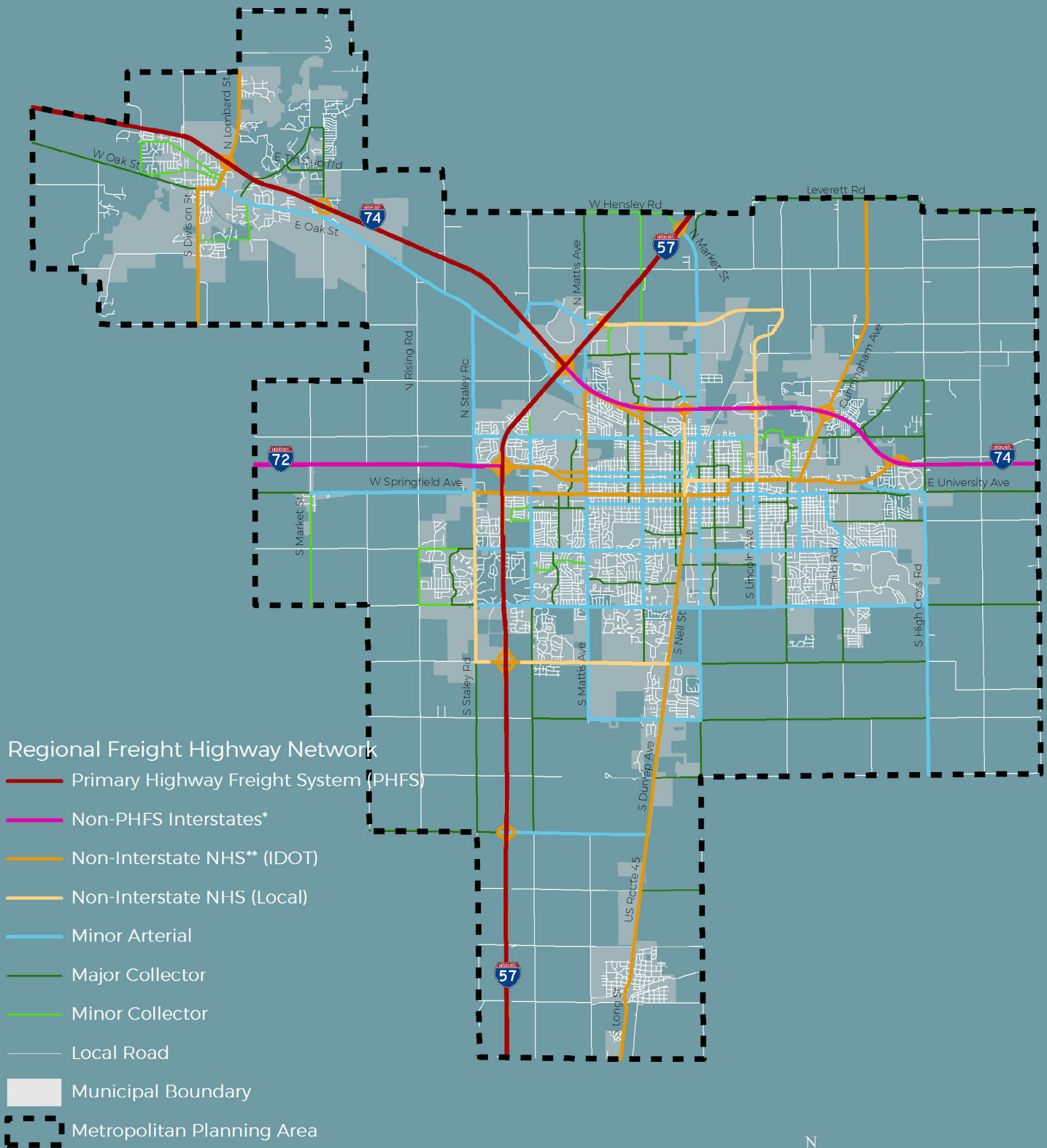
The Champaign-Urbana MPA is at the crossroads of three major interstates. The MPA is served by I-57, which connects the region with Chicago to the north and Memphis to the south. I-74 connects the region with Indianapolis to the east, and Bloomington and Peoria to the northwest. I-72 connects the region with Decatur and Springfield to the west. There are approximately 1,087 miles of roadways in the Champaign-Urbana MPA, including the interstates, arterials, collectors, and local streets ([Figure 4-3](#)).

Figure 4-2: I-74 Prospect Avenue Exit



Source: [AARoads.com](http://AARoads.com)<sup>1</sup>

### Figure 4-3 : Regional Freight Highway Network



\*\* National Highway System

Source: IDOT, Champaign County GIS Consortium



I-57 and I-74 west of I-57 are part of the Primary Highway Freight System (PHFS), designated by U.S. DOT as the most critical highway portions of the U.S. freight transportation system<sup>3</sup>. They are also listed among the National Top 25 Key Freight Corridors<sup>4</sup>.

Other interstate segments that are not on the PHFS, namely, I-72 and I-74 east of I-57, provide important continuity and access to regional freight transportation facilities. Upon CUUATS's recommendation, these two interstate segments have been designated as Critical Urban Freight Corridors (CUFC) by IDOT, to be eligible to use FHWA freight formula funds, as the PHFS interstates<sup>5</sup> are.

In terms of non-interstate roadways, CUUATS, in collaboration with the Champaign County Highway Department, proposed a total length of 173.8 miles of rural roadways (Figure 4-4) to be considered as Critical Rural Freight Corridors (CRFC) for the Illinois State Freight Plan\*. These segments were not selected as CRFCs by IDOT in this round. However, future CUFC and CRFC designations would make roadways eligible for National Highway Freight Program (NHFP) funding.

Average Daily Traffic (ADT) counts are bi-directional 24-hour traffic volumes for a given roadway segment. The interstates have the highest ADT volume, followed by major arterials like Mattis Avenue, Prospect Avenue, U.S. 45/Neil Street, University Avenue, and U.S. 45/Cunningham Avenue (Figure 4-5). These roadways have higher speed limits and act as gateways into the Champaign-Urbana MPA.

\*. The proposed roadways have to meet one or more of the following criteria:

(A) is a rural principal arterial roadway and has a minimum of 25 percent of the annual average daily traffic of the road measured in passenger vehicle equivalent units from trucks (Federal Highway Administration vehicle class 8 to 13).

(B) provides access to energy exploration, development, installation, or production areas.

(C) connects the PHFS or the interstate system to facilities that handle more than:

1. 50,000 20-foot equivalent units per year; or
2. 500,000 tons per year of bulk commodities.

(D) provides access to:

1. a grain elevator.
2. an agricultural facility.
3. a mining facility.
4. a forestry facility.
5. an intermodal facility.

(E) connects to an international port of entry.

(F) provides access to significant air, rail, water, or other freight facilities in the state.

(G) is determined by the state to be vital to improving the efficient movement of freight of importance to the economy of the state.



Figure 4-4: Proposed Critical Rural Freight Corridors in Champaign County

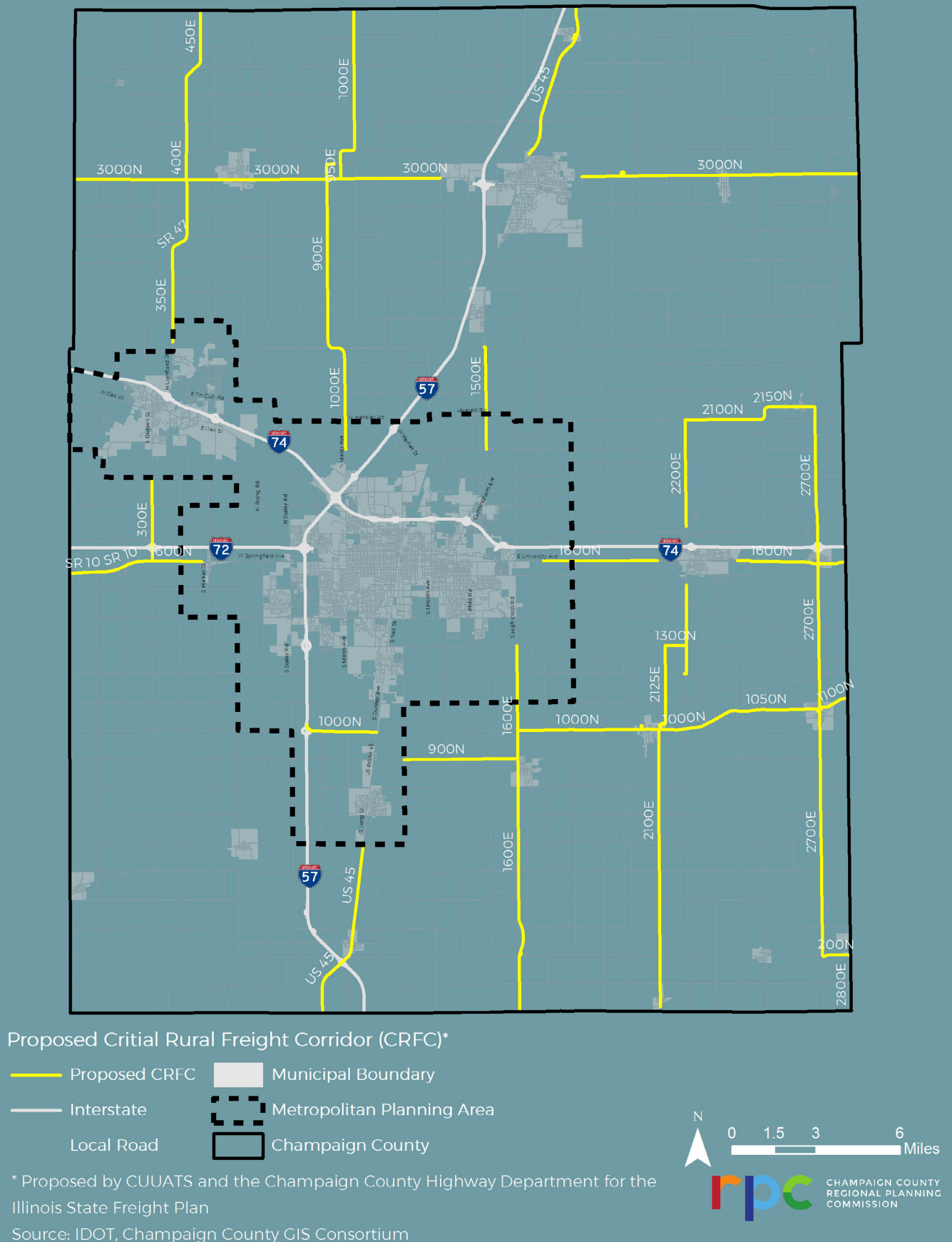
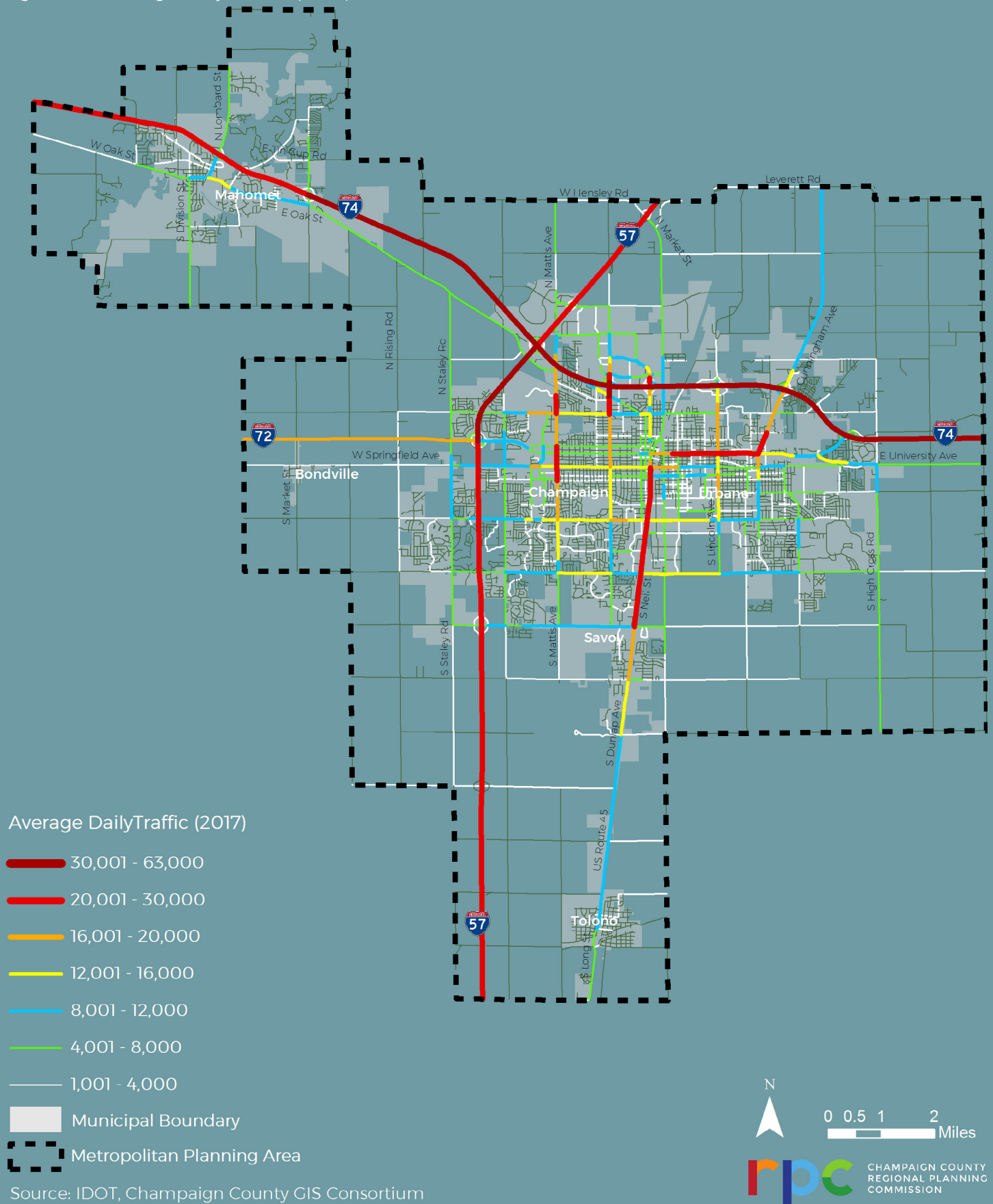


Figure 4-5: Average Daily Traffic (2017)



### 4.1.2. Pavement condition

Trucks, especially heavy load tractor-semi trailers, can cause major pavement structure damage to roadways. According to the Generalized Fourth Power Law, a rule of thumb on measuring the impact of trucks on pavement, damage to the roadbed is proportional to the fourth power of the axle load of the vehicle<sup>6</sup>. Although actual road damage from heavy vehicles can vary significantly depending on existing road conditions, the road construction methods, and even factors like tire pressure and suspension systems<sup>7</sup>, roadways with high heavy vehicle traffic would require additional bituminous materials designed into the pavement structure; otherwise, the additional unanticipated heavy vehicles would consume the pavement's design life<sup>8</sup>.

Unsatisfactory pavement conditions, on the other hand, add to the wear and tear of trucks, and even bring damage to the cargo on the vehicles. The American Transportation Research Institute (ATRI) identified transportation infrastructure condition, along with driver shortage, congestion, and regulations, as among the top 10 issues affecting the trucking industry<sup>9</sup>.

Figure 4-6: Westbound Traffic on I-74 Entering Urbana



Source: Google Maps Street View

Each of the roadway jurisdictions in Champaign County gathers pavement management data independently, using different rating systems. The methodologies, time, and staff requirements for data collection, the data format, and the focus of pavement distresses vary significantly among the different rating systems. Structural (foundational) distresses that are particularly related to heavy vehicle traffic, including level of stability, settlement, fatigue, and rutting, are not always equally represented in the different rating systems. In addition, pavement distress indices used in the different rating systems may provide significantly different results<sup>10</sup>, making it even more challenging to provide an accurate overview of the pavement conditions in the Champaign County MPA.

In an effort to create a unified regional pavement condition database that brings the different rating systems together in a comparable manner, this plan developed a set of pavement condition categories, based on the distresses and required treatments originally specified by the agencies in their own rating systems (Table 4-1). Roadways rated under the same category in this unified regional qualitative rating system do not necessarily have the same distress types and severity levels. This unified regional rating system is just a qualitative representation of the overall pavement conditions and treatments that each agency deems necessary based on their infrastructure improvement priorities and fiscal constraints.

**Table 4-1: Unified Regional Qualitative Pavement Condition Rating System**

Rating	Condition and Treatment
Excellent	Excellent condition. No/minimal maintenance required.
Good	Good condition, requiring only routine/normal maintenance.
Fair	Adequate condition, but approaching the need for considerable maintenance.
Poor	Deficient condition. Intensive/structural maintenance required.
Failed	Failed. Reconstruction required.

This section describes how this unified qualitative rating system corresponds with the original pavement condition system each agency utilizes. This section also discusses the overall condition of the roadways in the Champaign-Urbana MPA under this qualitative categorical system.

### a) Condition Rating Survey (CRS)

IDOT, through the Office of Planning and Programming, conducts a Condition Rating Survey (CRS) to assess the pavement condition of the highway system it manages<sup>11</sup>. The CRS is an automated data collection process using Data Collection Vehicles, which collect digital views of the roadway with laser sensors to record rutting and faulting, among other roadway condition indicators, at highway speed. IDOT workstation expert panels then view and rate each pavement section by identifying and weighting a maximum of five predominant distresses to calculate a CRS value. CRS ratings range from 1.0 to 9.0 in 0.1 value increments. A CRS rating of a 1.0 denotes a total failure of a pavement, and a CRS rating of 9.0 denotes a newly constructed pavement surface. [Table 4-2](#) describes distress levels and treatment needed for each IDOT CRS rating, and corresponding pavement condition categories under the unified regional qualitative rating system. See the original CRS ratings for the IDOT roadways in the MPA in [Appendix A](#).

**Table 4-2: CRS Ratings and Corresponding Unified Regional Qualitative Ratings**

IDOT CRS Rating		Distress and Treatment Description	Regional Qualitative Rating
7.6-9.0	Excellent	The pavement is in excellent condition.	Excellent
6.1-7.5	Good	The pavement is in acceptable condition (low end) to good condition (high end) and not in need of improvement.	Good
4.6-6.0	Fair	The pavement is approaching a condition that will likely necessitate improvement over the short term.	Fair
2.0-4.5	Poor	The pavement is critically deficient and in need of immediate improvement.	Poor
1.0-1.9	Poor	The pavement is critically deficient and in need of immediate improvement.	Failed

*Source: IDOT Bureau of Design and Environmental Manual, Chapter Fifty-three, Pavement Rehabilitation<sup>12</sup>*

### b) Pavement Condition Index Survey (PCI)

The Champaign County Highway Department, the City of Champaign Public Works Department, and the University of Illinois Facilities and Services Department use the Pavement Condition Index Survey (PCI) to rate pavement conditions. The PCI rating system measures the pavement integrity and surface operational condition based on a 100-point rating



scale<sup>13</sup>. The PCI assessment method focuses on the severity and extent of pavement distresses of a representative portion of the roadway<sup>14</sup>. The pavement distress types include not only distresses related to surface conditions, but also structural conditions. [Table 4-3](#) describes distress levels and treatment needed for each PCI ratings, and corresponding pavement condition categories under the unified regional qualitative rating system. See the original PCI ratings for the Champaign County, the City of Champaign, and the University of Illinois roadways in [Appendix A](#).

**Table 4-3: PCI Ratings and Corresponding Unified Regional Qualitative Ratings**

PCI Rating		Distress and Treatment Description	Regional Qualitative Rating
86-100	Good	Pavement has minor or no distresses and requires only routine maintenance.	Excellent
71-85	Satisfactory	Pavement has scattered low severity distresses that need only routine maintenance.	Good
56-70	Fair	Pavement has a combination of generally low- and medium-severity distresses. Maintenance and repair needs are routine to major in the near future.	Fair
41-55	Poor	Pavement has low-, medium-, and high severity distresses that probably cause some operational problems. Near-term maintenance and repair needs may range from routine to a requirement for reconstruction.	Poor
26-40	Very Poor	Pavement has predominantly medium- and high-severity distresses that cause considerable maintenance and operational problems. Near-term maintenance and repair needs will be intensive in nature.	Poor
11-25	Serious	Pavement has mainly high-severity distresses that cause operational restrictions; immediate repairs are needed.	Failed
1-10	Failed	Pavement deterioration has progressed to the point that safe operations are no longer possible; complete reconstruction is required.	Failed

*Source: Indiana Department of Transportation. Pavement Condition Report<sup>15</sup>*

### c) Pavement Surface Evaluation and Rating System Survey (PASER)

The Village of Mahomet Engineer uses the Pavement Surface Evaluation and Rating System Survey (PASER). PASER is a system for visually rating the surface condition of a pavement on a scale from 1 to 10, with 1 being a

pavement in failed condition and 10 being a pavement in excellent condition<sup>16</sup>. The PASER rating procedure is based on a series of photographs and descriptions for each of the individual rating categories. PASER does not require specific measurements for each distress type, instead focusing on the overall surface condition of the pavement segment<sup>17</sup>. The benefit of the PASER method is its speed; there is no need to measure the severity and extent of specific pavement distress type<sup>17</sup>. [Table 4-4](#) describes distress levels and treatment needed for each PASER ratings, and corresponding pavement condition categories under the unified regional qualitative rating system. See the original PASER ratings for the Village of Mahomet roadways in [Appendix A](#).

**Table 4-4: PASER Ratings and Corresponding Unified Regional Qualitative Ratings**

PASER Rating		Distress and Treatment Description	Regional Qualitative Rating
9, 10	Good	No maintenance required.	Excellent
8	Very Good	No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4"). Crack sealing and minor patching, routine maintenance.	Excellent
6, 7	Good	Slight raveling (loss of fines) and traffic wear. First sign of block cracking. Slight to moderate flushing or polishing. Occasional patching in good condition. Non-structural surface preservation treatment, partial-depth patching.	Good
4, 5	Fair	Moderate to severe raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" deep or less). Would benefit from a structural overlay.	Fair
3	Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes. Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.	Poor
2	Very Poor	Alligator cracking (over 25% of surface). Severe distortions (over 2" deep) Extensive patching in poor condition. Potholes. Severe deterioration.	Poor
1	Failed	Severe distress with extensive loss of surface integrity. Failed. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.	Failed

*Source: University of Wisconsin–Madison. Pavement surface evaluation and rating. Asphalt PASER manual<sup>18</sup>*

#### d) Modified CRS + PASER

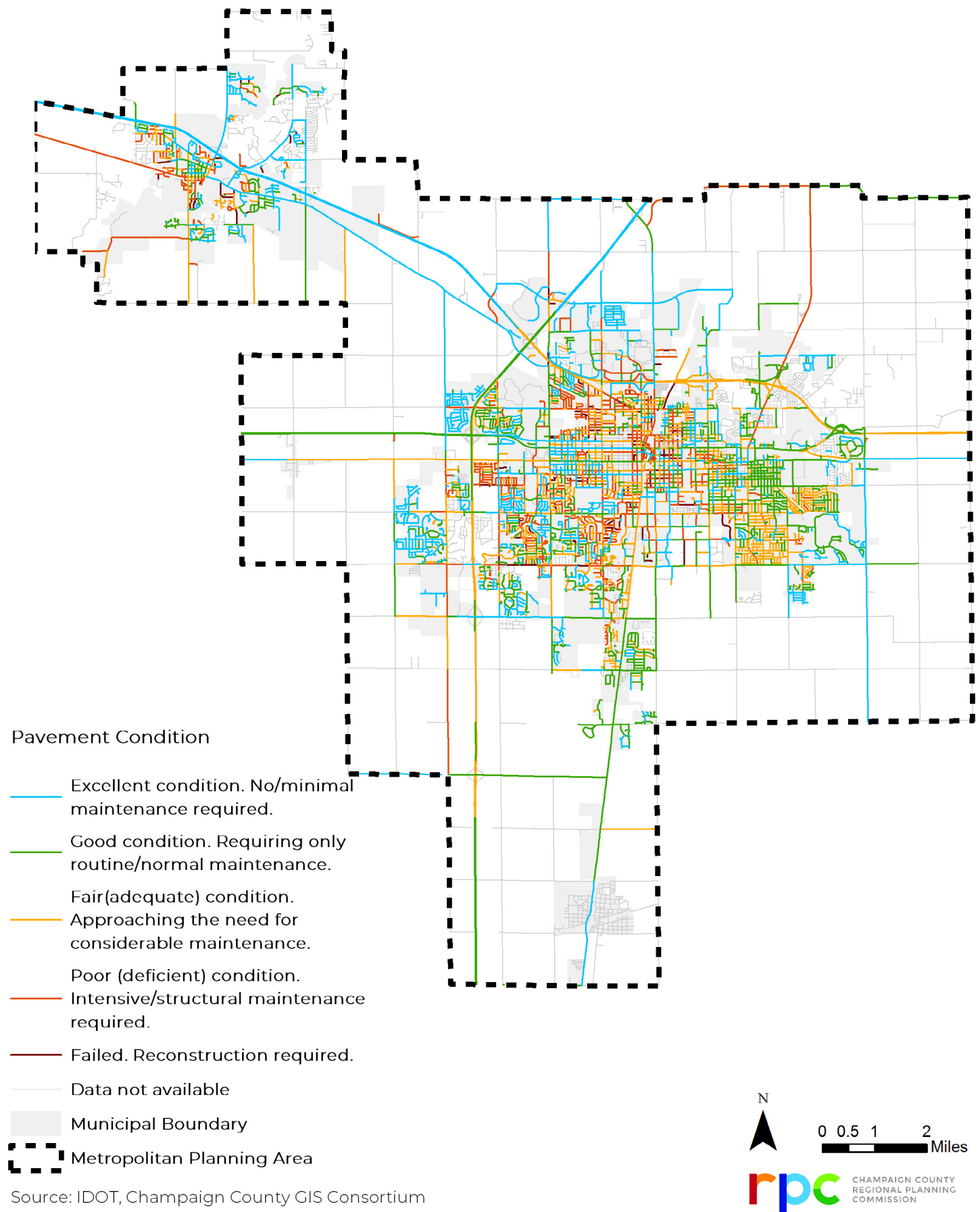
The City of Urbana Public Works Department uses a modified version of the CRS and PASER systems, specifically developed for the city, as a quick visual-based method that could be performed annually with limited staff time. Rating guidelines for different pavement types (brick, concrete, and asphalt) include descriptions for different aspects of surface, foundation, and drainage conditions. The guidelines include a rating scale from 0 to 9, with 0 being a pavement in failed condition and 9 being a pavement in excellent condition. [Table 4-5](#) describes distress levels and treatment needed for Urbana ratings, and corresponding pavement condition categories under the unified regional qualitative rating system. Note that the City of Urbana will be transitioning to a PCI base system in the future. See the original ratings for the City of Urbana roadways in [Appendix A](#).

**Table 4-5: Modified CRS + PASER Ratings (Urbana Ratings) and Corresponding Unified Regional Qualitative Ratings**

Urbana Rating			Regional Qualitative Rating
8-9	Excellent	New or near perfect conditions.	Excellent
6-7	Good	Surface adequate with normal maintenance.	Good
4-5	Fair	Limited failures but adequate. Maintenance will be considerably higher than normal to prevent continued deterioration.	Fair
2-3	Poor	Considerable failures and disintegration beyond practical limits of normal maintenance.	Poor
0-1	Failed	Failures to the extent that operation of traffic is severely affected.	Failed

The Village of Savoy Engineer rated the village roadways using the regional qualitative rating system. The townships in the region do not have a systematic pavement data collection schedule and a database at this time.

Figure 4-7: MPA Pavement Condition



## e) Unified regional qualitative pavement condition

Figure 4-7 shows the overall pavement condition of the roadways in the region, under the unified regional qualitative rating categories. Note that roadways under the same categories in this map do not necessarily have the same measurement scores, as different roadway owners use different pavement measurement methods. This map is only a qualitative representation of the overall condition.

More than 19 percent of the roadways in the Champaign-Urbana MPA were rated Poor and Failed in 2017. Roadways rated Poor would require intensive/structural maintenance. Roadways rated Failed would require reconstruction.

### 4.1.3. Truck routes

There are three types of truck routes designated in the Champaign-Urbana MPA (Figure 4-9). Class One truck routes are the interstates in the region (41.5 miles within the MPA), which allows up to 80,000 pounds truck weights. In addition, 138 miles of state highways and 0.45 miles of City of Urbana roadways are designated as Class Two truck routes. City of Urbana also designated 0.53 miles of Airport Road as Class Three truck routes. Illinois also has a standard limit of 80,000 pounds for Class Two and Class Three truck routes.

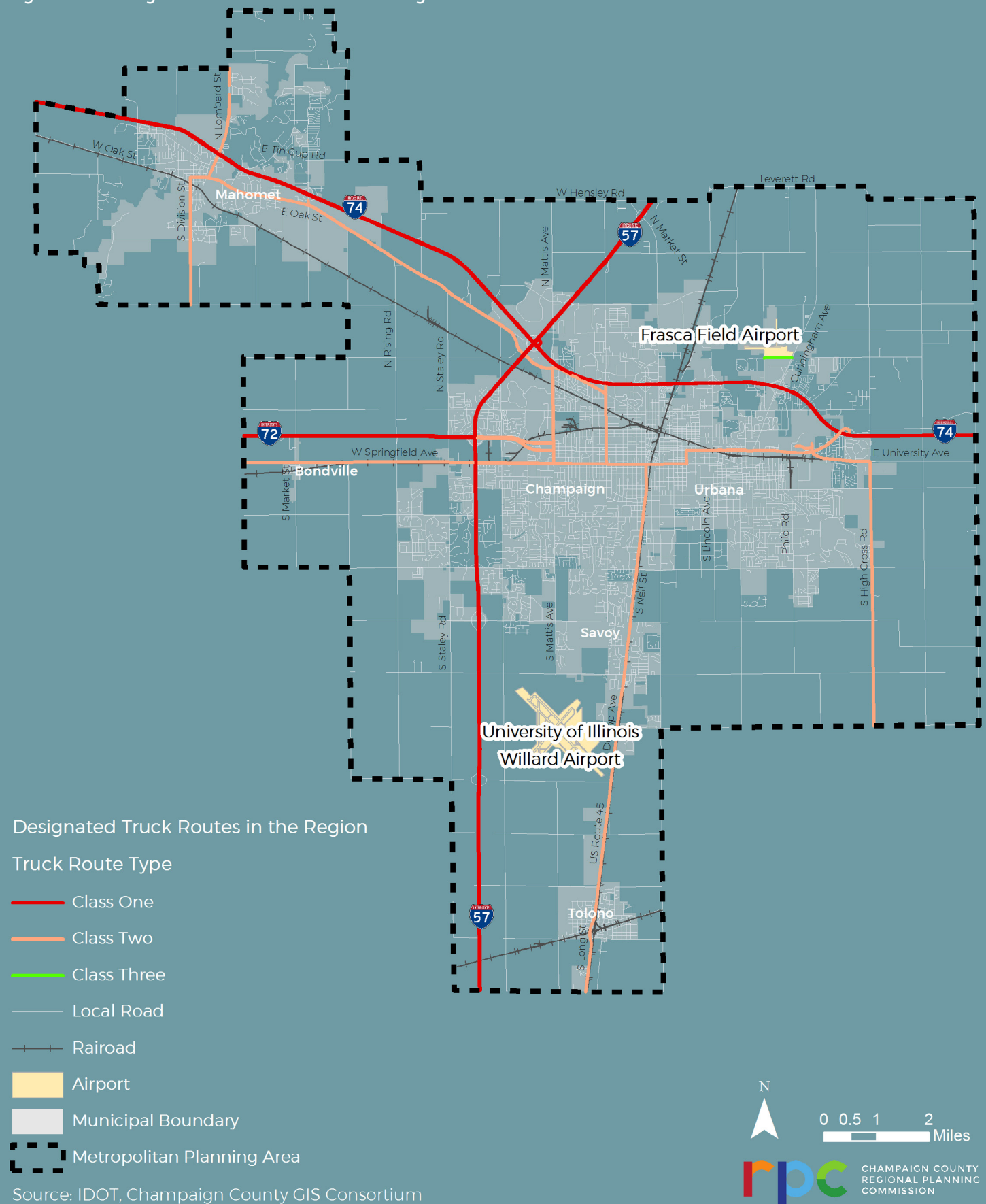
Figure 4-8: “No Truck” Sign at the Intersection of Neil Street and Vine Street



Source: Google Maps Street View



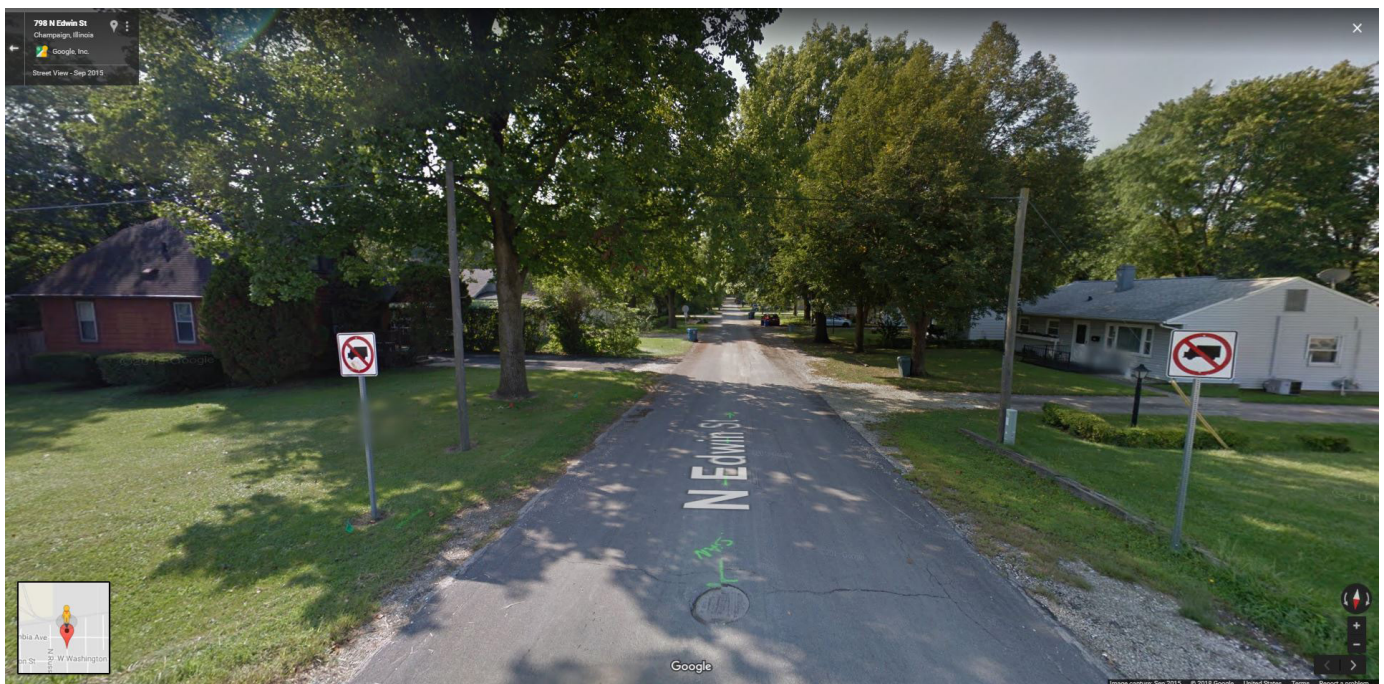
Figure 4-9: Designated Truck Routes in the Region



The City of Champaign does not have designated truck routes. The city typically directs trucks to stay on state highways and/or major arterial streets as much as possible. There are only a few places where there are No Trucks signs: Neil Street through downtown (Figure 4-8), Church Street east of Mattis Avenue, and Edwin Street (installed specifically to deter trucks heading from County Materials, Figure 4-10). The City of Urbana designated Guardian Drive from University Avenue to the Flex-N-Gate Guardian West plant and Butzow Drive from Guardian Drive to Lierman Avenue serving the industrial businesses in that area as Class Two truck routes. The city also designated Airport Road from Cunningham Avenue to east of Willow Road as a Class Three truck route.

IDOT conducts truck traffic counts for two categories of trucks in the region: single-unit trucks (24 to 38 feet length), and multi-unit trucks (39 feet and over length). Multi-unit trucks travel mainly on the interstate system (Figure 4-11). Although there were less than 500 daily multi-unit trucks traveling on the arterials that go through the Champaign-Urbana urbanized area, a higher number of single-unit trucks are more common on these roadways (Figure 4-12). Figure 4-13 shows the combined 2018 average daily truck traffic counts in the region. In addition to the interstates, segments of Market Street, Lincoln Avenue, University Avenue, Prospect Avenue, Mattis Avenue, and Bradley Avenue saw an average daily truck traffic of more than 1,000 in 2018.

Figure 4-10: “No Truck” Sign on Edwin Street south of Columbia Avenue



Source: Google Maps Street View

Figure 4-11: Average Daily Multi-Unit Truck Traffic in the MPA (2018)

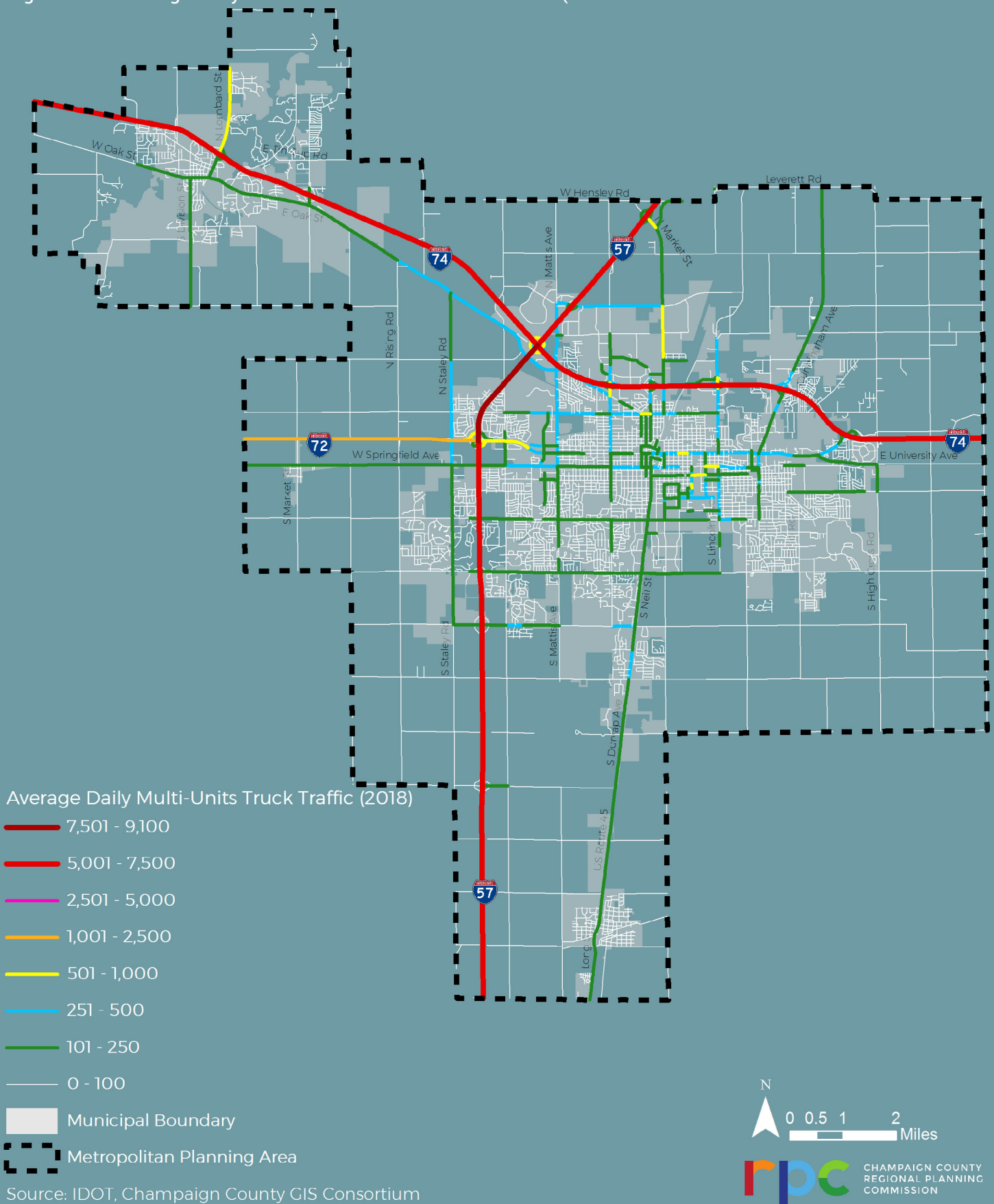




Figure 4-12: Average Daily Single-Unit Truck Traffic in the MPA (2018)

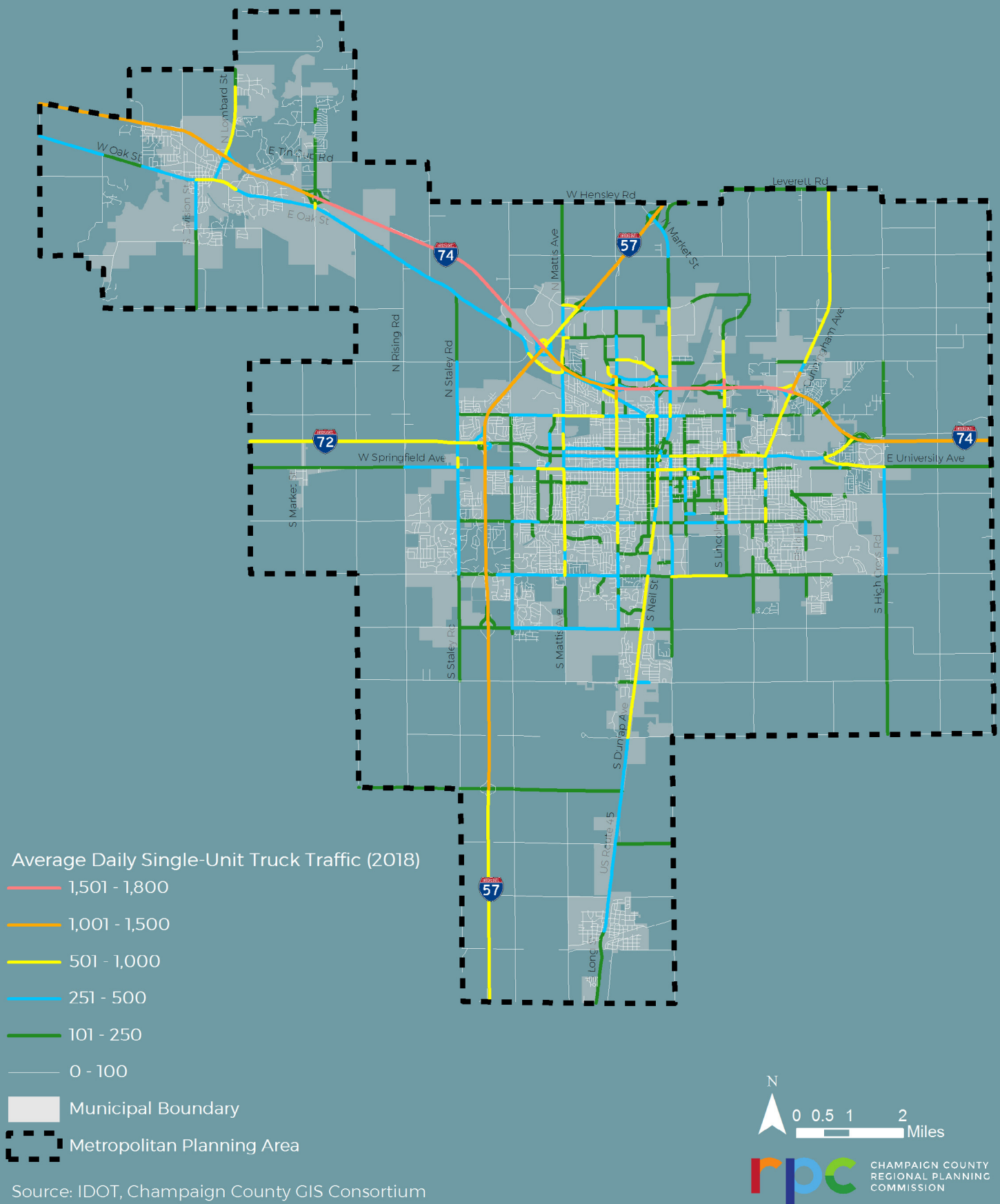
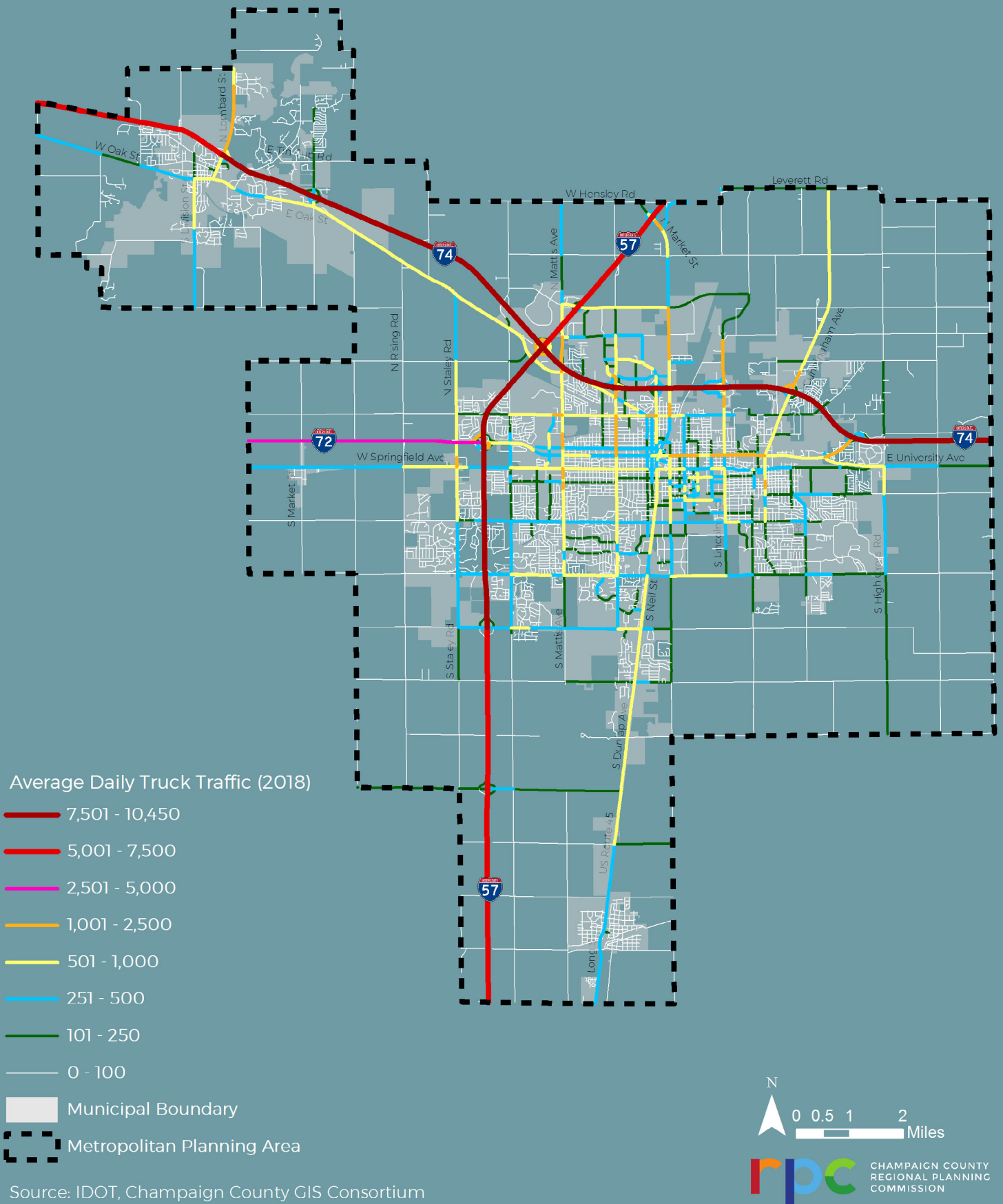


Figure 4-13: Combined Average Daily Truck Traffic in the MPA (2018)





## 4.2. Bridges

There are more than 900 bridges in Champaign County, and approximately 280 bridges in the Champaign-Urbana MPA (Figure 4-15). Fifteen bridges carry railroad tracks and approximately 60 bridges carry the interstates in the MPA. There are 15 railroad underpasses, and approximately 36 bridges crossing the interstates in the MPA.

IDOT maintains a listing of structurally deficient bridges in the region (Figure 4-16). Structural deficiency is based on condition ratings for several bridge components, including the quality of the bridge's deck, structure, and waterway adequacy, among others. "Structurally deficient" does not mean the bridges are unsafe for travel, but that there are elements of the bridge that need to be monitored, inspected, and maintained on a more frequent basis<sup>19</sup>.

There are 19 structurally deficient bridges in the MPA. As of April 2019, eight structurally deficient bridges in the MPA have been scheduled for improvement, repair, or rehabilitation<sup>20</sup>.

Figure 4-14: Mattis Avenue Bridge Over I-57 in North Champaign



Source: Google Maps Street View

Figure 4-15: Bridges in the MPA

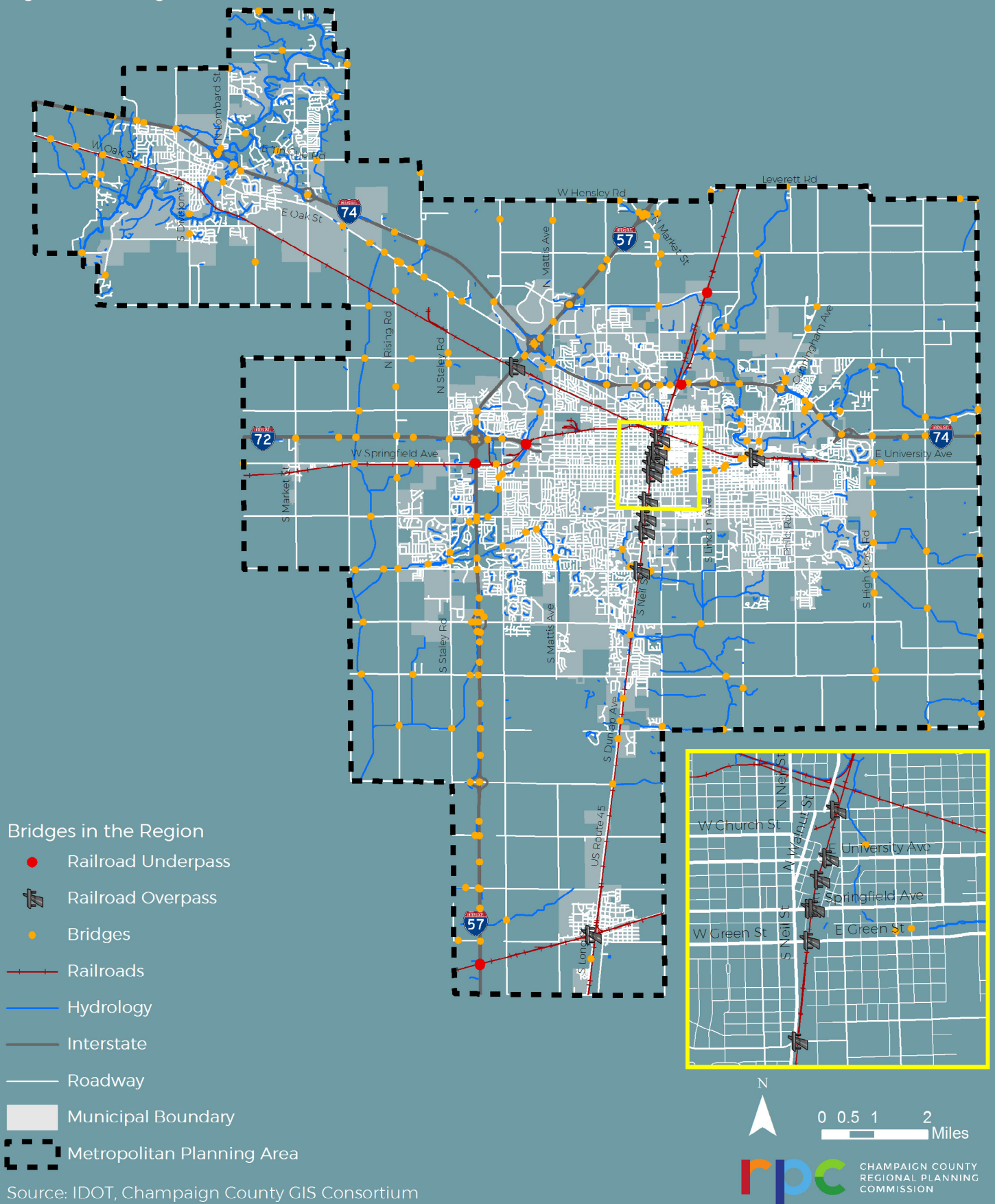
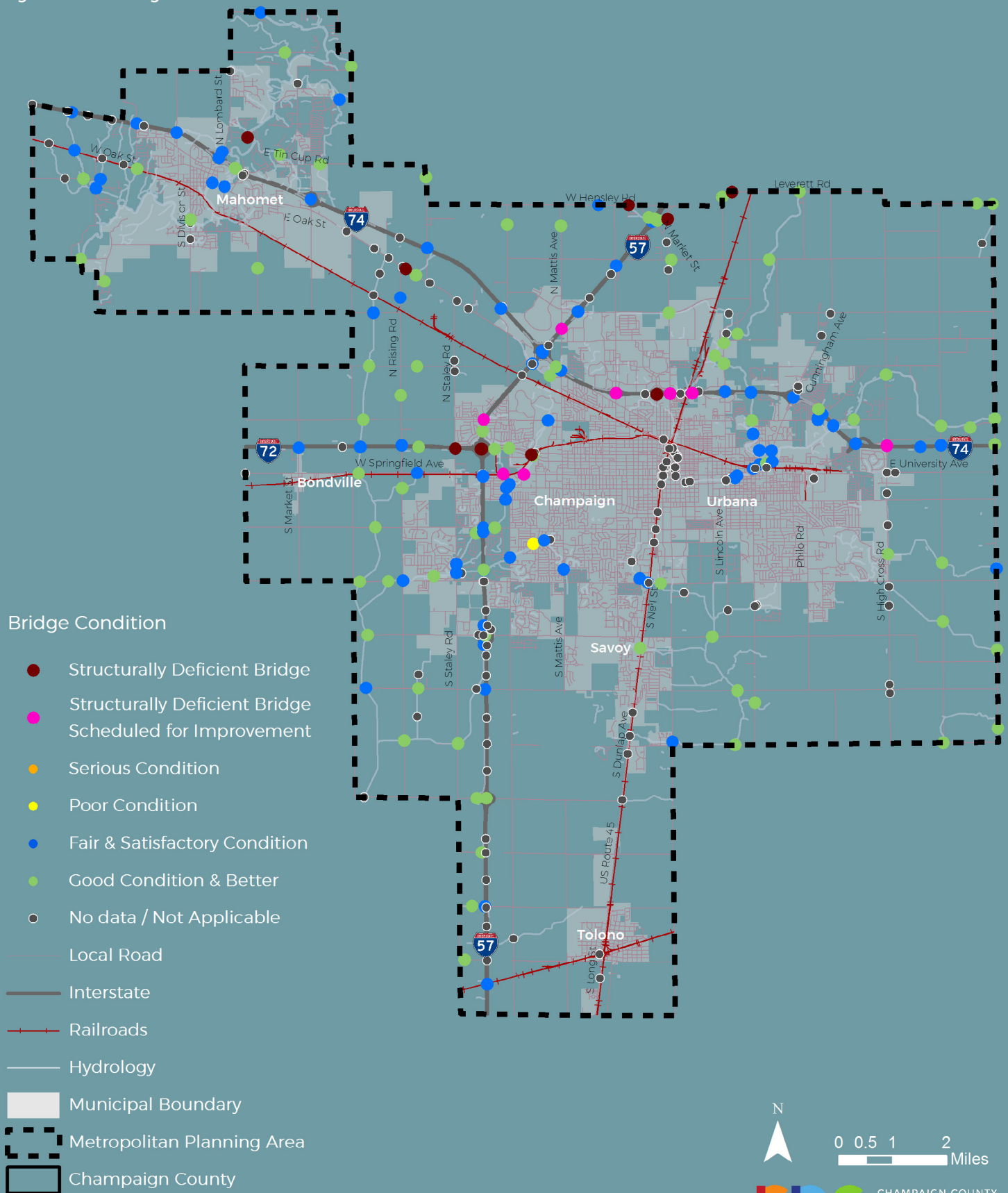


Figure 4-16: Bridge Condition



Source: IDOT, Champaign County GIS Consortium



## 4.3. Truck parking

Truck parking is one of the critical issues for freight planning, urging the need for safe, secure and accessible truck parking areas. Section 1401 of MAP-21 (also known as Jason's Law) effective from October 1, 2012 established a "national priority on addressing the shortage of long-term parking for commercial motor vehicles on the National Highway System (NHS) to improve the safety of motorized and non-motorized users and for commercial motor vehicle operators"<sup>21</sup>. Absence of technology and intelligent transportation systems that will alert drivers about parking availability, exacerbating the truck parking problems. ATRI reported that drivers spend on average about an hour of travel time per day looking for a safe place to park, which results in \$4,600 lost wages annually<sup>22</sup>. IDOT is conducting a rest area study to evaluate existing truck park facilities, additional needs and exploring options for strengthening parking capacity including Truck Parking Information Management System (TPIMS)<sup>5</sup>.

There are seven truck parking areas in Champaign County, five of which are in the Champaign-Urbana MPA (Figure 4-17). Illini Prairie Northbound and Southbound rest stop along I-57 are the only two public parking available in the region. Table 4-6 lists the truck parking facilities in the County.

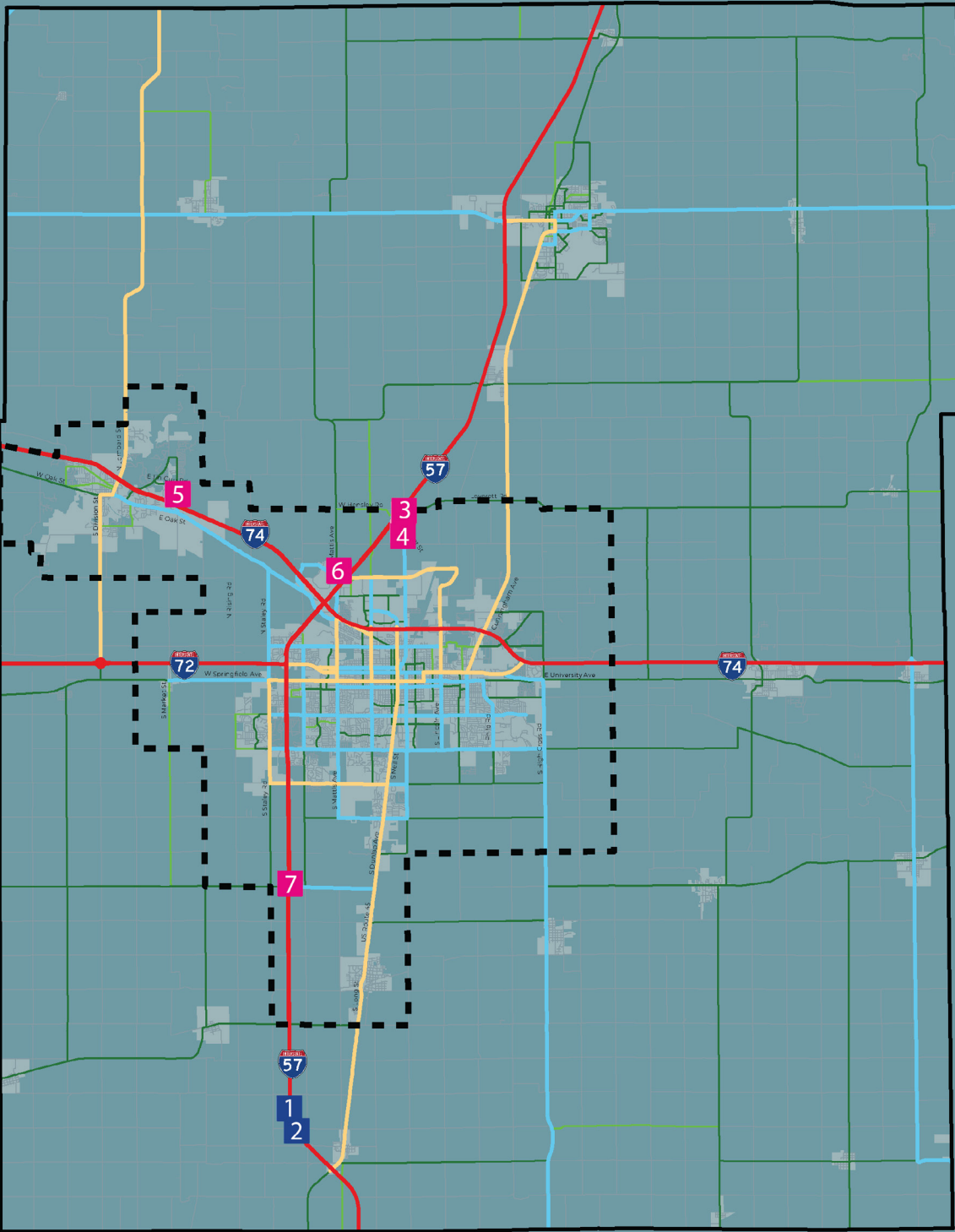
**Table 4-6: Truck Parking in Champaign County**

No	Name	Address	Truck Parking Spaces
1	IL Prairie Rest Stop Southbound	I-57 south bound west of Pesotum, IL	20
2	IL Prairie Rest Stop Northbound	I-57 north bound west of Pesotum, IL	20
3	CIT Trucks	148 E Leverett Rd, Champaign, IL	40
4	Road Ranger	4910 Market St, Champaign, IL	40
5	Mobil/Circle K	506 S Prairie View Rd, Mahomet, IL	<10
6	Mobil/Circle K	3604 N Mattis Ave, Champaign, IL	<10
7	Marathon	872 County Rd 1000 N, Champaign, IL	<10


*Source: Google Maps, FHWA Freight Management and Operations<sup>23</sup>, Find Truck Service<sup>24</sup>*


There are eleven more parking areas available within 10 miles of Champaign County. Love's Travel Stops and Country Stores at I-74 (northbound) Exit 206, eight miles east of Champaign County in the Village Oakwood opened in November 2018. It provides 67 truck parking spaces, seven diesel bays and seven showers, among other amenities<sup>25</sup>.


Figure 4-17: Regional Truck Parking






Regional Truck Parking


-  Public


 Private


 Interstate


 Other Principal Arterial


 Minor Arterial
-  Major Collector

 Minor Collector

 Local Road

 Municipal Boundary

 Metropolitan Planning Area

 Champaign County

Source: IDOT, Champaign County GIS Consortium



01.536 Miles



CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION



## 4.4. Railroads

Railroads are another important freight infrastructure component for goods movement in the region (Figure 4-18). Trains carried about 15 percent of the total regional commodity tonnage (3.0 million tons), and six percent of the commodity value (1.2 billion dollars) in 2017, indicating that railroads are mainly used for moving relatively high-weight, low-value commodities, such as agriculture products (Section 3.2.2). Champaign County is home to 19 rail-served grain elevators (six are within the MPA). These elevators are the region's most common intermodal points, as they facilitate the transfer of corn and soybeans from trucks to trains (Figure 2-6 in Chapter 2).

The region is served by Canadian National (CN) Railway to the north, south, and west of Champaign-Urbana. The CN railway is largely single track, except for portions at the railyard, with a maximum speed of 79 mph. Train operations are controlled by Central Traffic Control (CTC)\*. The north-south bound CN railway serves around 19 freight trains (130 train cars per train on average) daily. Amtrak has trackage rights over the entire length of the north-south CN railway within Champaign County<sup>26</sup>, operating six trains daily. The east-west bound CN railway serves two freight trains daily, supporting companies including Kraft Foods and Plastipak Packaging.

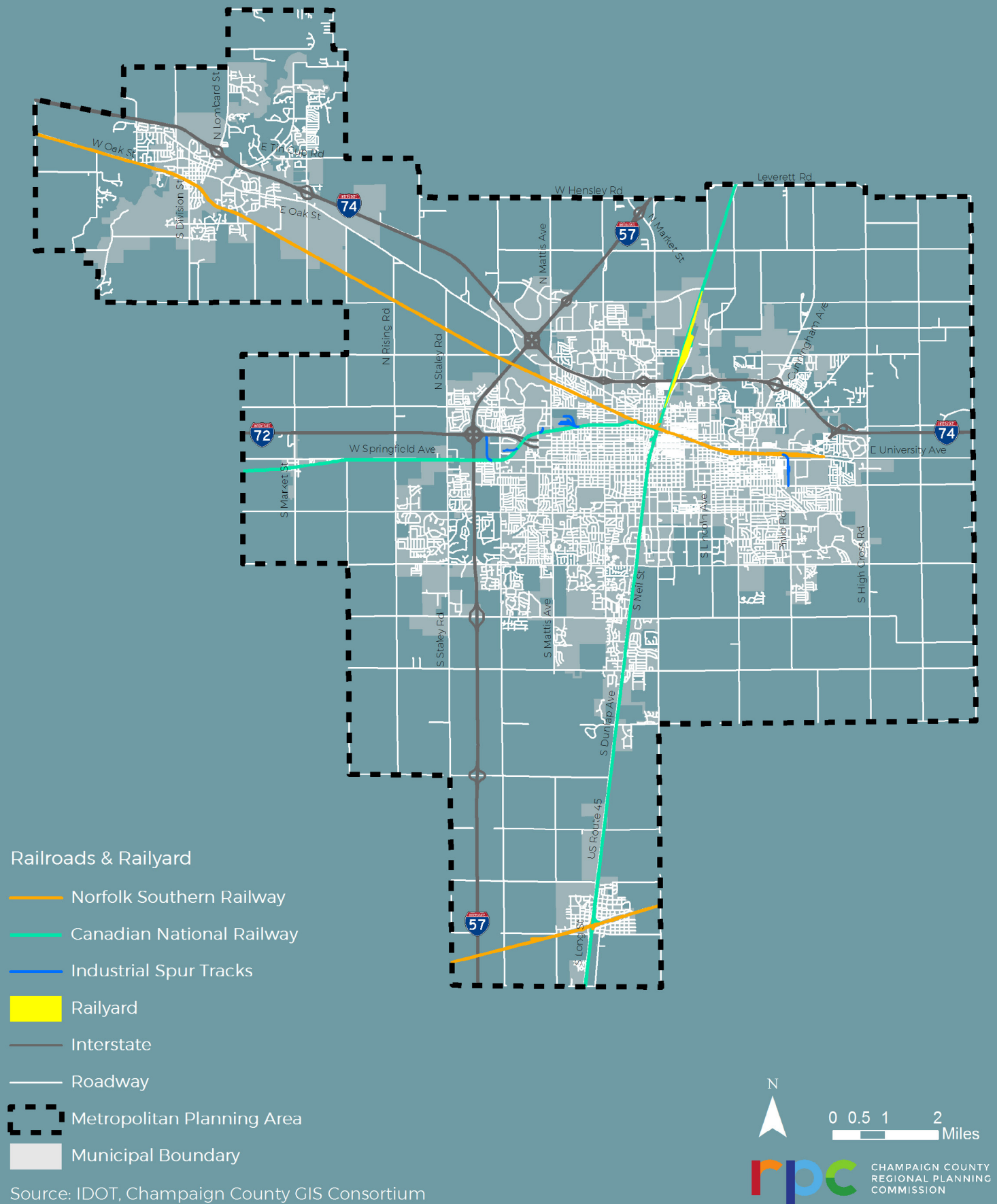
The region is also served by Norfolk Southern (NS) Railway in the northwest of the MPA. This segment is double track with an operating speed of 50 mph. Train operations on this segment are controlled by Automatic Block Signaling (ABS)†. The number of freight trains this segment of NS railways serves is around two weekly, and fluctuates with the activity of the companies along this railway. NS also owns the single-track railway in the southeast and southwest, serving around 30 freight trains daily. Several manufacturing companies in the region have spur tracks. There is one railyard north of I-74.

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\* CTC is a series of electronic switches, or interlockings, that are designed so that conflicting train movements cannot be authorized. A train dispatcher remotely controls signals and powered switches, generally over a long section of railroad. Train operators observe the controlled signals to authorize train movements.

† ABS consists of a series of signals that govern blocks of track between signals. Under ABS, signals are automatically activated by the condition of the block beyond the signal, providing restrictive signal aspects to move between blocks so that safe braking distances are ensured if two trains attempt to enter the same block.

Figure 4-18: Railroads and Railyard



There are 52 at-grade crossing locations along the rail lines in the Champaign-Urbana MPA (Figure 4-20). Each at-grade crossing is distinct from the others due to roadway geometry and the type of protection the crossing offers. At-grade crossings can have flashing lights, crossbucks, or gates as controls. The amount of freight transported by railroads coming into and originating from Champaign County is expected to increase by more than 40 percent by 2045<sup>27</sup>. The increased rail traffic will result in increased delay at the at-grade crossings, especially for drivers in the urbanized area, as railway freight movement usually has higher priority over roadway traffic. For example, at the Curtis Road and CN railroad at-grade crossing in Savoy (Figure 4-19), when freight trains approached the intersection, the gates were down, blocking the traffic on the roadways, for an estimated 49 minutes on average per day in 2017\*.

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\*. For this particular intersection, an INFRA grant application has been submitted by CUUATS on behalf of the Village of Savoy, proposing a grade separation and improvements on Curtis Road. In March 2018, the Illinois Commerce Commission (ICC) approved a portion of the project funding.

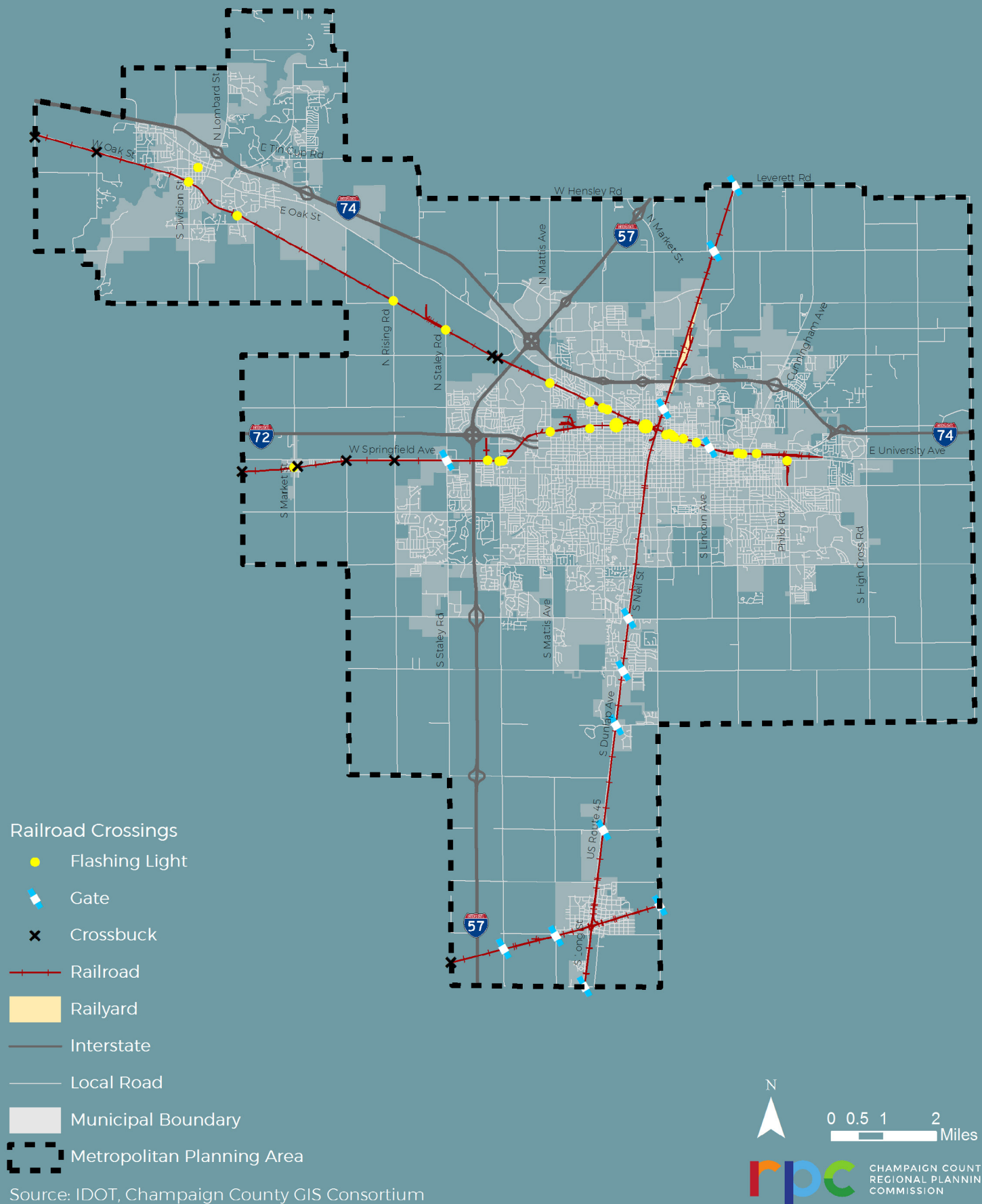
<http://www.illinoishomepage.net/news/local-news/icc-approves-rail-safety-improvement-plan/1080194603>

**Figure 4-19: CN At-Grade Railroad Crossing at Curtis Road in the Village of Savoy**



Source: CUUATS staff

Figure 4-20: Railroad Crossings in the MPA





## 4.5. Airports

There are two airports within the Champaign-Urbana MPA (Figure 4-22). Willard Airport is a commercial airport with convenient access to the interstate system and major arterials in the region. Willard Airport enplanements (number of passengers) increased by more than 11 percent from 2015 to 2017<sup>28</sup>. In 2017, Willard Airport carried 59 tons of cargo<sup>29</sup>, often as belly cargo in passenger planes. Compared with other airports in central Illinois, Willard Airport carries a small amount of freight cargo. However, companies in the region and the management team of the Willard Airport expressed great interest in adding freight cargo capacity to the airport in the future (see Chapter 6 for more details).

The airport's three runways are approximately 8,100 feet, 6,500 feet, and 3,800 feet in length<sup>30</sup>, which means the airport can support large jet operations. For example, the 8,000-foot runway is long enough to support takeoff of a fully-loaded Boeing 767<sup>31</sup>. The length of the runways, the potential capacity for large aircraft, as well as the easy connections to the interstate system provide Willard Airport the potential to grow as a freight terminal for the region.

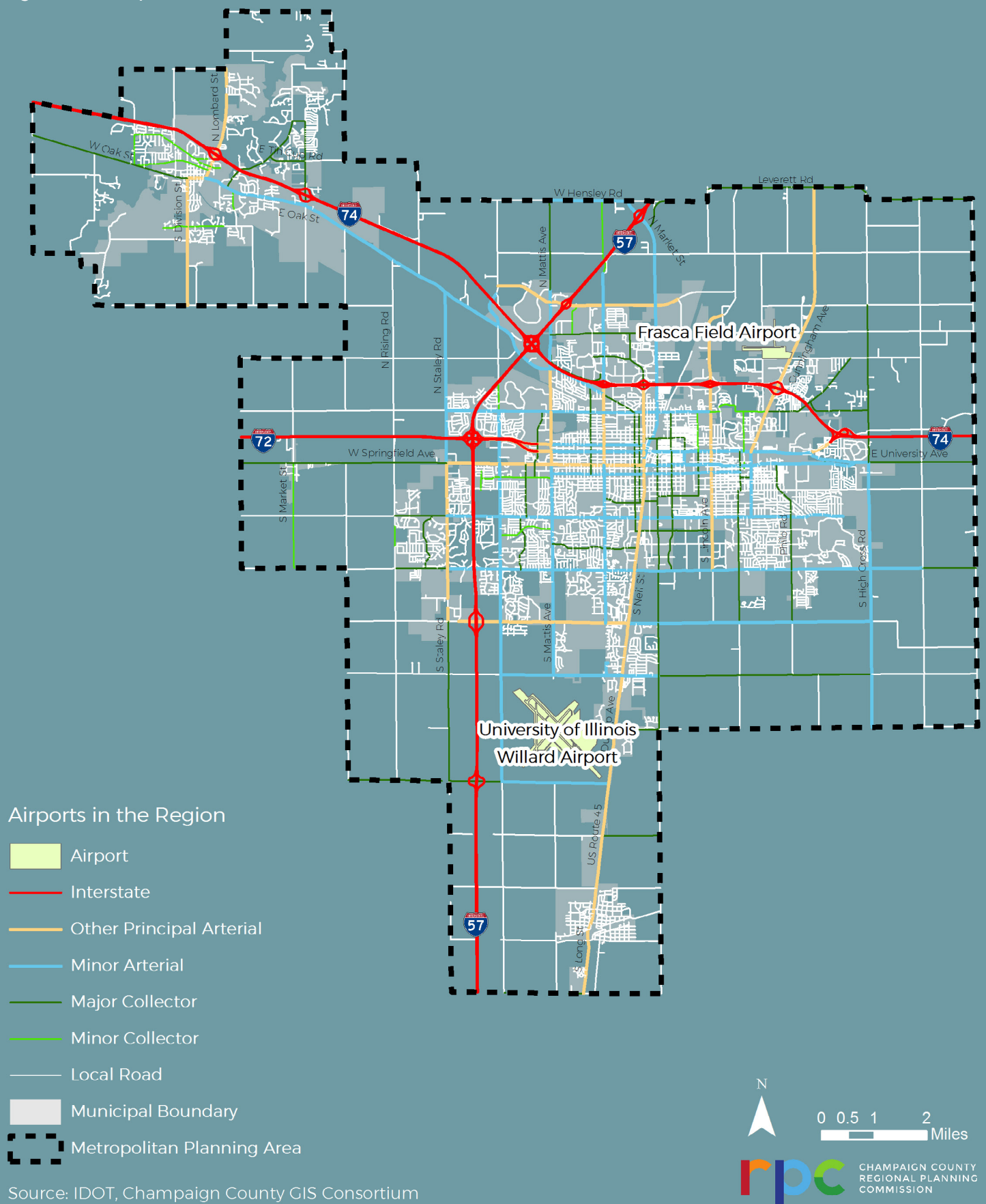
Figure 4-21: University of Illinois Willard Airport (CMI)



Source: Google Maps Aerial View



Figure 4-22: Airports in the MPA



Frasca Field Airport is a private airport of Urbana-based Frasca International, a company that specializes in manufacturing flight simulators. The Rantoul National Aviation Center, located outside of the MPA boundary in the Village of Rantoul, was created in 1993 after the closure of Chanute Airforce Base. The airport is owned by the Village of Rantoul and is open for public use.

## 4.6. Pipelines

Pipelines are used for distribution of liquid and gas commodities in the region. There are approximately 63 miles of pipelines in the Champaign-Urbana MPA (Figure 4-24) and 375 miles in Champaign County. Pipelines range in size from 12 to 36 inches in diameter. The operating pressure depends on the product in the line and distance from the pump station. The pressures, pound per square inch (PSI), can range from 50 to 950.

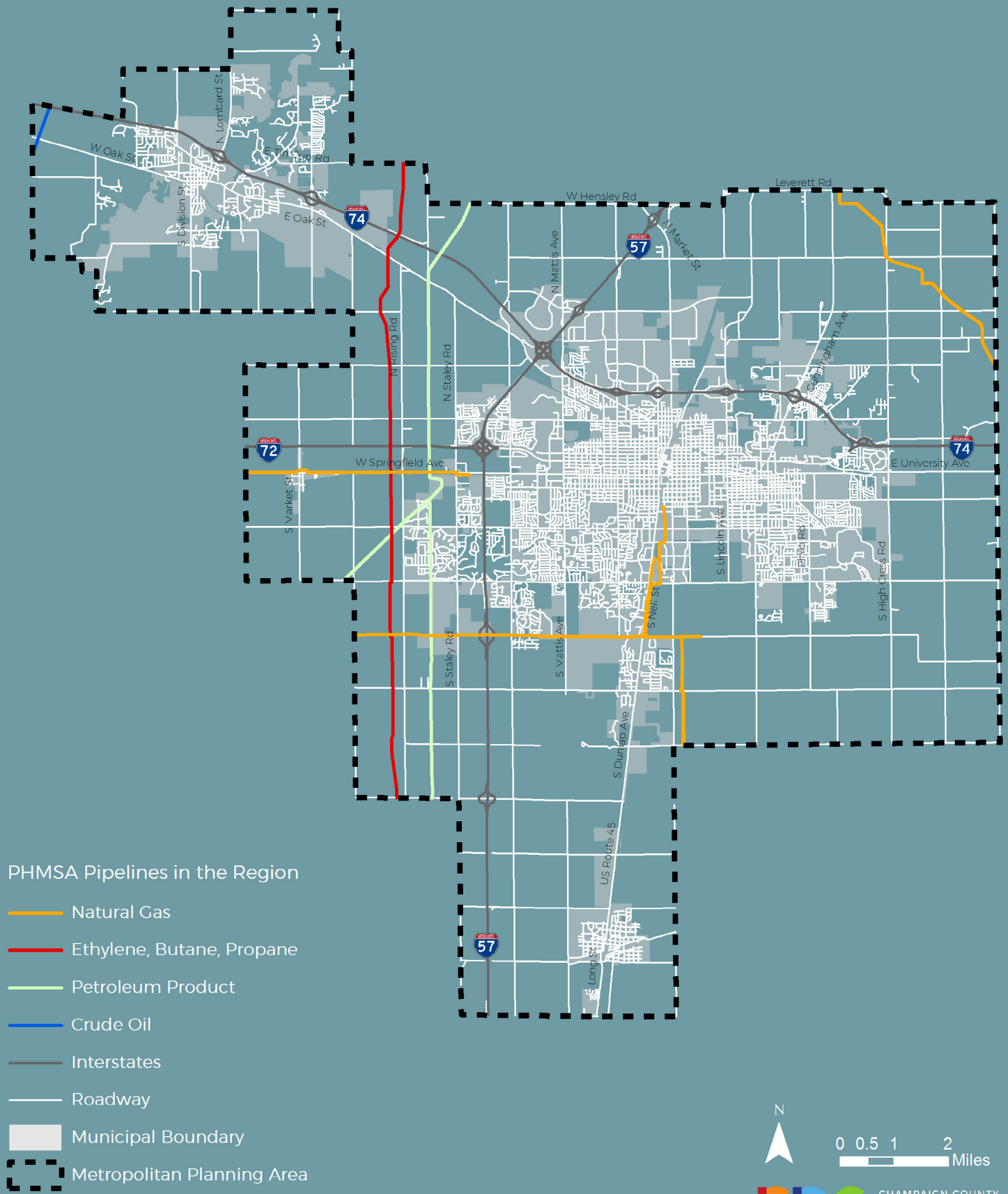
As discussed in Section 2.5 (Figure 2-22), just north of the Village of Mahomet in Newcomb Township outside of the MPA boundary, there is a natural gas storage facility, People's Gas Manlove Field.

Figure 4-23: Marathon Gas Storage in Champaign, IL



Source: Google Maps Street View

Figure 4-24: Pipelines in the MPA



Source: IDOT, Champaign County GIS Consortium, USDOT, Pipeline and Hazardous Materials Safety Administration (PHMSA)

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# How is the key freight infrastructure used today?

The efficient and reliable movement of goods on the transportation system is critical to the success of regional businesses. This chapter focuses on the safety and mobility performance of the freight infrastructure system within the Champaign-Urbana Metropolitan Planning Area (MPA), analyzing truck crashes, truck-viaduct crashes, train-vehicle crashes, truck route choice, and truck travel speed reflected in 26 million truck GPS records.



5



Figure: Canadian National freight train crossing Bradley Ave

Source: CUUATS Staff

## 5. How is the key freight infrastructure used today?

The efficient and reliable movement of goods on the transportation system is critical to the success of regional businesses. The ability of businesses to receive and ship products without delay reduces costs and increases productivity. In addition, continued improvement in the reduction of delay could attract new industries to locate in the region.

This chapter focuses on the safety and mobility performance of the freight infrastructure system within the Champaign-Urbana Metropolitan Planning Area (MPA), analyzing truck crashes, truck-viaduct crashes, train-vehicle crashes (Section 5.1), truck route choice, and truck travel speed reflected in three million truck GPS records (Section 5.2).

### 5.1. Safety analysis

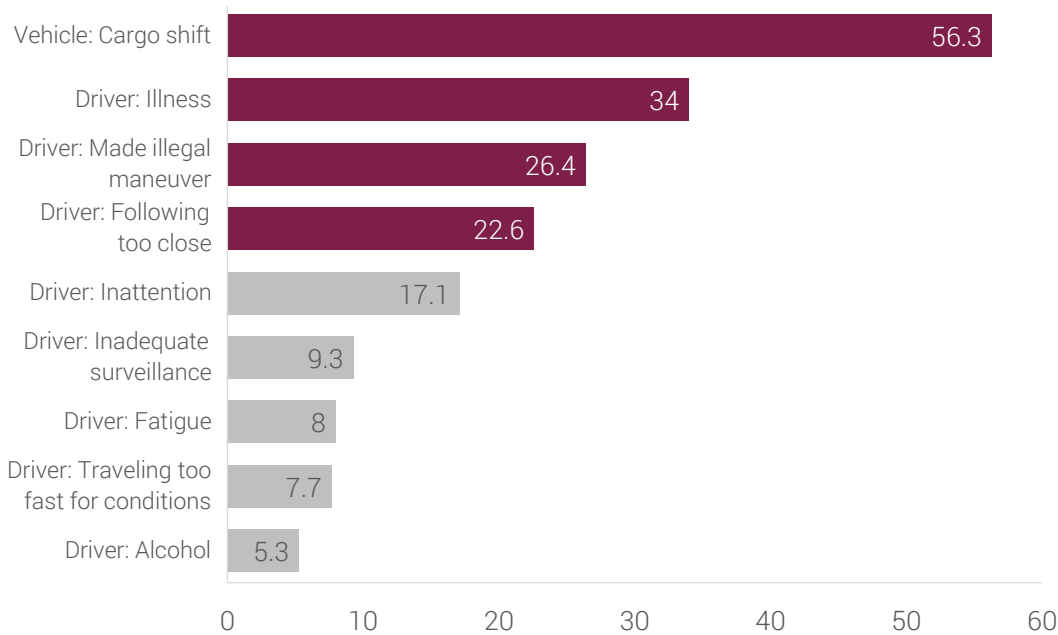
#### 5.1.1. Truck crashes

Crashes on a roadway are a type of non-recurring congestion that impedes traffic flow, and can be more disruptive to motorists and freight carriers than recurring congestion at a traffic bottleneck. This is because the delay caused by crashes is more likely to be unknown and cannot be planned for prior to departure.

According to a Large Truck Crash Causation Study completed by the Federal Motor Carrier Safety Administration (FMCSA), nationally, on average, driver reasons (e.g., speeding, drug use, distracted driving, etc.) accounted for 87 percent of the trucks involved in a fatal or injury crashes. Vehicle reasons (e.g., brake problems, cargo shift, etc.) accounted for 10 percent, and environment reasons (e.g., roadway problems) accounted for three percent<sup>1</sup>. Figure 5-1 shows the top factors associated with truck crashes. “Relative Risk” is an indicator developed by the FMCSA study to measure the increased risk each factor added, compared with trucks that are not coded under the factors. This research shows that vehicle cargo shift and driver reasons, including illness, making an illegal maneuver, following too close, or not paying attention, added the most risk leading up to a truck crash.



**Figure 5-1: Relative Risk of Truck Crash Reasons**

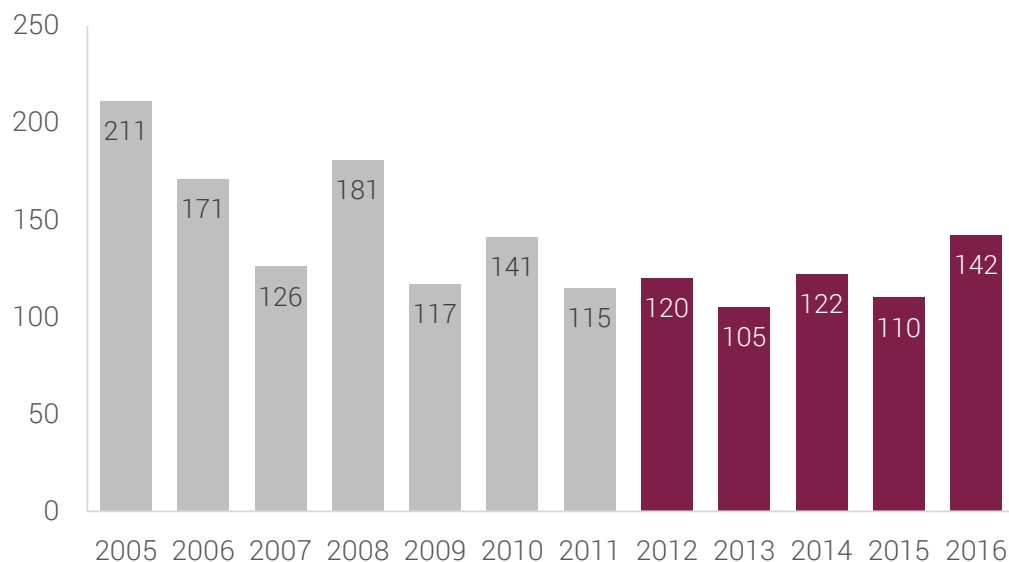


*Source: Large Truck Crash Causation Study (2007), Federal Motor Carrier Safety Administration (FMCSA)*

To better understand the truck crashes within the MPA, crash data from 2005 to 2016 was obtained from IDOT. A crash was considered a truck crash if any of the vehicles involved were classified as "Tractor with Semi-Trailer," "Tractor without Semi-Trailer," and "Truck Single Unit."

In the 2012-2016 period, the number of truck crashes per year in the MPA has fluctuated, with an average of 120 truck crashes per year (Figure 5-2); 2016 is the most recent year with available crash data.

**Figure 5-2: Number of Truck Crashes in the Champaign-Urbana MPA (2005-2016)**



*Source: IDOT*

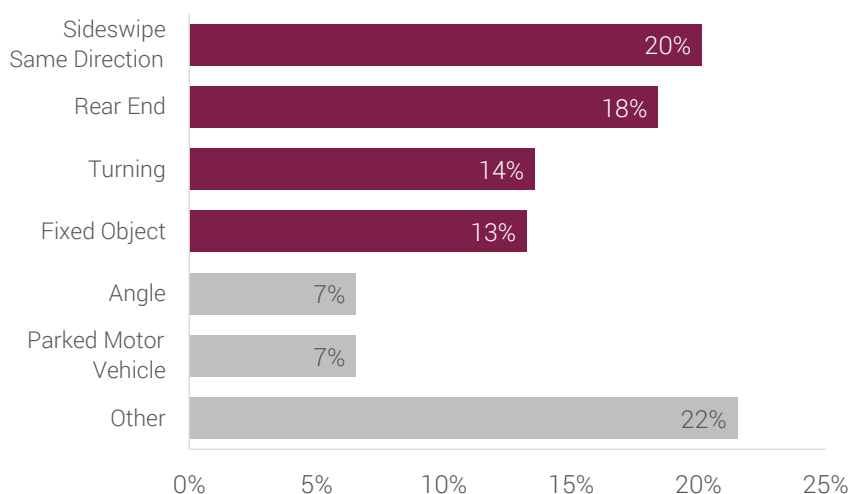
Sideswipe collisions between vehicles going in the same direction, rear end collisions, crashes while vehicles are turning, and fixed object collisions were the top crash types in the Champaign-Urbana MPA (Figure 5-3).

Driver reasons (e.g. improper lane usage, exceeding speed limit or failing to reduce speed, and failing to yield right-of-way) accounted for 87 percent of all truck crashes, and 92 percent of truck crashes that led to human injuries. Environment reasons (e.g. animals crossing or fixed object on the roadway, low bridges, weather condition resulting in low driver vision) accounted for nine percent of all truck crashes (e.g. less than four percent of truck crashes that led to human injuries). Vehicle reasons account for less than five percent of all truck crashes and less than four percent of truck crashes that led to human injuries.

Figure 5-4 shows the locations and relative density of truck crashes within the Champaign-Urbana MPA from 2012 to 2016. The interstates, particularly the interchanges, had a high concentration of truck crashes, accounting for 42 percent of all truck crashes. The I-74 and I-57 interchange has been scheduled for reconstruction<sup>2</sup>. Driver reasons (e.g. improper lane usage, exceeding speed limit or failing to reduce speed, and failing to yield right-of-way) were the main causes of truck crashes on the interstates.

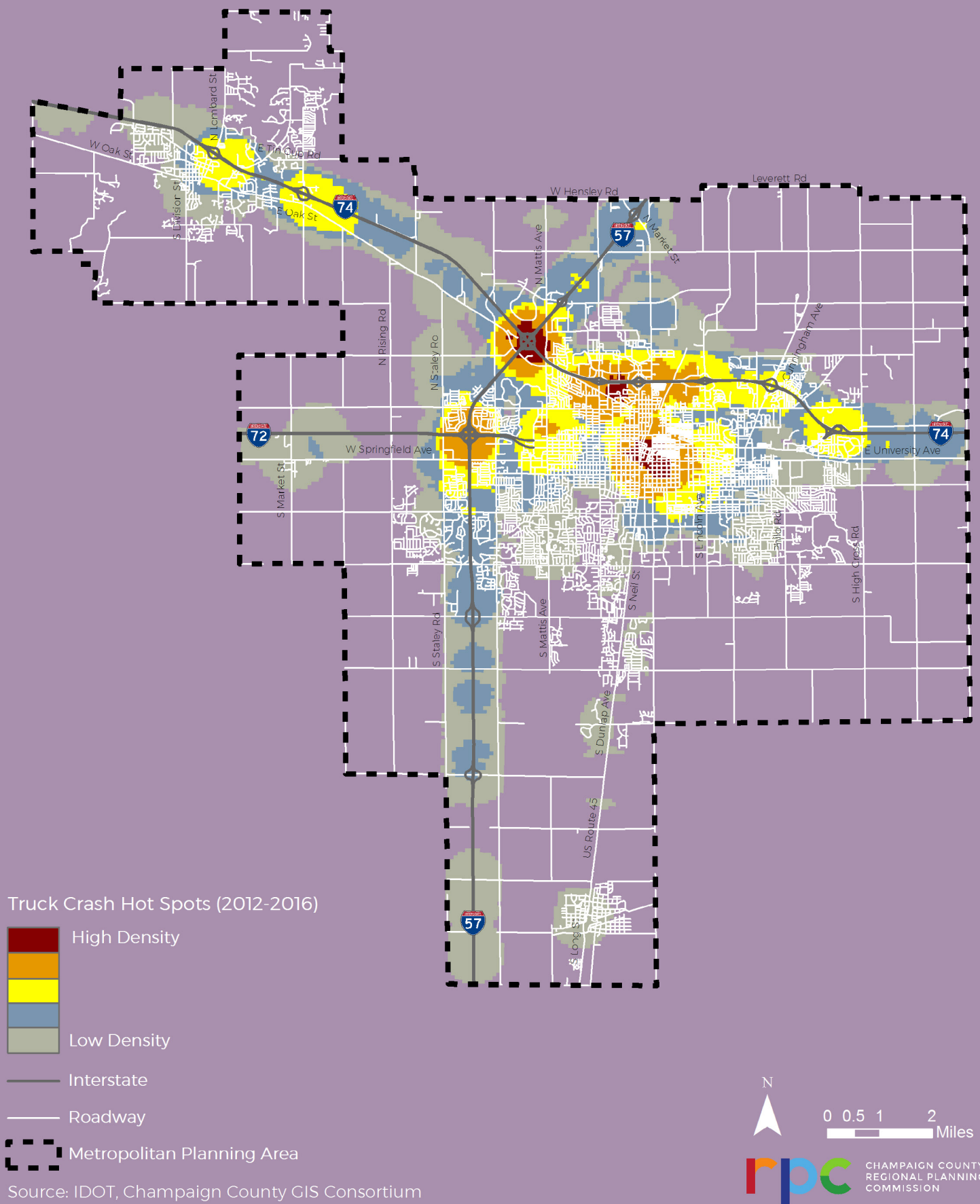
Mattis Avenue, between the I-72 exit and Bradley Avenue, and Bradley Avenue, between Mattis Avenue and Prospect Avenue, had a high number of truck crashes from 2012 to 2016 (Figure 5-5). This area is heavily traveled by trucks due to the presence of Kraft Foods, DSC Logistics, and other freight-generating businesses nearby.

**Figure 5-3: Types of Truck Crashes in the Champaign-Urbana MPA (2012-2016)**



Source: IDOT

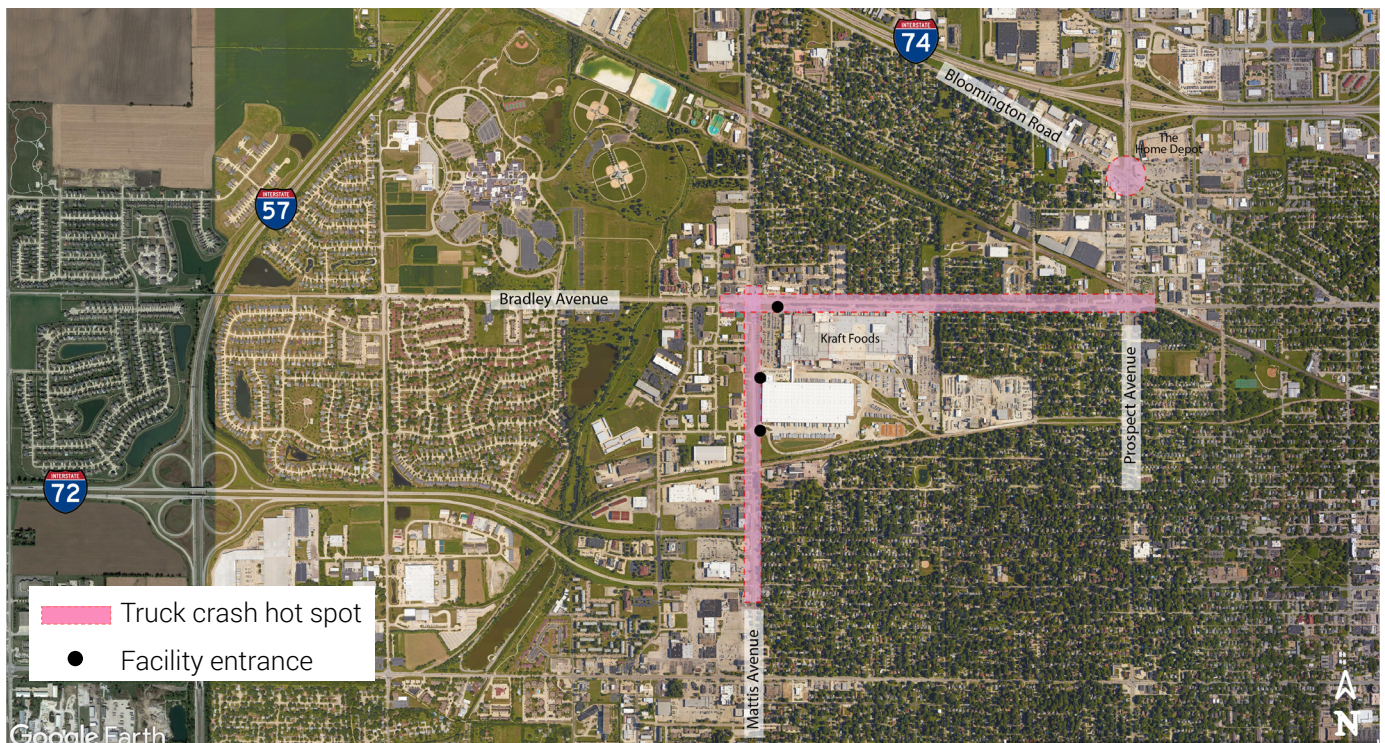
Figure 5-4: Truck Crash Hot Spots in the Champaign-Urbana MPA (2012-2016)



Although driver reasons continue to be the main causes for the crashes, other reasons, such as lack of signage or inappropriate roadway access point locations, may also influence driver decisions and cause crashes. For example, two truck crashes that occurred on Bradley Avenue east of the Mattis Avenue intersection were because truck drivers missed the north entrance of Kraft Foods and decided to take a U-turn.

The intersection of Bloomington Road and Prospect Avenue had the highest number of crashes in the MPA: 15 crashes related to trucks happened during 2012 and 2016 (Figure 5-6). This skewed intersection provides immediate access to I-74 in fewer than 500 feet, with the Home Depot store located at the northeast quadrant of the intersection. The eastbound left turn movement from Bloomington Road onto Prospect Avenue accounted for more than half of the truck crashes. The eastbound leg of this intersection has one left turn lane, one shared through and left turn lane, one through lane, and one right turn lane separated by a median. In addition to the large 120-degree turn that trucks must make to get onto Prospect Avenue, crash reports also cited the lack of clear marking of the two left turn lanes in the intersection as contributing the crashes.

**Figure 5-5: Truck Crash Hot Spots at Mattis Avenue and Bradley Avenue**



Source: IDOT, Google Earth



Figure 5-6: Truck Crash Hot Spots at the Intersection of Bloomington Road and Prospect Avenue



Source: Google Earth

Truck crashes on Washington Street, Springfield Avenue, and Green Street under the Canadian National railroad bridges contributed to the high density of truck crashes near downtown Champaign and the University District. The next section discusses these crashes in more detail.

The intersection of First Street and Green Street and the segment of Wright Street from University Avenue to Green Street also had a high number of truck crashes.

Figure 5-7 shows the day of week and time of day distribution of truck crashes in the MPA between 2012 and 2016. Figure 5-8 shows the severity of truck crashes in the MPA. More than 80 percent of the crashes during the 2012 to 2016 time period did not lead to human injuries. There were three fatal crashes: all of these crashes were between a truck and a passenger vehicle. There were 23 crashes that led to severe injuries (A-Injury).

Figure 5-7: Day of Week and Time of Day Distribution of Truck Crashes in the MPA (2012-2016)

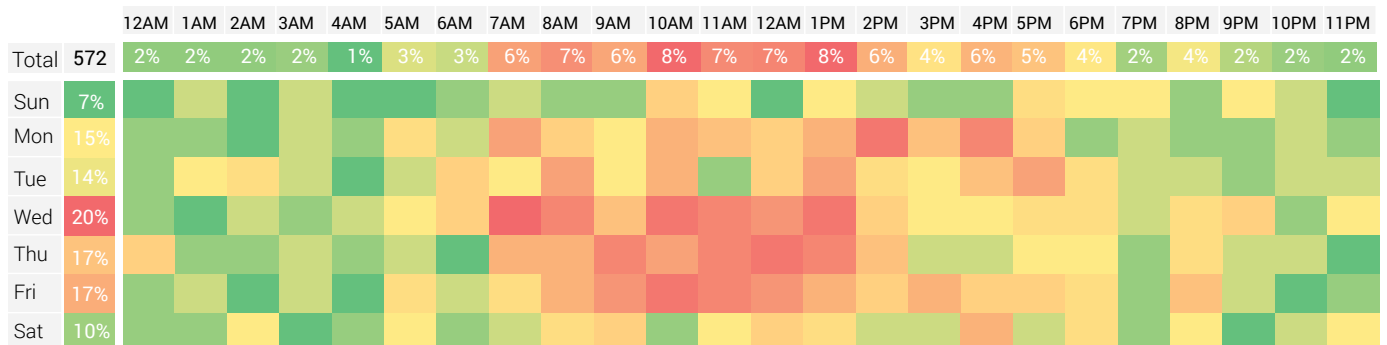
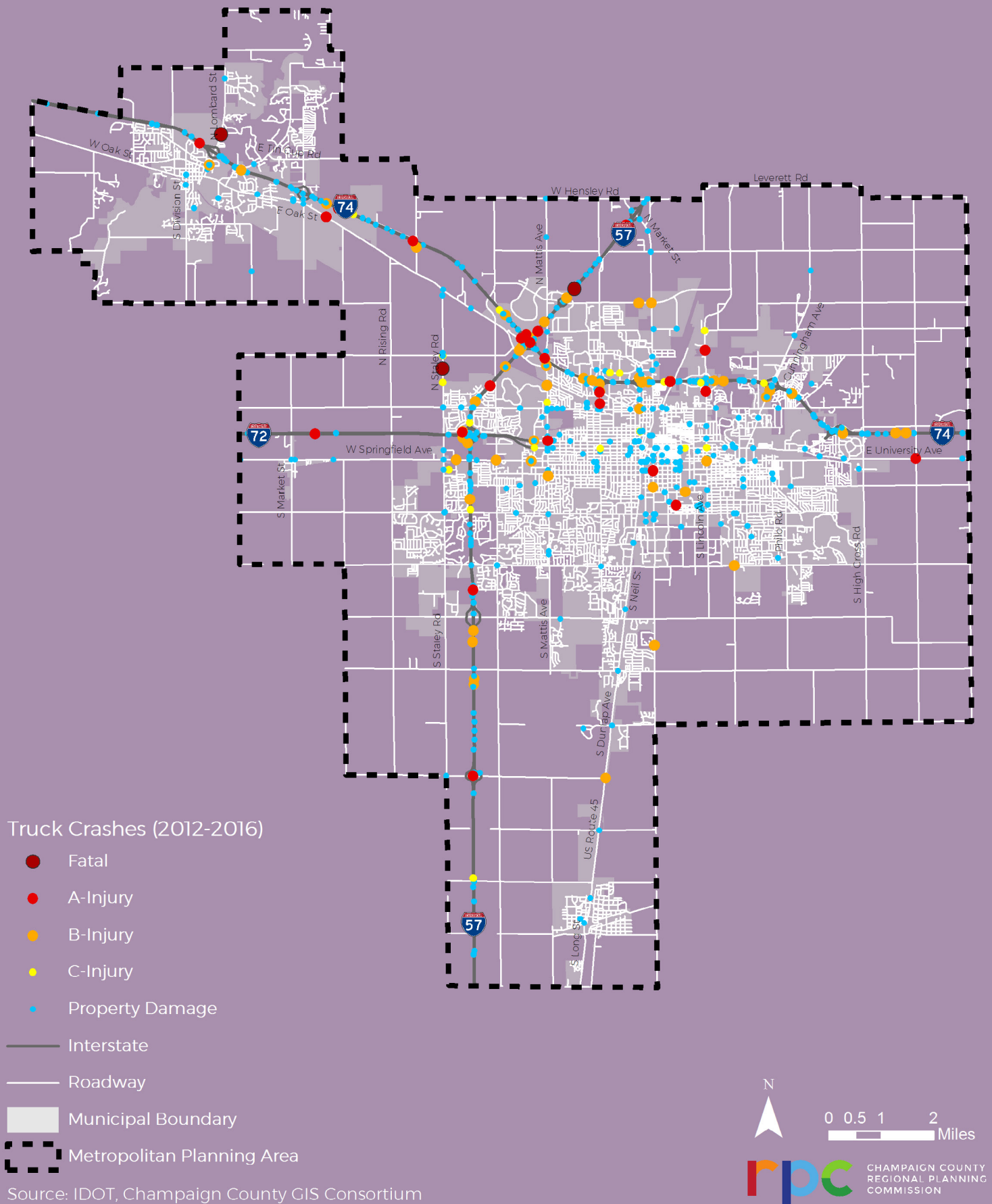


Figure 5-8: Severity of Truck Crashes in the Champaign-Urban MPA (2012-2016)





### 5.1.2. Truck-viaduct crashes

Vertical clearance of bridges is critical for truck access. When trucks collide with viaducts, it ties up traffic for up to six hours<sup>3</sup>. The maximum legal dimensions of heavy vehicles vary based on roadway and vehicle types. The Illinois Vehicle Code (IVC) requires that the total outside width of a truck must not exceed eight feet, six inches, and the maximum height requirement is 13 feet, six inches. In the Champaign-Urbana MPA, there are a few bridges with lower vertical clearance than 13 feet, six inches. There have been several incidents with trucks colliding with the bridges that carry the Canadian National railroad tracks in the City of Champaign<sup>3</sup> (Figure 5-9):

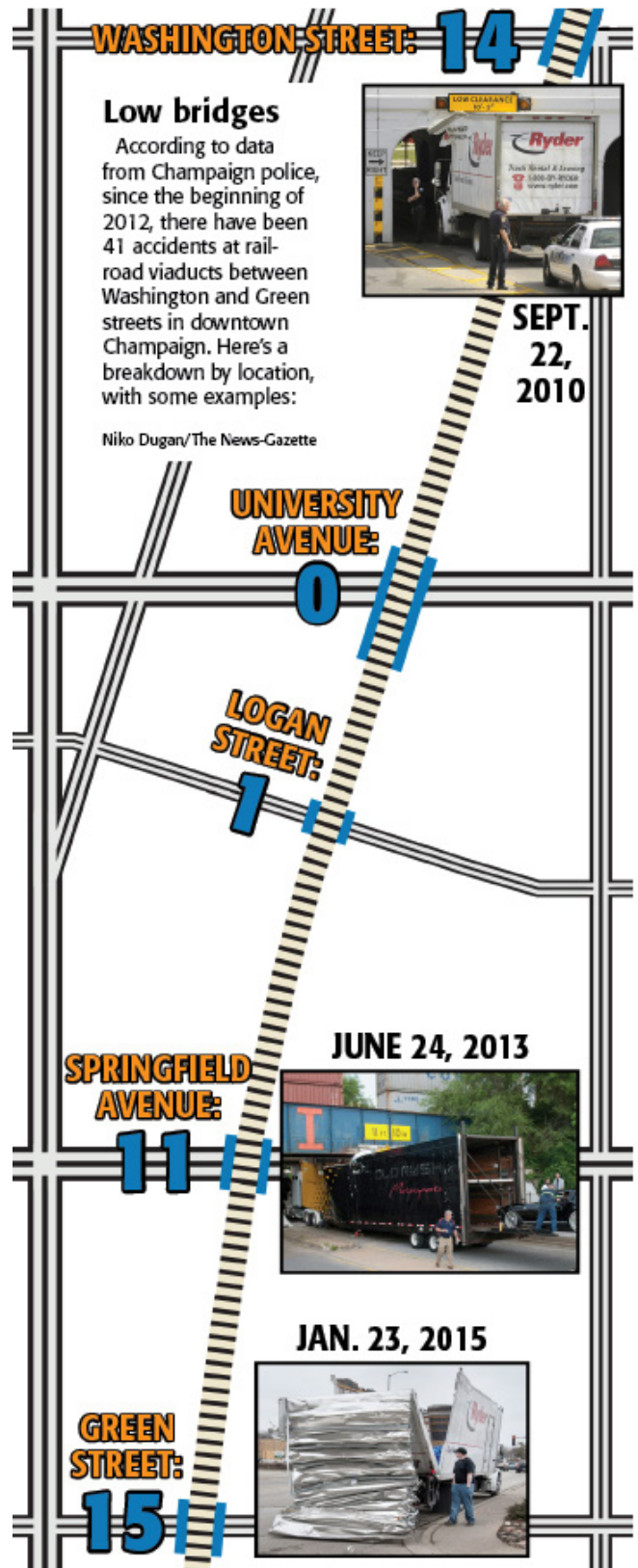
- Washington Street: 14 incidents from 2012 to 2017, bridge vertical clearance 10 feet three inches
- Logan Street: 1 incident from 2012 to 2017, bridge vertical clearance 12 feet
- Springfield Avenue: 11 incidents from 2012 to 2017, bridge vertical clearance 11 feet 10 inches
- Green Street: 15 incidents from 2012 to 2016, new MCORE project bridge vertical clearance 11 feet, 14 inches

According to the 2017 truck-viaduct crash reports, drivers not noticing the clearance signs or not being familiar with the area and solely following the GPS directions<sup>3</sup> resulted in the crashes. In addition to safety trainings, use of GPS made specifically for trucks that provides information related to low bridge clearance can help drivers avoid these accidents.

### 5.1.3. Train-vehicle crashes

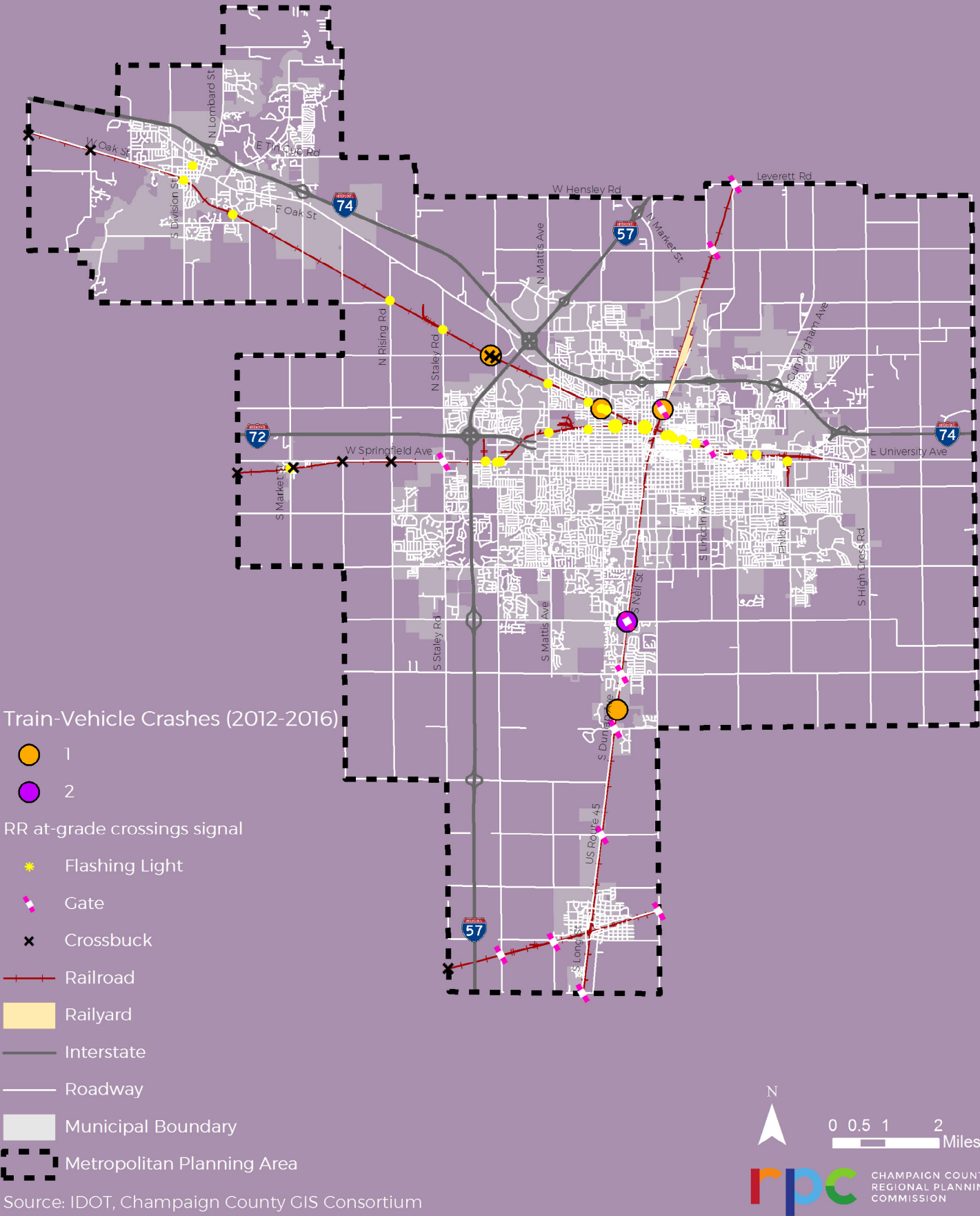
Train-vehicle crashes at at-grade crossings also delay freight movements. Figure 5-10 shows the location of train-vehicle crashes in the region between 2012 and 2016, mostly due to vehicle drivers' reckless driving or disregarding traffic signals or gates. One crash occurred at a roadway and railroad intersection with no traffic control in the Village of Savoy.

Figure 5-9: Truck-Viaduct Incidents (2012-2017)



Source: Niko Dugan, The News-Gazette<sup>3</sup>

Figure 5-10: Train-Vehicle Crashes in the Champaign-Urbana MPA (2012-2016)





## 5.2. Mobility analysis

### 5.2.1. Data source and limitations

In order to understand how trucks travel on the region's roadway network, from the perspectives of truck route choice and slow speed segments, about 26 million truck GPS records were obtained from the American Transportation Research Institute (ATRI) for Champaign County and five miles outside of Champaign County. ATRI obtains truck position data from a large sample of trucks that use onboard, wireless communications systems such as GPS, through partnerships with trucking companies and data vendors.

The ATRI truck GPS data contains eight weeks of truck movement records for the months of February, April, July, and October of 2017 for two weeks per month. The time periods were selected to cover the most and least busy truck traffic periods expected in a year, taking into consideration the University of Illinois academic calendar. The October dataset contained the largest number of GPS records. The week of October 17 to 24, which contains a total of 2.9 million GPS records for more than 33,000 unique trucks, was selected for more detailed analysis.

The truck GPS data from ATRI is limited to data collected from onboard communications equipment installed on commercial trucks (e.g., vehicle class nine through 13 with tractor-trailer combinations). Therefore, the ATRI truck GPS data does not provide a complete picture of the truck traffic in the region, as agricultural truck movements on the rural roadways and a number of logistics providers' trucks (e.g., UPS trucks) are not represented in the ATRI truck GPS datasets.

Each GPS record contains information on its spatial and temporal location, along with a unique truck ID that did not change for a certain time period. It should be noted that the ID is a random-digit identifier assigned to each vehicle and cannot be used to identify the actual vehicle or to trace the carriers that provided the data. Each GPS record also contains spot speed information (i.e., the speed of the truck at the time the GPS record was collected). However, the frequency of the GPS data streams varied considerably, ranging from a few seconds to several minutes of interval between consecutive GPS records. Thus, it makes it difficult to identify the exact routes each truck took by connecting the consecutive GPS records.

Another limitation of the ATRI truck GPS records is that no information regarding truck activity is included. This makes it difficult to explain if a truck is moving slowly due to roadway congestion or loading/unloading activity, or is decelerating or accelerating while entering or leaving an intersection.

### 5.2.2. Champaign County truck GPS data analysis

In Champaign County outside of the Metropolitan Planning Area (MPA), in addition to the interstates (I-74, I-72, and I-57), trucks traveled heavily on IL 47, which connects Champaign County north to west-Chicago suburbs where several major distribution centers are located (Figure 5-11). Other roadways traveled heavily by trucks reflected in the GPS records included:

- U.S. 45 connecting the MPA with the Village of Rantoul to the north;
- U.S. 136 through the Village of Rantoul;
- County Highway 1 connecting the MPA to U.S. 136;
- County Highway 22 connecting the MPA to the Village of Gifford; and
- U.S. 45, IL 130, and IL 49 connecting the MPA to the south.

### 5.2.3. MPA truck GPS data analysis

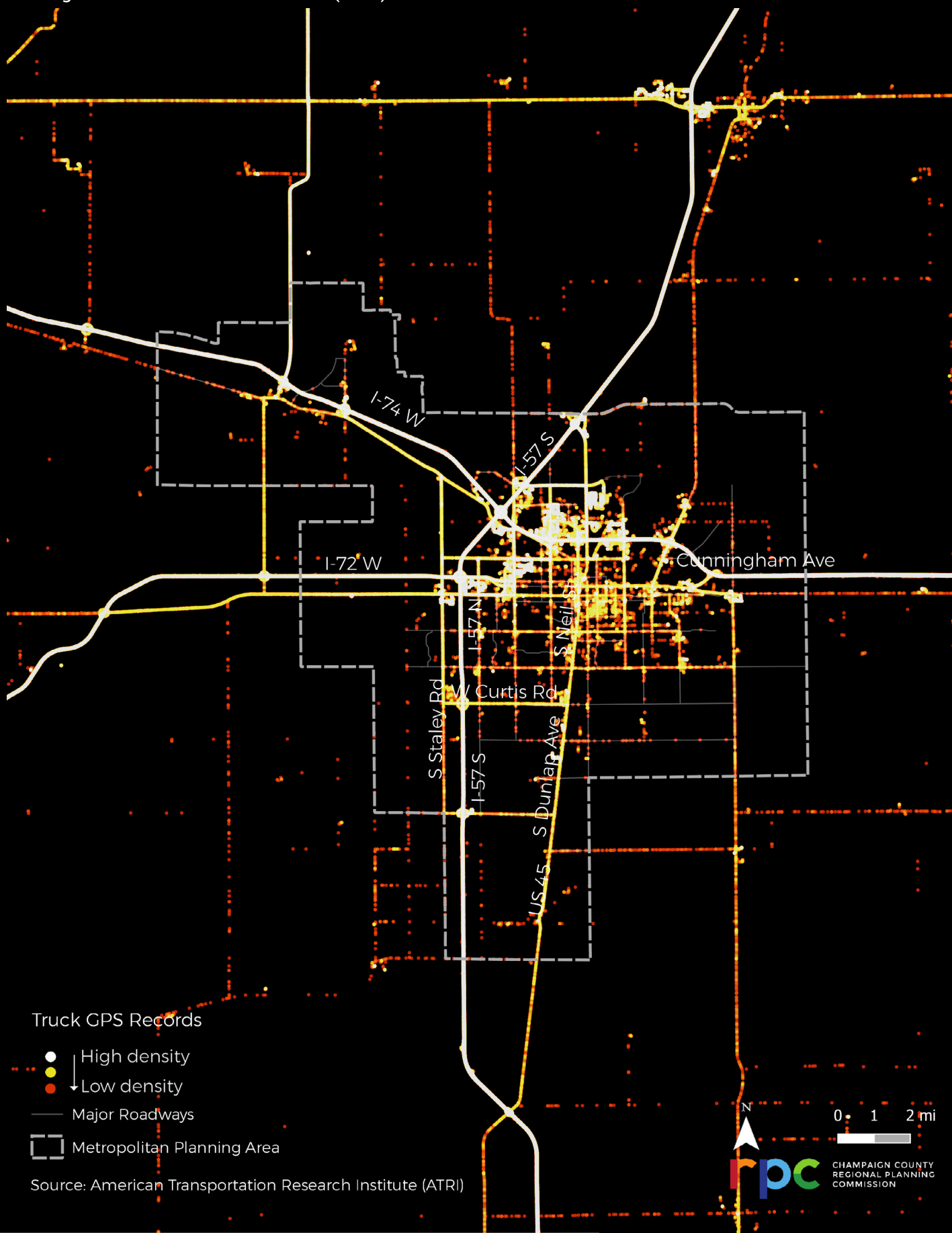
Of the 968,000 GPS records within the MPA, 47 percent of the records were on the interstate system, 44 percent of the records represented the idling movement of trucks in industrial and commercial areas, and less than 10 percent of the records were on the rest of the roadway network.

The following roadways were most heavily traveled by trucks during the study period (Figure 5-12):

- The interstates (I-57, I-72, I-74);
- The U.S. routes (U.S. 45, U.S. 150);
- The state routes (IL 10, IL 47, IL 130);
- Staley Road (U.S. 150 - Curtis Road);
- Olympian Drive (I-57 - Apollo Drive);
- Bradley Avenue (Staley Road - Lincoln Avenue);
- Mattis Avenue (Bloomington Road - Windsor Road);
- Duncan Road (Bradley Avenue - IL 10/Springfield Avenue);
- Prospect Avenue (Bloomington Road - Interstate Drive);
- Market Street (I-57 - I-74);
- Neil Street (Bradley Avenue - Town Center Boulevard);
- Lincoln Avenue (Wilbur Road - Florida Avenue);
- Vine Street (University Avenue - Florida Avenue);
- Windsor Road (Duncan Road - IL 130/High Cross Road);
- Monticello Road (Staley Road - U.S. 45); and
- Prairie Road and I-74 interchange in the Village of Mahomet.



Figure 5-12: Truck GPS Records (MPA)





Other general trends observed from the truck GPS data within the MPA include:

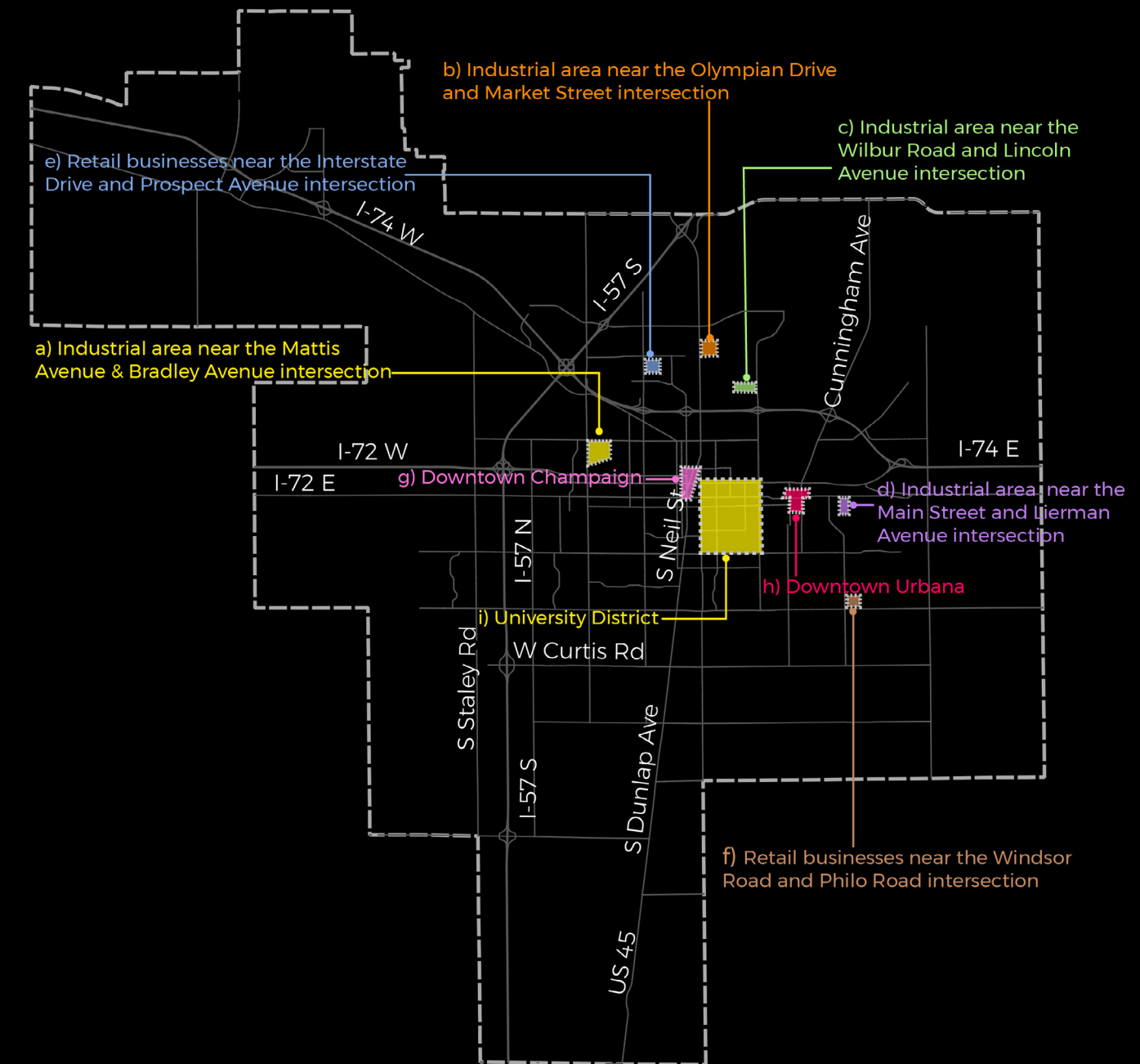
- Trucks frequently utilized the truck stops and their amenities located on Market Street at the I-57 entrance (Section 4.3).
- Trucks frequently utilized the gas station located at the intersection of Springfield Avenue and Staley Road (Section 2.5).
- In order to avoid the traffic at the I-72 entrance and exit at Church Street and University Avenue, some trucks took IL 10/West Springfield Avenue to access I-72 at the interchange located less than two miles west of the Champaign County boundary.

In order to examine truck GPS movements more closely, the rest of this chapter focuses on nine areas of interest, covering major industrial land use areas, logistics and distribution centers, and major grocery stores in the region. Community commercial areas (downtown Champaign, downtown Urbana, and University of Illinois campus district) were also selected for detailed analysis due to the bigger impact of truck traffic on local roadways, even though the truck traffic volume in these areas is less than in other major freight generating areas (Figure 5-13).

The following areas of interest discussions include observed major access roadways utilized by trucks during the one-week study period in October 2017, illustrated by the truck routes maps (e.g., Figure 5-15). As discussed earlier in this chapter, the inconsistency of the frequency of the GPS data streams caused the lack of in-between GPS records, which further resulted in truck routes not following the roadway network in those maps. However, these truck route maps provide a good representation of the roadways utilized most by the trucks. The truck speed maps (e.g., Figure 5-16) show the speed of the trucks recorded. Note that each point only represents one GPS record, not one truck.

Truck speeds lower than 10 miles per hour (mph) mean that trucks are likely idling in a parking lot, decelerating or accelerating when entering or exiting an intersection, or performing loading/unloading activities. Truck speeds between 10 to 25 mph means that trucks are likely traveling slow on a roadway. Figure 5-14 shows the posted speed limits of the major roadways in the MPA.

Figure 5-13: Areas of Interest



#### Areas of Interest

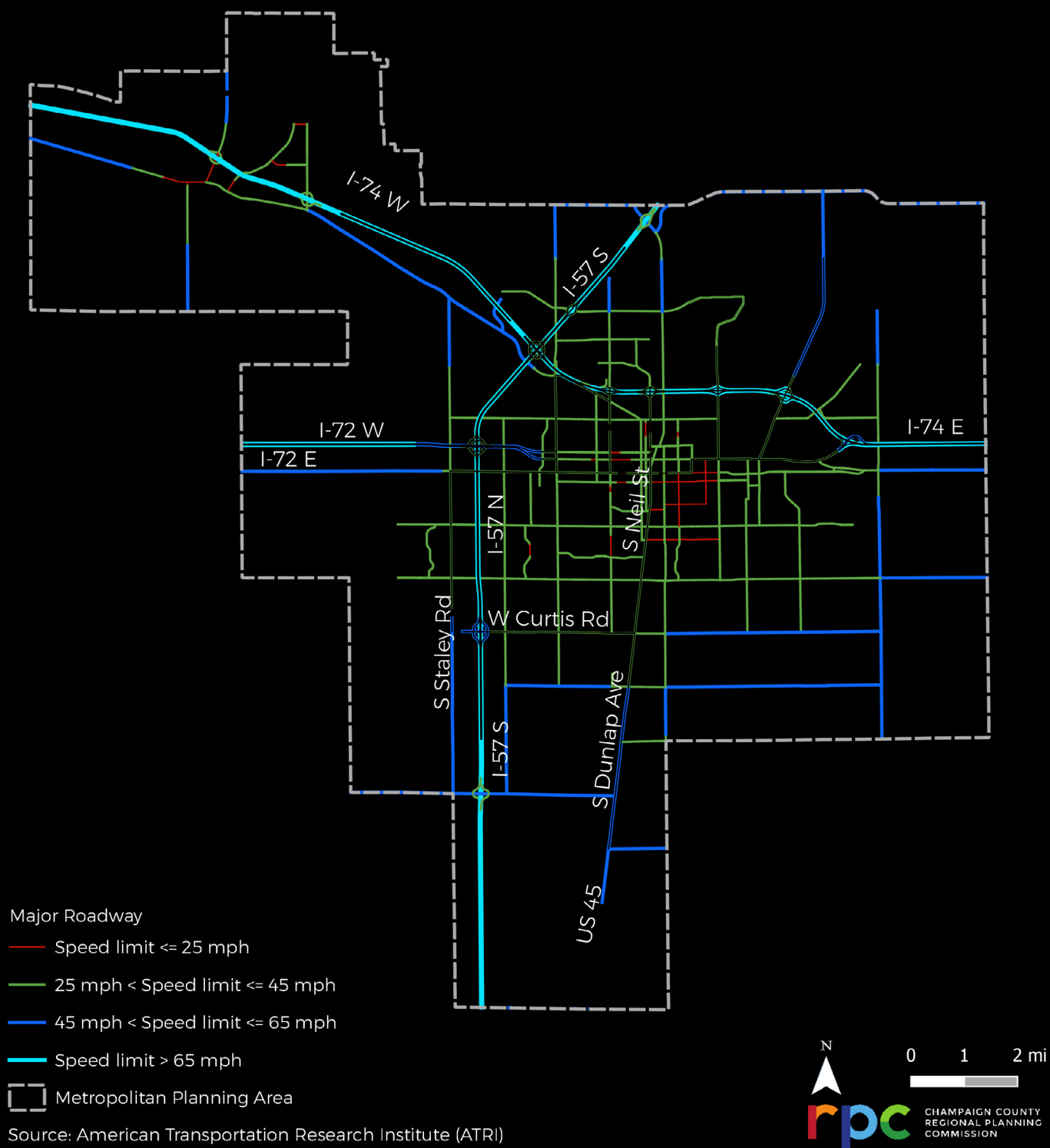
— Major Roadways

□ Metropolitan Planning Area

Source: American Transportation Research Institute (ATRI)



Figure 5-14: Posted Speed Limit (MPA)



### a) Trucks accessing the industrial area near the Mattis Avenue and Bradley Avenue intersection

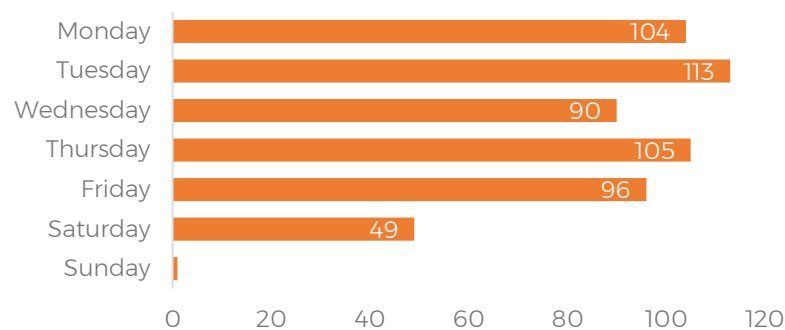
During the one-week study period in October 2017, approximately 580 trucks accessed the industrial land use area near the Mattis Avenue and Bradley Avenue intersection in the City of Champaign. Trucks coming to or leaving the area have easy access to I-74, I-57, and I-72 via Mattis Avenue, Bradley Avenue, Bloomington Road, and Prospect Avenue. Some trucks to or from this area also served the MPA using Neil Street, Lincoln Avenue, and Cunningham Avenue (Figure 5-15).

#### Major access roadways

- I-57, I-74, I-72
- Mattis Avenue, Bradley Avenue, Prospect Avenue, and Bloomington Road

#### Daily number of trucks

Busiest days: Mondays, Tuesdays, Thursdays



#### Time of day truck access



**55%** of the truck movements were concentrated between 7 a.m. and 3 p.m. on weekdays.

Mattis Avenue (south of the facilities and north of Church Street, southbound) and Church Street (west of Mattis Avenue, westbound) saw the slow movement of the trucks leaving the industrial facilities. Mattis Avenue between University Avenue and Church Street (northbound) also saw the slow movement of the trucks heading toward the facilities (Figure 5-16, Appendix B-1).



Figure 5-15: Routes of Trucks Accessing the Industrial Area Near the Mattis Avenue and Bradley Avenue Intersection

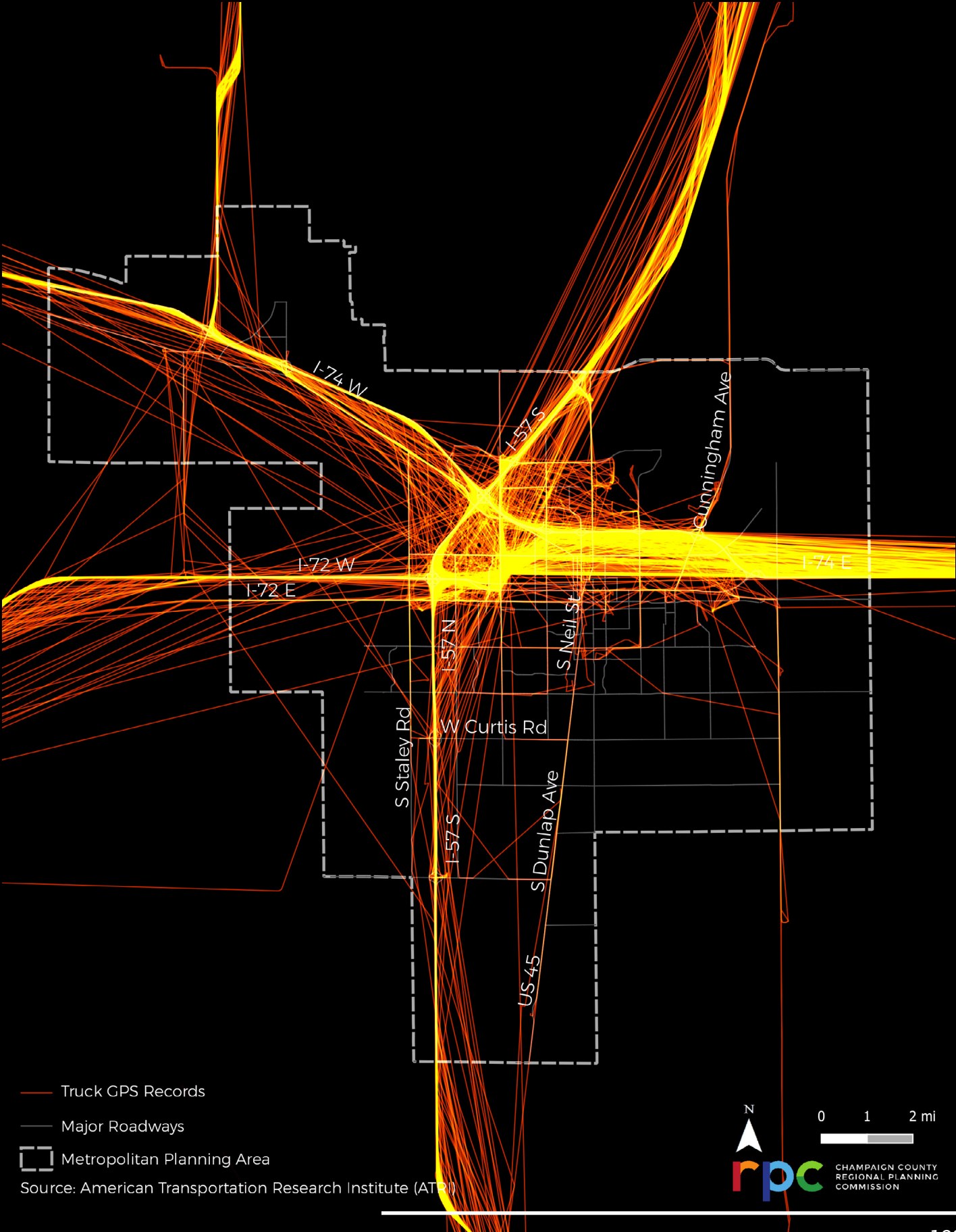


Figure 5-16: Speed of Trucks Accessing the Industrial Area Near the Mattis Avenue and Bradley Avenue Intersection



## b) Trucks accessing the industrial area near the Olympic Drive and Market Street intersection

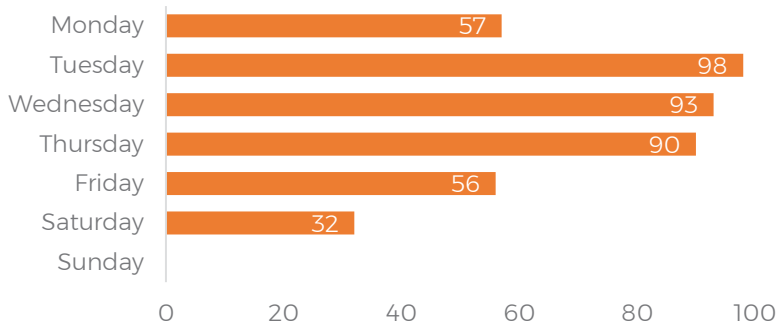
During the one-week study period in October 2017, more than 420 trucks accessed the industrial area near the Olympic Drive and Market Street intersection in the City of Champaign. Trucks coming to or leaving the area mainly used Olympic Drive to access I-57, while also utilizing the truck parking facilities on Market Street off of I-57 (Section 4.3). Trucks used Marketview Drive and North Neil Street to access I-74 (Figure 5-17).

### Major access roadways

- I-57, I-74, I-72
- Olympic Drive and Market Street

### Daily number of trucks

Busiest days: Tuesdays, Wednesdays, Thursdays



### Time of day truck access



**31%** of the truck movements were concentrated between 12 a.m. and 1:00 a.m. and between 6:00 a.m. and 7:00 a.m. on weekdays.

Neil Street north of I-74 and Marketview Drive between Neil Street and Market Street saw slow truck movements during the study period. Truck traffic merging to Olympic Drive from the eastbound ramp of the I-57 and Olympic Drive interchange experienced slow speed (Figure 5-18, Appendix B-2).

Figure 5-17: Routes of Trucks Accessing the Industrial Area Near the Olympian Drive and Market Street Intersection

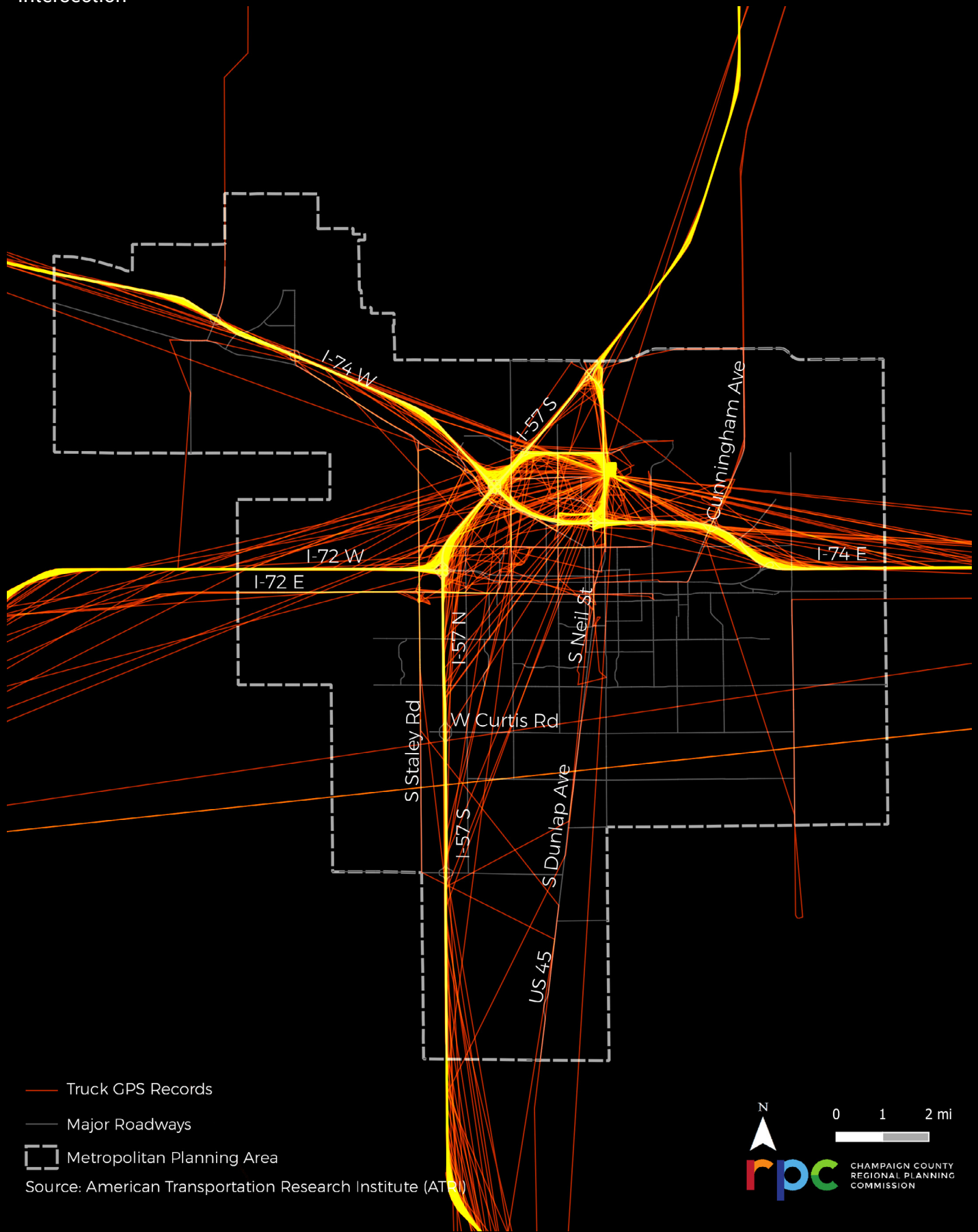




Figure 5-18: Speed of Trucks Accessing the Industrial Area Near the Olympian Drive and Market Street Intersection



### c) Trucks accessing the industrial area near the Wilbur Road and Lincoln Avenue intersection

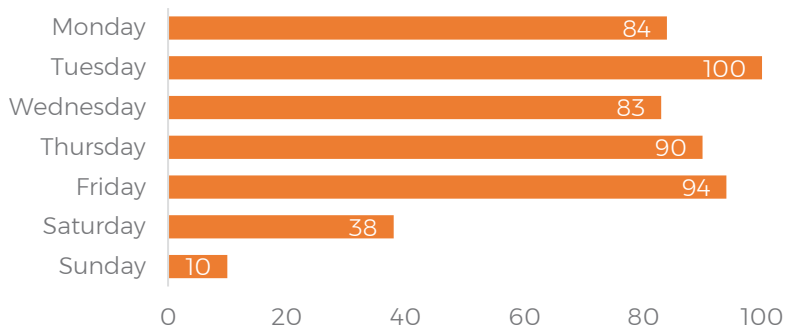
About 500 trucks accessed the industrial area located north of I-74 on North Lincoln Avenue during the one-week study period in October 2017. Trucks coming to or leaving the area mainly used the North Lincoln Avenue bridge to access I-74. Some of these trucks also served the industrial area located on Apollo Drive west of the railroad tracks, using north Market Street and the Neil Street bridge over I-74. There were also truck movements on I-57 and I-74 traveling between the industrial area discussed in section a) and this industrial area (Figure 5-19).

#### Major access roadways

- I-57, I-74
- North Lincoln Avenue, Market Street, Olympian Drive, Cunningham Avenue, and Bradley Avenue

#### Daily number of trucks

Busiest days: Tuesdays, Thursdays, Fridays



#### Time of day truck access



**45%** of the truck movements were concentrated between 12 a.m. and 4 a.m. on weekdays.

Northbound truck traffic on the bridge carrying North Lincoln Avenue over I-74 experienced slow speed during the analysis period. Trucks that also served the industrial area located on Apollo Drive west of the railroad tracks via North Neil Street off of I-74 and Market Street experienced slow speed (Figure 5-20, Appendix B-3).

Figure 5-19: Routes of Trucks Accessing the Industrial Area Near the Wilbur Road and Lincoln Avenue Intersection

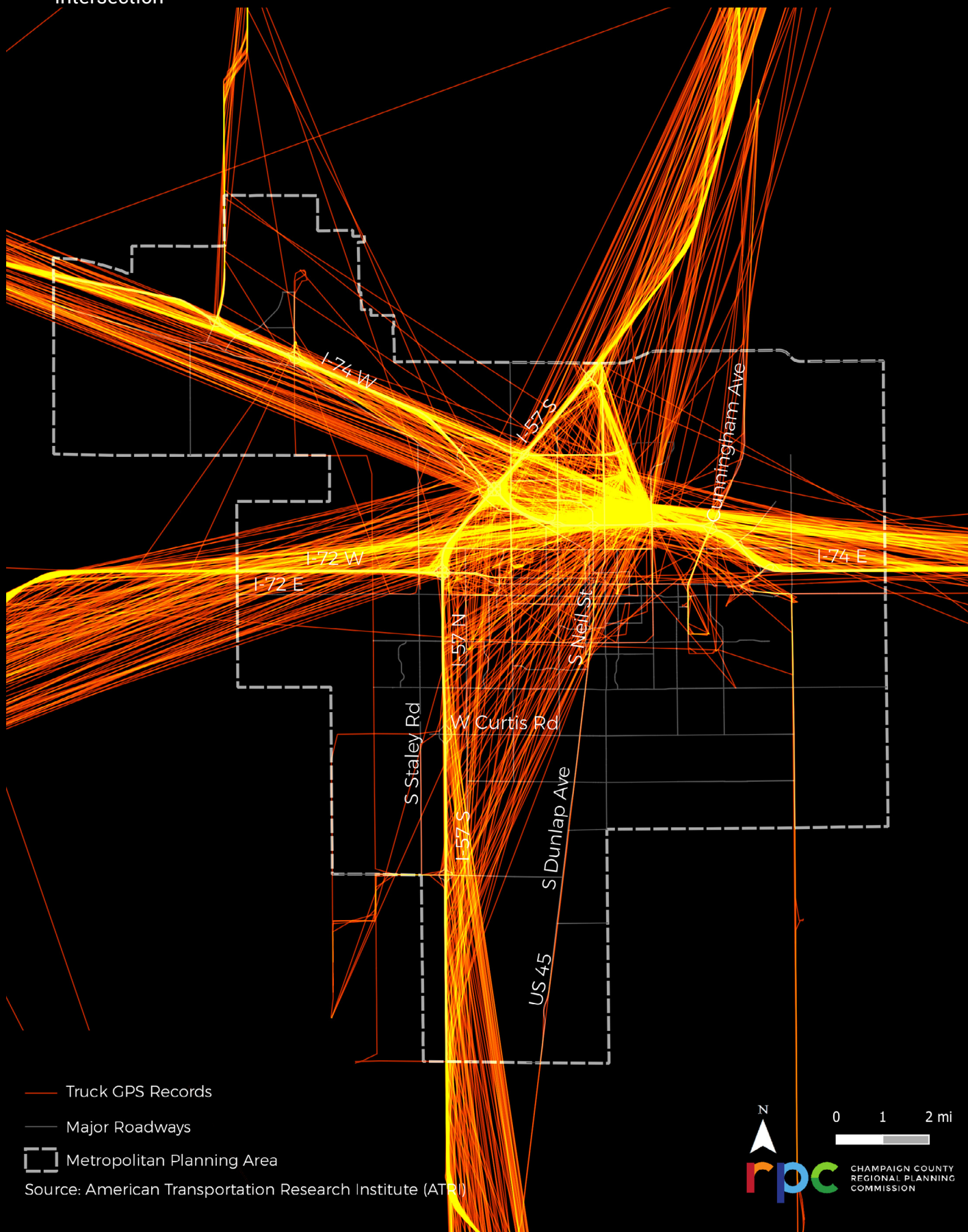


Figure 5-20: Speed of Trucks Accessing the Industrial Area Near the Wilbur Road and Lincoln Avenue Intersection





#### d) Trucks accessing the industrial area near the Main Street and Lierman Avenue intersection

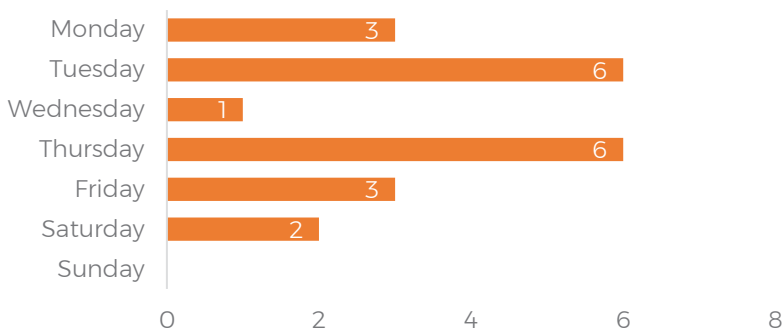
Approximately 20 trucks accessed the industrial area near the Main Street and Lierman Avenue intersection in east Urbana during the October 2017 study period. Trucks coming to or leaving the area mainly used East Main Street, North Smith Road, and East University Avenue to access I-74. Some of these trucks also traveled to the area discussed in section a) and c) (Figure 5-21).

#### Major access roadways

- I-57, I-74
- East University Avenue, North Smith Road and East Main Street

#### Daily number of trucks

Busiest days: Tuesdays, Thursdays



#### Time of day truck access



**60%** of the truck movements were concentrated between 11 a.m. and 1 p.m. on weekdays.

North Smith Road and East University Avenue saw slow truck travel speed (Figure 5-22, Appendix B-4).

Figure 5-21: Routes of Trucks Accessing the Industrial Area Near the Main Street and Lierman Avenue Intersection

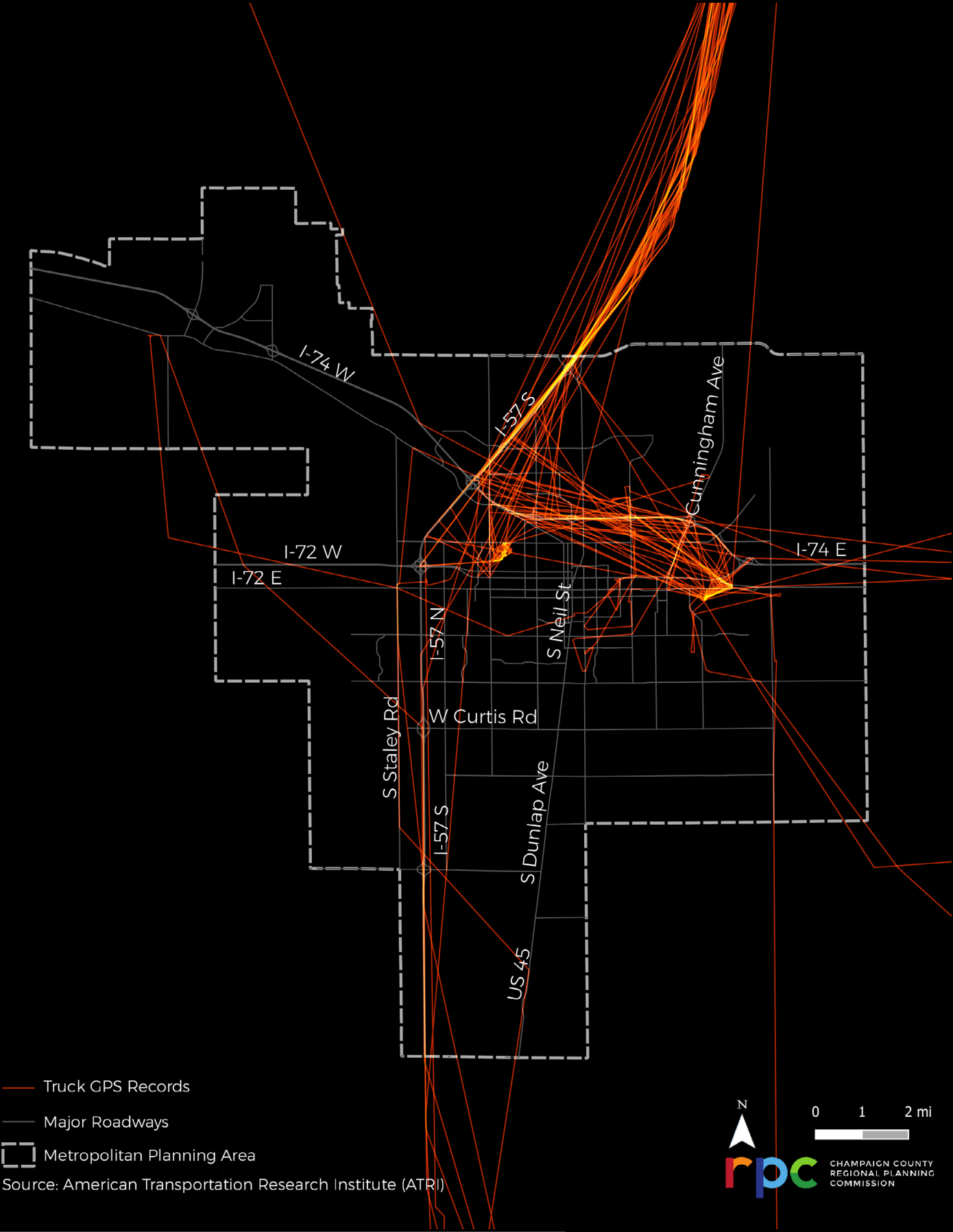


Figure 5-22: Speed of Trucks Accessing the Industrial Area Near the Main Street and Lierman Avenue Intersection



### e) Trucks accessing the retail businesses near the Interstate Drive and Prospect Avenue intersection

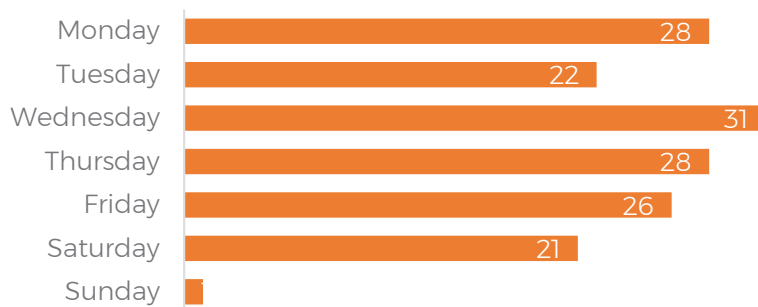
During the one-week study period in October 2017, about 160 trucks accessed the retail business area near the Interstate Drive and Prospect Avenue intersection in north Champaign. Trucks coming to or leaving the area mainly used West Olympian Drive, North Prospect Avenue, and University Avenue to access I-57, I-74, and I-72 (Figure 5-23).

#### Major access roadways

- I-57, I-74, I-72, U.S. 45
- West Olympian Drive, North Prospect Avenue, Bradley Avenue, Mattis Avenue, and East University Avenue

#### Daily number of trucks

Busiest days: Mondays, Wednesdays, Thursdays



#### Time of day truck access

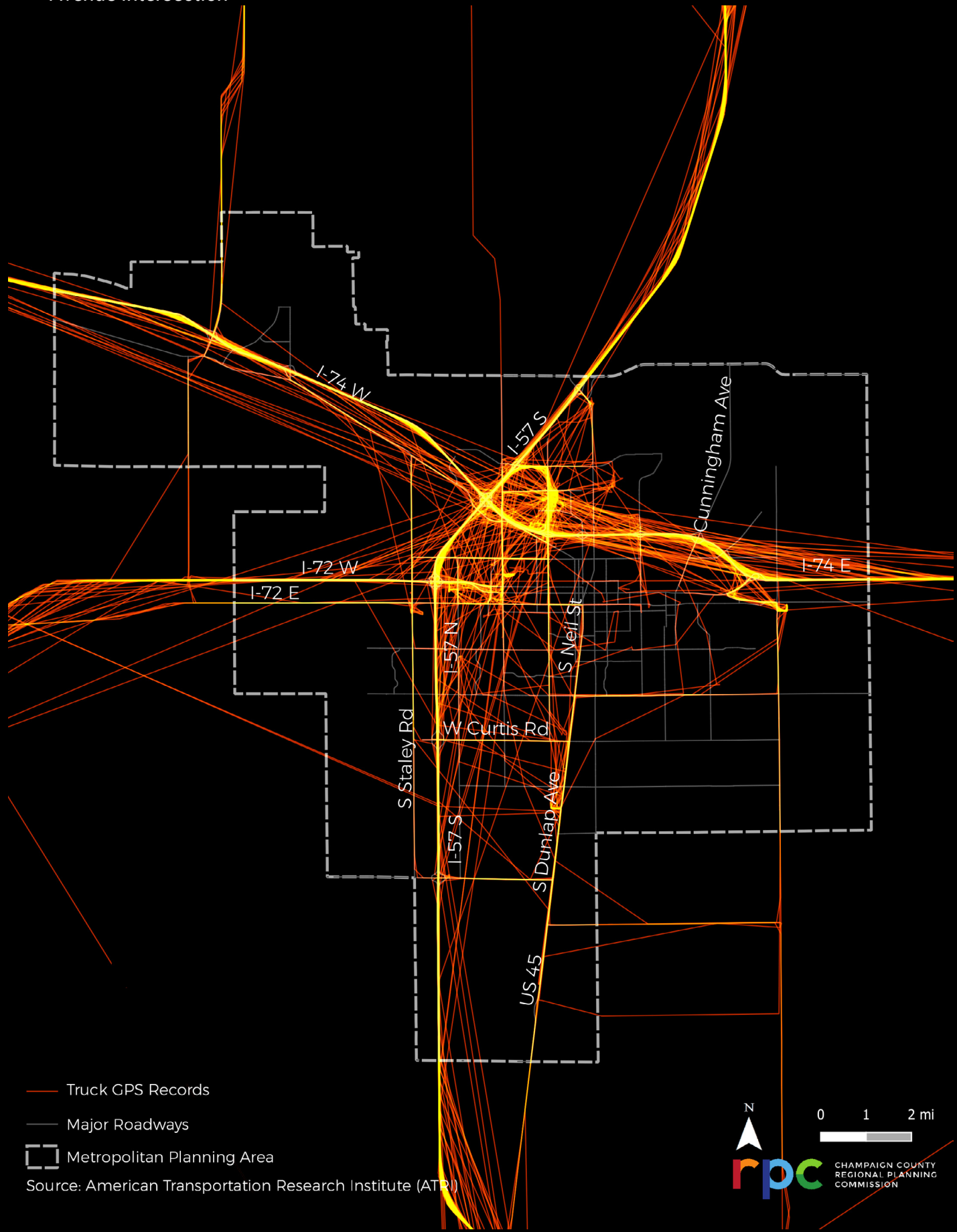


**27%** of the truck movements were concentrated between 7 a.m. and 8 a.m. and between 12 p.m. and 1 p.m. on weekdays.

Some trucks serving the retail businesses also served between other retail businesses and industrial zones in that area, including one located southwest of business area, one on North Mattis Avenue north of I-72, and one located west of the railroad tracks. There were also truck movements between the gas station on Staley Road south of Springfield Avenue and this business area using I-57 and Olympian Drive (Figure 5-24, Appendix B-5).



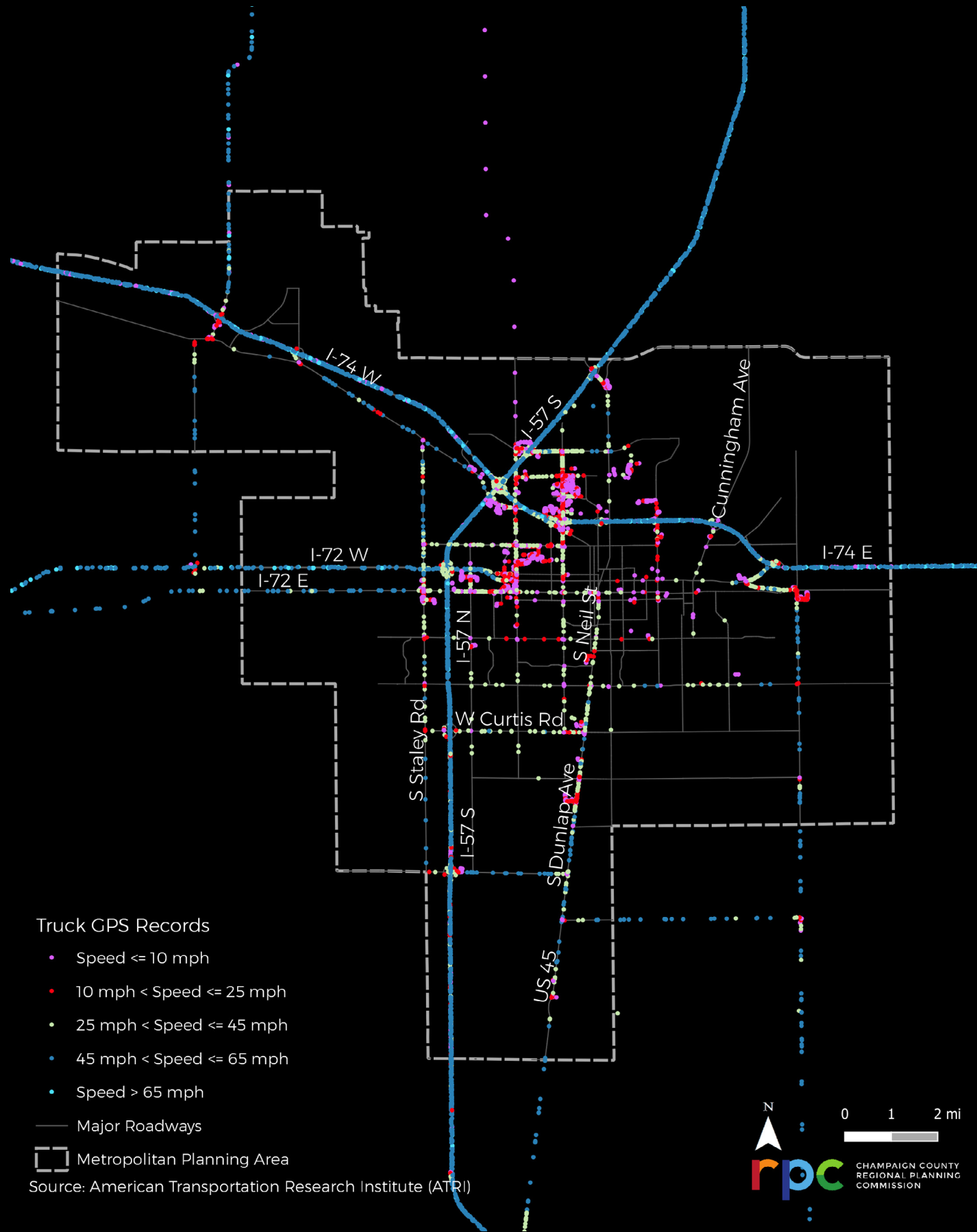
Figure 5-23: Routes of Trucks Accessing the Retail Businesses Near the Interstate Drive and Prospect Avenue Intersection



- Truck GPS Records
- Major Roadways
- Metropolitan Planning Area

Source: American Transportation Research Institute (ATRI)

Figure 5-24: Speed of Trucks Accessing the Retail Businesses Near the Interstate Drive and Prospect Avenue Intersection



## f) Trucks accessing the retail businesses near the Windsor Road and Philo Road intersection

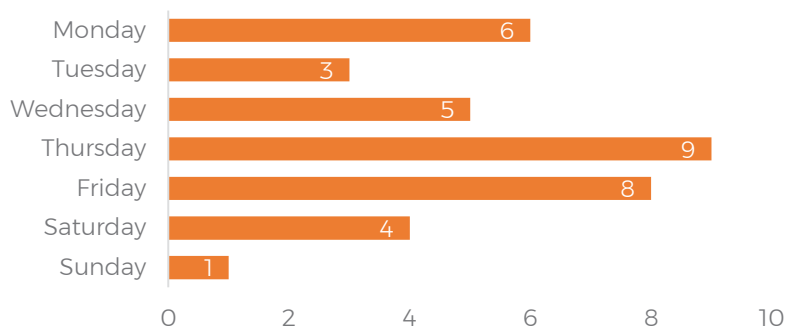
Fewer than 40 trucks accessed the retail businesses near the Windsor Road and Philo Road intersection in southeast Urbana during the one-week study period in October 2017. Trucks coming to or leaving the area mainly used I-74, East University Avenue, High Cross Road/IL130, Windsor Road, and Philo Road (Figure 5-25).

### Major access roadways

- I-57, I-74
- East University Avenue, High Cross Road/IL 130 and Windsor Road

### Daily number of trucks

Busiest days: Thursdays, Fridays



### Time of day truck access



**41%** of the truck movements were concentrated between 6 a.m. and 8 a.m. on weekdays.

The major routes that trucks took to access this area did not experience significant slow speed during the study period. Trucks serving this area were also observed traveling to another business area just south of University Avenue and east of High Cross Road/IL130, downtown Champaign, downtown Urbana, the University District, the commercial area along Prospect Avenue north of I-74, and the Village of Savoy (Figure 5-26, Appendix B-6).

Figure 5-25: Routes of Trucks Accessing the Retail Businesses Near the Windsor Road and Philo Road Intersection





Figure 5-26: Speed of Trucks Accessing the Retail Businesses Near the Windsor Road and Philo Road Intersection



### g) Trucks accessing downtown Champaign

During the one-week study period in October 2017, approximately 70 trucks accessed the downtown Champaign area. Trucks coming to or leaving the area mainly used I-74, U.S. 45/Neil Street/Dunlap Avenue, Bloomington Road, Market Street, and University Avenue (Figure 5-27).

#### Loading area at a building in downtown Champaign

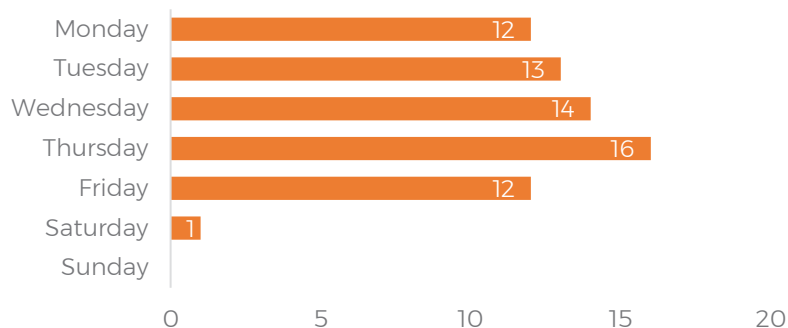


#### Major access roadways

- I-74
- U.S. 45/Neil Street/Dunlap Avenue, Bloomington Road, Market Street, and University Avenue

#### Daily number of trucks

Busiest days: Thursdays (partially due to restaurants in preparation for weekend customers)



#### Time of day truck access



**45%** of the truck movements were concentrated between 10 a.m. and 1 p.m. on weekdays.

Trucks serving the businesses in downtown Champaign utilized on-street parking spaces and loading areas, when available, to deliver goods (Figure 5-28, Appendix B-7).

Figure 5-27: Routes of Trucks Accessing Downtown Champaign

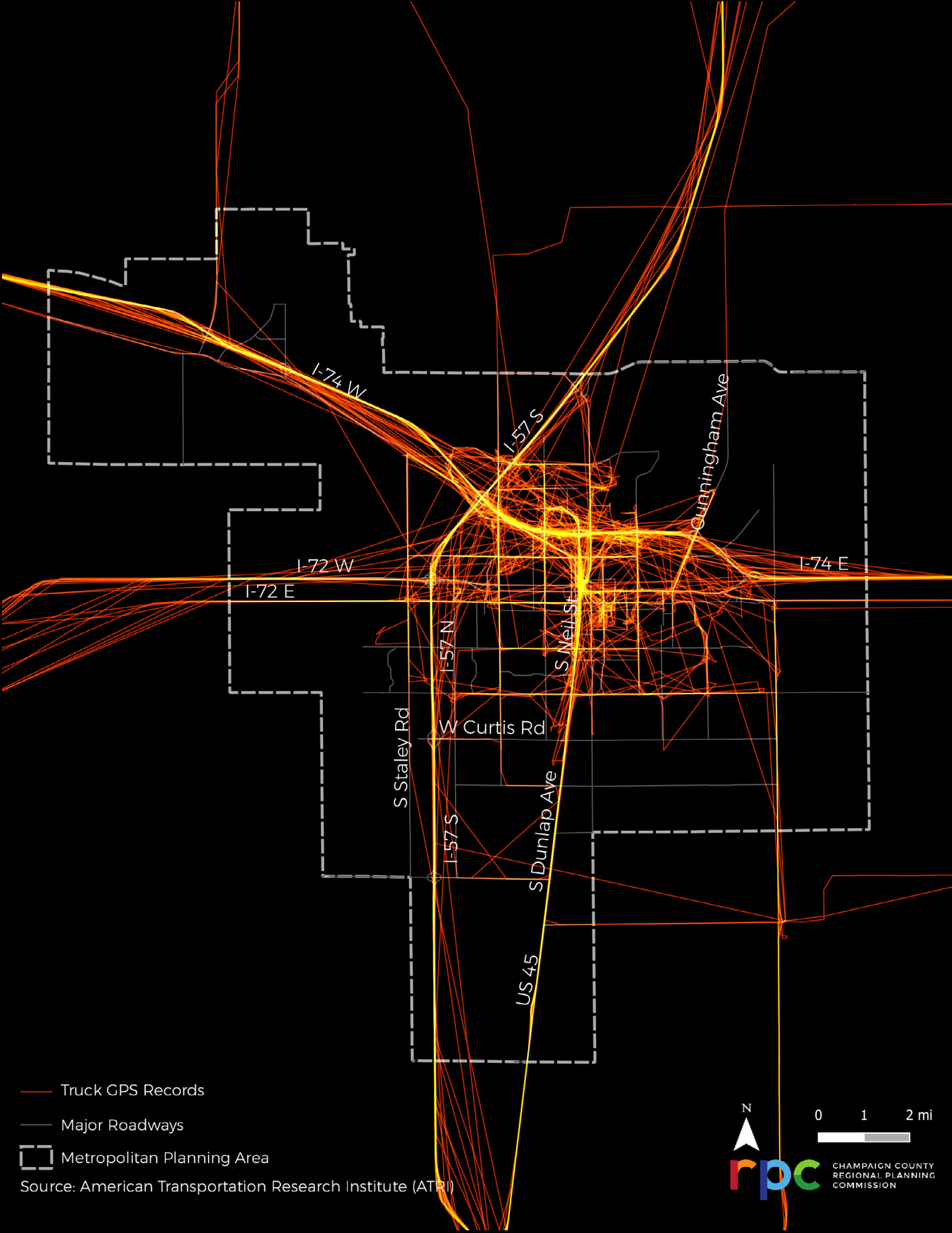
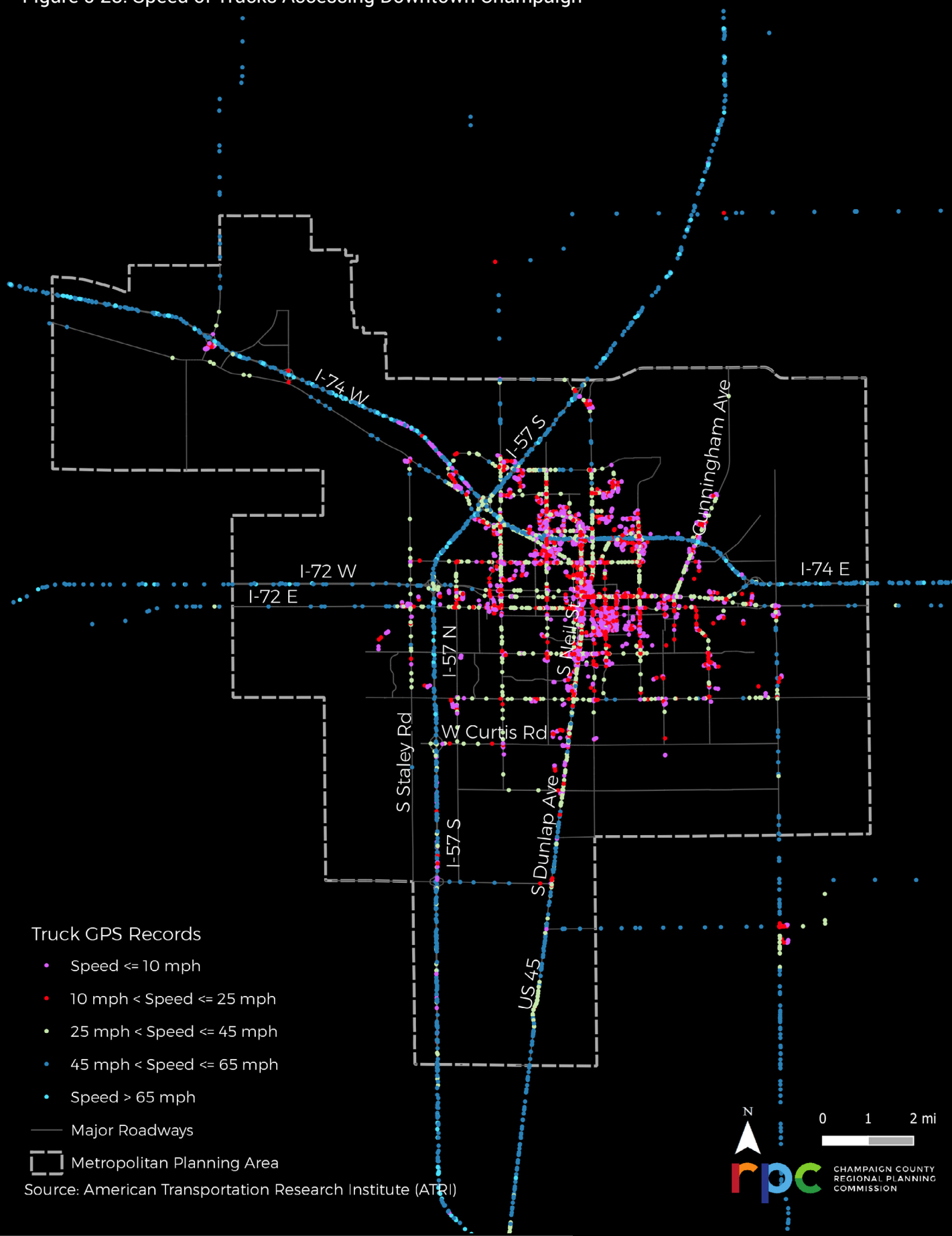


Figure 5-28: Speed of Trucks Accessing Downtown Champaign





## h) Trucks accessing downtown Urbana

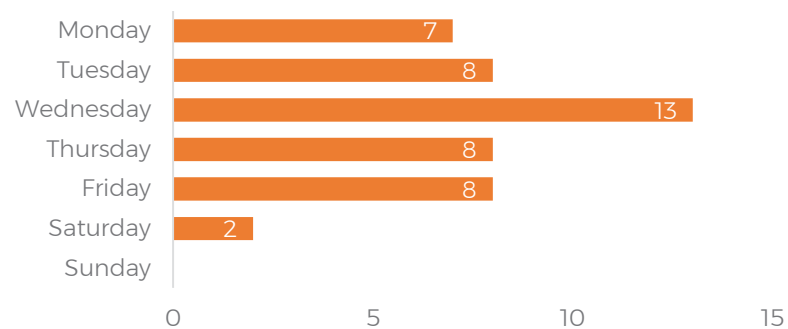
Fewer than 50 trucks accessed downtown Urbana during the one-week study period in October 2017. Trucks coming to or leaving the area mainly used I-74, Cunningham Avenue, Vine Street, East University Avenue, West Springfield Avenue, and East Main Street (Figure 5-29).

### Major access roadways

- I-74
- Cunningham Avenue, Vine Street, East University Avenue, West Springfield Avenue, East Main Street, Cottage Grove Avenue, and Philo Road.

### Daily number of trucks

Busiest days: Wednesdays



### Time of day truck access



**43%** of the truck movements were concentrated between 8 a.m. and 10 a.m. on weekdays.

Trucks serving the businesses in downtown Urbana also utilized on-street parking spaces and loading areas, when available, to deliver goods (Figure 5-30, Appendix B-8).

Figure 5-29: Routes of Trucks Accessing Downtown Urbana

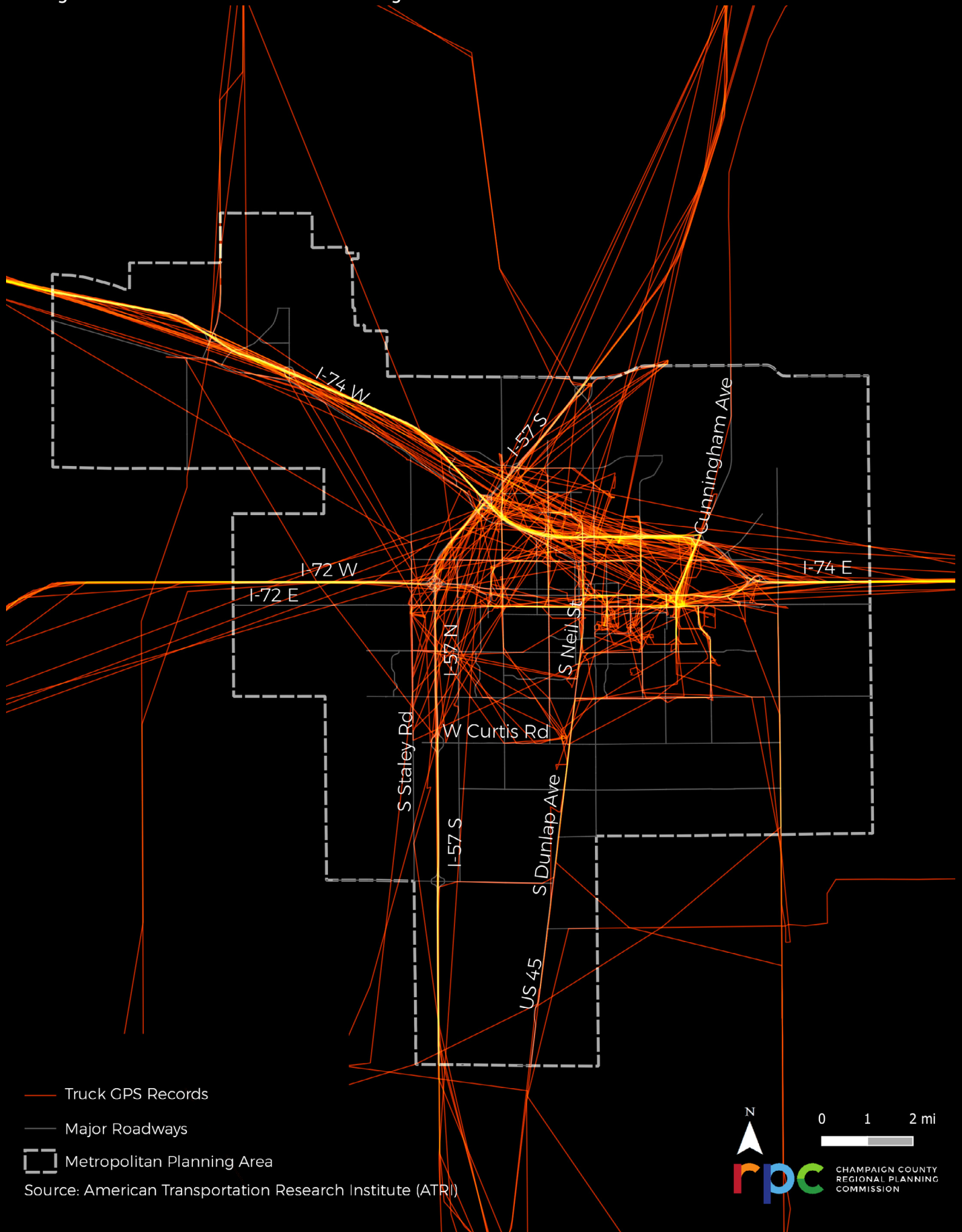
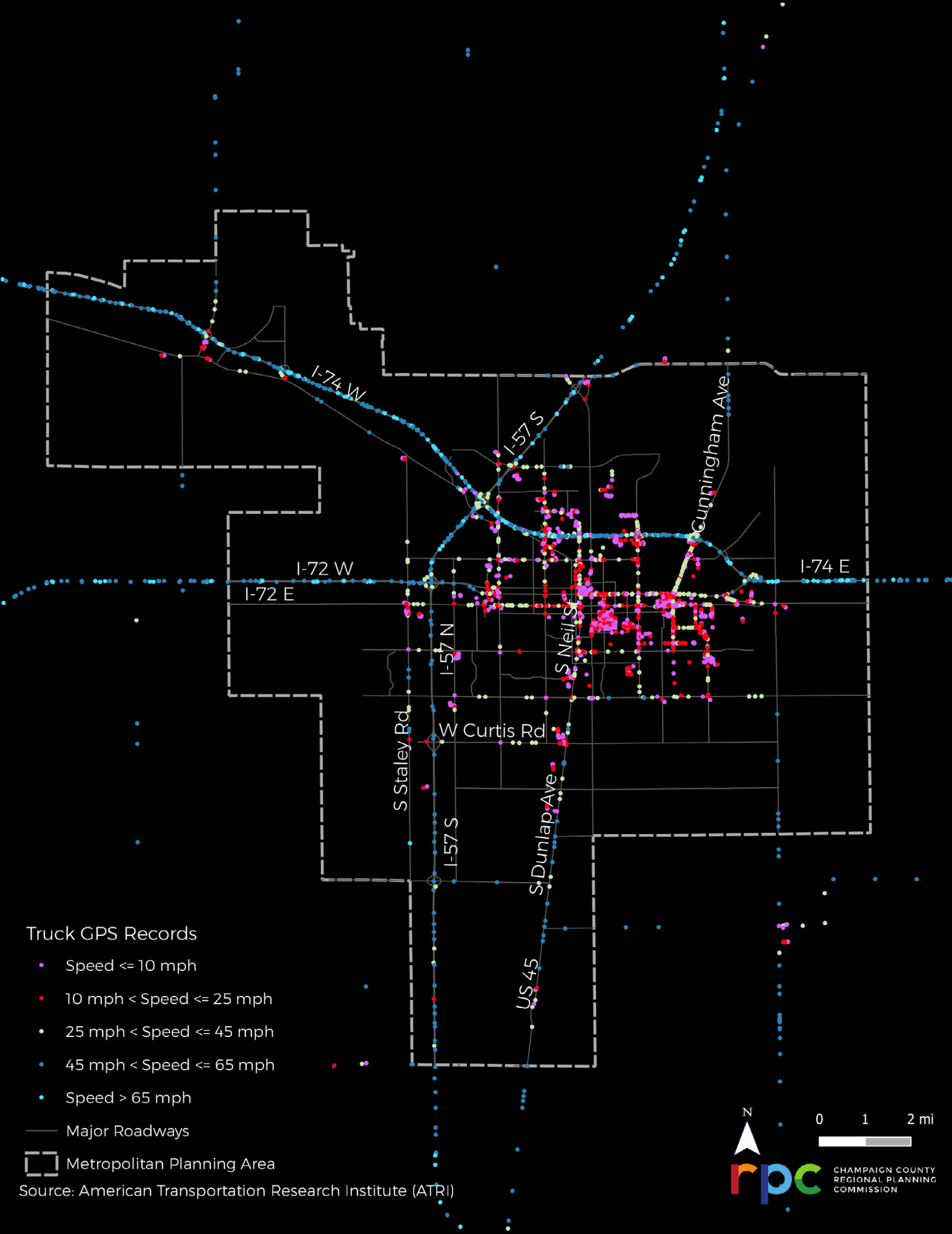


Figure 5-30: Speed of Trucks Accessing Downtown Urbana



### i) Trucks accessing the University District

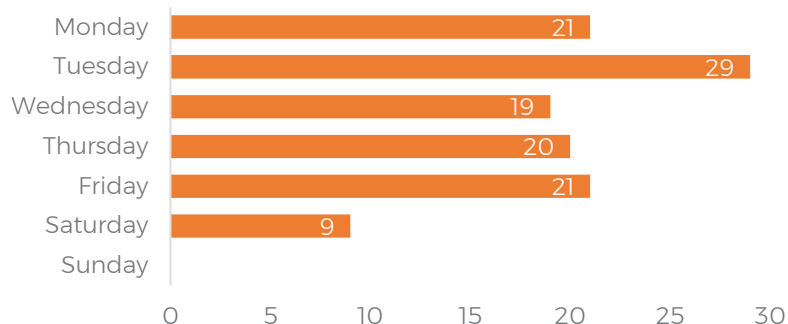
During the one-week study period in October 2017, approximately 120 trucks traveled through the University of Illinois campus district, defined as the area bounded by University Avenue to the north, Florida Avenue/Kirby Avenue to the south, Lincoln Avenue to the east, and First Street to the west. Trucks coming to or leaving the University District relied on nearly all local arterials (Figure 5-31).

#### Major access roadways

- I-74
- Bloomington Road, Neil Street, East University Avenue, Fourth Street, Springfield Avenue, Lincoln Avenue, Kirby Avenue, Windsor Road, and West Curtis Road

#### Daily number of trucks

Busiest days: Mondays, Tuesdays, Fridays



#### Time of day truck access



**28%** of the truck movements were concentrated between 4 a.m. and 6 a.m. on weekdays.

In addition to a grocery store and a convenience store, trucks served the restaurants and other businesses in the University District using on-street parking and loading spaces when available. Sixth Street, between Healey Street and Daniel Street, and Chalmers Street, between Fifth Street and Sixth Street, saw a high concentration of trucks loading and unloading during the study period (Figure 5-32, Appendix B-9).



Figure 5-31: Routes of Trucks Accessing the University District

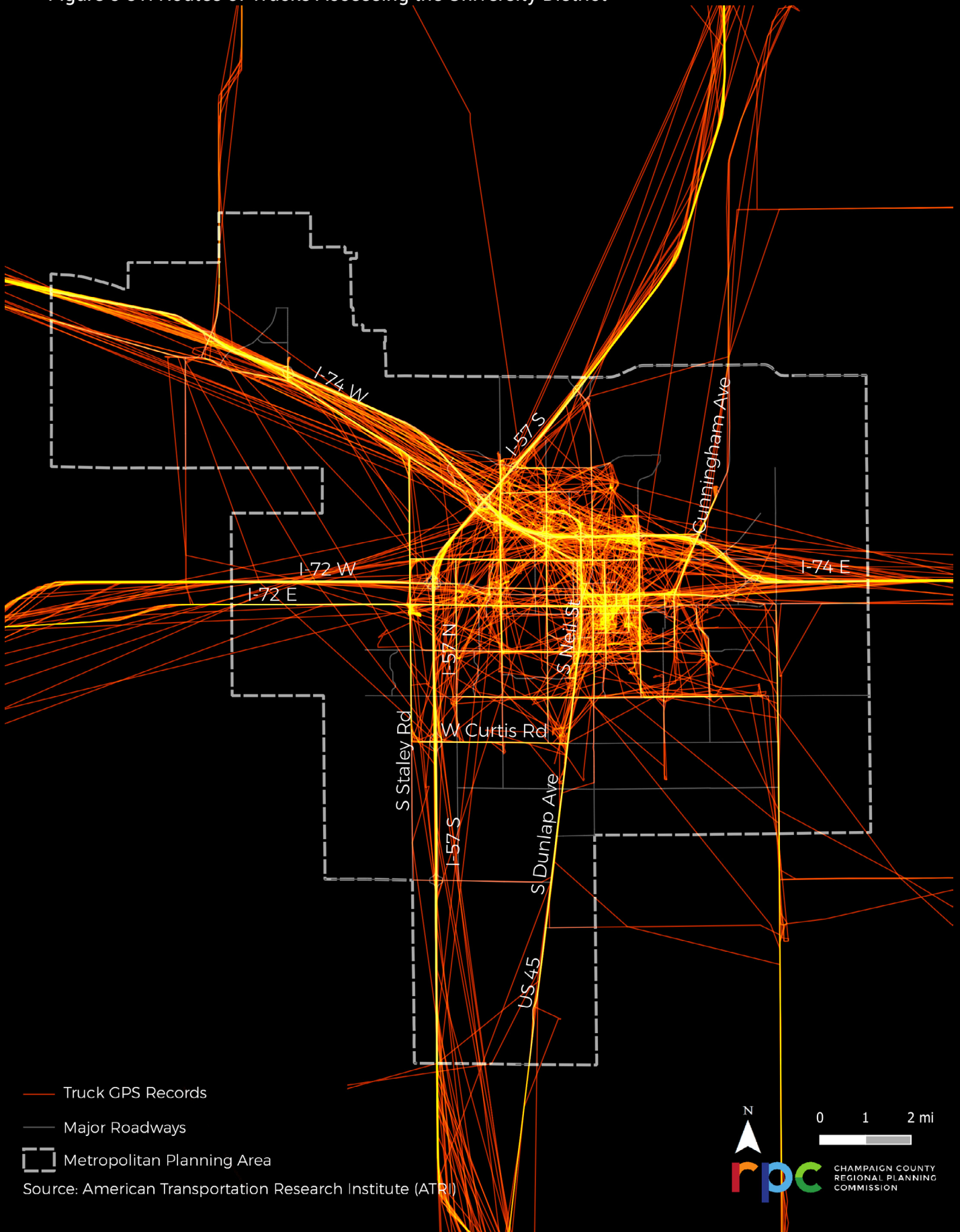


Figure 5-32: Speed of Trucks Accessing the University District



Truck GPS Records

- Speed  $\leq 10$  mph
  - $10 \text{ mph} < \text{Speed} \leq 25$  mph
  - $25 \text{ mph} < \text{Speed} \leq 45$  mph
  - $45 \text{ mph} < \text{Speed} \leq 65$  mph
  - Speed  $> 65$  mph
- Major Roadways

Metropolitan Planning Area

Source: American Transportation Research Institute (ATRI)

## Endnotes

1. Large Truck Crash Causation Study (2007), Federal Motor Carrier Safety Administration (FMCSA), <https://www.fmcsa.dot.gov/safety/research-and-analysis/large-truck-crash-causation-study-analysisbrief>
2. CUUATS 2019-2022, Champaign County Regional Planning Commission, Transportation Improvement Program (TIP). Retrieved from <https://ccrpc.org/documents/transportation-improvementprogram/>
3. Zigterman, Ben. "A bridge too low, a trucker too late, a crash too often." The News-Gazette, 17 Sep. 2017. Retrieved from <http://www.news-gazette.com/news/local/2017-09-17/bridge-too-low-truckerto-late-crash-too-often.html>



# What are the needs? How does the existing system meet them?

A number of stakeholder engagement activities were implemented to provide opportunities for area businesses and industry associations to provide input and feedback on freight system needs and opportunities. This chapter summarizes the stakeholder outreach effort, followed by the issues identified by stakeholders as affecting their freight movements, as well as insights on how those issues can be addressed.



# 6





Figure: A Freight Truck

Source: CUUATS Staff



## 6. What are the needs? How does the existing system meet them?

The purpose of the Champaign-Urbana Region Freight Plan (Freight Study) is to develop goals and strategies to guide freight policies, programs, and projects for the Champaign-Urbana area. Analysis of performance data reveals only part of the region's freight story. Feedback from stakeholders familiar with the local freight system is necessary to fully assess the region's freight needs and opportunities. A number of stakeholder engagement activities were implemented to provide opportunities for area businesses and industry associations to provide input and feedback on freight system needs and opportunities.

This section provides a summary of the stakeholder outreach activities (Section 6.1), followed by the issues identified by stakeholders as affecting their freight movements, as well as insights on how those issues can be addressed (Section 6.2). These outreach efforts also help to portray current freight movements and future freight operation trends, discussed in Section 6.3.

### 6.1. Stakeholder outreach

#### 6.1.1. Business roundtables

To initiate the freight stakeholder involvement, the Champaign County Economic Development Corporation (EDC) collaborated with CUUATS staff by hosting two freight roundtables with representatives from freight-related sectors in the region to attend two business roundtable discussions scheduled on April 24 and 26, 2018. The business roundtable discussions were organized to gather input from freight stakeholders on the transportation issues they face while moving freight in the region and suggestions on improvements to enhance regional freight movement efficiency.

The participants in the roundtables were:

- Associated Transfer and Storage, Inc.
- JELD-WEN
- Clarkson Soy Products LLC
- The Atkins Group
- City of Urbana Department of Economic Development
- State Representative Rodney Davis's Office
- Farnsworth Group

### **6.1.2. Freight stakeholder survey**

The freight stakeholder survey was designed by CUUATS staff with the help of the Freight Advisory Committee. The survey was self-administered and had 25 questions on three broad topics: (1) freight supply chain, (2) challenges and recommendations on the freight transportation infrastructure, and (3) projections for future freight operations. The survey asked a mix of multiple choice and narrative response questions, intended to capture stakeholders' concerns on transportation issues affecting freight movement and to identify the strategies needed to improve the efficiency of freight transport. The survey questions can be found in [Appendix C](#).

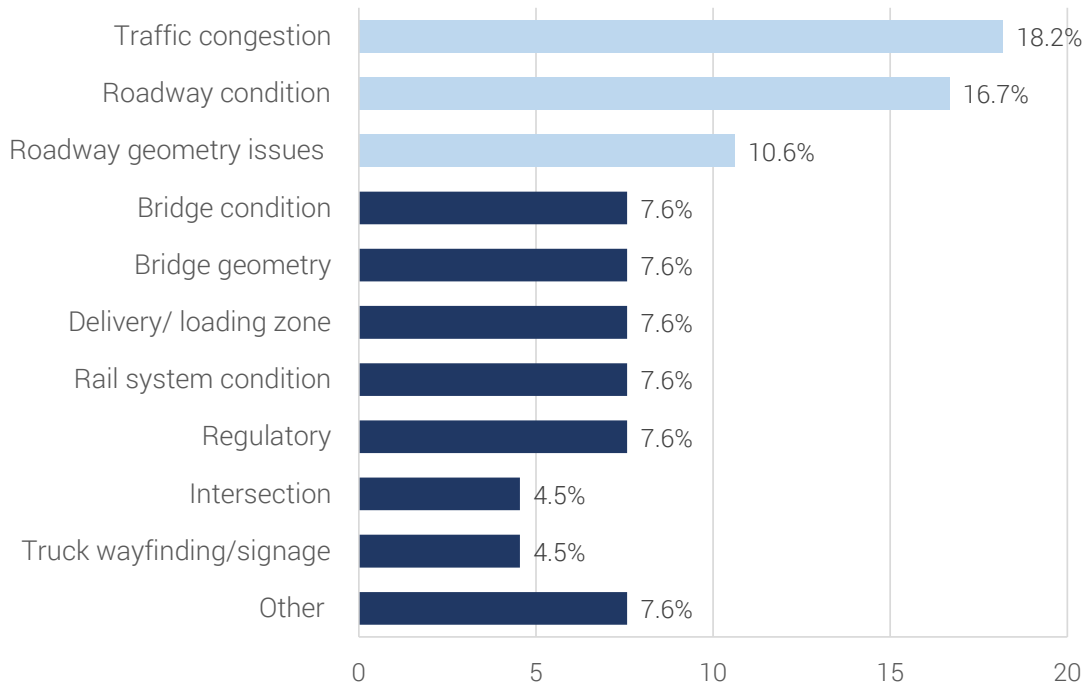
The survey sample was designed to represent a wide variety of freight businesses in the region. From April to July of 2018, area businesses were contacted through the Champaign County EDC, the Champaign County Chamber of Commerce, the University of Illinois Facilities and Services Office, and the freight carriers contact list requested from the Federal Motor Carrier Safety Administration, to fill out the online survey. A total of 83 survey responses were recorded, including 27 complete and 56 partial responses.

Due to the low response rate of the online survey, paper questionnaires were mailed to 124 major freight businesses in the region, including 12 grain elevators, 19 manufacturing companies, 11 wholesale companies, 42 retail stores, eight trucking companies, and 25 construction and public works companies. Four mailed survey responses were received.

## 6.2. Key freight system issues and needs

Freight stakeholders identified a range of transportation issues affecting their freight movement, shown in Figure 6-1. While some of the comments are specific to a location (Figure 6-3), other comments focus more on the system in general. This section provides a summary of the freight system issues and needs by mode of transportation. Specific comments on each issue are listed in Appendix C.

**Figure 6-1: Transportation Issues Identified by Freight Stakeholders**



### 6.2.1. Highway and truck

Freight stakeholders indicated that traffic congestion and poor roadway pavement condition are the top challenges affecting freight movements in the region. Other transportation concerns include roadway and bridge geometry issues, as well as truck routing and signage issues.

#### a) Traffic bottlenecks and congestion

Some of the notable congestion locations in the interstate system mentioned by the stakeholders are I-74 between University Avenue and Prospect Avenue, I-74 between the Village of Mahomet and the City of Champaign during commute hours, and bridges carrying I-57. The I-74 and I-57 interchange, noted by several stakeholders as problematic, has been scheduled for reconstruction, according to the FY 2019-2022 CUUATS Transportation Improvement Program<sup>1</sup>.

Figure 6-2: A Freight Truck Entering I-72 on County Fair Drive



Source: CUUATS Staff

Stakeholders indicated they try to avoid traffic bottlenecks by taking different routes, but those options are limited. They try to avoid I-74 during peak hours and usually allow more time to pass through the region. They also try to avoid I-74 and the interchange of I-74 and I-57 due to "congestion caused by high number of traffic crashes." The speed limit of I-74 between the I-57 interchange in Champaign and the Cunningham Avenue exit in Urbana has been lowered to from 70 mph to 60 mph to address this issue<sup>2</sup>.

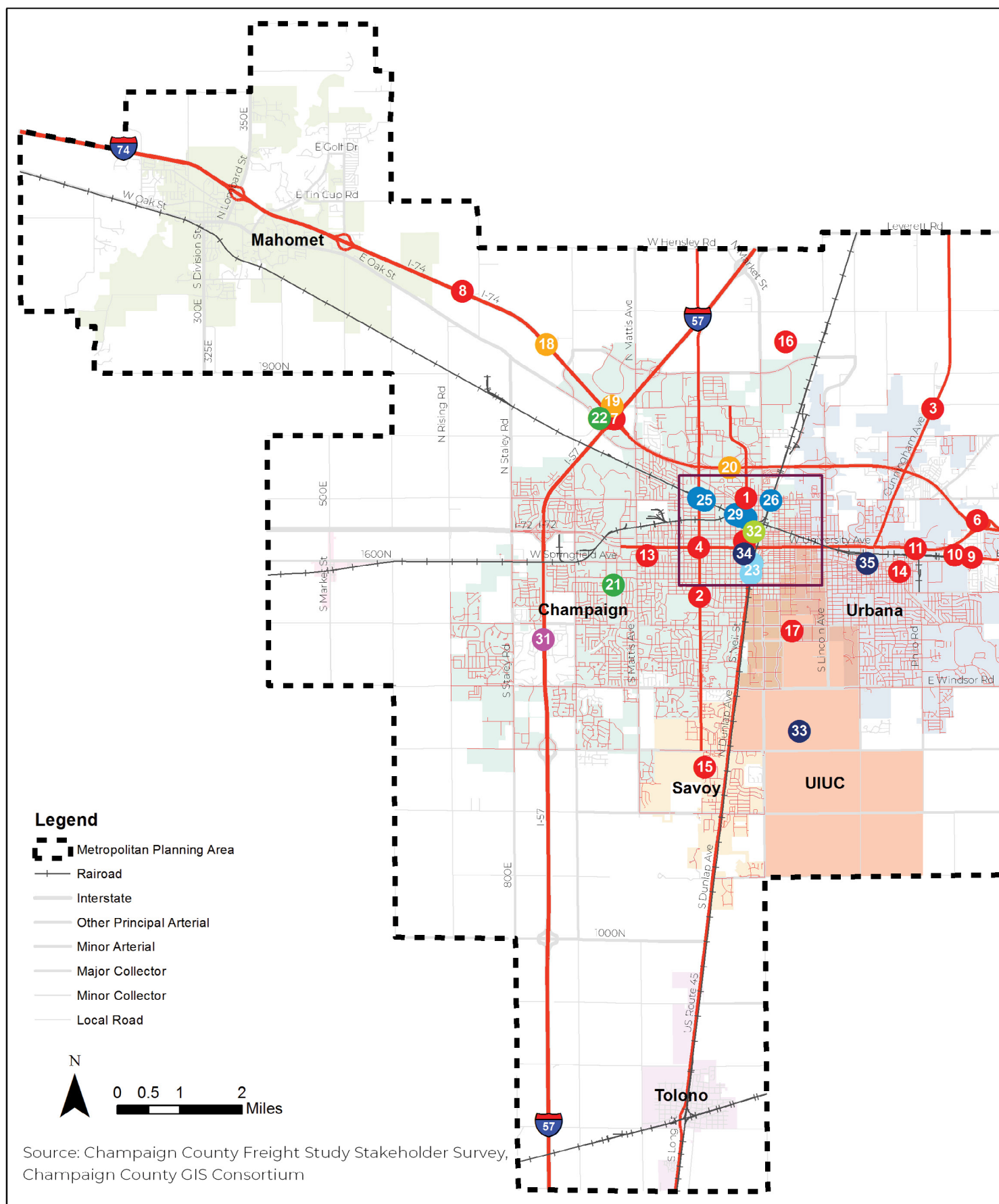
In terms of suggestions for improvements, one stakeholder recommended "I-74 through Champaign needs to be a full three lanes segment, not just with a third turning lane." Currently, I-74, except for the segment between the U.S. 45/Cunningham Avenue interchange and the U.S. 150/Prospect Avenue interchange, is two lanes in the region. Another stakeholder recommended widening U.S. 150/Prospect Avenue between Bradley Avenue and Kirby Avenue in Champaign.

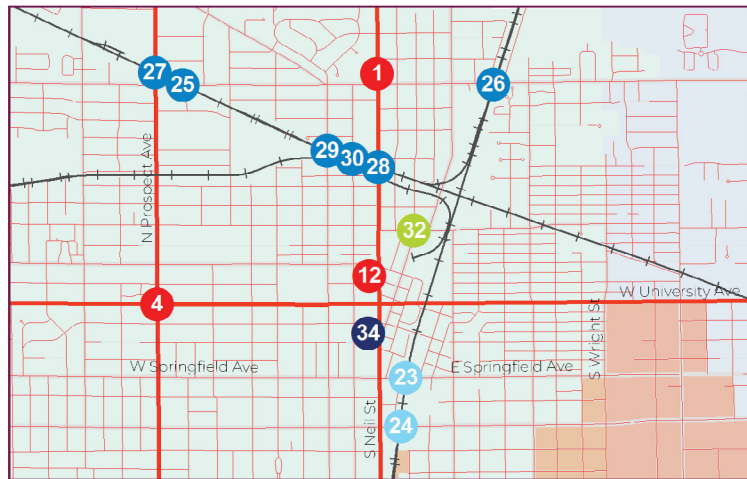
Freight stakeholders also mentioned traffic bottlenecks on U.S. 45, North Neil Street, North Prospect Avenue, University Avenue, and Highway 136 west of the Village of Rantoul. Not having adequate north-south access roads in the cities of Champaign and Urbana was also raised as an issue.

Stakeholders also mentioned difficulty in maneuvering freight vehicles within downtown Champaign, the University District, and roadway construction zones. It is worth noting that urbanized area roadways are not designed for large semi tractor-trailer combinations, and construction-induced congestions are temporary.



Figure 6-3: Transportation Issues Identified by Freight Stakeholders





## Transportation issues affecting freight movement

### Traffic congestion

- 1 Neil Street
- 2 Prospect Ave
- 3 Route 45
- 4 University Ave to Prospect Ave
- 5 I-74 (Champaign and Danville)
- 6 Route 150 and I-74 ramp
- 7 I-74 an I-57 Interchange
- 8 I-74 from Mahomet during commuter hours
- 9 Route 150 (Route 130 to I-74)
- 10 Route 150, huge quantity of additional traffic due to I-74 construction
- 11 East University Ave, Urbana
- 12 Downtown Champaign
- 13 Champaign
- 14 Urbana
- 15 Savoy
- 16 North/South access roads to/from Champaign/Urbana
- 17 Campus streets difficult to maneuver

### Roadway condition issues

- 18 I-74
- 19 I-74 and I-57 Interchange
- 20 I-74, too many accidents causes huge back ups and delays

### Roadway geometry issues

- 21 Champaign
- 22 I-74 and I-57 Interchange

### Bridge geometry issues

- 23 Springfield Ave
- 24 Green Street

### Railroad crossing issues

- 25 CN rail crossing over Bradley Rd
- 26 Bradley Ave
- 27 Prospect Ave
- 28 Neil St
- 29 State St
- 30 Randolph St

### Bridge condition issues

- 31 Narrow bridges over I-57

### Truck wayfinding/signage issues

- 32 Walnut Street northbound, where the oneway ends is not marked adequately to note left lane needs to turn left. Two way traffic ahead.

### Delivery/ loading zone issues

- 33 Campus
- 34 Parking in downtown Champaign
- 35 Parking in downtown Urbana

## b) Roadway condition and maintenance

The need to maintain and improve roadway conditions in the region was consistently identified by freight stakeholders, as roadways in the region in general are in "rough condition" with potholes and patches. Some stakeholders highlighted the I-74 and I-57 interchange, I-74, U.S. 150 (both east and west bounds), U.S. 45/Cunningham Avenue in Urbana, as well as Wilbur Avenue\*, Church Street†, and Farber Drive‡ in Champaign with severe pavement condition issues. U.S. 45/Cunningham Avenue between I-74 and University Avenue in Urbana was resurfaced in Summer/Fall 2018.

Stakeholders also expressed that there is a great need to secure funding to maintain the interstate and local roadway systems. Stakeholders commented that I-74 east of I-57 should also be designated as part of the Primary Highway Freight System (Section 4.1) to be eligible for federal freight formula funds.

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\*. The segment of Wilbur Avenue between Market Street and the railroad tracks is currently rated as in Poor pavement condition (see Chapter 4 and Appendix A for detail).

†. West Church Street between State Street and Neil Street in downtown Champaign and East Church Street between First Street and Sixth Street are rated as in Poor or Failed pavement condition (see Chapter 4 and Appendix A for detail).

‡. Farber Drive serving the businesses southeast of I-57 and Olympian Drive is partially rated as in Poor pavement condition, see Chapter 4 and Appendix A for detail.

**Figure 6-4: A Freight Truck in the University District**



Source: CUUATS Staff



### c) Roadway geometry issues

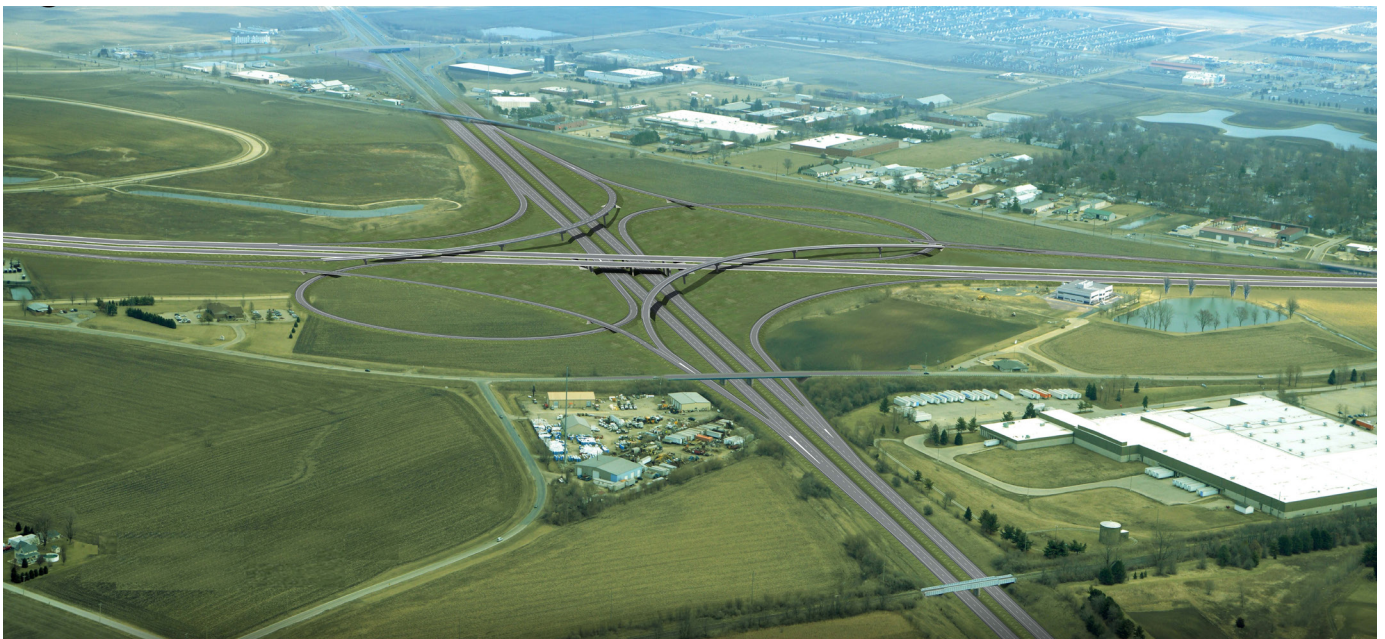
Roadway geometry design or intersection maneuverability is another issue affecting freight movement in the region. Several stakeholders expressed the need to improve the I-74 and I-57 interchange, which has already been scheduled for reconstruction.

Figure 6-5: Interstate 57 and Interstate 74 Interchange Reconstruction looking north east



Source: Google Earth Aerial View

Existing Condition



Source: Illinois Department of Transportation<sup>3</sup>

Proposed Reconstruction



Stakeholders also noted that the westbound ramp 185 of I-74 west at IL 130/High Cross Road is "poorly designed", "so sharp", "trucks are down to 25 mph and trying to merge into 70 mph traffic", and "not safe" (Figure 6-6, highlighted in red). There were four truck crashes on this ramp during 2012 and 2016.

Figure 6-6: I-74 and IL-130 Interchange



Source: Google Maps Aerial View

#### d) Bridge-related issues

Several stakeholders mentioned that the low bridges carrying the Canadian National railroads over Washington Street, Springfield Avenue, and Green Street are challenging for their freight movement. As discussed in Chapter 5, there have been multiple truck-viaduct crashes at these bridges. Stakeholders also noted that some bridges carrying I-57 are narrow for trucks.

### e) Truck routing and signage issues

Freight stakeholders expressed a need for better truck route signage in the region, or even a designated truck route system. As discussed in [Chapter 4](#), currently there are three classes of truck routes in the region. Stakeholders indicated the adequate signage system with designated truck routes will increase efficiency and safety of freight operation.

Stakeholders noted that most of the non-IL truck drivers lack local knowledge and rely on Google maps or federal geo-plotting software for truck routing. As a result, additional truck traffic ends up on local streets and creates traffic congestion, and may cause traffic crashes. Adequate signage can prevent such through traffic entering local streets and can potentially reduce congestion and truck crashes.

Specifically, Kraft Foods recommended "better signage on the interstates to help direct traffic to avoid Bradley/Prospect Avenue." There had been several truck related crashes around the intersection of Bradley Avenue and Prospect Avenue from 2012 to 2016 ([Chapter 5](#)). Another stakeholder noted that the "Left Lane Must Turn Left" sign on Walnut Street at the East Washington Street intersection in downtown Champaign is "not marked adequately" ([Figure 6-7](#)).

**Figure 6-7: "Left Lane Must Turn Left" Sign on Walnut Street at the East Washington Street Intersection**



*Source: Google Maps Street View*



## f) Other issues

Two intersections in northeast Urbana were mentioned by the stakeholders as being problematic for freight movement: the North Vine Street and U.S. 150/East University Avenue intersection, and the U.S. 150/East University Avenue and IL 130 intersection. In addition, several stakeholders expressed a need to reconfigure signal timings along North Prospect Avenue and North Neil Street in Champaign.

Stakeholders mentioned that there are no street lights on Town Center Boulevard in the northwestern Champaign shopping area, and that "it is dark for vehicle and pedestrians."

Stakeholders also mentioned difficulty in parking in downtown Champaign, downtown Urbana, and the University District. The lack of rear delivery zones in the Champaign-Urbana area means that sometimes delivery trucks block through routes while loading and unloading (Figure 6-8). While this is an issue, it is also worth noting that the blockages are for short period of time and traffic then returns to normal.

Figure 6-8: A Semi-Truck Parked on John Street Blocking the Westbound Traffic While Making a Delivery



Source: CUUATS Staff

## 6.2.2. Rail system

### a) At-grade rail crossing issues

Several stakeholders highlighted the at-grade rail crossings in the urbanized area as being a challenge, especially the Norfolk Southern railroad crossings at North Prospect Avenue, Bradley Avenue, State Street, Randolph Street, and Neil Street, as well as the Canadian National railroad crossings at Bradley Avenue (Figure 6-9).

### b) Need for rail transloading facilities

Round table participants expressed the need to have more public transloading facilities where they can move their goods from truck to rail more easily. Businesses in the agriculture sector whose grains do not go through the grain elevators in the region have to bring their goods to the City of Decatur in Macon County to depot. This stakeholder also mentioned that the transloading activities of agricultural products are seasonal.

## 6.2.3. Air freight

Several freight stakeholders expressed the need for expanded air cargo service at Willard Airport. As discussed in [Section 4.4](#), Willard Airport has the potential to grow into a regional air freight terminal because of the length of the runways, the potential capacity for large aircraft, and the easy connections to the interstate system.

Figure 6-9: At-Grade Rail Crossing at Bradley Avenue



Source: Google Maps Street View



## 6.3. Top issues in the trucking industry

According to the 2017 American Transportation Research Institute (ATRI) Top Industry Issues Survey, driver shortage is the trucking industry's top concern<sup>4</sup>. Improving economic growth in the U.S. has many concerned that the demand for truck drivers will further outpace the supply of qualified drivers.

Action has already been taken in the Champaign-Urbana region. Parkland College has been providing Tractor Trailer Driver Training since 2013, contracting with 160 Driving Academy<sup>5</sup>. During the four-week truck-driving course, which prepares students for their commercial driver's license exam, students take their first 40 hours in the classroom, then 120 hours in the truck. Parkland uses part of the parking lot at Rural King near North Prospect Avenue for training.

Other industry issues include poor transportation infrastructure, congestion, and limited infrastructure funding. Poorly maintained roads and traffic congestion create wear and tear on vehicles, waste fuel, increase emissions, create additional stress for drivers, and negatively impact industry productivity.

Other major issues facing the industries are mainly regulatory or legislative, including Electronic Logging Devices (ELD) mandates, Hours-of-Service regulations, and trucking regulations.

**Figure 6-10: A Semi-Truck Parked on Springfield Avenue in Urbana Blocking the Westbound Traffic While Making a Delivery**



Source: CUUATS Staff

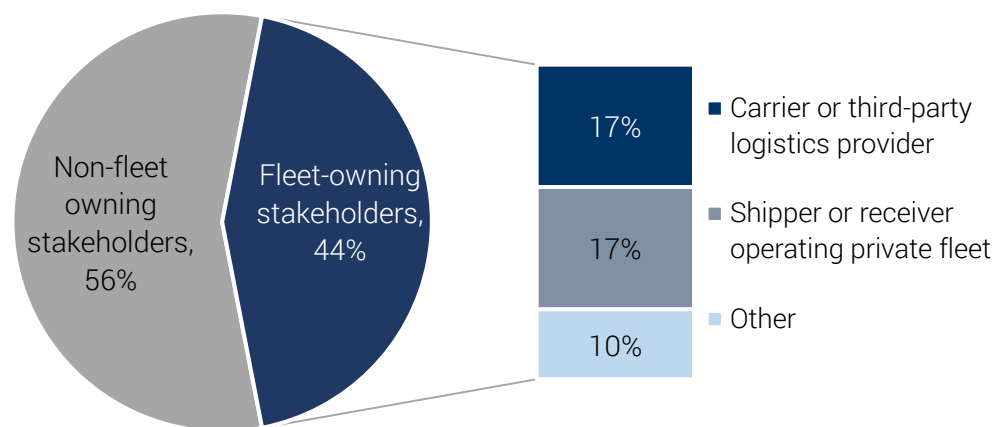
## 6.4. Participating freight stakeholder profile

This section summarizes additional information provided by the freight stakeholders who responded to the survey. See detailed survey statistics in Appendix C.

### 6.4.1. Supply chain role

Among freight stakeholders who participated in the outreach activities discussed in Section 6.1, 44 percent have their own truck fleet, with 17 percent being carriers or third-party logistics providers, and 17 percent being shippers or receivers operating private fleets, as shown in Figure 6-11.

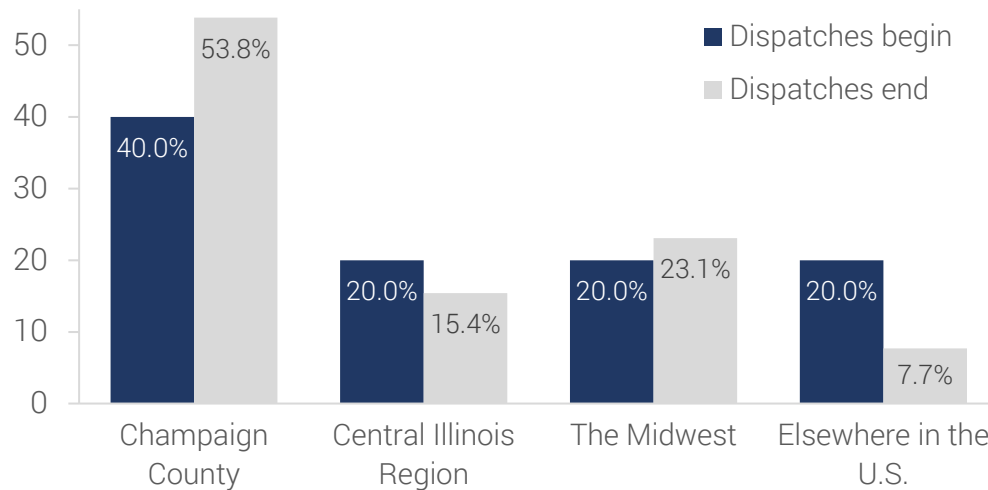
Figure 6-11: Surveyed Freight Stakeholder Truck Fleet Ownership and Role in Supply Chain



### 6.4.2. Commodity flow

Surveyed freight stakeholders or businesses who own truck fleets were asked to list locations where their dispatches most commonly begin and end. It was found that most of the dispatches begin and end within Champaign County (40 percent and 53 percent respectively), mostly in the Champaign-Urbana Urbanized Area. Outside Champaign County, dispatches most commonly begin in central Illinois counties, Indiana, Ohio, and Kentucky. Within Illinois, dispatches most commonly begin in counties adjacent to Champaign County and from the Chicago area. Four respondents also begin dispatches from outside the Midwest States (Figure 6-12).

**Figure 6-12: Surveyed Businesses' Truck Dispatch Origin and Destination**



Among surveyed freight stakeholders or businesses who do not have their own truck fleets and rely on carriers for shipments, 37 percent receive commodities (inbound) from central Illinois counties and 30 percent ship their goods (outbound) within this region (Figure 6-13). Almost one in four surveyed businesses receives and ships commodities from and to Midwest states. Clarkson Soy Products, LLC cited receiving commodities from outside the U.S., from locations such as the Netherlands, Norway, Ukraine, China, and Hungary. They also ship commodities to the UK, France, Bulgaria, the Netherlands, Switzerland, Spain, S. Korea, Australia, and Thailand (Figure 6-14).

**Figure 6-13: Surveyed Businesses' Commodity Flow Origin and Destination**

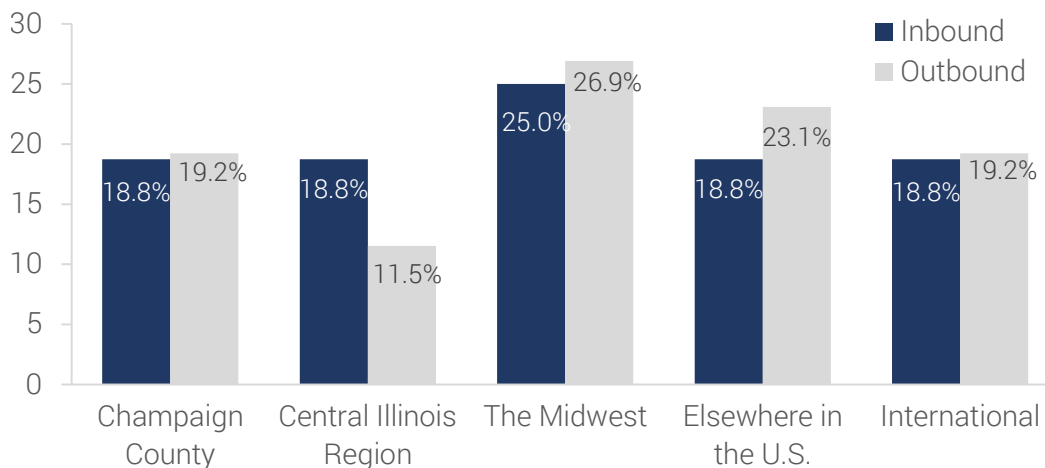
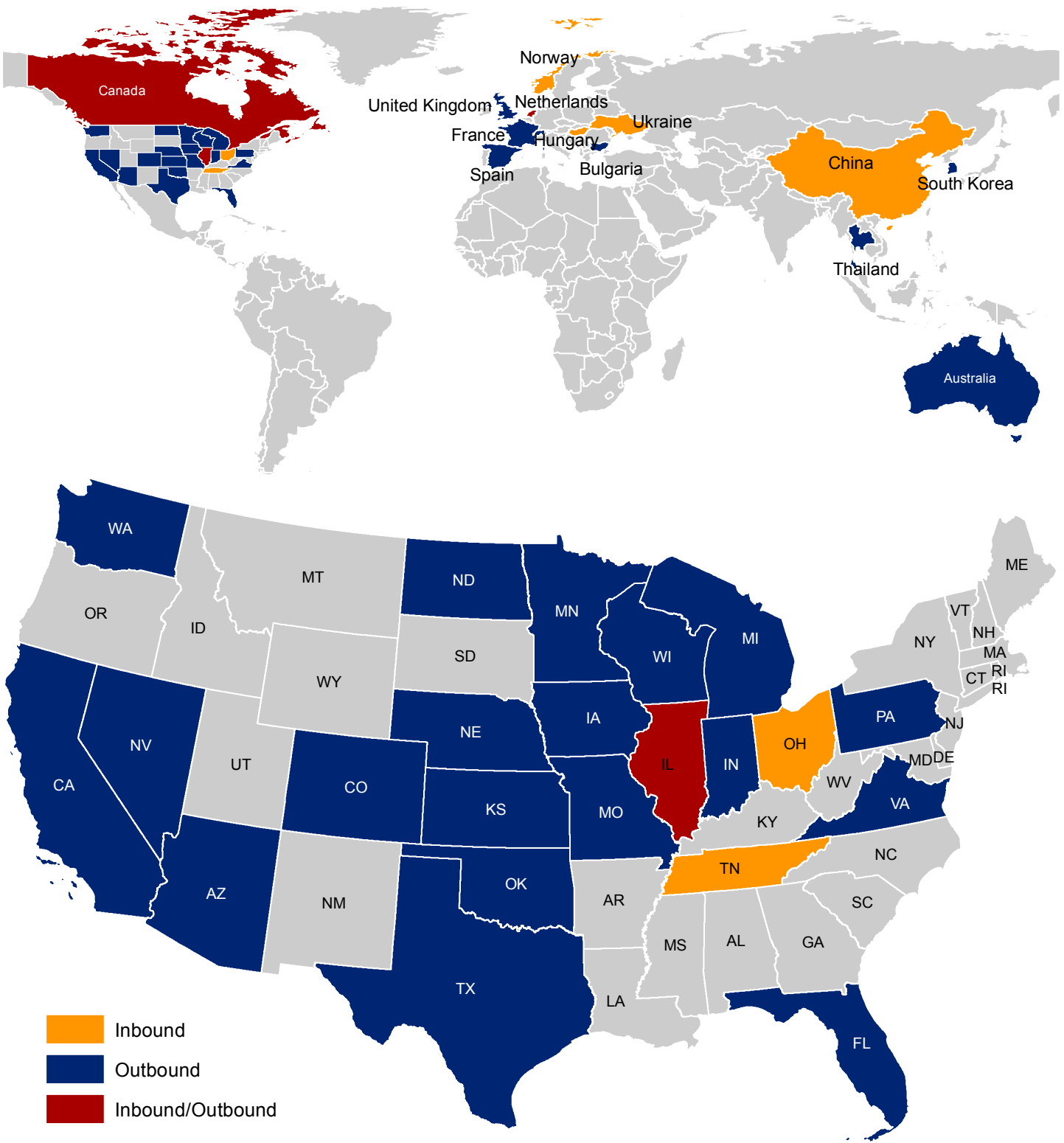


Figure 6-14: Surveyed Businesses' Trading Partners





### 6.4.3. Future freight operation

In the last section of the freight stakeholder survey, participants were asked to state their anticipated plans in operating in the region, and to identify technological and infrastructure changes that are likely to influence freight movement in the next 10 to 25 years. Survey responses revealed that the majority of the respondents (86 percent) are optimistic about business expansion in the Champaign-Urbana area in the next 10 to 25 years. Trucking is considered to continue as the most desired mode of freight transportation. However, businesses cited a few non-infrastructure concerns in operating freight in Champaign County, including taxes, regulations, and driver and dispatcher shortage ([See Appendix C for details](#)).

Stakeholders' insights on trends that are likely to influence freight movement in the next 10 to 25 years are listed below:

- » "Rail freight speed/transfer improvements"
- » "More efficient trucks, trailers"
- » "Electronic Logging and hours of service"
- » "Lack of semi-truck parking"
- » "Truck driver recruitment and retention"
- » "Buildup of the Carle at the Fields campus"
- » "Driverless trucking"
- » "Highway improvement (locally and in Chicago area)"
- » "Online shopping"

## Endnotes

1. CUUATS, Champaign County Regional Planning Commission, Transportation Improvement Program (TIP). Retrieved from <https://ccrpc.org/documents/transportation-improvement-program/>
2. Ditman, Tim " New speed limit on I-74 in C-U: 60 mph." The News-Gazette, 28 Aug. 2017. Retrieved from <http://www.news-gazette.com/news/local/2018-08-28/new-speed-limit-i-74-c-u-60-mph.html>
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# How are the freight movements and needs likely to change in the future?

This chapter focuses on estimating future freight movement and truck travel using a commodity-based freight travel demand model. This chapter also reviews other major trends that might affect freight demands and infrastructure needs in the Champaign-Urbana region, including connected and autonomous vehicles, truck platooning, and the growth of E-commerce and retail home delivery.





Figure: Traffic on I-74 East of the City of Urbana

Source: Google Maps Streetview



## 7. How are the freight movements and needs likely to change in the future?

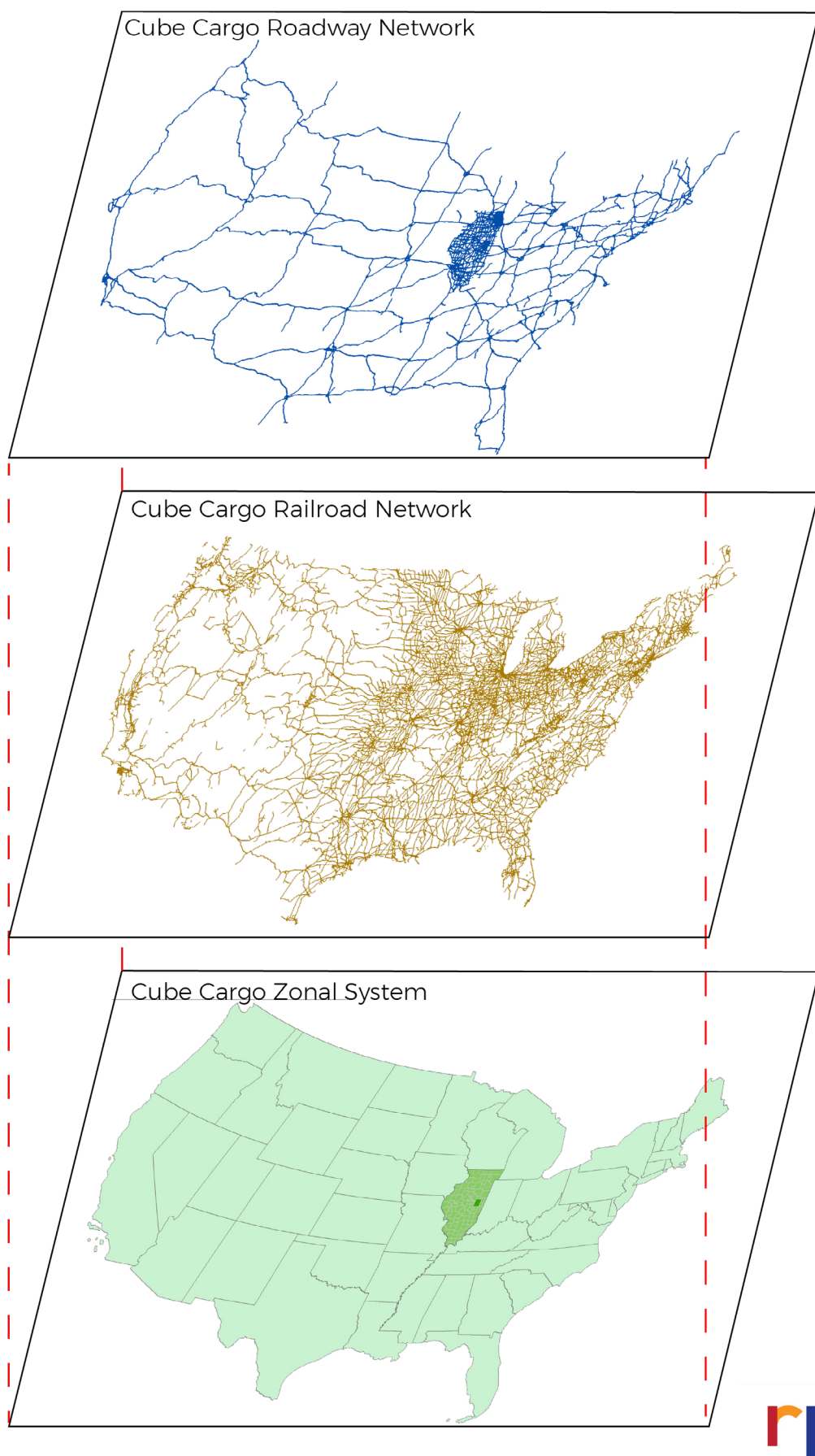
Freight activity is economic activity in action. Trucks accounted for approximately 15 percent of vehicle miles traveled (VMT) on major roadways in the Champaign-Urbana Metropolitan Planning Area (MPA) in 2015, carrying various goods to, from, and within the region. Because of the significance of truck traffic to the region's commodity flow and the overall transportation system performance, this plan includes a special effort to estimate truck travel in the context of the region's economy, using a commodity-based freight travel demand model, Cube Cargo. This chapter provides an overview of the model and discusses the base year 2015 and horizon year 2045 model results. This chapter also reviews other major trends that might affect freight demands and infrastructure needs in the Champaign-Urbana region, including connected and autonomous vehicles, truck platooning, and the growth of E-commerce and retail home delivery. These trends were not represented in the model due to their own uncertainties or the limitations of the model.

### 7.1. Modeling freight demand

#### 7.1.1. A gentle introduction to the Champaign-Urbana Cube Cargo freight model

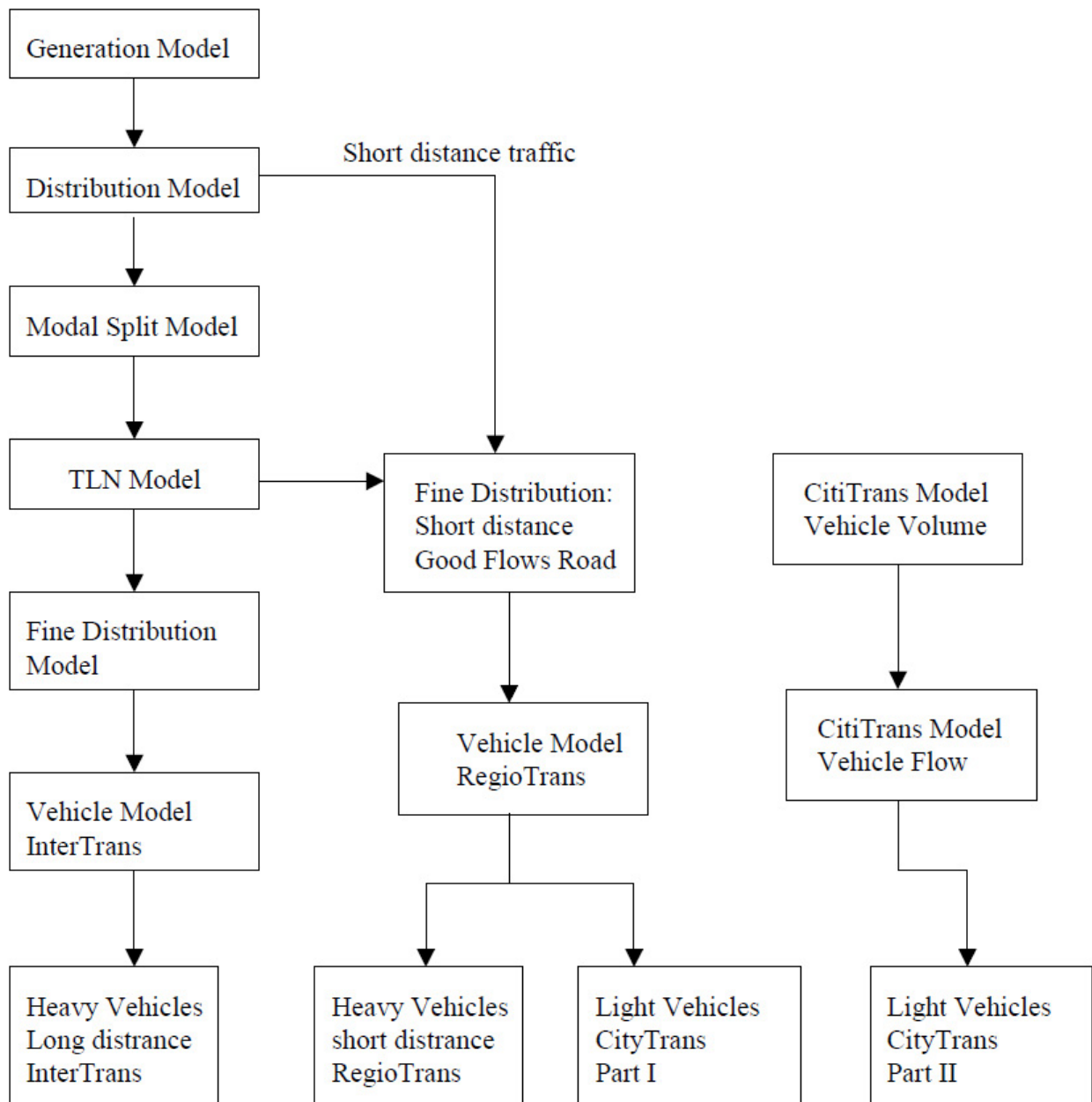
Cube Cargo is a freight forecasting model that was initially developed through research undertaken as part of the German National Freight Forecasting Model. The underlying methodology and parameters were subsequently adapted in urban and regional applications in other countries. Cube Cargo was designed for use on urban, regional, and long distance applications. It estimates origin–destination matrices of annual tons of goods by commodity class and mode, as well as origin–destination matrices of truck trips by truck type. It also generates matrices of urban service trips to provide a complete estimate of truck flows<sup>1</sup>.

Figure 7-1: Champaign-Urbana Freight Model Zonal System, Railroad Network, and Roadway Network



The Champaign-Urbana freight model uses Cube Cargo and considers the entire United States (U.S.) as the study area, with Champaign County divided into 307 zones, the rest of Illinois divided into 112 zones generally following county boundaries with counties adjacent to Champaign County divided into more zones, and the rest of the mainland U.S. divided into 48 zones following state boundaries. Figure 7-1 shows the model zonal system, railroad network, and roadway network. The Champaign-Urbana freight modeling process is shown in Figure 7-2.

Figure 7-2: Cube Cargo Flow Chart



Source: Xiong, D., Zhao, F., Chow, L. F., & Chung, S. (2007). *Integrating Data and Models for Analysis of Freight Movements on Multimodal Transportation Systems for Florida*.

### a) Generation model

The Cube Cargo model starts with a commodity generation step, which estimates annual tons of commodities produced and consumed in the study area using regression models with locally adjusted parameters. The Freight Analysis Framework (version 4, FAF4) commodity flow database and a set of local socio-economic data were used to develop the generation model parameters for eight broad commodity groups that represented the highest volume in Champaign County in 2015 (see more details in [Chapter 3](#)). Below is a list of the eight commodity groups and the corresponding Standard Classification of Transportation Goods (SCTG) codes.

- » Agricultural products: SCTG 02, SCTG 03
- » Gravel: SCTG 11, SCTG 12
- » Food products: SCTG 07
- » Nonmetal mineral product: SCTG 31
- » Waste: Waste and scrap: SCTG 41
- » Mixed freight: Mixed freight: SCTG 43
- » Gasoline and Fuel Oils: SCTG 17, SCTG 18
- » Other commodities: All other SCTG categories

The 2015 base year Generation Model results were validated using FAF4 database, as shown in [Table 7-1](#). The Champaign-Urbana freight model's estimates of the commodity flows generated from and destined to Champaign County in 2015 are within a reasonable range in comparison with FAF4 estimates.

**Table 7-1: The Champaign-Urbana Freight Model 2015 Base Year Commodity Generation Validation**

	From Champaign County	To Champaign County	Total
Modeled tonnage (tons)	10,395,402	10,442,507	20,837,909
FAF4 tonnage (tons)	10,436,984	10,304,976	20,741,960



## **b) Distribution model**

Cube Cargo then allocates the commodity flows estimated in the generation step from their zones of origin to their zones of destination using gravity models in the commodity flow distribution step. In this process, the model makes assumptions about the percentage of goods considered to be short-haul versus long-haul by commodity class.

The 2015 base year distribution model results were validated using the FAF4 database, as shown in [Figure 7-3](#) and [Figure 7-4](#). The modeled commodity tonnage distributed to the Midwest, and northwestern, southwestern, northern, southern, southeastern, and northeastern U.S. was compared with the FAF4 commodity tonnage distribution. Although there are discrepancies in the distribution tonnage, the model estimates are within a reasonable range with FAF4 estimates.

## **c) Mode split model**

Long haul flows enter the mode split model to be divided into two modes: heavy trucks and rail. Goods considered to be short haul are assumed to go by truck and do not go through the mode split model. The mode split model parameters were developed using the FAF4 2015 commodity flow database, which estimates that approximately 85 percent of total commodity tonnage were moved by trucks; 15 percent by trains.

## **d) Transport Logistics Nodes (TLN) model**

An important feature of Cube Cargo is the TLN model, which partitions the long-haul matrices into direct flows and transport chain flows. For example, commodity flows that need to go through a distribution center or a railroad goods yard to be consolidated or distributed will go through the TLN step. The Champaign-Urban freight model considers 23 grain elevators, two distribution centers, and one gas storage facility as Champaign County TLNs to represent the consolidation and distribution of goods at these locations.

## **e) Fine distribution model**

A series of origin-destination commodity flow matrices for short-haul and long-haul flows by mode and commodity type are distributed into smaller zones in the fine distribution model.

Figure 7-3: The Champaign-Urbana Freight Model 2015 Base Year Commodity Distribution Validation, Commodities Generated from Champaign County and Their Regions of Distribution (1,000 tons)

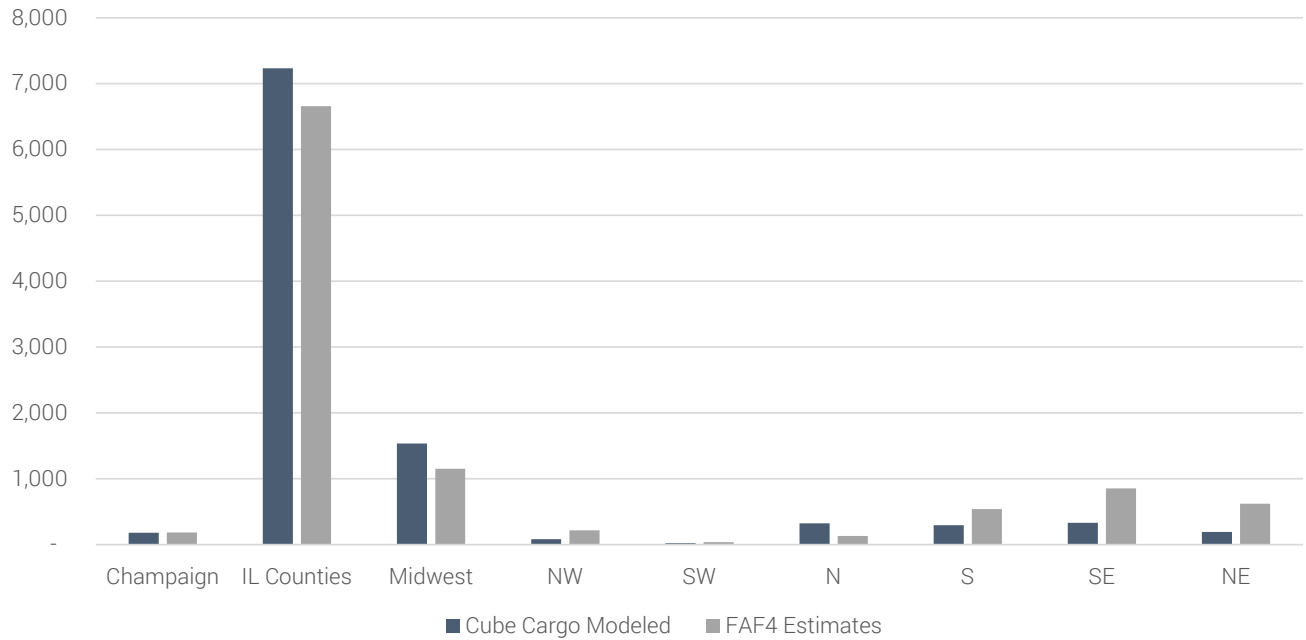
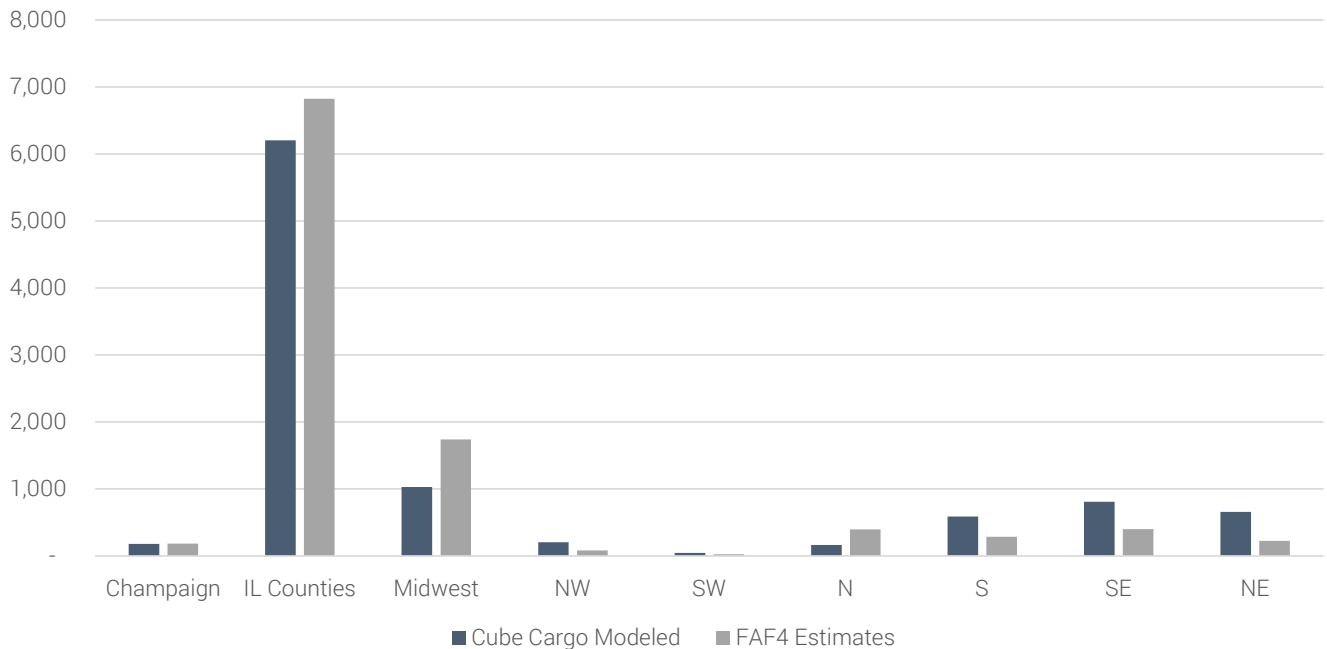


Figure 7-4: The Champaign-Urbana Freight Model 2015 Base Year Commodity Distribution Validation, Commodities Destined to Champaign County and Their Regions of Origin (1,000 tons)



#### **f) Vehicle model**

Finally, vehicle models convert the estimated annual commodity flow by truck into number of heavy and light trucks.

#### **g) Service traffic model**

Cube Cargo also models trucks moving small amounts of goods or workers, or delivering services within the region in the CitiTrans Model or service traffic model.

#### **h) Roadway assignment**

Truck traffic estimated from the Champaign-Urbana freight model was then incorporated into the Champaign-Urbana travel demand model to be assigned onto the regional roadway network along with personal and transit vehicles.

The model estimated approximately 20,000 daily truck trips in Champaign County in 2015, with one-third of the truck trips on the regional roadway network passing through Champaign County. Of the three million vehicle miles traveled on the roadway network within the Champaign-Urbana MPA, approximately 13 percent were traveled by trucks. One-fifth of the truck vehicle miles were traveled by light trucks, as heavy trucks tend to travel long distance on the interstate system. Around one to three miles of the roadway in the Champaign-Urbana MPA were congested in 2015.

### **7.1.2. Estimating future freight demand**

The main goal of developing a freight travel demand model for the region is to estimate freight commodity flows for 2045, and further estimate truck traffic volume on the regional roadway network. The Champaign-Urbana freight model estimates future commodity flow tonnage using population and employment projections and additional trend factors while assuming that model parameters calibrated for base year 2015 would remain applicable for 2045.

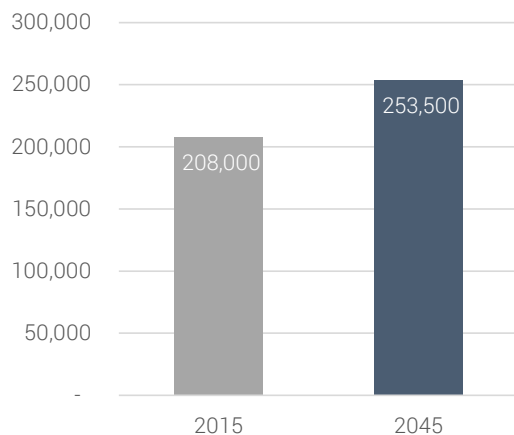
A set of fiscally constrained and vision projects were added to the model roadway network to represent the most optimistic impact of the future population and economic growth as well as commodity flow increase on traffic volume and freight infrastructure needs. These funded and vision projects are discussed in more detail in Section 8.6 and 8.7.

Champaign County total population is projected\* to grow about 22 percent from approximately 208,000 in 2015 to 253,500 in 2045. Total employment in Champaign County is projected to grow over 34 percent from approximately 103,500 in 2015 to 139,050 in 2045. Total commodity flows in Champaign are projected to increase by 43 percent from 21 million tons in 2015 to around 30 million tons in 2045†. Figure 7-5, Figure 7-6, and Figure 7-7 show the projected growth in population, employment, and total commodity flow tonnage in Champaign County from 2015 to 2045.

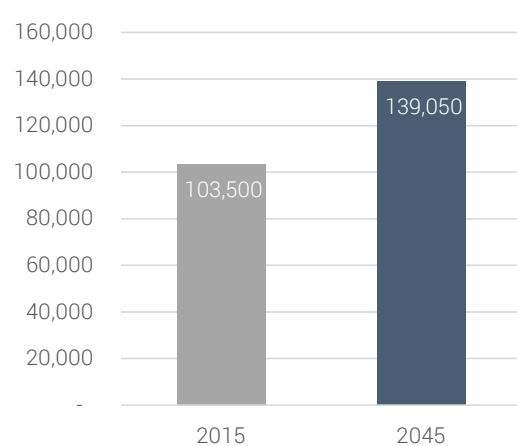
\* Population and employment projections are based on CUUATS L RTP 2045 UrbanSim model results. See details about the model at L RTP 2045 website <https://ccrpc.gitlab.io/lrtp2045/vision/model/>

†As discussed in Chapter 3, commodity flow tonnage projection is from FAF4 estimation. See details in Section 3.3.

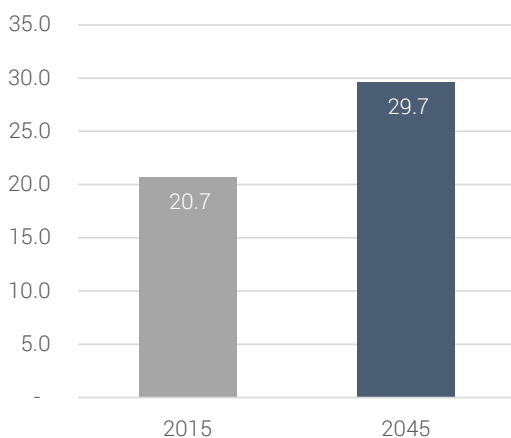
**Figure 7-5: Champaign County Population**



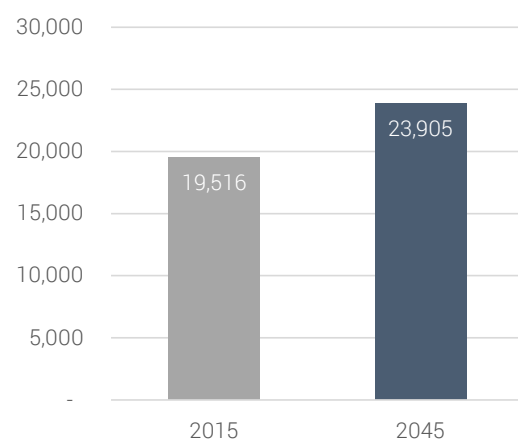
**Figure 7-6: Champaign County Employment**



**Figure 7-7: Champaign County Commodity Flow Tonnage (1,000,000 tons)**



**Figure 7-8: Champaign County Average Daily Truck Trips**



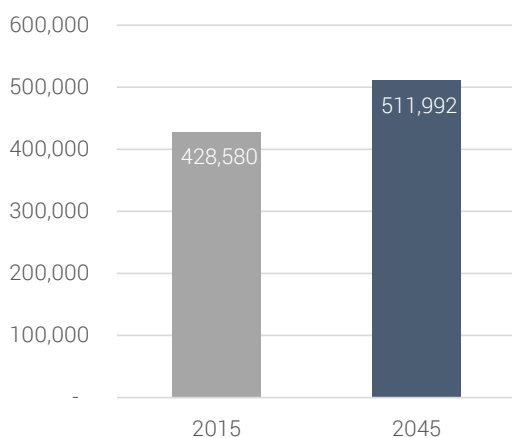


As a result of these growth, average daily truck trips on the Champaign County roadway network is projected to increase by approximately 23 percent from over 19,000 in 2015 to almost 24,000 in 2045. Of the approximately four million vehicle miles traveled on the MPA roadway network, roughly the same percentage (13 percent) will be traveled by trucks in 2045 compared with 2015. The total truck miles traveled will increase by around 20 percent in 2045. Therefore, the total congested lane miles is projected to increase to a minimum of four miles and a maximum of nine miles in 2045. [Figure 7-8](#), [Figure 7-9](#), and [Figure 7-10](#) show the projected daily truck trips in Champaign County, total truck VMT, and congested lane miles in the MPA from 2015 to 2045.

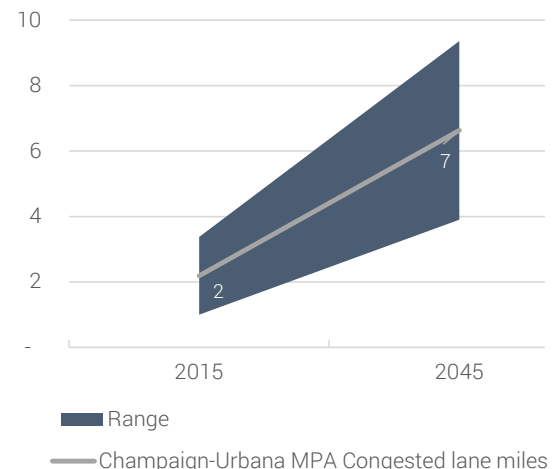
## 7.2. Other trends affecting regional freight system

In addition to population and employment growth projected based on historical trends and land use characteristics, there are other broader trends at the national and global scales that might affect the future freight commodity flows and therefore infrastructure needs in the Champaign-Urbana region. These trends include the advent of connected and autonomous vehicle technology and its application in truck platooning as well as the growth of e-commerce and home delivery, among others.

**Figure 7-9: Champaign-Urbana MPA Truck Vehicle Miles Traveled**



**Figure 7-10: Champaign-Urbana MPA Congested Lane Miles**



### 7.2.1. Connected and Autonomous Vehicles

As more long-haul autonomous truck pilot programs are taking place throughout the country, such as Uber's self-driving trucks operating through the company's freight hauling app<sup>2</sup> and the United States Postal Service's pilot of self-driving trucks to handle its rural routes<sup>3</sup>, the American Transportation Research Institute (ATRI) expects that the technology will offer benefits on almost every issue facing the trucking industry (Table 7-2).

In addition to a series of challenges, including liability matters, cyber security concerns, driver technical training challenges, state and federal trucking regulations, as well as limitations in current traffic laws, ATRI also noted that autonomous trucks require high-quality roadways and that deficient infrastructure, such as potholes and poor lane markings, can impede the safe application of the technology.

Closely related to the autonomous driving technology, truck platooning technology is a configuration that allows two or more trucks traveling closely behind one another, using automated sensors and controls to maintain short headway distance between vehicles, which allows the vehicles behind the lead truck to reduce fuel consumption by air drafting<sup>4</sup>.

**Table 7-2: Top Ten Trucking Issues and Key Autonomous Truck Benefits<sup>5</sup>**

Top Issues	Key Autonomous Trucks Benefits
Hours-of-service	Allows for driver rest and productivity to occur simultaneously
Compliance, safety, accountability	Will decrease raw Safety Management System scores, though percentile scoring needs to change
Driver shortage and retention	Driving will be more attractive with higher productivity, less time away from home, and additional logistics tasks; fewer drivers may be needed. Companies with autonomous technology may attract and retain drivers
Truck Parking	If "productive rest" is taken in the cab during operations, less time will be required away from home at truck parking facilities and fewer facilities will be needed
Electronic logging device mandate	Modification will be necessary depending on level of autonomy
Driver health and wellness	Drivers could be less sedentary; injuries could be reduced
Infrastructure/congestion/funding	Urban congestion could be mitigated through widespread use of autonomous vehicles (including cars)
Driver distraction	Drivers will not be distracted from driving if vehicle is in autonomous mode

Source: ATRI

The implications of autonomous vehicles technology and truck platooning for the Champaign-Urbana region are varied and uncertain. IDOT suspects that long-haul freight traffic would be partially diverted from rail to highways due to truck platooning, affecting highway capacity and maintenance. Trucks and automobiles are likely to graduate through degrees of automation, and automated operations are likely to coexist with traditional ones for years<sup>4</sup>. Autonomous vehicle technology along with automation that integrates supply chain and delivery process would ultimately affect building designs and access, and roadway infrastructure and operations. Congestion in urban settings can potentially be addressed through automation in local and last mile freight carriage with smaller freight vehicles. Although views on employment impacts vary, in the near term, the autonomous truck technology will likely still require a driver to remain in the vehicle.

### 7.2.2. E-commerce and retail home delivery

Growth in U.S. online sales has averaged more than 15% year-over-year since 2010<sup>6</sup>. Consumers, particularly in densely populated urban areas, now expect a broad inventory of goods to be readily available to them both in-store and online. Consumers also expect that these products can be picked up or delivered to them at little-to-no additional cost in much shorter delivery windows. Businesses have also begun to shift their purchases of industrial and construction supplies to online platforms. Retailers are becoming more flexible in how they reach and transact with consumers by decentralizing their distribution/fulfillment networks to bring inventory closer to consumers<sup>4,7</sup>.

The growth of e-commerce and increased retail home delivery has a number of implications<sup>4</sup>:

- » Truck deliveries into residential communities will continue to climb and will carry a greater range of goods. Concern for the safety and environmental impact of delivery trucks would increase.
- » Truck deliveries will replace some passenger trips to stores and will occur not only in an urban setting, but also in suburban and rural settings.
- » Truck deliveries will originate from a greater variety of land uses, including warehouses, stores, and local staging points.

- » The demand for smaller and less centralized warehouse space will increase to facilitate the growing volume of last-mile deliveries in urban cores.
- » The demand for alternative delivery modes, including bicycles, motorized tricycles, and drones, will increase to navigate in high density urban areas, while residential building access and parking will come under continual pressure.
- » Truck traffic volume on rural roadways will increase.
- » Reverse logistics will increase.
- » Employment at local pickup and delivery operations will increase.
- » Truck drivers will be required to do value-added services like installation, product assembly, and repairs, which will require greater training of drivers.

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## Endnotes

1. Kuzmyak, J. R. (2008). Forecasting metropolitan commercial and freight travel (Vol. 384). Transportation Research Board.

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7. American Transportation Research Institute. (2019). E-Commerce Impacts on the Trucking Industry. Retrieved from <https://truckingresearch.org/wp-content/uploads/2019/02/ATRI-Impacts-of-E-Commerce-on-Trucking-02-2019.pdf>



# Goals, Objectives, Performance Measures, Strategies, and Projects

This chapter details the Vision and Goals that reflect the current freight stakeholder needs and desired outcomes of the freight infrastructure investment and non-infrastructure programs in the Champaign-Urbana region. The Goals articulate what the plan seeks to achieve over time in order to meet the Vision, the progress of which can be measured through the Objectives and Performance Measures, by implementing the proposed strategies and projects.



# 8



Figure: Traffic at the intersection of Prospect Avenue and Bloomington Road in Champaign

Source: CUUATS staff

## 8. Goals, Objectives, Performance Measures, Strategies, and Projects

The Freight Plan was prepared with input from freight stakeholders and other interested parties, including the general public. The vision and goals of the Freight Plan were initially developed to align with National Highway Freight Program goals established in the FAST Act (December 2015), the State Freight Program strategic goals established in the Illinois Freight Plan (October 2017), the Zero Fatalities goal established in the Illinois Strategic Highway Safety Plan (July 2017), the regional planning pillar goals established in the Long Range Transportation Plan: Sustainable Choices 2040 (December 2014). The vision and goals were presented to and refined through the Champaign-Urbana Freight Advisory Group.

The vision is intended to guide investment and improvement decisions in the Champaign-Urbana area. The freight stakeholders, particularly the member agencies of the Champaign-Urbana Metropolitan Planning Organization (MPO), Illinois Department of Transportation, Champaign County, the cities of Champaign and Urbana, and the Village of Savoy, conduct freight transportation planning, construction, and delivery process in the Champaign-Urbana region.

The goals describe the desired outcomes that reflect the vision. The objectives specify actions and activities associated with the goals, and are intended to be SMART (specific, measurable, agreed, realistic, and time bound) and lead directly to the formulation of performance measures. Performance measures operationalize the objectives by tracking how progress toward a goal is being made. Performance measures define desired outcomes and how, when, and where they will be measured, monitored, and reported. Implementation strategies are the ongoing programs that the freight stakeholders conduct to work toward meeting the objectives and goals of the Freight Plan. In addition, a wide range of existing freight related plans, studies, and initiatives conducted by different organizations at the federal, state, and local levels were reviewed ([Appendix D](#)) to identify best practices and proposed strategies/recommendations that may support this Freight Plan for the Champaign-Urbana Metropolitan Planning Area (MPA).

# Vision

The Champaign-Urbana Region Freight Plan (the Freight Plan) envisions the Champaign-Urbana area as a vibrant region with a thriving economy connecting people and goods to regional, national, and global markets by providing safe, efficient, and reliable transportation connections.

## 8.1. Goal: Improve safety

The Champaign-Urbana area will ensure the safety of the transportation system for all people, goods, and services, and in the long term, achieve the state's "Zero Fatalities" goal and reduce heavy-vehicle-involved serious injuries.

### **National Highway Freight Program Goal: Improve Safety, Security, and Resiliency**

- » Improve the safety, security, efficiency, and resiliency of freight transportation in rural and urban areas.
- » Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway Freight Network.

### **Illinois Strategic Highway Safety Plan (ILSHP) Goal: Vision Zero**

- » The ILSHSP "Zero Fatalities" goal envisions reducing fatalities on Illinois roads to zero in the long term.
- » Eliminate all heavy-vehicle-involved fatalities.

### **Illinois Freight Plan Goal: Improve Safety**

- » Improve safety through minimizing roadway incidents involving freight vehicles and ensuring IDOT's Intelligent Transportation System (ITS) has adequate safety notification protocols.

### **L RTP 2040 Sustainable Choices 2040 Goal: Safety and Security**

- » The Champaign-Urbana area will maintain, preserve and operate its existing transportation system in a safe and secure usable state to provide safe, efficient and reliable movement of people, goods, services in the short term, and in the long term, achieve the state's goal of zero death and disabling injuries.



## 8.1.1. Objectives

### a. Reduce the number of heavy-vehicle involved serious injuries (five-year rolling average) by 50% from 2016 by 2025 \*

» Performance Measure: Total number of heavy-vehicle involved serious injuries (five-year rolling average)

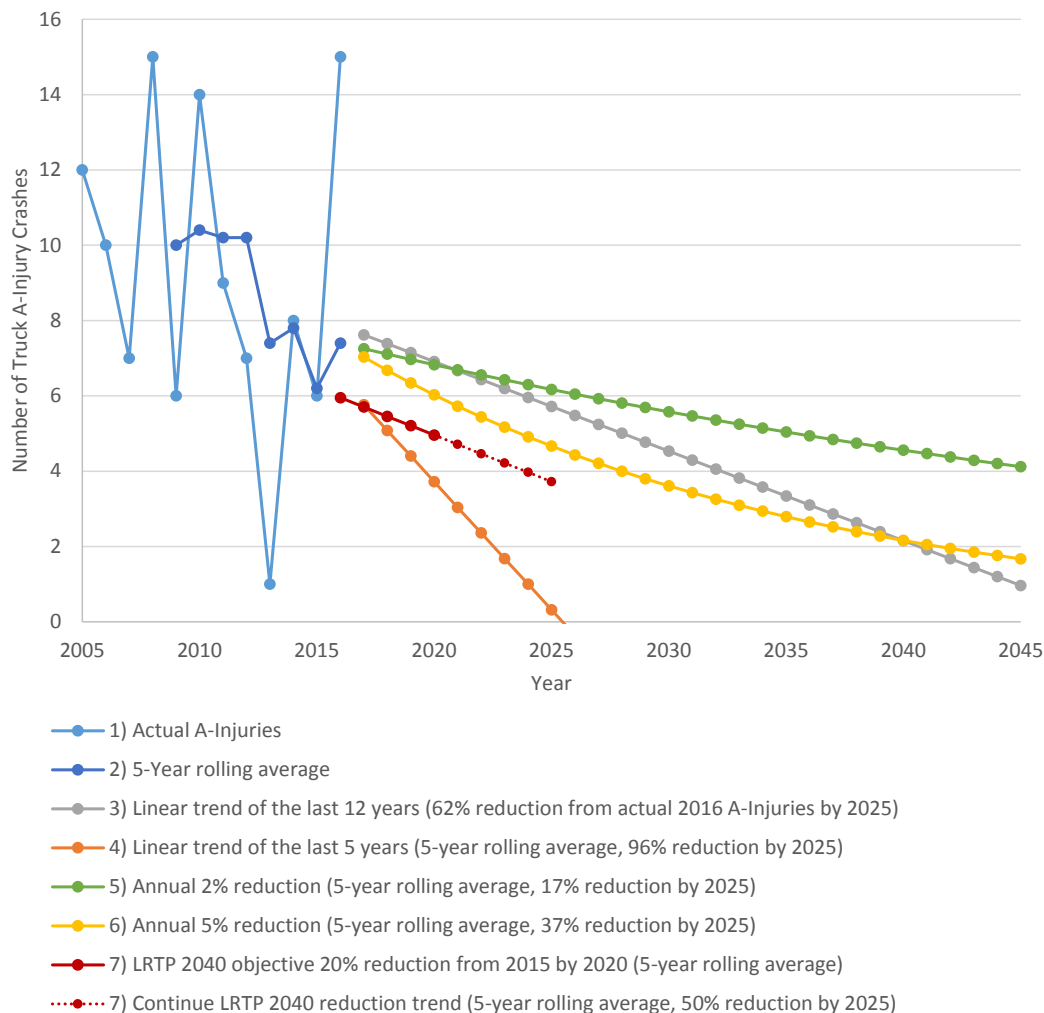
» Data Sources: IDOT crash database

### b. Eliminate all heavy-vehicle-involved fatalities by 2025

» Performance Measure: Total heavy-vehicle involved fatalities (five-year rolling average)

» Data Sources: IDOT crash database

Figure 8-1: Number of Truck A-Injury Crashes in the MPA since 2005



\*This objective is the continuation of the LRTP 2040 reduction trend, line 7) in Figure 8-1.

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From 2012 to 2016, the rolling average of heavy-vehicle-involved fatalities in the MPA was 0.6. No heavy-vehicle involved fatalities happened in 2012 or 2015. One fatality happened each year in 2013, 2014, and 2016.

---

**c. Reduce the number of truck-viaduct crashes by 50 percent from 2017 by 2025**

- » Performance Measure: Number of truck-viaduct crashes in the Champaign-Urbana area
- » Data Sources: IDOT crash database

---

From 2012 to 2017, there were 41 crashes at the bridges carrying Canadian National railroad tracks over Washington Street, University Avenue, Logan Street, Springfield Avenue, and Green Street (Section 5.1.2.), an average of 6.8 crashes per year.

---

**Figure 8-2: A Truck-Viaduct Crash at the Canadian National Railroad Bridge on Springfield Avenue**



Source: CUUATS staff, 2014




## 8.1.2. Strategies



1. Conduct a safety study for Mattis Avenue, between Church Street (I-72 exit) and Bradley Avenue, and Bradley Avenue, between Mattis Avenue and Prospect Avenue, and work with Kraft Foods and DSC Logistics to explore possible improvements for the entrances and signage of the facilities, as well as other solutions to improve the safety for truck traffic and other modes of transportation (see detailed discussions in Section 5.1.1., Figure 5-5).
2. Improve the markings for the intersection of Bloomington Road and Prospect Avenue (see detailed discussions in Section 5.1.1., Figure 5-6).
3. Conduct an intersection study for the intersection of Bloomington Road and Prospect Avenue and investigate solutions, including the "peanutabout" concept (Figure 8-3), to improve safety for truck traffic and other modes of transportation at that intersection (see detailed discussions in Section 5.1.1., Figure 5-6).
4. Highlight low bridges in the region in IDOT's web-based services, including "IDOT in Motion", and other commercial information platforms for truck drivers to reduce truck-viaduct crashes in the MPA (see detailed discussions in Section 5.1.2., Figure 5-9).

### Responsible Parties

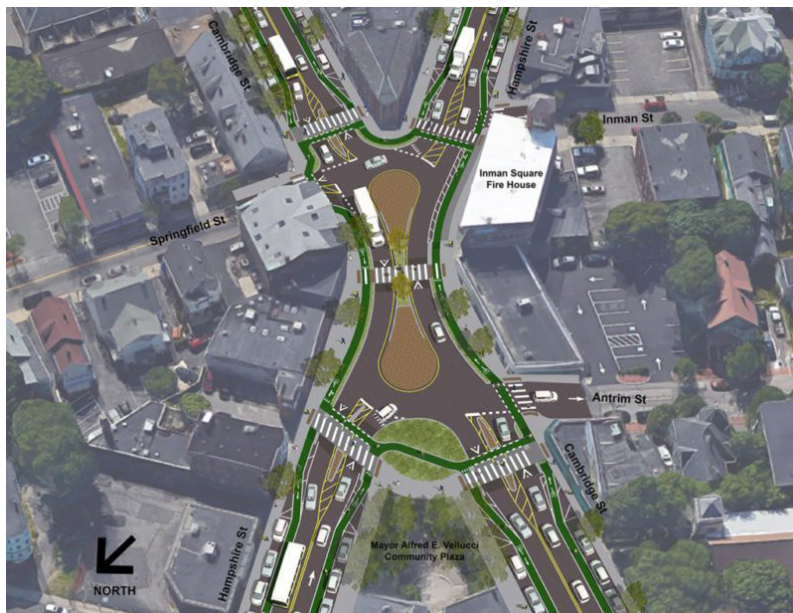
-  CUUATS
-  City of Champaign
-  Champaign County Economic Development Corporation (EDC)
-  Kraft Foods
-  DSC Logistics

-  IDOT

-  CUUATS
-  IDOT
-  City of Champaign

-  IDOT
-  City of Champaign

**Figure 8-3: "Peanutabout" Concept Could Improve Safety at Irregular Intersections**

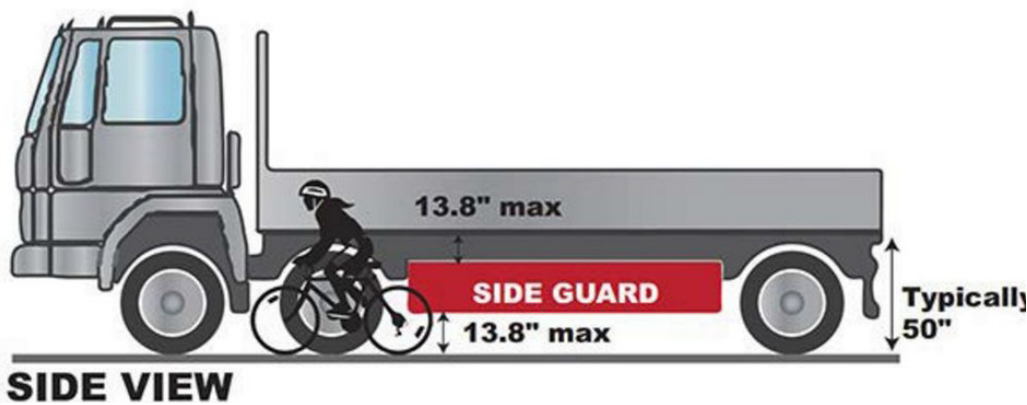


Source: Michael Anderson. (2016). The 'Peanutabout' Concept Could Be a Breakthrough for Diagonal Streets. Retrieved from <https://usa.streetsblog.org/2016/12/01/the-peanutabout-concept-could-be-a-breakthrough-for-diagonal-streets/>

5. Study the feasibility of installing a gate at the Norfolk Southern railroad at-grade crossing at Prospect Avenue to prevent future crashes (see detailed discussions in Section 5.1.3., Figure 5-10).
    -  IDOT
    -  Norfolk Southern Railway
  6. Study the feasibility of reconfiguring the current I-74 and IL-130 interchange ramps to improve safety for truck traffic and other modes of transportation (see detailed discussions in Section 6.2.1. c), Figure 6-6).
    -  IDOT
    -  City of Urbana
  7. Conduct an intersection safety study at the IL 10/ Springfield Avenue and Mattis Avenue intersection (LRTP 2040)
    -  IDOT
    -  City of Champaign
  8. Continue monitoring and analyzing heavy-vehicle-involved crashes to identify areas that have problematic or crash-inducing patterns, and work with the state and local agencies to investigate safety solutions.
    -  CUUATS
    -  IDOT
  9. Continue monitoring and analyzing crashes at at-grade rail crossings in the MPA to identify unsafe crossings and work with railroad companies and local agencies to identify solutions.
    -  CUUATS
    -  IDOT
  10. Ensure that bridge construction and reconstruction projects in the region provide safe passage of heavy vehicles when applicable.
    -  IDOT
    -  Champaign County and Municipalities
    -  University of Illinois
  11. Improve visibility for freight transportation by providing adequate lighting, striping, signage, visibility triangles, and access control.
    -  IDOT
    -  Champaign County and Municipalities
    -  University of Illinois
- 
- Stakeholders commented that there are no street lights on Town Center Boulevard in the northwestern Champaign shopping area, and that "it is dark for vehicles and pedestrians." See Appendix C for specific comments.
- 
12. Ensure freight safety is considered as an integral part of all planning activities.
    -  CUUATS
  13. Explore the feasibility of requiring freight vehicles operating under IDOT/municipal/University contracts to have truck side guards installed (Figure 8-4), where appropriate.
    -  IDOT
    -  Champaign County and Municipalities
    -  University of Illinois



Figure 8-4: Side Guards Protect Cyclists from Getting Run over by the Back Wheels



Source: Seattle Department of Transportation. Citylab<sup>1</sup>

14. When purchasing new or replacing old municipal truck fleets, consider reducing vehicle size and incorporating technologies and other measures to increase driver visibility and improve maneuverability of the trucks in the urban environment.
15. Encourage trucking companies and truck fleet owning businesses that often operate on local streets to utilize smaller trucks and incorporate technologies and other measures (such as high vision truck cabs and side guards<sup>2</sup>) to increase driver visibility and improve maneuverability of the trucks in the urban environment.



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Mid-West Truckers Association



Champaign County Chamber of Commerce



Champaign County Economic Development Corporation (EDC)

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Advanced Driver Assistance System (ADAS), including Forward Collision Warning (FCW) and Automatic Emergency Braking (AEB) system, uses onboard radar, camera, and other sensors to scan the vehicle's surroundings and either alert the driver or automatically intercede on the driver's behalf to prevent or mitigate a wide range of crash types <sup>2</sup>.

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## 8.2. Goal: Preserve existing infrastructure

On January 18, 2017, FHWA published the Pavement and Bridge Condition Performance Measures (PM2) Final Rule, which assesses the condition of pavement on the Interstate System and the National Highway System (NHS), as well as bridges carrying the NHS, including on- and off-ramps connected to the NHS. The PM2 Final Rule is for State DOTs and MPOs to use as required by the MAP-21 and the FAST Act<sup>3</sup>. In 2018, PM2 targets for Illinois, proposed by IDOT, were adopted and approved for the Champaign-Urbana MPA<sup>4</sup>.

The targets for these performance measures, proposed by IDOT, were approved by the CUUATS Technical and Policy Committees at the September, 2018 meetings<sup>4</sup>.

**Table 8-1: PM2 System Performance Approved Targets**

Performance Measure	IL State 2017 Baseline	IL State 2020 Target	IL State 2022 Target	Champaign-Urbana MPA 2017 Baseline	Champaign-Urbana MPA 2020 Target	Champaign-Urbana MPA 2022 Target
Percent of Interstate Pavement in Good condition	65.96%	65.00%	65.00%	62.93%	65.00%	65.00%
Percent of Interstate Pavements in Poor condition	0.27%	<5.00%	<5.00%	0.00%	<5.00%	<5.00%
Percent of non-Interstate NHS pavements in Good condition	27.71%	27.00%	27.00%	33.12%	27.00%	27.00%
Percent of non-interstate NHS pavements in Poor condition	4.94%	6.00%	6.00%	0.00%	6.00%	6.00%
Percent of NHS bridges classified as in Good condition	29.40%	28.00%	27.00%	14.80%	28.00%	27.00%
Percent of NHS bridge classified as in Poor condition	11.60%	13.00%	14.00%	35.80%	13.00%	14.00%

The Champaign-Urbana area will maintain, preserve, and operate its existing transportation system to provide safe, efficient and reliable movement of people, goods, and services, and achieve the state's goal for PM2: pavement and bridge conditions of the Interstate and non-Interstate National Highway System (NHS).

**National Highway Freight Program Goal: Improve State of Good Repair**

- » Improve the state of good repair of the National Highway Freight Network.

**Illinois Freight Plan Goal: Preserve existing infrastructure**

- » Preserve existing infrastructure through performing routine maintenance in order to control deterioration of roadways and lessen number of critical repairs.
- » Preserve existing infrastructure through reducing stress on roadway system by supporting multimodal alternatives for freight shipments.

## **8.2.1. Objectives**

**a. Meet the 2020 and 2022 PM2 targets approved for the Champaign-Urbana MPA (Table 8-1)**

- » Performance Measure: PM2
- » Data Sources: IDOT

**b. Reduce the mileage of roadways that were rated Poor and Failed by five percent by 2025**

- » PM: Percent of roadway mileage that was rated Poor and Failed by each jurisdiction
- » Data Sources: IDOT, Cities, Villages, the University of Illinois, Champaign County Highway Department

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More than 19 percent of the roadway mileage in the Champaign- Urbana MPA was rated Poor and Failed in the unified regional pavement condition database in 2017 (Section 4.1.2. a). Since the development of the database, the City of Urbana has decided to switch to the PCI system for pavement management, the same system used by the City of Champaign, the Champaign County Highway Department, and the University of Illinois.

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Therefore, this objective should be tracked separately for IDOT roadways (CRS) and local roadways (PCI, if applicable). The five percent reduction objective was selected considering municipal funding limitations.

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**c. Reduce the number of bridges in the MPA that are structurally deficient by 10 percent from 2019 levels by 2025.**

» PM: Number of bridges that are structurally deficient

» Data Sources: IDOT

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As of April 2019, there were 19 structurally deficient bridges in the MPA, eight of which have been scheduled for improvement, repair, or rehabilitation. The 10 percent (1-2 bridges) objective was selected considering municipal funding limitations to do bridge improvements.

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## 8.2.2. Strategies

1. Monitor the pavement conditions of IDOT roadways in the MPA using IDOT CRS rating data (see detailed discussions in Section 4.1.2.).
2. Monitor the pavement conditions of local roadways in the MPA using PCI rating data.

---

As discussed in Section 4.1.2., trucks, especially heavy load tractor-semi trailers, can cause major pavement structure damage to roadways. Unsatisfactory pavement conditions, on the other hand, add to the wear and tear of trucks, and even bring damage to the cargo on the vehicles. The American Transportation Research Institute (ATRI) identified poor transportation infrastructure condition as one of the top 10 issues affecting the trucking industry. Monitoring the condition of the regional roadway pavement condition would provide a clear picture of the current status of the roadways and would be beneficial for future maintenance and truck route designation strategies.

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3. Monitor the regional bridge conditions using data from IDOT (see detailed discussions in Section 4.2.).

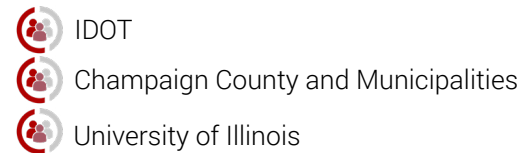


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Monitoring the condition of the bridges in the region is another aspect of having a better understanding of and preserving the existing infrastructure.

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4. Continue considering truck volumes in the pavement prioritization process and implementing scheduled infrastructure improvements to ensure that major roads and bridges are able to handle truck loads and that pavements are free of potholes.

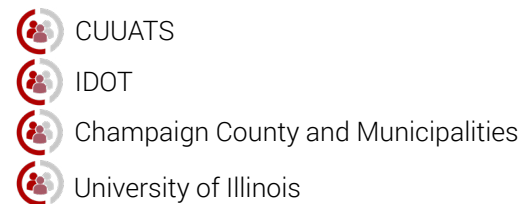


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Stakeholders commented Wilbur Avenue, Church Street, and Farber Drive in Champaign and U.S. 150 with severe pavement condition issues. See Appendix C for specific comments from stakeholders regarding the infrastructure condition.

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5. Continue working with public and private stakeholders to identify and prioritize major freight system investments and advocate for adequate funding and investment to maintain and improve the freight transportation system.



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Stakeholders expressed that there is a great need to secure funding to maintain the interstate and local roadway systems. Stakeholders commented that additional roadways should be designated as part of the Primary Highway Freight System (Chapter 4.1) to be eligible for federal freight formula funds. . See Appendix C for specific comments

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6. When purchasing new or replacing old municipal truck fleets, consider reducing vehicle size to reduce deterioration of the pavement due to truck movements.
7. Encourage trucking companies and truck fleet owning businesses that often operate on local streets to utilize smaller trucks to reduce deterioration of the pavement due to truck movements.



## 8.3. Goal: Improve efficiency

On January 18, 2017, FHWA published the System Performance/Freight/CMAQ Performance Measures (PM3) Final Rules, which establish a set of performance measures for the Interstate and non-Interstate National Highway System (NHS) on freight movement, traffic congestion, and on-road mobile source emissions. The PM3 Final Rule is for State DOTs and MPOs to use as required by the MAP-21 and the FAST Act<sup>5</sup>. In 2018, PM3 targets for Illinois, proposed by IDOT, were adopted and approved for the Champaign-Urbana MPA<sup>6</sup>.

**Table 8-2: PM3 System Performance Approved Targets**

Performance Measure	IL State 2017 Baseline	IL State 2020 Target	IL State 2022 Target	C-U MPA 2017 Baseline (Appendix E)	Champaign-Urbana MPA 2020 Target	Champaign-Urbana MPA 2022 Target
Percent of person-miles traveled on the Interstate that are reliable	80.80%	79.00%	77.00%	100.00%	79.00%	77.00%
Percent of person-miles traveled on the non-Interstate NHS that are reliable	87.30%	85.30%	83.30%	87.00%	85.30%	83.30%
Truck Travel Time Reliability Index	1.3	1.34	1.37	1.22	1.34	1.37

The Champaign-Urbana area will invest in upgrading existing infrastructure, building environmentally responsible and technologically forward-looking new infrastructure, increasing persons and freight movement efficiency, and achieving the state's goal for PM3: reliable persons and freight movement on the Interstate and non-Interstate National Highway System (NHS).

## **National Highway Freight Program Goals: Improve Efficiency and Productivity**

- » Invest in infrastructure improvements and to implement operational improvements on the highways of the United States that:
  - Reduce congestion and bottlenecks on the National Highway Freight Network.
  - Reduce the cost of freight transportation.
  - Improve the year-round reliability of freight transportation.
  - Increase productivity, particularly for domestic industries and businesses that create high-value jobs.
- » Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway Freight Network.
- » Improve the efficiency and productivity of the National Highway Freight Network.

## **Illinois Freight Plan Goal: Improve Efficiency**

- » Improve efficiency through updating IDOT's Illinois Transportation Automated Permits (ITAP) truck permitting process and establishing performance measures using the National Performance Management Research Data Set (NPMRDS)

### **8.3.1. Objectives**

- a. Meet the 2020 and 2022 PM3 targets for performance measures approved for the Champaign-Urbana MPA (Table 8-2)**
  - » Performance Measure: PM3
  - » Data Sources: NPMRDS

### 8.3.2. Strategies

#### Responsible Parties

1. Support the development, maintenance, and communication of a regional truck route system and a truck wayfinding plan with consistent truck route signage to improve access to local freight generators, help the freight community navigate the region, and minimize through truck traffic within residential areas. Review existing truck route designation and signage (see detailed discussions in [Section 4.1.3.](#)), as well as major truck access roadways identified in this Freight Plan (see detailed discussions in [Section 5.2](#)). Investigate the relationship between the existing roadway speed limits and truck movement speeds using ATRI GPS data and the data collected through the Champaign-Urbana Major Corridor Speed Study. Work with private companies and public agencies to understand the legal and maintenance implications of this truck route system. Investigate the potential impact of this truck route system on other modes of travel. Develop a truck route system and a wayfinding plan that can potentially be integrated with other congestion and incident update information in the IDOT online information tools and other platforms. Develop maps and information brochures, and work with both public and private partners to communicate the plan and system with truck drivers.

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Stakeholders expressed a need for better truck route signage in the region. Stakeholders recommended "better signage on the interstates to help direct traffic to avoid Bradley/Prospect Avenue," and that the "Left Lane Must Turn Left" sign on Walnut Street at East Washington Street in downtown Champaign is not marked adequately. See Appendix C for specific comments.





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2. Review the need for signal prioritization and timing reconfiguration to improve reliability and throughput around major freight-generating facilities with fixed schedules or high service requirements<sup>†</sup> and on roadways with high truck volumes during peak hours to avoid traffic congestion.

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<sup>†</sup> Such as the Canadian National railroad crossing at Bradley Avenue and the area where Kraft Foods and DSC Logistics are located.

-  CUUATS
-  IDOT
-  Mid-West Truckers Association
-  Champaign County and Municipalities
-  University of Illinois
-  Champaign County Chamber of Commerce
-  Champaign County Economic Development Corporation (EDC)

-  CUUATS
-  IDOT
-  Champaign County and Municipalities
-  University of Illinois







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Stakeholders expressed a need to reconfigure signal timings along North Prospect Avenue and North Neil Street in Champaign. See Appendix C for specific comments.

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3. Continue identifying truck congestion hot spots and freight bottlenecks caused by peak hour traffic, incidents, work zones, or other factors where high volumes of freight and passenger traffic must coexist. Consider congestion mitigation efforts, including reducing lane widths to add a travel and/or auxiliary lane, use of a shoulder as a peak-hour lane, re-striping merge or diverge areas to better serve demand, modifying weaving areas, adding a collector/distributor lane, or other similar measures.

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4. Consider incorporating freight-friendly design features for roadway construction and reconstruction projects with high truck traffic, such as the use of wider shoulders, generous turning lanes, median barriers, and other features when applicable.

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5. Continue monitoring train activities on the railroads in the MPA, support projects and programs that improve safety at at-grade rail crossings, calculate increased traffic delay at the at-grade railroad crossings due to the possible increase of rail traffic, and identify opportunities for solutions such as grade separations.

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There are 52 at-grade crossing locations along the rail lines in the Champaign-Urbana MPA. The amount of freight transported by railroads coming into and originating from Champaign County is expected to increase by more than 40 percent by 2045. The increased rail traffic will result in increased delay at the at-grade crossings, especially for roadways in the urbanized area, as railway freight movement usually has higher priority over roadway traffic (Section 4.4., Figure 4-20).

---

## 8.4. Goal: Expand freight-supporting services and grow the economy

The Champaign-Urbana area will continue to support existing and emerging sensible business developments, invest in establishing strong interconnected multimodal freight transportation options, and expand freight supporting services without encouraging sprawl or sacrificing important historical structures.

### **National Highway Freight Program Goals: Increase Economic Competitiveness and Reliability**

- » Invest in infrastructure improvements and to implement operational improvements on the highways of the United States that:
- » Strengthen the contribution of the National Highway Freight Network to the economic competitiveness of the United States.
- » Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway Freight Network.

### **Illinois Freight Plan Goal: Expand Infrastructure Strategically and Grow the Economy**

- » Expand infrastructure strategically through optimizing the limited funds that are available for new construction projects and ensuring design policies encourage innovation and design flexibility to support multi-modal transportation goals
- » Grow the economy through securing a stable dedicated state funding source for freight projects and improving international competitiveness of Illinois

## 8.4.1. Objectives

- a. **Increase the number of truck parking facilities in Champaign County from seven to 10, or expand the square footage of the trucking parking areas by 40 percent by 2025.**

- » Performance Measure: Number/area of truck parking areas in Champaign County
- » Data Sources: FHWA Freight Management and Operations<sup>7</sup>, Find Truck Service<sup>8</sup>, Google maps

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Currently there are approximately 162,000 square foot of truck parking area in the MPA (not including building footprints), with an average of 23,000 square foot per facility. An addition of three truck parking facilities will result in 40 percent increase in the total truck parking area.

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## 8.4.2. Strategies

1. Support new and expanded truck parking locations that provide fuel, alternative fuel, electric power sources, and other services for truck drivers and measures to enhance driver safety (see detailed discussions in Section 4.3., Figure 4-17) .




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Stakeholders commented that the lack of semi-truck parking would influence their future freight activity in the region. ATRI reported that drivers spend on average about an hour of travel time per day looking for a safe place to park. Possible new public/private truck parking sites/rest areas: along I-74 east of Urbana, along US 45/Cunningham Avenue north of I-74 in Urbana, I-72 west of Champaign. Possible expanded trucking parking sites: Road Ranger at the I-57 and Market Street interchange.



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2. Integrate the IDOT Truck Parking Information Management System (TPIMS), which is currently under development, into the Champaign Urbana ITS Architecture.
3. Continue participating in regional and state freight forums, including the Illinois State Freight Advisory Council (ISFAC), to strengthen the ability of the Champaign-Urbana area to be aware of national and state freight needs and prepare for a changing future.

### Responsible Parties

-  CUUATS
-  IDOT
-  Champaign County and Municipalities

-  CUUATS
-  IDOT

-  CUUATS
-  IDOT

4. Continue integrating planning for freight with other modes and include freight elements in performance-based transportation project prioritization process
5. Continue to identify federal, state, and other funding sources and work with public agencies, the private sector, and elected officials to identify eligible and suitable local projects. Continue to advocate for adequate funding and investment to maintain and improve the freight transportation system.

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The Village of Savoy, with the assistance of CUUATS, has submitted a proposal titled "Curtis Road Grade Separation and Complete Streets" for the INFRA grant in 2017 and 2019.

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6. Include freight as one of the modes discussed when educating stakeholders (including the public at large) about transportation options, highlighting topics such as freight safety issues (e.g. truck blind spots), design challenges, and the critical role and benefits of freight in the region.
7. Develop and distribute educational materials for trucking companies and truck drivers on the freight network, local municipal regulations, preferred routes, hours of operation, parking, low bridges, the online information system, and other resources.
8. Identify opportunities for an intermodal terminal yard or a rail transloading facility and improve multimodal connections among rail yards, industrial developments, airport, and the truck freight network to relieve traffic congestion on highways by encouraging use of alternate modes whenever possible.






---




Stakeholders expressed the need to have more public transloading facilities where they can move their goods from truck to rail more easily. Businesses in the agriculture sector whose grain does not go through the grain elevators in the region have to bring their goods to the City of Decatur in Macon County to depot. See Appendix C for specific comments.

This strategy also aligns with the state's goal of supporting new and/or downstate facilities to offer capacity relief for the Chicago area, and less costly transport distances for some shippers.









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 University of Illinois

 Champaign County EDC  CUUATS  
 Mid-West Truckers Association  
 Champaign County and Municipalities  
 University of Illinois  IDOT  
 Champaign County Chamber of Commerce

 CUUATS  
 IDOT  
 Champaign County and Municipalities  
 Canadian National Railway  
 Norfolk Southern Railways  
 Champaign County Farm Bureau  
 Champaign County EDC  
 Champaign County Chamber of Commerce

9. Provide support to the development of the Willard Airport Master Plan to encourage new and enhanced air cargo services<sup>9</sup>.



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Several stakeholders expressed the need for expanded air cargo service at Willard Airport. See Appendix C for specific comments. As discussed in Section 4.5., Willard Airport has the potential to grow into a regional air freight terminal because of the length of its runways, its potential capacity for large aircraft, and the easy connections to the interstate system.

---

10. In preparation for emerging technologies such as autonomous/connected vehicles and truck platooning, continue maintaining roadway striping to keep roadways detectable for sensors, participate in discussions about pilot programs in the state to be aware of emerging opportunities, consider vehicle-to-infrastructure technology as part of the Champaign Urbana ITS Architecture, and initiate studies to coordinate and build consensus among stakeholders on the requirements for operating autonomous trucks on local streets.



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For example, initially strictly require driver attendance and gradually loosen appropriate requirements as the federal and state legislations are established, technology to ensure life and information safety has matured, and the technology becomes more widely accepted by the public.

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11. Expand MPO access to more truck traffic count data than what is currently made available on Illinois Technology Transfer Center<sup>10</sup> and Getting Around Illinois app<sup>11</sup>.



IDOT



## 8.5. Goal: Improve quality of life

The Champaign-Urbana area will aim to improve overall residential quality of life and health by:

- » Ensuring freight projects and programs enable reliable movement of people, goods, and services on all modes, including transit, biking, and walking;
- » Promoting equity in investment and public engagement relating to freight projects and programs;
- » Improving freight operations in the region by making goods movement more efficient and reducing its environmental footprint.

### **National Highway Freight Program Goals: Reduce Environmental Impacts**

- » Reduce the environmental impacts of freight movement on the National Highway Freight Network.

### **Illinois Freight Plan Goal: Support Multimodal Distribution**

- » Support multimodal distribution through enhancing coordination of multimodal planning with MPOs, local jurisdictions, and adjoining states.
- » Encourage mode shifting to lessen environmental impacts and reduce vehicle emissions from freight vehicles by promoting more environmentally friendly modes, such as rail, water, and air.

### 8.5.1. Objectives

#### **a. Eliminate collisions between trucks and pedestrians and bicyclist.**

- » Performance Measure: Total number of collisions between trucks and pedestrians and bicyclists (five-year rolling average)
- » Data Sources: IDOT crash database

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From 2012 to 2016, the rolling average of heavy-vehicle-involved fatalities in the MPA was 0.8. No pedestrian- or bicyclist-involved heavy-vehicle crashes happened in 2013 or 2015. One pedestrian- or bicyclist involved heavy-vehicle crash happened each year in 2012 and 2016. Two pedestrian or bicyclist involved heavy-vehicle crashes happened in 2014.

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## 8.5.2. Strategies

1. Develop a curbside management study that inventories existing curbside spaces, private loading bays, current municipal curbside usage, permitting regulations, pricing, signage, truck loading zone designation and hours, and the relationship between truck loading zones and traveling lanes, parking lanes, transit stops, and bicycle and pedestrian facilities. The study should also propose consistent curbside management practices across the municipalities, work with local businesses that would be impacted, and take into consideration future demand for curbside space by shared mobility services such as pick-up/drop-off areas.

### Responsible Parties

-  CUUATS
-  IDOT
-  Champaign County and Municipalities
-  University of Illinois

Curbside management practices to consider include mountable curbs (Figure 8-1), mirrors in loading zones that can help drivers see blind spots, moving the stop bar at marked intersections back to allow for a wider turning radius, centralized collection and drop-off facilities in dense areas (Figure 8-2), and vehicle parking reservation systems allowing drivers to reserve curbside parking space in advance.

Figure 8-1: A Truck Curbside Loading Zone in Seattle



Source: Seattle Department of Transportation. Institute of Transportation Engineers (2018) Curbside Management Practitioners Guide.

2. When purchasing new or replacing old municipal truck fleets, consider alternative fuel trucks and educate truck drivers in eco-driving practices to conserve fuel while driving.



IDOT



Champaign County and Municipalities



University of Illinois

3. Encourage trucking companies and truck fleet owning businesses to consider using alternative fuel trucks and educating truck drivers in eco-driving practices to conserve fuel while driving.



Mid-West Truckers Association



Champaign County Chamber of Commerce



Champaign County EDC

4. Adopt sustainable land use strategies and regulations to accommodate freight in urbanized areas through maximizing freight-oriented development in existing and planned freight clusters that favor accessible locations and minimize environmental and community impacts.



Champaign County



Municipalities

5. Review and update building codes for new construction or require retrofitting to better accommodate adequate dock space, delivery zones, and freight elevators. Since building inventory turnaround in the region is slow, consider operational improvements such as curbside management strategies as mentioned above to accommodate freight with all other modes.



Municipalities

**Figure 8-2: A DHL Packstation in Germany**



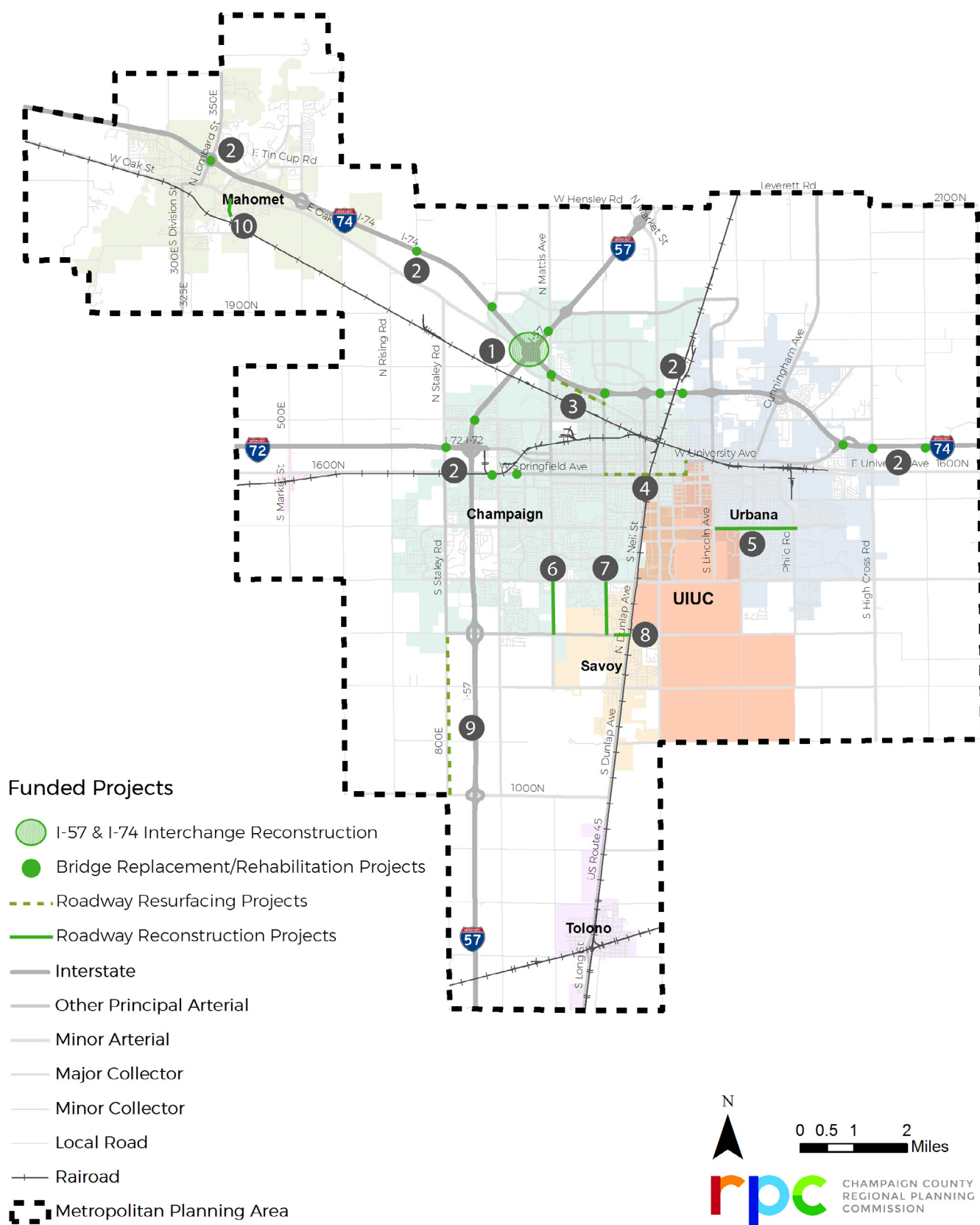
Source: Vanessa Lu. (2016). Online shoppers look for a system that delivers the goods. Retrieved from <https://www.thestar.com/business/2016/06/16/online-shoppers-look-for-a-system-that-delivers-the-goods.html>

## 8.6. Funded projects

This section lists all the freight infrastructure projects in the Champaign-Urbana Metropolitan Planning Area (MPA) that have been funded (Figure 8-3).

1. I-57 and I-74 interchange reconstruction
2. Various interstate bridge replacement/rehabilitation projects
3. U.S. 150/Bloomington Road from Mattis Avenue to Prospect Avenue resurfacing
4. U.S. 45/U.S. 150/Springfield Avenue from Prospect Avenue to Wright Street and Wright Street to University Avenue resurfacing
5. Florida Avenue from Lincoln Avenue to Vine Street reconstruction
6. Mattis Avenue from Windsor Road to Curtis Road complete street widening to three lanes
7. Prospect Avenue from Windsor Road to Curtis Road complete street reconstruction
8. Curtis Road from Wesley Avenue to U.S. 45/Dunlap Avenue complete street widening to four lanes
9. Staley Road from Monticello Road to Curtis Road resurfacing
10. Sunny Acres Road from U.S. 150/Oak Street to South Mahomet Road reconstruction

Figure 8-3: Funded Projects in the Champaign-Urbana MPA





## 8.7. Vision projects

This section lists all the freight infrastructure projects that have been identified as "vision projects" by the agencies in the region (Figure 8-4).

1. Rising Road between Cardinal Road and Curtis Road improvement to two/three lanes with bike lanes to provide better north-south access <sup>†</sup>
2. Staley Road and I-72 bridge approach improvement to be similar to Windsor Road/Bradley Avenue and I-57 bridge approaches
3. Staley Road between Springfield Avenue and Windsor Road improvement to three lanes with bike lanes
4. Duncan Road between Springfield Avenue and Kirby Avenue complete street widening with possible additional automobile lanes
5. Kirby Avenue between Duncan Road and Staley Road improvement to two/three lanes with bike lanes
6. Windsor Road between Field South Drive and Rising Road improvement to two/three lanes with bike lanes
7. Windsor Road between Mattis Avenue and Duncan Road complete street widening with possible additional automobile lanes

### Referenced Plans



Long Range Transportation Plan (LRTP) 2035, 2040, 2045 (draft) Vision Projects



LRTP 2045 Vision Projects (draft)



LRTP 2035, 2040, 2045 (draft) Vision Projects, Staley/Rising Corridor Study



LRTP 2040, 2045 (draft) Vision Projects



LRTP 2045 Vision Projects (draft)



LRTP 2045 Vision Projects (draft)

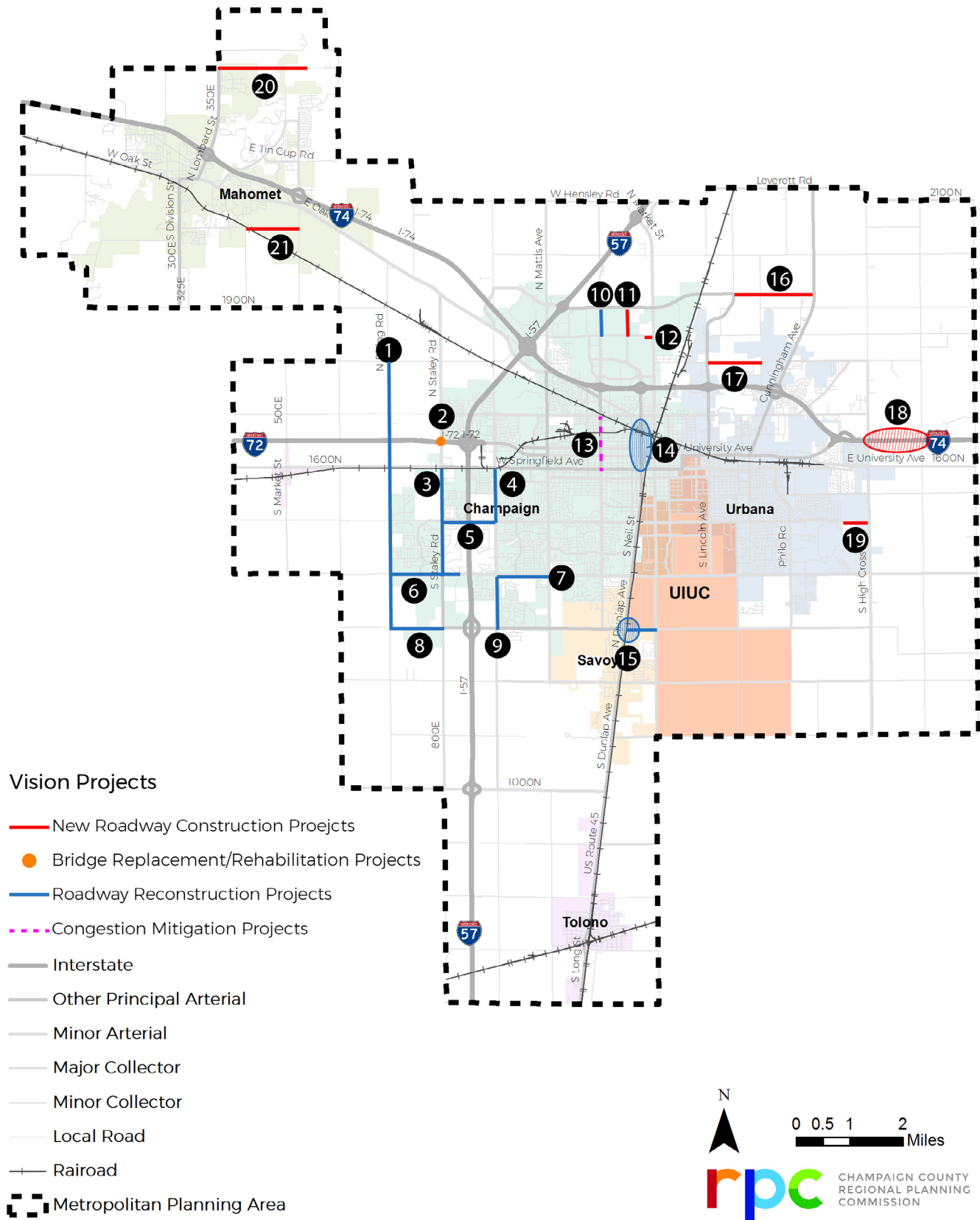


LRTP 2040, 2045 (draft) Vision Projects

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<sup>†</sup> Not having adequate north-south access roads was raised as an issue by multiple stakeholders. See Appendix C for specific comments.

Figure 8-4: Vision Projects in the Champaign-Urbana MPA



- |                                                                                                                                                                                     |                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8. Curtis Road between Staley Road and Rising Road improvement to three lanes oil and chip street with bike lanes to provide better connections to I-57                             |  LRTP 2035, 2040, 2045 (draft)<br>Vision Projects                                                 |
| 9. Duncan Road between Windsor Road and Curtis Road improvement to two/three lanes with bike lanes                                                                                  |  LRTP 2045 Vision Projects (draft)                                                                |
| 10. Prospect Avenue between Interstate Drive and Olympian Drive improvement to three lanes with bike lanes and lighting to improve safety for all modes                             |  LRTP 2045 Vision Projects (draft)                                                                |
| 11. Neil Street extension to Olympian Drive to provide better roadway connections for Olympian Drive                                                                                |  LRTP 2045 Vision Projects (draft)                                                                |
| 12. Interstate Drive extension to Market Street to provide better roadway connections for that area                                                                                 |  2018 City of Champaign 10-Year<br>Capital Improvement Plan, LRTP<br>2045 Vision Projects (draft) |
| 13. Prospect Avenue from Springfield Avenue to Bradley Avenue congestion mitigation                                                                                                 |  LRTP 2040 Vision Projects (draft)                                                                |
| 14. North Neil Street infrastructure improvements                                                                                                                                   |  Neil Street Corridor Improvement<br>Plan, LRTP 2045 Vision Projects                              |
| 15. Curtis Road Grade Separation at U.S. 45 and complete street improvements from U.S. 45/Dunlap Avenue to First Street                                                             |  LRTP 2035, 2040, 2045 (draft)<br>Vision Projects                                               |
| 16. Olympian Drive extension to U.S. 45/Cunningham Avenue to mitigate the truck traffic bottleneck on I-74 between I-57 and IL 130                                                  |  LRTP 2035, 2040, 2045 (draft)<br>Vision Projects                                               |
| 17. Airport Road extension to Lincoln Ave to mitigate the truck traffic bottleneck on I-74, U.S. 45/Cunningham Avenue, and Lincoln Avenue                                           |  LRTP 2045 Vision Projects (draft)                                                              |
| 18. Possible interchange location along I-74 in east Urbana to mitigate the truck traffic bottlenecks on I-74 at the U.S. 150/University Avenue and U.S. 45/Cunningham Avenue exits |  LRTP 2035, 2040, 2045 (draft)<br>Vision Projects                                               |
| 19. Florida Avenue extension to IL 130/High Cross Road                                                                                                                              |  LRTP 2035, 2040, 2045 (draft)<br>Vision Projects                                               |

20. County Road 2400 North connection from IL 47 to existing County Road 2400 North east of the Sangamon River



L RTP 2045 Vision Projects (draft)

21. South Mahomet Road construction to provide the connection from IL 47 to Prairie View Road and I-74 interchange



L RTP 2045 Vision Projects (draft)

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## Endnotes

1. Chiarenza, J., Dawes, M., Epstein, A. K., Fisher, D., & Welty, K. (2018). Optimizing Large Vehicles for Urban Environments: Downsizing (No. DOT-VNTSC-NACTO-18-01). John A. Volpe National Transportation Systems Center (US).

2. John Metcalfe. (2017). Seattle Puts Side Guards on Trucks to Protect Cyclists. Retrieved from <https://www.citylab.com/transportation/2017/02/seattle-puts-side-guards-on-its-trucks-to-protect-cyclists/515403/>

3. U.S. DOT Federal Highway Administration. Transportation Performance Management. Pavement and Bridge Condition Performance Measures Final Rule. Retrieved from <https://www.fhwa.dot.gov/tpm/rule.cfm>. Accessed on January 2, 2019.

4. CUUATS Technical Committee Meeting, September 5, 2018. Retrieved from <https://ccrpc.org/committees/cuuats-technical/meetings/cuuats-technical-committee-meeting-5/>

5. U.S. DOT Federal Highway Administration. Transportation Performance Management. System Performance/Freight/CMAQ Performance Measures Final Rule. Retrieved from <https://www.fhwa.dot.gov/tpm/rule.cfm>. Accessed on January 2, 2019.

6. The targets for these performance measures, proposed by IDOT, were approved by the CUUATS Technical and Policy Committees at the September, 2018 meetings. <https://ccrpc.org/committees/cuuats-technical/meetings/cuuats-technical-committee-meeting-5/>. Accessed on January 2, 2019.

7. FHWA Freight Management and Operations. Retrieved from <https://ops.fhwa.dot.gov/freight/index.cfm>. Accessed on January 2, 2019

8. Find Truck Service. Retrieved from <https://www.findtruckservice.com/>. Accessed on January 2, 2019

9. University of Illinois- Willard Airport Master Plan website. <https://www.cmimasterplan.com/>. Accessed on January 2, 2019.

10. Illinois Technology Transfer Center. <http://apps.dot.illinois.gov/gist2/>

11. Getting Around Illinois. <https://www.gettingaroundillinois.com/gai.htm?mt=aadt>

# Moving forward

This section outlines the steps to move forward with implementing the recommended infrastructure projects and non-infrastructure strategies, the responsible parties, anticipated timeline, and potential funding sources.



# 9





Figure: Traffic at the intersection of Lincoln Avenue and University Avenue in Urbana







Source: CUUATS staff

## 9. Moving forward

### 9.1. Goal implementation

Implementing the freight infrastructure projects and non-infrastructure strategies identified in [Chapter 8](#) will improve the safety, efficiency, and reliability of the movement of people and goods, and ensure continued economic growth and vitality in the Champaign-Urbana region while preserving quality of life for its residents. Both infrastructure projects and non-infrastructure strategies must be advanced and executed in a coordinated way, which will require ongoing partnership between the municipalities, freight stakeholders, and the state and federal governments.

**Table 9-1: Infrastructure Projects and Non-Infrastructure Strategies Implementation**

Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.1.2-2		Intersection improvement	Improve the markings for the intersection of Bloomington Road and Prospect Avenue.
8.6-2		Bridge replacement/rehabilitation	Replace/rehabilitate various interstate bridges.
8.6-3		Resurfacing	Resurface U.S. 150/Bloomington Road from Mattis Avenue to Prospect Avenue.
8.6-4		Resurfacing	Resurface U.S. 45/U.S. 150/Springfield Avenue from Prospect Avenue to Wright Street and Wright Street to University Avenue.
8.6-5		Reconstruction	Reconstruct Florida Avenue from Lincoln Avenue to Vine Street.
8.6-6		Widening	Widen Mattis Avenue from Windsor Road to Curtis Road to three lanes as a complete street.
8.6-7		Widening	Reconstruct Prospect Avenue from Windsor Road to Curtis Road as a complete street.
8.6-8		Widening	Widen Curtis Road from Wesley Avenue to U.S. 45/Dunlap Avenue to four lanes as a complete street.













Infrastructure Project



Non-Infrastructure Strategy

This section outlines the responsible parties, anticipated timeline, and corresponding goals (highlighted in green in [Table 9-1](#)) for each infrastructure project and non-infrastructure strategy. The responsible agencies were suggested based on current roles of the regional freight stakeholders, and consideration of what may be their logical roles in the future. The timeframe for each strategy –short-term (2019-2025), medium-term (2026-2035), or long-term (2036-2045) – was determined based on any work already in progress, as well as the complexity and appropriate timing of the activity. Each strategy may be serving multiple goals identified in [Chapter 8](#). Refer back to [Chapter 8](#) for additional information on the strategies and projects.

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
IDOT	Short-term					
IDOT	Short-term					
IDOT	Short-term					
IDOT	Short-term					
City of Urbana	Short-term					
City of Champaign	Short-term					
Village of Savoy	Short-term					
Village of Savoy	Short-term					

Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.6-8		Grade separation	Build Curtis Road grade separation at U.S. 45 and improve Curtis Road from U.S. 45/Dunlap Avenue to First Street as a complete street.
8.6-9		Resurfacing	Resurface Staley Road from Monticello Road to Curtis Road.
8.6-10		Reconstruction	Reconstruct Sunny Acres Road from U.S. 150/Oak Street to South Mahomet Road.
8.7-21		Construction	Construct South Mahomet Road to provide the connection from IL 47 to Prairie View Road and I-74 interchange.
8.1.2-1		Safety study	Conduct a safety study for Mattis Avenue, between Church Street (I-72 exit) and Bradley Avenue, and Bradley Avenue, between Mattis Avenue and Prospect Avenue, and work with Kraft Foods and DSC Logistics to explore possible improvements for their facilities' entrances and signage, as well as other solutions to improve safety for truck traffic and other modes of transportation.
8.1.2-3		Intersection study	Conduct an intersection study for the intersection of Bloomington Road and Prospect Avenue and investigate solutions, including the "peanutabout" concept, to improve safety for truck traffic and other modes of transportation at that intersection.
8.1.2-7		Intersection study	Conduct an intersection safety study at the IL 10/Springfield Avenue and Mattis Avenue intersection.
8.1.2-5		Railroad crossing study	Study the feasibility of installing a gate at the Norfolk Southern railroad at-grade crossing at Prospect Avenue to prevent future crashes.
8.1.2-13		Freight fleet safety measures	Explore the feasibility of requiring freight vehicles operating under IDOT/municipal/University contracts to have truck side guards installed, where appropriate.
8.3.2-1		Truck route study	Support the development, maintenance, and communication of a regional truck route system and a truck wayfinding plan with consistent truck route signage.
















Infrastructure Project



Non-Infrastructure Strategy

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
Village of Savoy, Canadian National Railroad	Short-term					
Champaign County	Short-term					
Village of Mahomet	Short-term					
Village of Mahomet	Short-term					
CUUATS, City of Champaign, EDC, Kraft Foods, DSC Logistics	Short-term					
CUUATS, IDOT, City of Champaign	Short-term					
IDOT, City of Champaign	Short-term					
IDOT, Norfolk Southern Railway	Short-term					
IDOT, Champaign County, municipalities, University of Illinois	Short-term					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois, Mid-West Truckers Association, Champaign County Chamber of Commerce, Champaign County EDC	Short-term					



Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.3.2-2		Intersection study	Review the need for signal prioritization and timing reconfiguration to improve reliability and throughput around major freight-generating facilities with fixed schedules or high service requirements and on roadways with high truck volumes during peak hours to avoid traffic congestion.
8.1.2-4		ITS Architecture update	Highlight low bridges in the region in IDOT's web-based services, including "IDOT in Motion," and other commercial information platforms for truck drivers to reduce truck-viaduct crashes in the MPA.
8.4.2-2		ITS Architecture update	Integrate the IDOT Truck Parking Information Management System (TPIMS), which is currently under development, into the Champaign Urbana ITS Architecture.
8.4.2-9		Enhance air cargo services	Provide support to the development of the Willard Airport Master Plan to encourage new and enhanced air cargo services.
8.1.2-6, 8.6.1		Interchange reconstruction	Reconstruct I-57 and Reconstruct I-57 and I-74 interchange.
8.6-5		Construction	Construct Florida Avenue extension to IL 130/High Cross Road.
8.7-4		Widening	Widen Duncan Road between Springfield Avenue and Kirby Avenue as a complete street with possible additional automobile lanes.
8.7-9		Widening	Improve Duncan Road between Windsor Road and Curtis Road to two/three lanes with bike lanes.
8.7-3		Widening	Improve Staley Road between Springfield Avenue and Windsor Road to three lanes with bike lanes.
8.7-5		Widening	Improve Kirby Avenue between Duncan Road and Staley Road to two/three lanes with bike lanes.
8.7-6		Widening	Improve Windsor Road between Field South Drive and Rising Road to two/three lanes with bike lanes.
8.7-7		Widening	Widen Windsor Road between Mattis Avenue and Duncan Road as a complete street with possible additional automobile lanes.
8.7-8		Widening	Improve Curtis Road between Staley Road and Rising Road to three-lane oil and chip street with bike lanes to provide better connections to I-57.














Infrastructure Project



Non-Infrastructure Strategy

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Short-term					
IDOT, City of Champaign	Short-term					
CUUATS, IDOT	Short-term					
CUUATS, Champaign County, municipalities, University of Illinois	Short-term					
IDOT	Medium-term					
City of Urbana	Medium-term					
City of Champaign	Medium-term					
City of Champaign	Medium-term					
City of Champaign	Medium-term					
City of Champaign	Medium-term					
City of Champaign	Medium-term					
City of Champaign	Medium-term					
City of Champaign	Medium-term					

Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.7-11		Reconstruction	Improve North Neil Street infrastructure.
8.1.2-6		Interchange study	Study the feasibility of reconfiguring the current I-74 and IL 130 interchange ramps to improve safety for truck traffic and other modes of transportation.
8.4.2-1		New and expanded truck parking locations	Support new and expanded truck parking locations that provide fuel, alternative fuel, electric power sources, and other services for truck drivers and measures to enhance driver safety.
8.4.2-7		Public outreach and education	Develop and distribute educational materials to trucking companies and truck drivers on the freight network, local municipal regulations, preferred routes, hours of operation, parking, low bridges, the online information system, and other resources.
8.4.2-11		Truck count data access	Expand MPO access to more truck traffic count data than what is currently made available via the Illinois Technology Transfer Center and Getting Around Illinois app.
8.7-18		Interchange construction	Conduct a feasibility study for building an interchange along I-74 in east Urbana to mitigate the truck traffic bottlenecks on I-74 at the U.S. 150/University Avenue and U.S. 45/Cunningham Avenue exits.
8.7-3		Bridge replacement/rehabilitation	Improve Staley Road and I-72 bridge approach to be similar to Windsor Road/Bradley Avenue and I-57 bridge approaches.
8.7-11		Construction	Extend Neil Street to Olympian Drive to provide better roadway connections for Olympian Drive.
8.7-12		Construction	Extend Interstate Drive to Market Street to provide better roadway connections for that area.
8.7-16		Construction	Extend Olympian Drive to U.S. 45/Cunningham Avenue to mitigate truck traffic bottleneck on I-74 between I-57 and IL 130.
8.7-17		Construction	Extend Airport Road to Lincoln Ave to mitigate truck traffic bottleneck on I-74, U.S. 45/Cunningham Avenue, and Lincoln Avenue.











Infrastructure Project



Non-Infrastructure Strategy

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
City of Champaign	Medium-term					
IDOT, City of Urbana	Medium-term					
CUUATS, IDOT, Cities, and Villages	Medium-term					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois, Mid-West Truckers Association, Champaign County Chamber of Commerce, Champaign County EDC	Medium-term					
IDOT	Medium-term					
IDOT, City of Urbana, Champaign County	Long-term					
City of Champaign	Long-term					
City of Champaign	Long-term					
City of Champaign	Long-term					
City of Urbana	Long-term					
City of Urbana	Long-term					

Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.4.2-8		Intermodal terminal yard	Identify opportunities for an intermodal terminal yard or a rail transloading facility and improve multimodal connections among rail yards, industrial developments, airports, and the truck freight network to relieve traffic congestion on highways by encouraging use of alternate modes whenever possible.
8.7-20		Construction	Connect County Road 2400 North from IL 47 to existing County Road 2400 North east of the Sangamon River.
8.7-1		Widening	Improve Rising Road between Cardinal Road and Curtis Road to two/three lanes with bike lanes to provide better north-south access.
8.7-10		Widening	Improve Prospect Avenue between Interstate Drive and Olympian Drive to three lanes with bike lanes and lighting to improve safety for all modes.
8.7-13		Congestion mitigation	Implement congestion mitigation measures on Prospect Avenue from Springfield Avenue to Bradley Avenue.
8.5.2-1		Curbside management study/plan	Develop a curbside management study that inventories existing curbside spaces and proposes consistent curbside management practices across the municipalities, working with local businesses that would be impacted, taking into consideration future demand for curbside space by shared mobility services such as pick-up/drop-off areas.
8.1.2-14		Freight fleet downsizing	Consider reducing vehicle size when purchasing new or replacing old municipal truck fleets, to decrease deterioration of the pavement due to truck movements.
8.1.2-15		Freight fleet downsizing	Encourage trucking companies and truck fleet owning businesses that often operate on local streets to utilize smaller trucks to reduce deterioration of the pavement due to truck movements.













Infrastructure Project



Non-Infrastructure Strategy



Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
CUUATS, IDOT, Champaign County, municipalities, Canadian National Railway, Norfolk Southern Railways, Champaign County Farm Bureau, Champaign County Chamber of Commerce, Champaign County EDC	Long-term					
Village of Mahomet	Long-term					
City of Champaign	Long-term					
City of Champaign	Long-term					
IDOT, City of Champaign	Long-term					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Long-term					
IDOT, Champaign County, municipalities, University of Illinois	Long-term					
Mid-West Truckers Association, Champaign County Chamber of Commerce, Champaign County EDC	Long-term					

Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.5.2-2		Alternative fuel freight fleet	Consider alternative fuel trucks when purchasing new or replacing old municipal truck fleets and educate truck drivers in eco-driving practices to conserve fuel while driving.
8.5.2-3		Alternative fuel freight fleet	Encourage trucking companies and truck fleet owning businesses to consider using alternative fuel trucks and educating truck drivers in eco-driving practices to conserve fuel while driving.
8.5.2-5		Improved truck delivery zone	Review and update building codes for new construction or require retrofitting to better accommodate adequate dock space, delivery zones, and freight elevators. Since building inventory turnaround in the region is slow, consider operational improvements such as curbside management strategies to accommodate freight with all other modes.
8.4.2-4		Planning and engineering	Continue integrating planning for freight with other modes and include freight elements in performance-based transportation project prioritization process.
8.1.2-12		Planning and engineering	Ensure that freight safety is considered as an integral part of all planning activities.
8.1.2-8		Safety data analysis	Continue monitoring and analyzing heavy-vehicle involved crashes to identify areas that have problematic or crash-inducing patterns and work with the state and local agencies to investigate safety solutions.
8.1.2-9		Safety data analysis	Continue monitoring and analyzing crashes at at-grade rail crossings in the MPA to identify unsafe crossings and work with railroad companies and local agencies to identify solutions.
8.2.2-1		Condition monitoring	Monitor the pavement conditions of IDOT roadways in the MPA using IDOT CRS rating data.
8.2.2-2		Condition monitoring	Monitor the pavement conditions of local roadways in the MPA using PCI rating data.
8.2.2-3		Condition monitoring	Monitor regional bridge conditions using data from IDOT.











Infrastructure Project



Non-Infrastructure Strategy

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
IDOT, Champaign County, municipalities, University of Illinois	Long-term					
Mid-West Truckers Association, Champaign County Chamber of Commerce, Champaign County EDC	Long-term					
Champaign County, municipalities	Long-term					
CUUATS, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS	Ongoing					
CUUATS, IDOT	Ongoing					
CUUATS, IDOT	Ongoing					
CUUATS, IDOT	Ongoing					
CUUATS, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT	Ongoing					

Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.2.2-4		Planning and engineering	Continue considering truck volumes in the pavement prioritization process and implementing scheduled infrastructure improvements to ensure that major roads and bridges are able to handle truck loads and that pavements are free of potholes.
8.3.2-3		Bottleneck monitoring	Continue identifying truck congestion hot spots and freight bottlenecks caused by peak hour traffic, incidents, work zones, or other factors where high volumes of freight and passenger traffic must coexist.
8.3.2-3		Planning and engineering	Consider congestion mitigation efforts, including reducing lane widths to add a travel and/or auxiliary lane, use of a shoulder as a peak-hour lane, re-striping merge or diverge areas to better serve demand, modifying weaving areas, adding a collector/distributor lane, or other similar measures.
8.3.2-5		At-grade railroad crossing monitoring	Continue monitoring train activities on the railroads in the MPA, support projects and programs that improve safety at at-grade rail crossings, calculate increased traffic delay at the at-grade railroad crossings due to the possible increase of rail traffic, and identify opportunities for solutions such as grade separations.
8.1.2-10		Planning and engineering	Ensure that bridge construction and reconstruction projects in the region provide safe passage of heavy vehicles when applicable.
8.3.2-4		Planning and engineering	Consider incorporating freight-friendly design features for roadway construction and reconstruction projects with high truck traffic, such as the use of wider shoulders, generous turning lanes, median barriers, and other features when applicable.
8.1.2-11		Planning and engineering	Improve visibility for freight transportation by providing adequate lighting, striping, signage, visibility triangles, and access control
8.4.2-5		Funding advocacy	Continue to identify federal, state, and other funding sources, and work with public agencies, the private sector, and elected officials to identify eligible and suitable local projects. Continue to advocate for adequate funding and investment to maintain and improve the freight transportation system.










Infrastructure Project



Non-Infrastructure Strategy

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT, Cities, and Villages, Champaign County Chamber of Commerce, Champaign County EDC	Ongoing					



Item number in Chapter 8	Project/Strategy Type	Project/Strategy	Description
8.4.2-3		Funding advocacy	Continue participating in regional and state freight forums, including the Illinois State Freight Advisory Council (ISFAC), to strengthen the ability of the Champaign-Urbana area to be aware of national and state freight needs and prepare for a changing future.
8.2.2-5		Funding advocacy	Continue working with public and private stakeholders to identify and prioritize major freight system investments and advocate for adequate funding and investment to maintain and improve the freight transportation system.
8.4.2-10		Connected/Autonomous vehicle study	In preparation for emerging technologies such as connected/autonomous vehicles and truck platooning, continue maintaining roadway striping to keep roadways detectable for sensors, participate in discussions about pilot programs in the state to be aware of emerging opportunities, consider vehicle-to-infrastructure technology as part of the Champaign Urbana ITS Architecture, and initiate studies to coordinate and build consensus among stakeholders on the requirements for operating autonomous trucks on local streets.
8.4.2-6		Public outreach and education	Include freight as one of the modes discussed when educating stakeholders (including the public at large) about transportation options, highlighting topics such as freight safety issues (e.g. truck blind spots), design challenges, and the critical role and benefits of freight in the region.
8.1.2-14		Freight fleet safety measures	When purchasing new or replacing old municipal truck fleets, consider reducing vehicle size and incorporating technologies and other measures to increase driver visibility and improve maneuverability of the trucks in the urban environment.
8.1.2-15		Freight fleet safety measures	Encourage trucking companies and truck fleet owning businesses that often operate on local streets to utilize smaller trucks and incorporate technologies and other measures to increase driver visibility and improve maneuverability of the trucks in the urban environment.
8.5.2-4		Sustainable freight land use strategies	Adopt sustainable land use strategies and regulations to accommodate freight in urbanized areas through maximizing freight-oriented development in existing and planned freight clusters that favor accessible locations and minimize environmental and community impacts.



Infrastructure Project



Non-Infrastructure Strategy

Responsible Parties	Timeframe	Improve Safety	Preserve Existing Infrastructure	Improve Efficiency	Expand Freight-Supporting Services	Improve Quality of Life
CUUATS, IDOT	Ongoing					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
CUUATS, Champaign County, municipalities, University of Illinois	Ongoing					
IDOT, Champaign County, municipalities, University of Illinois	Ongoing					
Mid-West Truckers Association, Champaign County Chamber of Commerce, Champaign County EDC	Ongoing					
Champaign County, municipalities	Ongoing					

## 9.2. Funding sources

The 25-year vision for the freight infrastructure system in the Champaign-Urbana region is defined, in part, by how much money there is to fund the infrastructure projects and non-infrastructure programs. This section (Table 9-2) lists the potential funding programs that the Champaign-Urbana region can leverage to execute the freight infrastructure projects identified above. The specific criteria for these funding sources need to be further reviewed to identify the best funding sources or package of funding sources for each project.

**Table 9-2: Funding Programs for Regional Freight Infrastructure Projects**

Funding Source	Agency	Project/Program Type
State Road Fund	FHWA through IDOT	Highway construction, reconstruction, or rehabilitation
State Construction Account Fund	IDOT - State Motor Fuel Tax and Driver Fees	State highway construction, reconstruction, or rehabilitation
Surface Transportation Block Grant Program (STBG) also known as STP	FHWA through MPO	Road, bridge, or bike/pedestrian infrastructure improvements
Illinois Grade Crossing Protection Fund	IDOT - State Motor Fuel Tax	Grade crossing improvements
Truck Access Route Program (TARP) Funds	IDOT	Road construction, reconstruction, or rehabilitation
Highway Safety Improvement Program (HSIP)	FHWA through IDOT	Road construction, reconstruction, or rehabilitation; bike/pedestrian infrastructure improvements
Highway Safety Improvement Program (HSIP)—non- infrastructure improvements	FHWA through IDOT	Non-infrastructure improvements

Eligibility Criteria	Examples	Notes
IDOT highway or supporting local roads/streets	Interstate reconstruction or rehabilitation	Programmed by IDOT
IDOT highway or bridge	Interstate construction, reconstruction, or rehabilitation; Bridge reconstruction or rehabilitation	Programmed by IDOT
Federal-aid highway and bridge projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects	Prospect Avenue from Windsor Road to Curtis Road improvement project	Programmed by CUUATS require at least 50% local match
Improves safety at a grade rail crossing with a local road	Grade separations, warning device/crossing signal upgrades, adjacent/connecting roadway improvements	Administered through the ICC
Roadway improvements to accommodate heavy trucks; must provide a connection between two truck routes or a truck route and a truck trip generator; count of daily truck volume	Upgrading roadways to a designated truck route, highway construction, reconstruction, or rehabilitation. Capped at \$600,000 per project	Administered by IDOT
Address a priority in the State's SHSP; identified through data-driven process; targets an identified safety problem; contributes to a reduction in fatalities and serious injuries	Traffic calming solutions, signage; lighting, safety barriers, bike lanes, crosswalks, signage	Programmed by IDOT based on performance measures (crash data analysis) and through an application process; require a minimum 10% local match
Address a priority in the State's SHSP; identified through data-driven process; targets an identified safety problem; contributes to a reduction in fatalities and serious injuries	Road safety audits, enforcement, data collection and analysis improvements	Programmed by IDOT based on performance measures (crash data analysis); up to 10 percent of HSIP funds; also require a minimum 10% local match

Funding Source	Agency	Project/Program Type
Economic Development Program (EDP)	IDOT	Road construction, reconstruction, or rehabilitation
Rail Freight Local Program	IDOT	Rail line improvements
Illinois Transportation Enhancement Program (ITEP)	FHWA through IDOT	Improvements for non-motorized transportation
Airport Improvement Program	FAA through IDOT	Runway construction/rehabilitation, taxiway construction/rehabilitation, land acquisition, airfield lighting, and airport layout plans
BUILD	U.S. DOT	Road, rail, transit, and port projects
National Highway Performance Program (NHPP)	FHWA through IDOT	Roadways on the National Highway System
National Highway Freight Program	FHWA through IDOT	Highway projects that improve freight movement
INFRA	U.S. DOT	Projects on the National Highway Freight Network; an intermodal or freight rail project; a grade separation project



Eligibility Criteria	Examples	Notes
Provides access to new or growing industrial, distribution, or tourism developments; contributes to creation or retention of primary jobs; local match	Road construction to increase access to new or growing industrial development	Administered by IDOT. IDOT provides up to 50% matching funds for local roads and 100% funding for state owned roadways
Contributes to economic development; improves access to local markets	Construction or rehabilitation of industrial service tracks	Financing not funding; provides low interest loans to finance improvements. Under special circumstances grants may be considered.
Improves transportation for non-motorized modes	Bike lanes, crosswalks, signage; address stormwater management and water pollution prevention or abatement strategies	Administered by IDOT; require a minimum 20% local match
Funding is based on national priorities with allocations for significant entitlement categories such as cargo, primary aviation, and general aviation programs.	Airport improvement projects in infrastructure, planning, and development for public-use airports	Administered by IDOT
Plays a critical role on moving freight; can be multi-modal and multi-jurisdictional	Major freight corridor expansion projects	Competitive grant program programmed through U.S. DOT
Provides funding for infrastructure project on the National Highway System	Reconstruction or rehabilitation of a bridge on the NHS system; installation of vehicle-to-infrastructure equipment	Allocated by IDOT
Provides funding for projects the improve efficient freight movement on the National Highway Freight Network	Environmental and community mitigation for freight movement; ITS, including intelligent freight transportation systems; certain truck parking facilities, etc.	Up to 10 percent of NHFP funds can be used for intermodal or freight rail projects every year; allocated by IDOT
Replaces FASTLANE grants. Revises project evaluation criteria focusing on economic outcomes, mobility outcomes, safety outcomes, financial leverage, and innovation. For national and regionally significant freight and highway projects that address a critical freight need	Curtis Road Grade Separation and Complete Street Project	Competitive grant program through U.S. DOT



## Appendix A

### Pavement condition ratings by agency

Figure A-1: IDOT Roadway Rating - Condition Rating Survey (CRS)

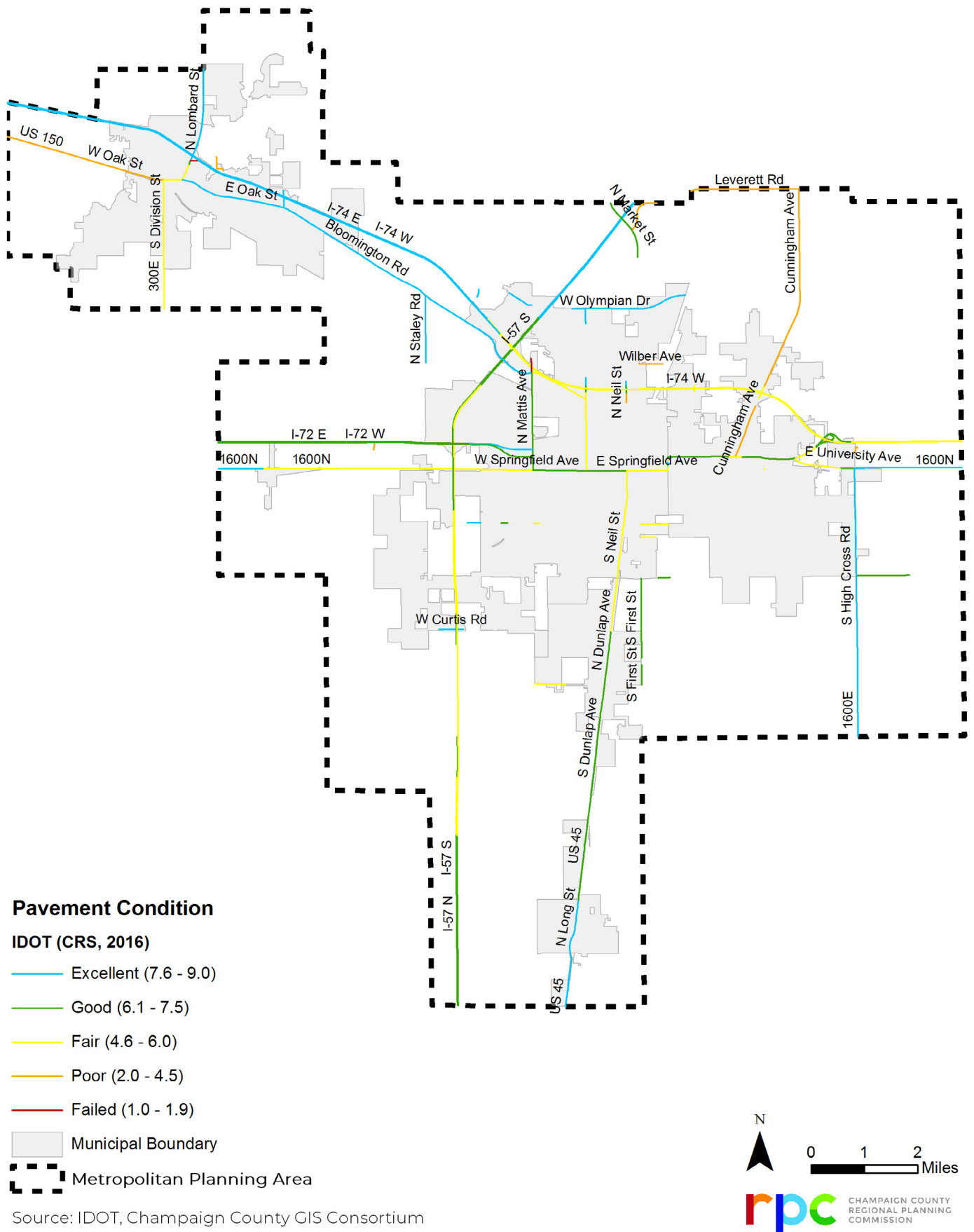


Figure A-2: Champaign County Highway Roadway Rating - Pavement Condition Index Survey (PCI)

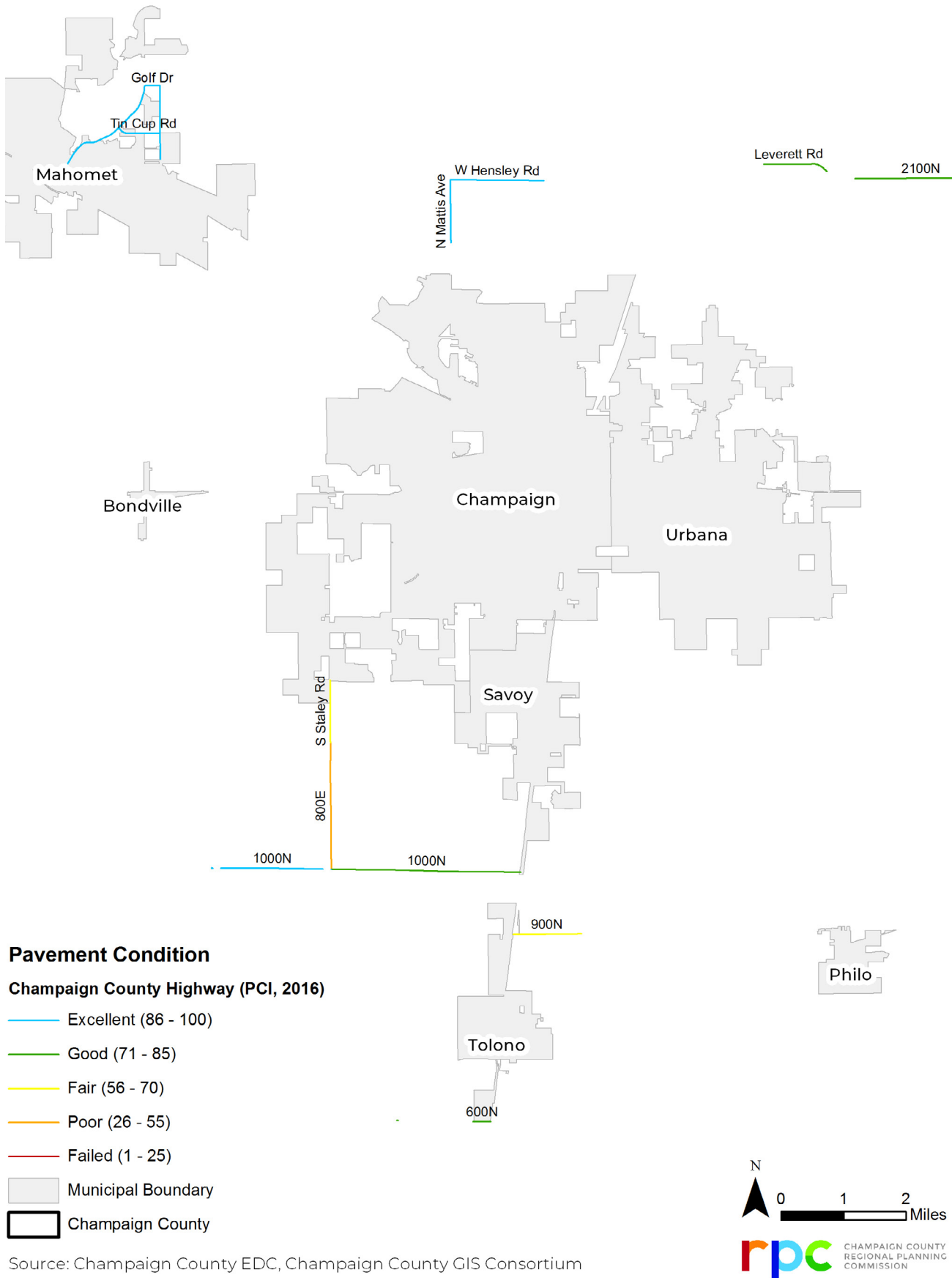




Figure A-3: City of Champaign Roadway Rating - Pavement Condition Index Survey (PCI)

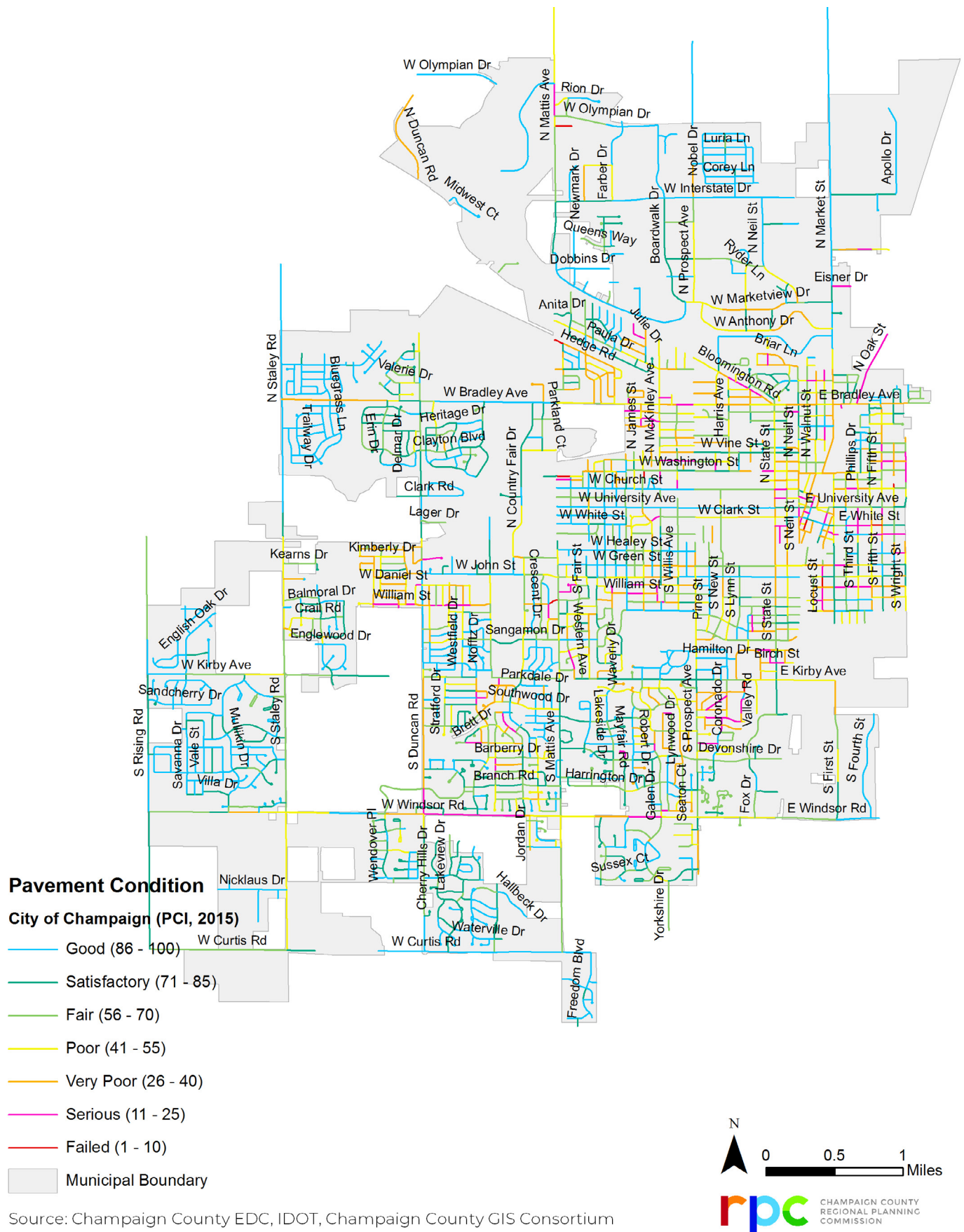


Figure A-4: U of I Roadway Rating - Pavement Condition Index Survey (PCI)

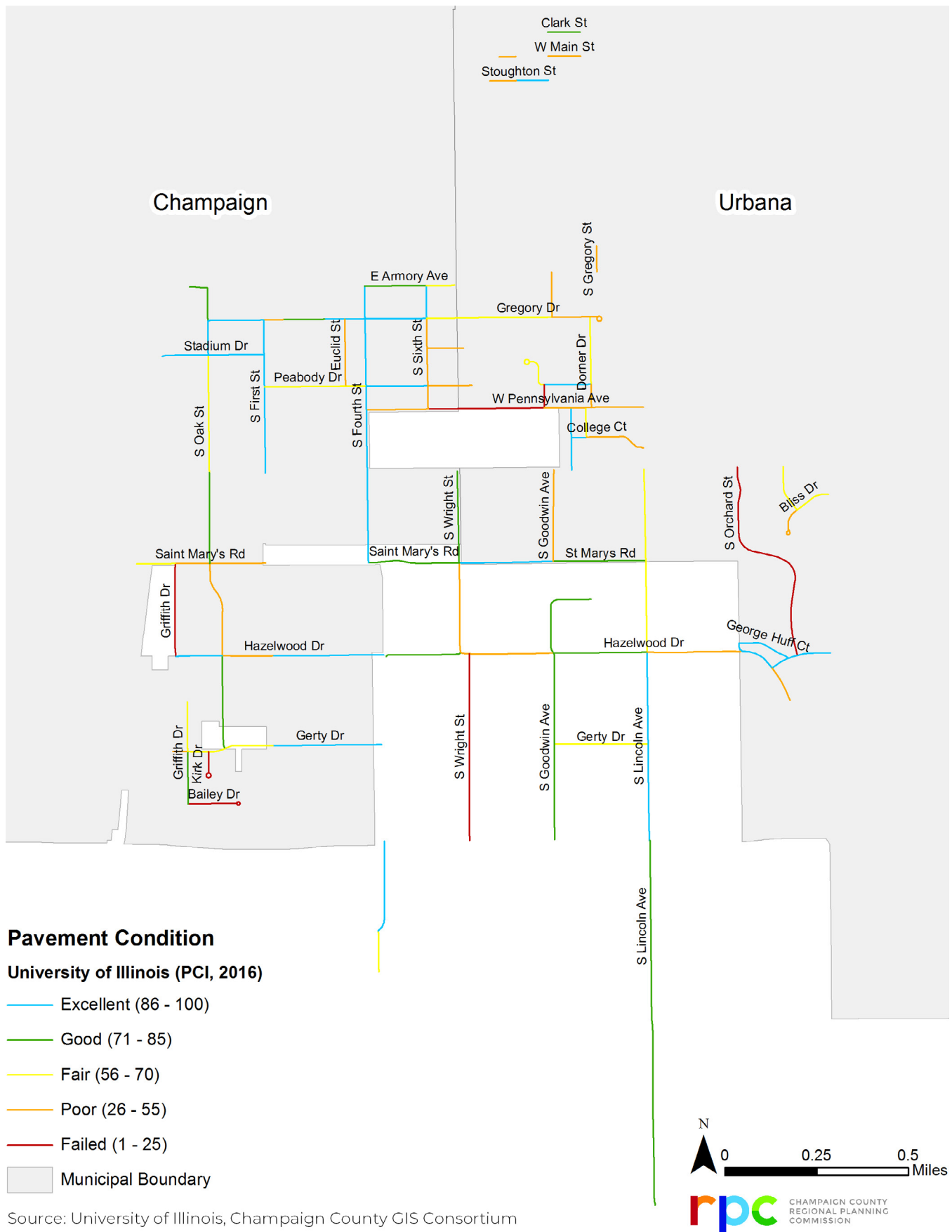
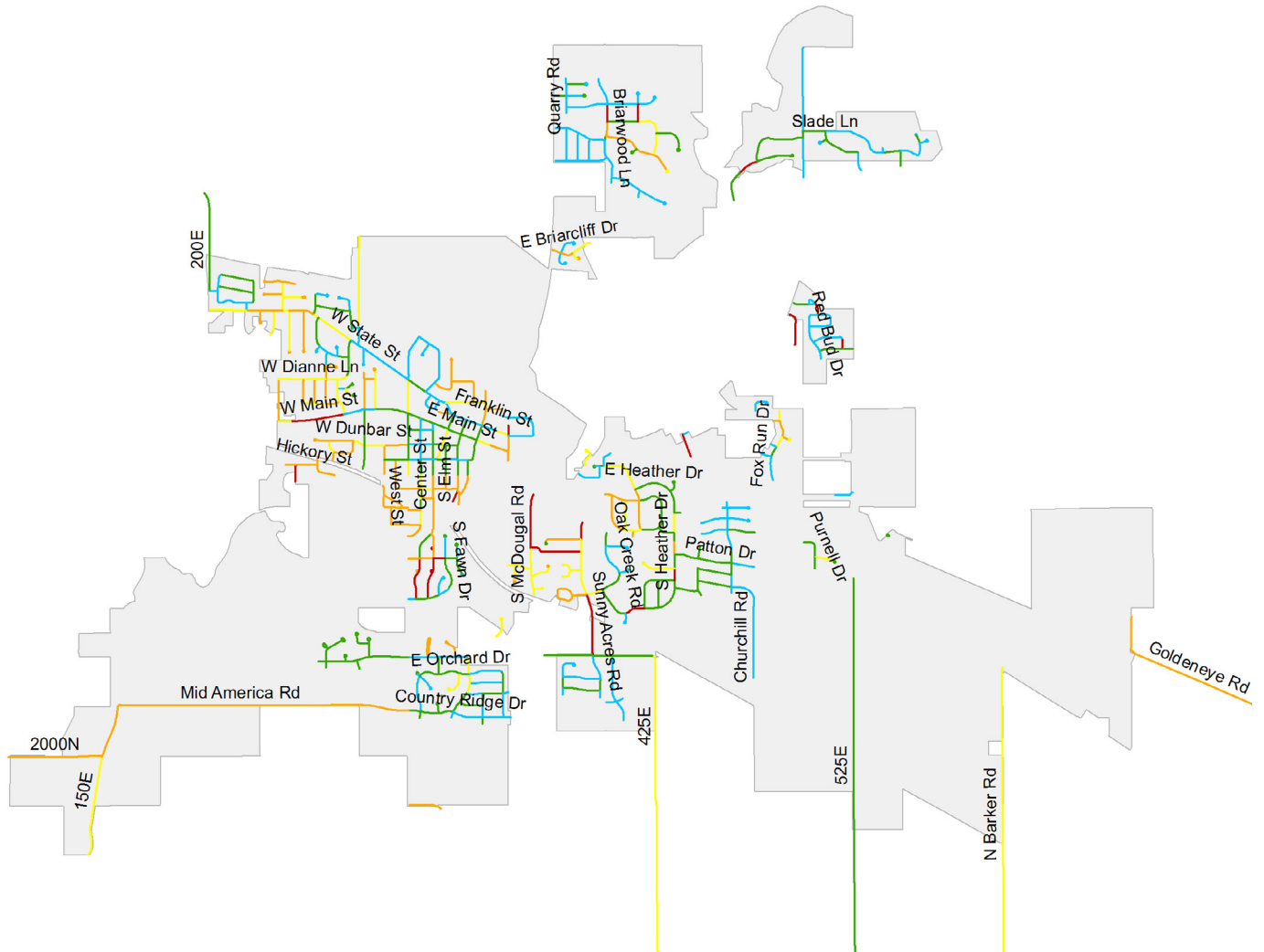


Figure A-5: Village of Mahomet Roadway Rating - Pavement Surface Evaluation and Rating System Survey (PASER)



## Pavement Condition

Village of Mahomet (PASER, 2017 & 2018)

— Excellent (8 - 10)

— Good (6 - 7)

— Fair (4 - 5)

— Poor (2 - 3)

— Failed (0 - 1)

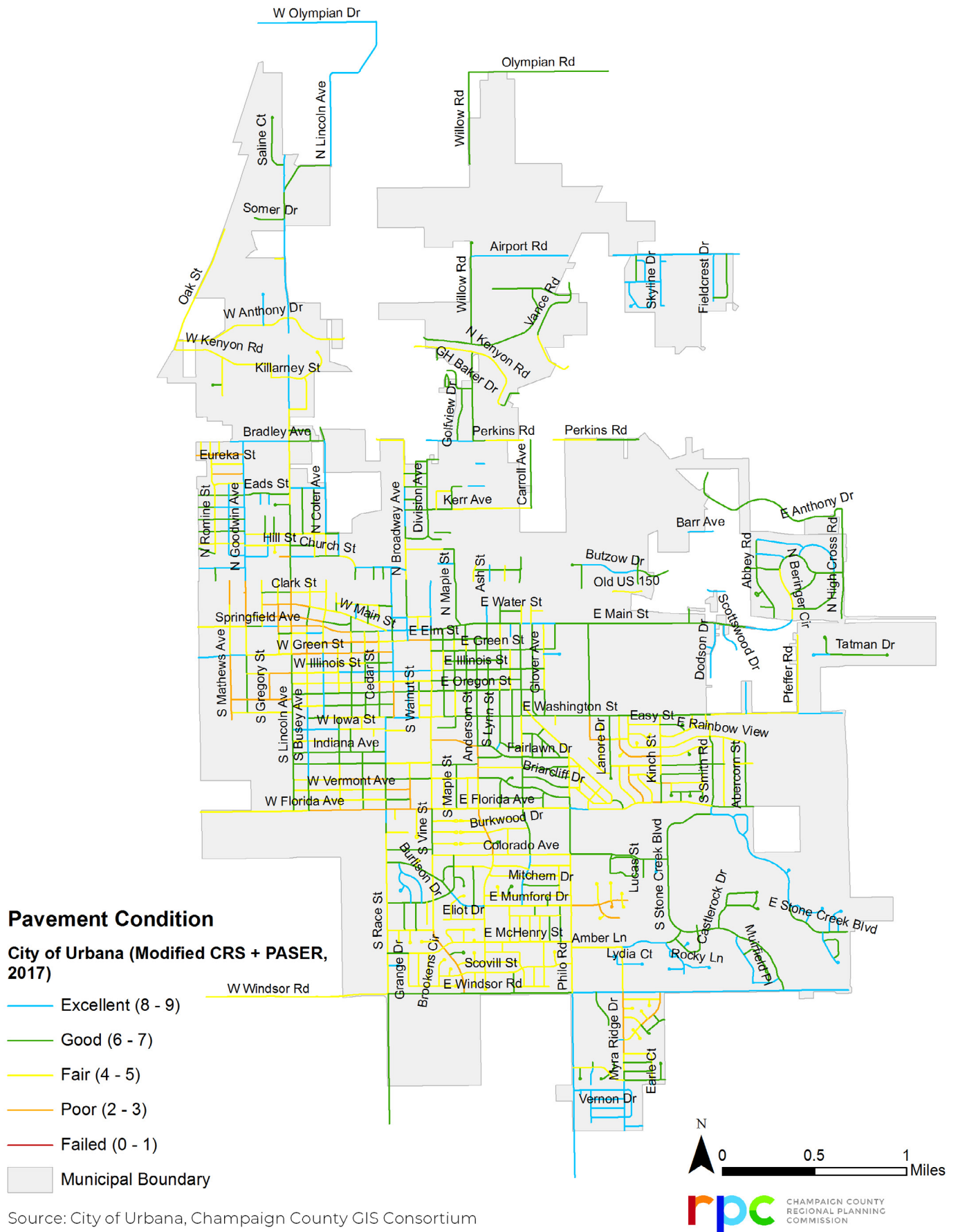
■ Municipal Boundary

Source: Village of Mahomet, Champaign County GIS Consortium



**rpc** CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION

Figure A-6: City of Urbana Roadway Rating - Modified CRS + PASER



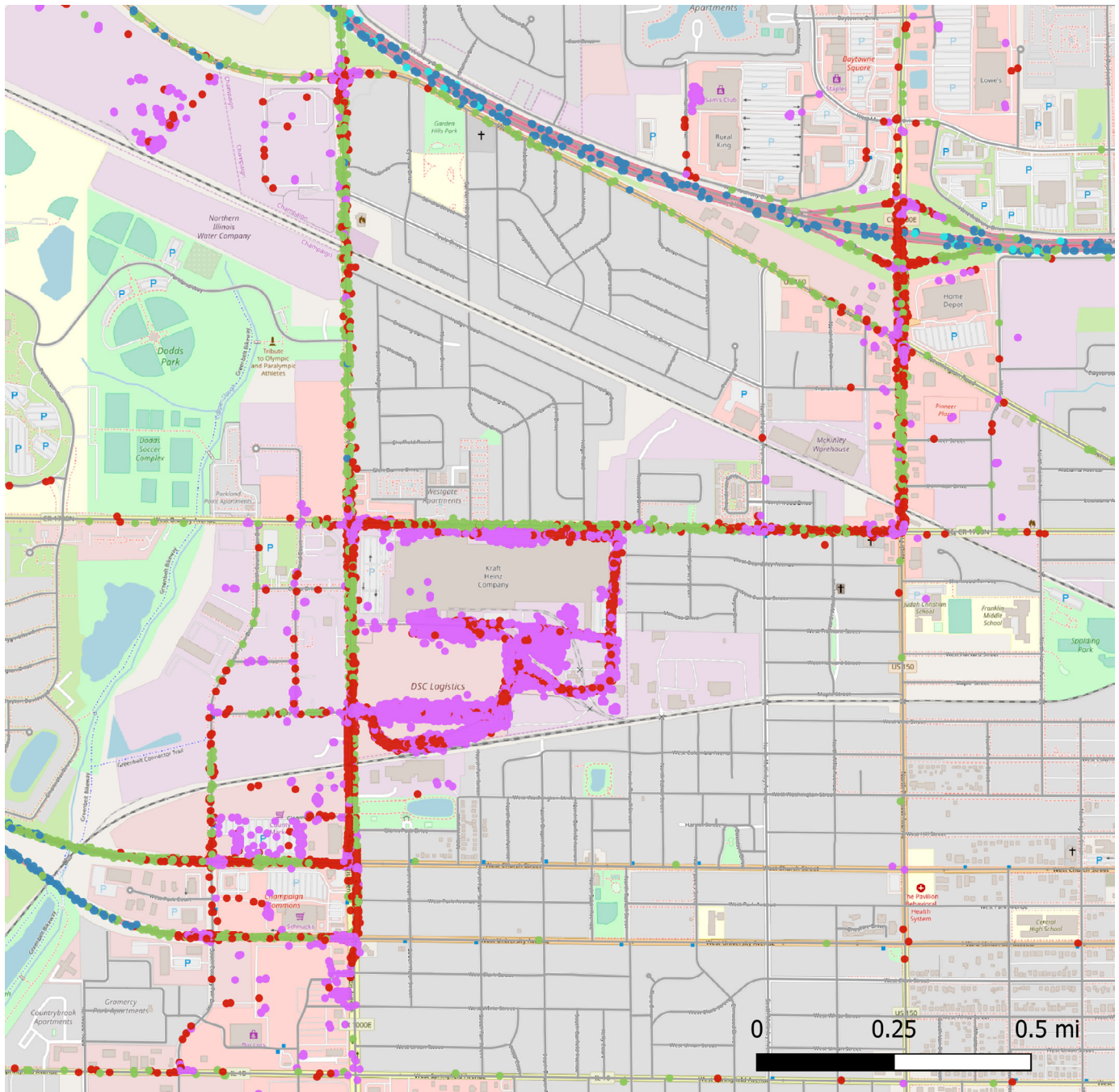




## Appendix B

### Truck GPS speed accessing areas of interest

Figure B-1: Speed of Trucks Accessing the Industrial Area Near the Mattis Avenue and Bradley Avenue Intersection



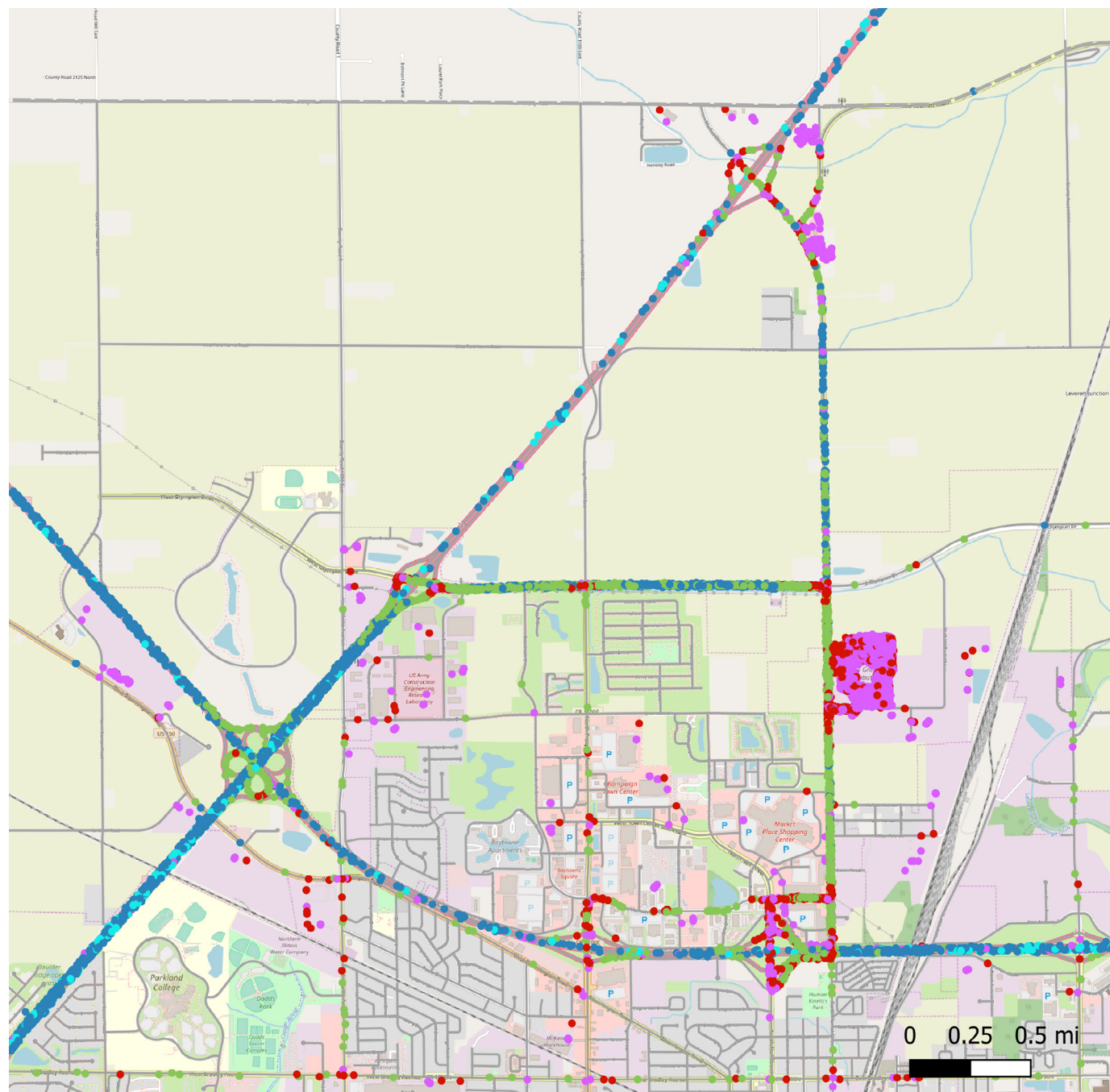
#### Truck GPS Records

- Speed ≤ 10 mph
- 10 mph < Speed ≤ 25 mph
- 25 mph < Speed ≤ 45 mph
- 45 mph < Speed ≤ 65 mph
- Speed > 65 mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)

Figure B-2: Speed of Trucks Accessing the Industrial Area Near the Olympian Drive and Market Street Intersection



#### Truck GPS Records

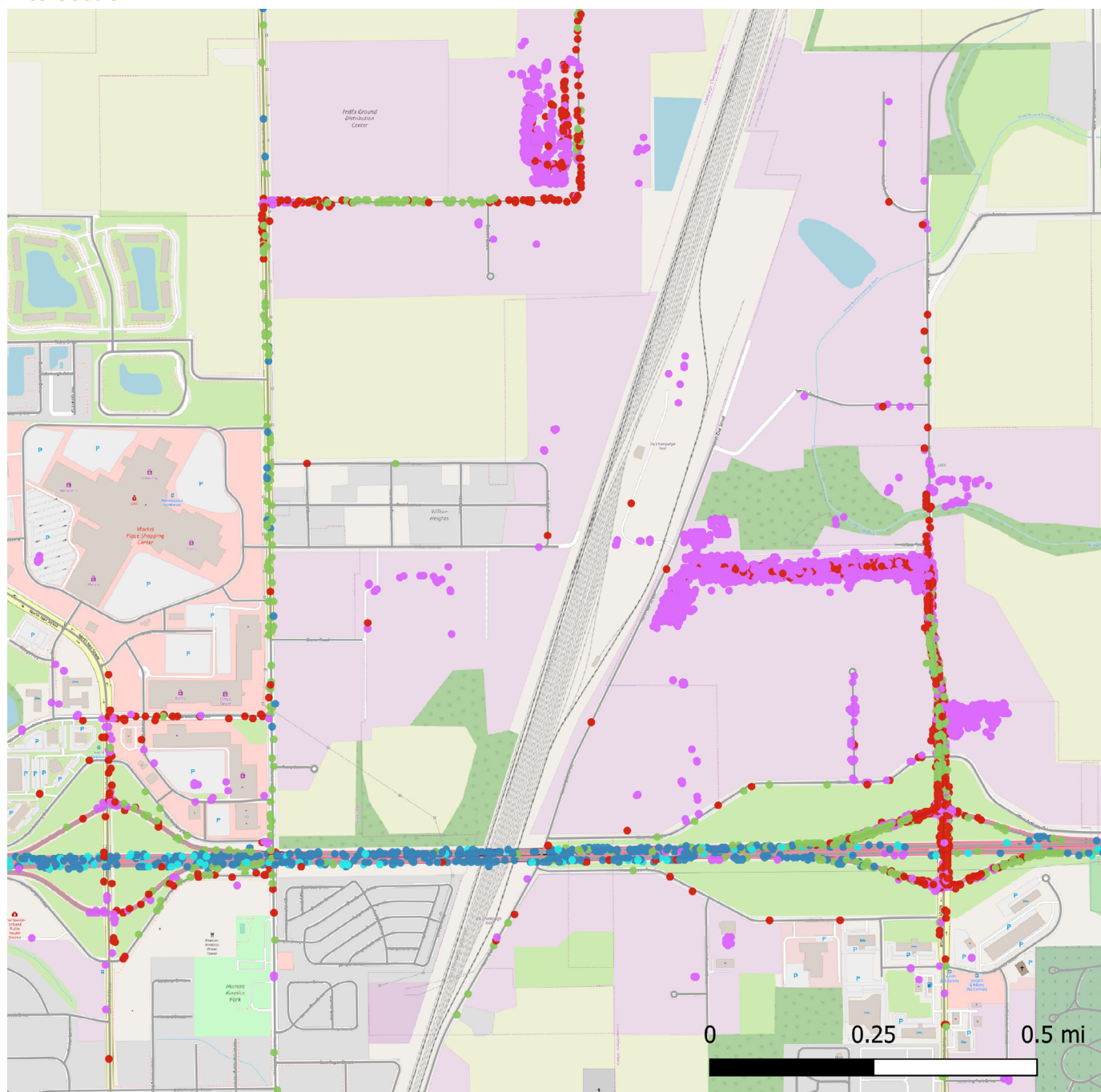
- Speed ≤ 10 mph
- 10 mph < Speed ≤ 25 mph
- 25 mph < Speed ≤ 45 mph
- 45 mph < Speed ≤ 65 mph
- Speed > 65 mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)



Figure B-3: Speed of Trucks Accessing the Industrial Area Near the Wilbur Road and Lincoln Avenue Intersection



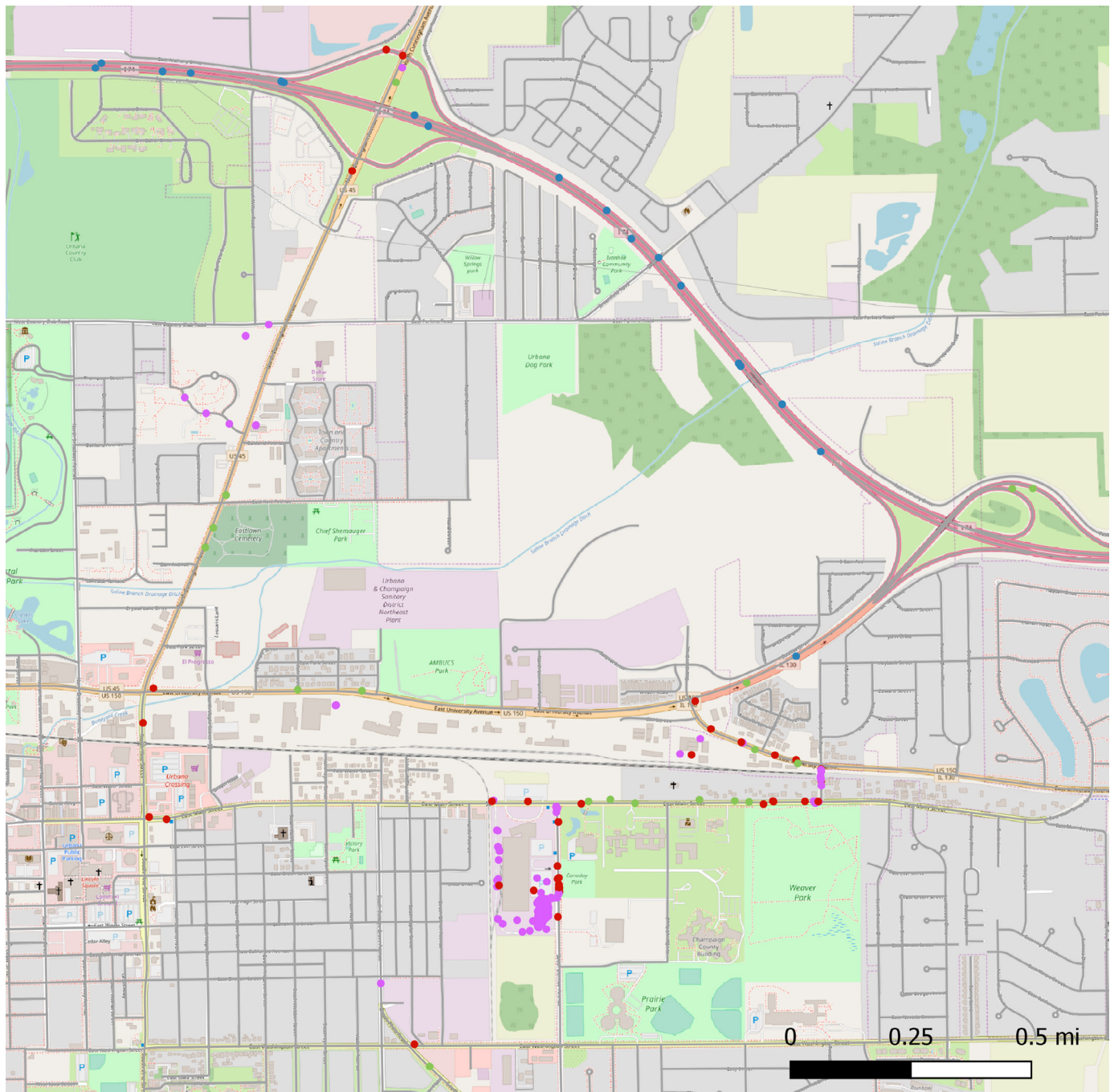
#### Truck GPS Records

- Speed  $\leq 10$  mph
- $10 \text{ mph} < \text{Speed} \leq 25$  mph
- $25 \text{ mph} < \text{Speed} \leq 45$  mph
- $45 \text{ mph} < \text{Speed} \leq 65$  mph
- Speed  $> 65$  mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)

Figure B-4: Speed of Trucks Accessing the Industrial Area Near the Main Street and Lierman Avenue Intersection



#### Truck GPS Records

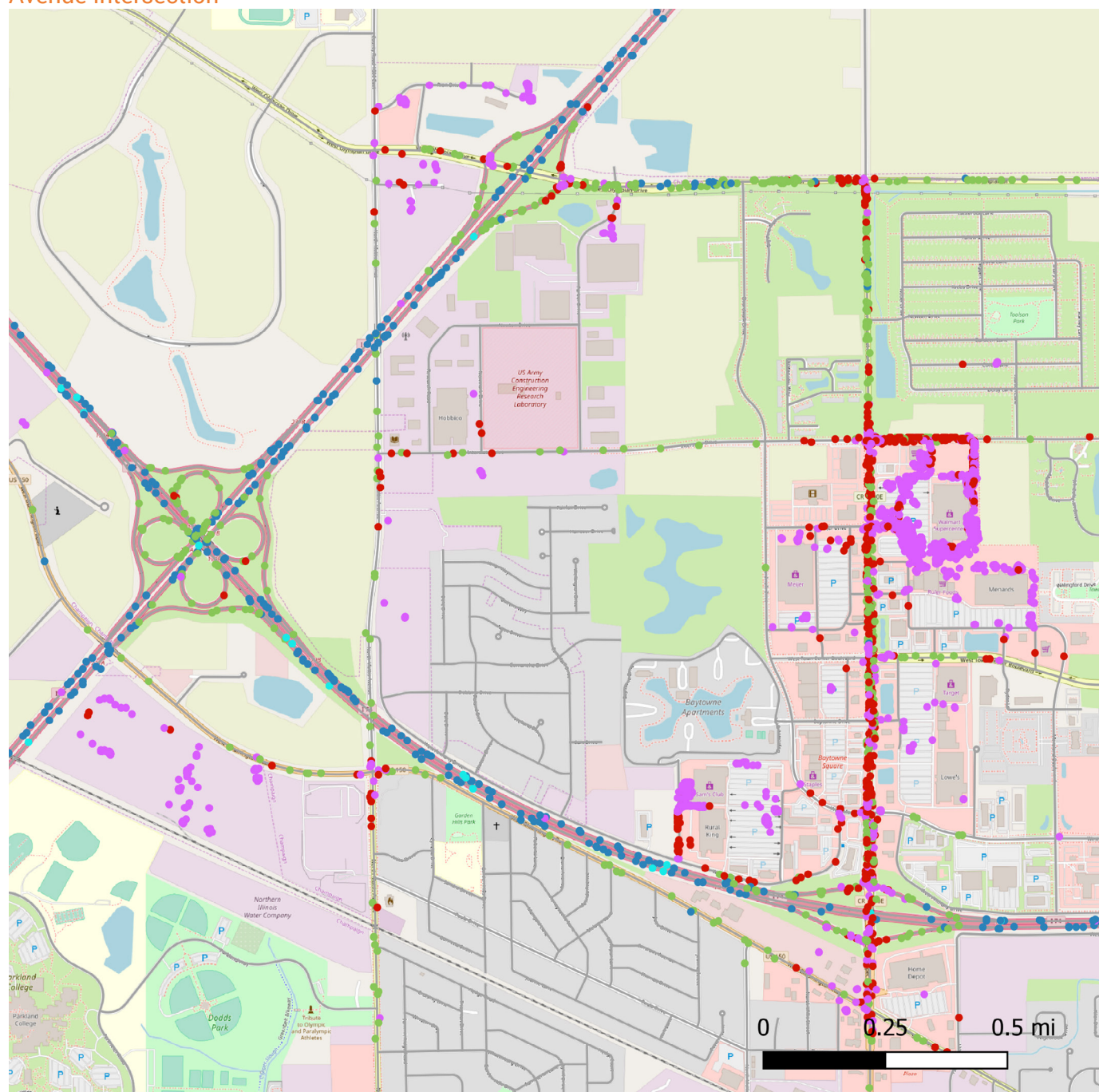
- Speed  $\leq 10$  mph
- $10 \text{ mph} < \text{Speed} \leq 25 \text{ mph}$
- $25 \text{ mph} < \text{Speed} \leq 45 \text{ mph}$
- $45 \text{ mph} < \text{Speed} \leq 65 \text{ mph}$
- Speed  $> 65 \text{ mph}$

— Major Roadways

Source: American Transportation Research Institute (ATRI)



Figure B-5: Speed of Trucks Accessing the Retail Businesses Near the Interstate Drive and Prospect Avenue Intersection



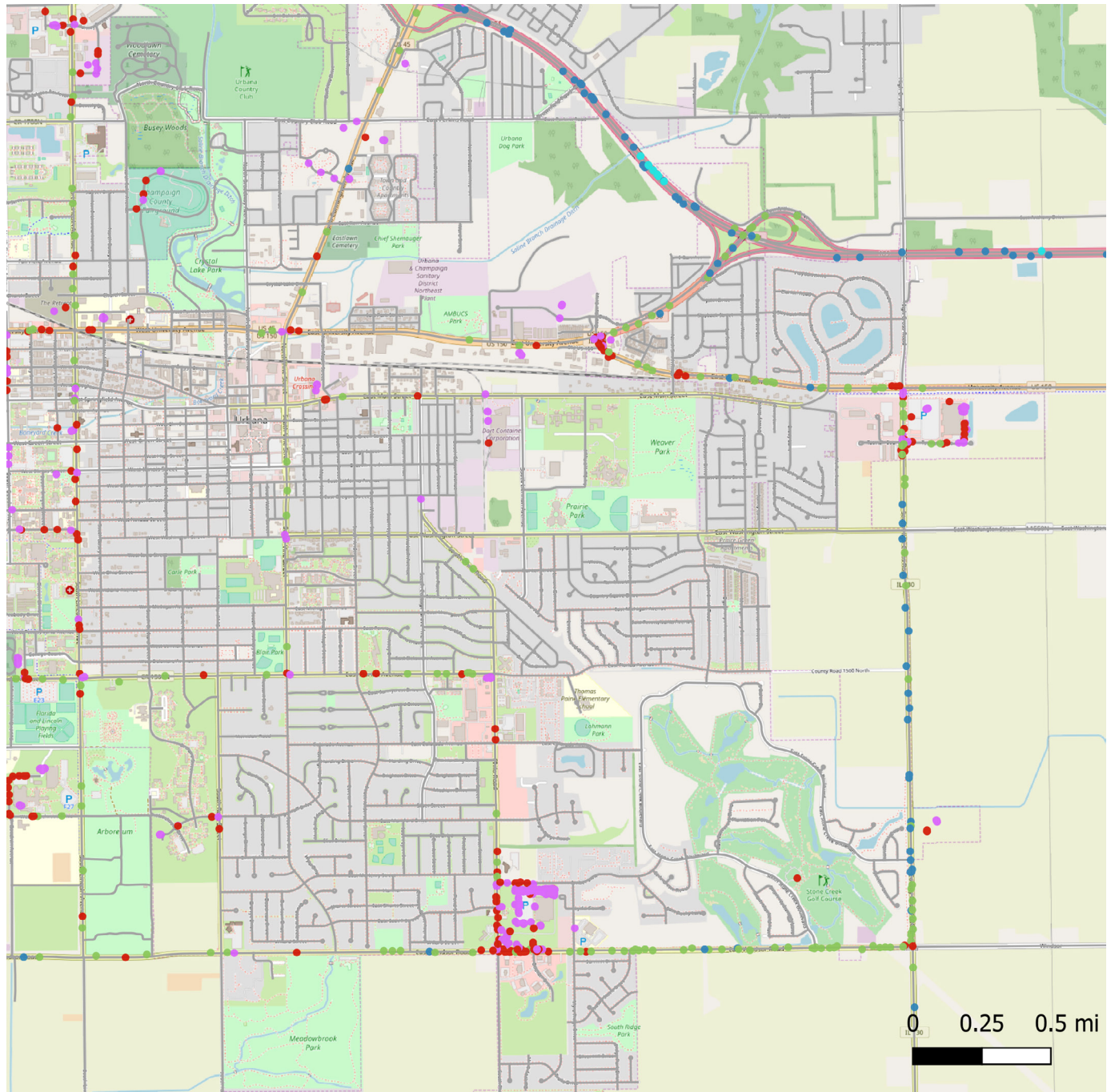
#### Truck GPS Records

- Speed  $\leq 10$  mph
- $10 \text{ mph} < \text{Speed} \leq 25$  mph
- $25 \text{ mph} < \text{Speed} \leq 45$  mph
- $45 \text{ mph} < \text{Speed} \leq 65$  mph
- Speed  $> 65$  mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)

Figure B-6: Speed of Trucks Accessing the Retail Businesses Near the Windsor Road and Philo Road Intersection



#### Truck GPS Records

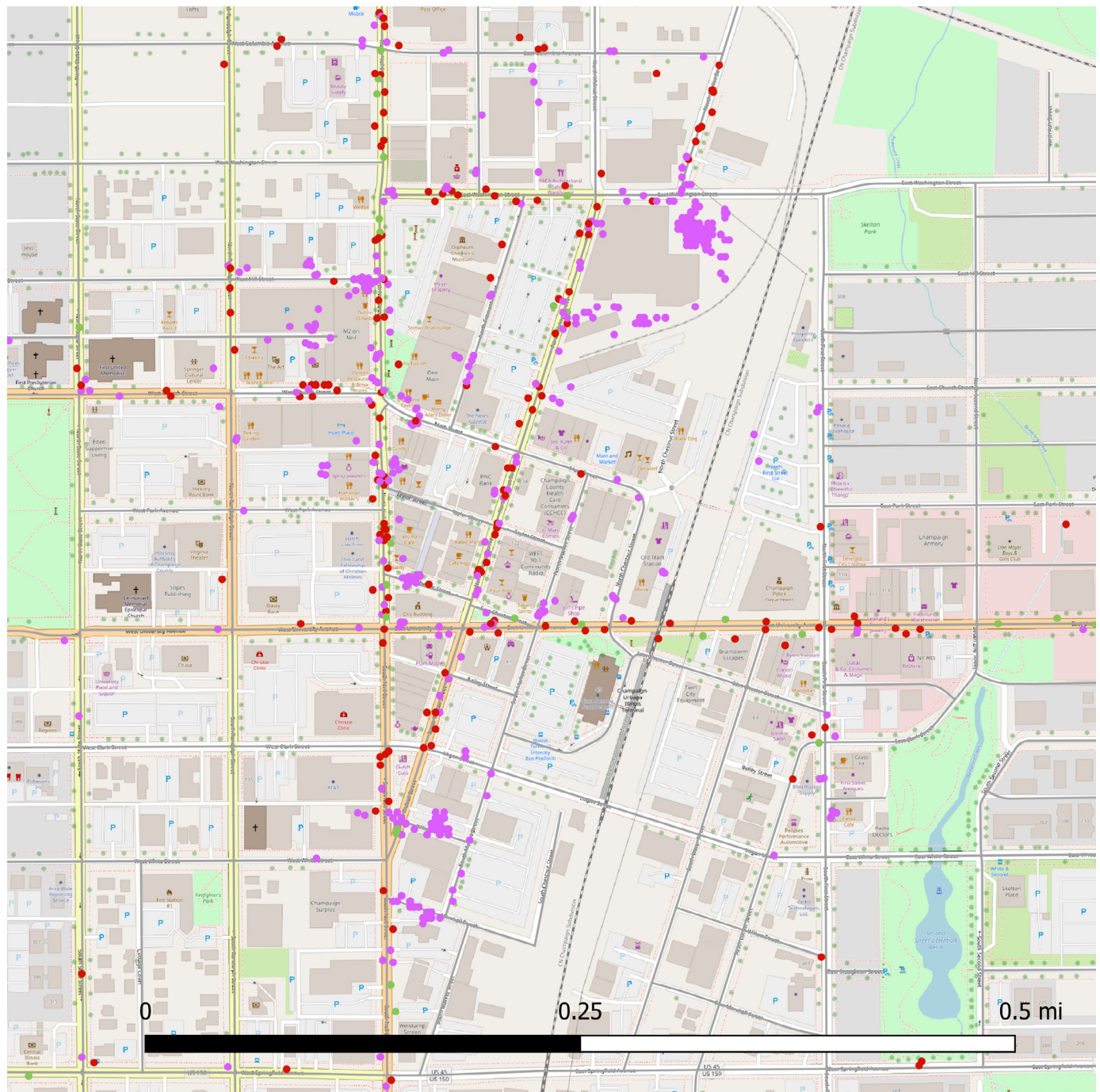
- Speed  $\leq 10$  mph
- $10 \text{ mph} < \text{Speed} \leq 25$  mph
- $25 \text{ mph} < \text{Speed} \leq 45$  mph
- $45 \text{ mph} < \text{Speed} \leq 65$  mph
- Speed  $> 65$  mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)



Figure B-7: Speed of Trucks Accessing Downtown Champaign



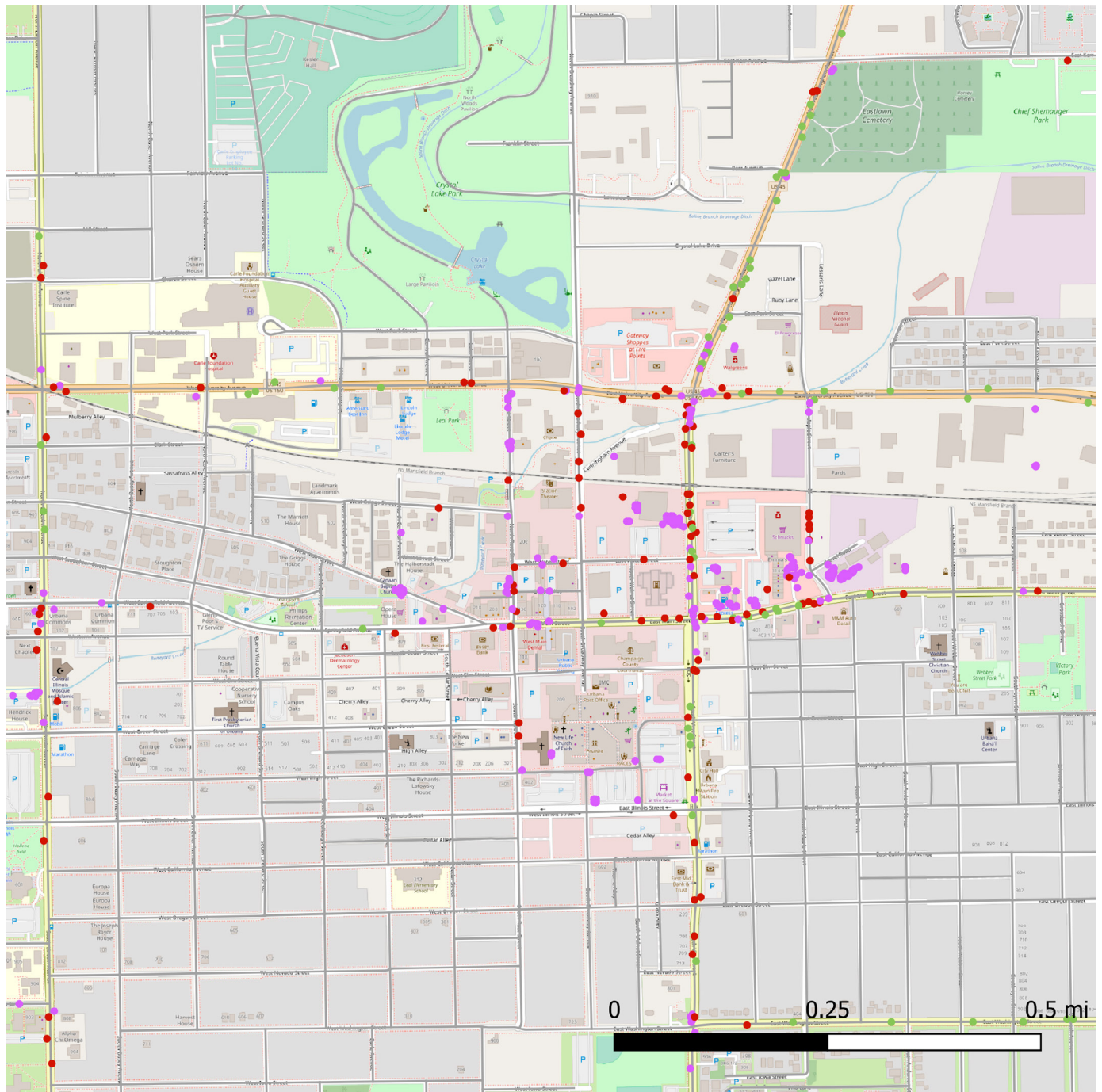
#### Truck GPS Records

- Speed ≤ 10 mph
- 10 mph < Speed ≤ 25 mph
- 25 mph < Speed ≤ 45 mph
- 45 mph < Speed ≤ 65 mph
- Speed > 65 mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)

Figure B-8: Speed of Trucks Accessing Downtown Urbana



#### Truck GPS Records

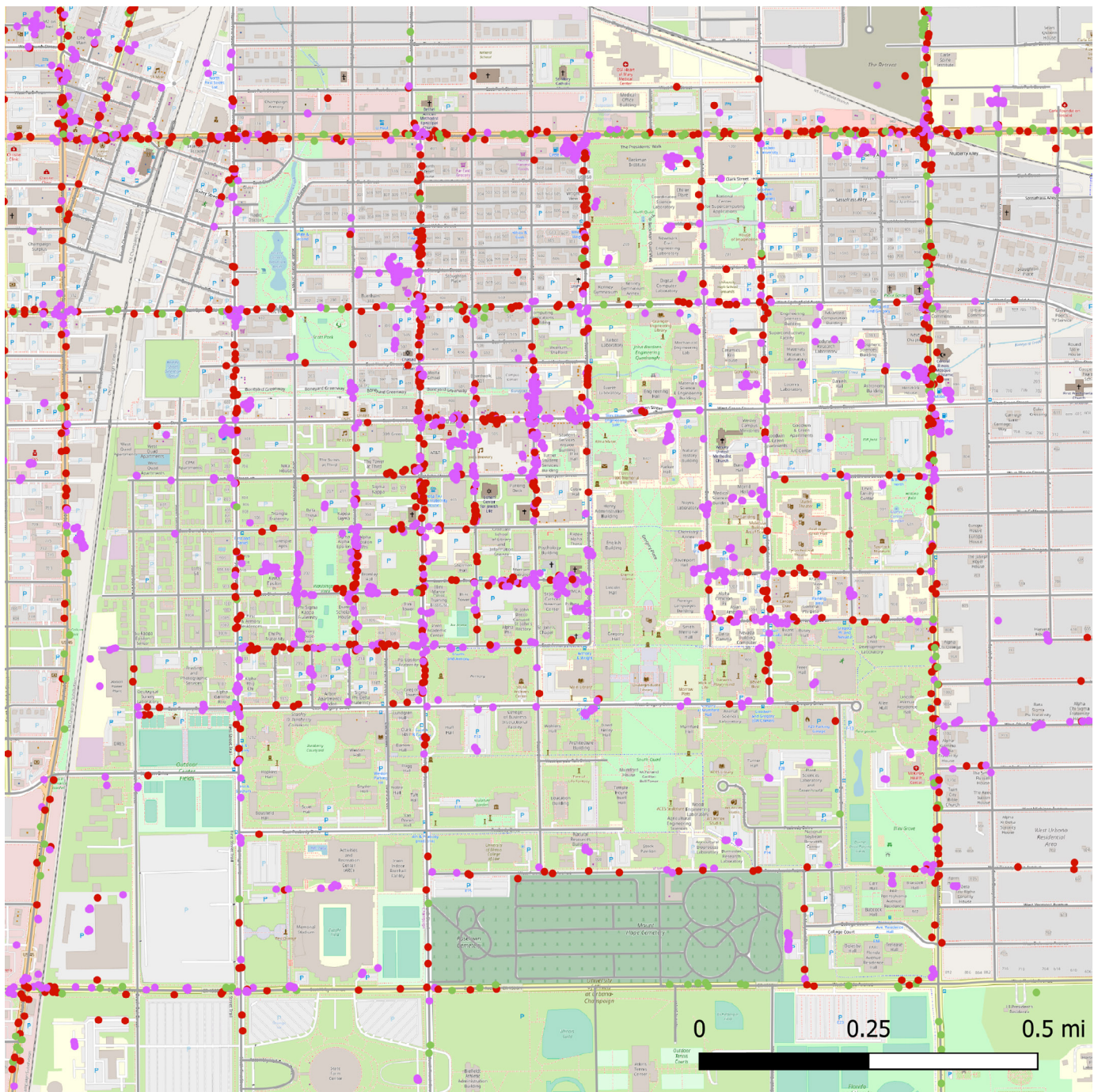
- Speed ≤ 10 mph
- 10 mph < Speed ≤ 25 mph
- 25 mph < Speed ≤ 45 mph
- 45 mph < Speed ≤ 65 mph
- Speed > 65 mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)



Figure B-9: Speed of Trucks Accessing the University District



#### Truck GPS Records

- Speed ≤ 10 mph
- 10 mph < Speed ≤ 25 mph
- 25 mph < Speed ≤ 45 mph
- 45 mph < Speed ≤ 65 mph
- Speed > 65 mph

— Major Roadways

Source: American Transportation Research Institute (ATRI)







## Appendix C

### Freight stakeholder survey responses

# 1. Survey questions and response summary

## Question 1: Does your company have its own truck fleet?

Responses	Count	Percent
Yes	30	41.7
No	42	58.3
<b>Total</b>	<b>72</b>	<b>100.0</b>

## Question 2: What best describes your company's role in the supply chain?

Responses	Count	Percent
Carrier or third-party logistics provider	13	39.4
Shipper or receiver operating private fleet	12	36.4
Other	8	24.2
<b>Total</b>	<b>33</b>	<b>100.0</b>

The following lists the other responses:

- "Construction vehicles"
- "Full service moving company"
- "Farmer"
- "Farm to market"
- "Manager of the department that uses vehicles in the fleet"
- "Milk runs inbound to us"

## Question 3: What traffic bottlenecks impact your fleet movement in Champaign County?

The following lists all the responses collected through online and mailed survey:

- "Champaign"
- "Urbana"
- "Savoy"
- "Downtown Champaign"
- "North/South access roads to/from Champaign/Urbana"
- "Campus streets difficult to maneuver"
- "Neil Street"
- "Prospect Ave"
- "Hwy 45"
- "I-74, University Ave to Prospect"
- "I-74 between Champaign and Danville"
- "Current I-74 construction (Hwy 150 and I-74 ramp location)"

- "I-74 an I-57 Interchange"
- "Route 150 from Route 130 to I-74"
- "Route 150, huge quantity of additional traffic due to I-74 construction (Route -150 and I-74 ramp intersection)"
- "Railroad Underpasses"
- "Rail road viaducts"

#### Question 4: How do the bottlenecks affect your route planning?

The following lists all the responses collected through online and mailed survey:

- "Primarily avoid these areas at peak times when possible"
- "Have to wait for loading zones to open"
- "We have to take alternative routes"
- "We try to take alternate routes but it's not always possible"
- "We try to avoid I-74 during peak times"
- "Avoid the traffic by taking different routes"
- "Allow more time and take alternative routes"

#### Question 5: Are there any roadways you avoid taking when moving freight in Champaign County, and why?

Location	Reason				
	Congestion	Accidents	Maneuverability	Bridge/ structural issues	Other
Campus area					
Many east/west routes in Champaign					
Prospect Avenue					
Neil Street					
Green Street					
Urbana to St Joseph					
I-57					
I-74					
Hwy 136					
Railroad underpasses					



**Question 6: What are the transportation issues affecting your freight movement in Champaign County?**

Responses	Count	Percent
Traffic congestion	12	18.2
Roadway condition issues	11	16.7
Roadway geometry issues (e.g. turn lanes, lane drops, etc.)	7	10.6
Bridge condition issues	5	7.6
Bridge geometry issues (e.g. height/ weight restrictions, etc.)	5	7.6
Delivery/ loading zone issues	5	7.6
Rail system condition issues	5	7.6
Regulatory issues	5	7.6
Other (Please specify)	5	7.6
Intersection issues (e.g. signal timing, railroad crossing, etc.)	3	4.5
Truck wayfinding/ signage issues	3	4.5
Access to warehousing issues	0	0.0
Other truck parking issues	0	0.0
<b>Total</b>	<b>66</b>	<b>100.0</b>

The following lists all the responses collected regarding transportation issues through online and mailed survey:

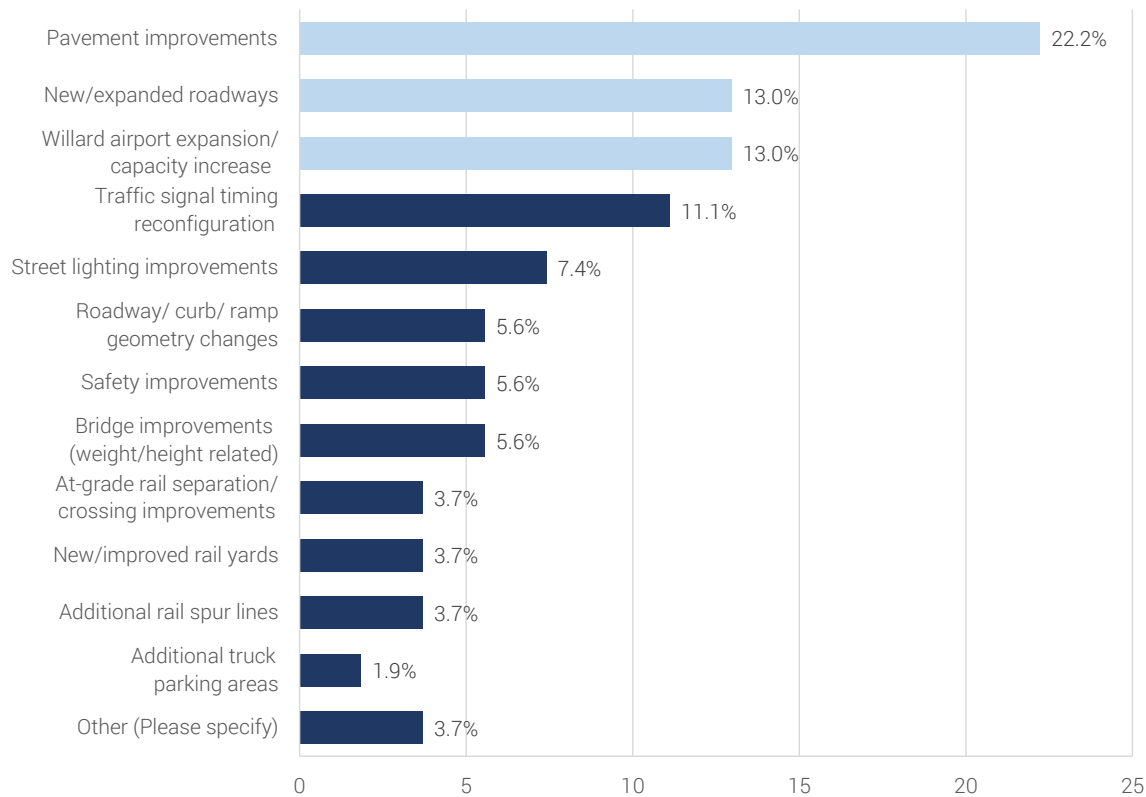
Transportation Issues	Responses
Roadway condition issues	"I-74"
	"I-74 and I-57 Interchange"
	"3209 Farber Dr. Champaign 61822"
	"In general roads have potholes and many patches, rough condition"
	"Sections on the interstates, in city surface streets"
	"Potholes are always an issue, but especially on Rt 45 coming into Urbana"
	"I-74 too many accidents causes huge back ups and delays"
Roadway geometry issues (e.g. turn lanes, lane drops, etc.)	"Champaign"
	"I-74 and I-57 Interchange"
Bridge condition issues	"Many bridges on the interstates"
	"Lanes very small or restricted"
	"Narrow bridges over I-57"

Transportation Issues	Responses
Bridge geometry issues (e.g. height/ weight restrictions, etc.)	"Springfield Ave"
	"Green Street"
	"Bridges over east/west Champaign city streets"
Intersection issues (e.g. signal timing, railroad crossing, etc.)	"CN rail crossing over Bradley Rd."
	"Prospect/Neil"
Traffic congestion	"N. Prospect"
	"I-74 from Mahomet during commuter hours"
	"East University Ave Urbana"
	"Campus"
	"Prospect/Neil"
	"Downtown Champaign and Prospect Ave"
Truck wayfinding/ signage issues	"Walnut Street northbound, where the one way ends is not marked adequately to note left lane needs to turn left. Two way traffic ahead"
Delivery/ loading zone issues	"Campus"
	"Downtown parking in Champaign/Urbana, campus town parking"
Rail system condition issues	"2309 W. Bloomington Rd (Atkins Group Building, Rail Site)"
	"Trains crossing Neil/State/Randolph/Bradley/Prospect during the day"
Regulatory issues	"3209 Farber Dr. / 2309 W. Bloomington Rd. Champaign"
	"Staley Road needs to 80,000 from Monticello Road to Rt150 for access to The Anderson's"
Other (Please specify)	"Air cargo at Willard Airport"
	"West bound ramp 185 at I-74 is poorly designed and is not safe"

### Question 7: What transportation improvements would help increase the efficiency of your freight movement in Champaign County?

Top three suggestions are pavement improvements (22.2%), new/expanded roadways (13%) and Willard airport expansion/ capacity increase (13%). Of the 3.7% (2 respondent) who cited "other" improvements, suggested to provide better signage on I-57 to help direct traffic to avoid Bradley or Prospect Ave and to close Olympia Drive. Some other comments on each transportation issues are listed in the Appendix.

**Figure C-1: Suggested Improvements to Increase the Efficiency of Freight Movement in Champaign County**



Responses	Count	Percent
Pavement improvements	12	22.2
New/expanded roadways	7	13.0
Willard airport expansion/ capacity increase	7	13.0
Traffic signal timing reconfiguration	6	11.1
Street lighting improvements	4	7.4
Roadway/ curb/ ramp geometry changes	3	5.6
Safety improvements	3	5.6
Bridge improvements (weight/height related)	3	5.6
At-grade rail separation/ crossing improvements	2	3.7
New/improved rail yards	2	3.7
Additional rail spur lines	2	3.7
Other (Please specify)	2	3.7
Additional truck parking areas	1	1.9
Better truck signage and wayfinding	0	0.0
Better connections between Willard airport and highways	0	0.0
Better connection between Willard airport and rail services	0	0.0
<b>Total</b>	<b>54</b>	<b>100.0</b>

The following lists all the responses collected regarding transportation issues through online and mailed survey:

Transportation Issues	Comments
New/expanded roadways	"Cracker and large holes in the road"
	"I-74 through Champaign needs to be a FULL three (3) lanes not just 3rd turn lane."
	"Widen prospect between Bradley and Kirby"
	"I-74 west bound ramp"
Pavement improvements	"Wilber Ave., Champaign, IL"
	"Many locations"
	"Large Pot holes not being fixed from the winter"
	"All over"
	"150 east and west bound"
	"Church"
Roadway/ curb/ ramp geometry changes	"Interstate junctions"
	"I-74 through Champaign needs to be a FULL three (3) lanes not just 3rd turn lane."
Traffic signal timing reconfiguration	"N. Prospect road"
	"Vine and University/U.S. 150 – Urbana"
	"North Prospect/North Neil"
	"All"
Safety improvements	"I-74, entrance off of University ave is so sharp, trucks are down to 25mph and trying to merge into 70 mph traffic, safety issue"
	"All"
	"Bike paths"
Bridge improvements (weight/ height related)	"Champaign east/west roads under the rail"
Additional truck parking areas	"Not at Walmart"
Street lighting improvements	"There are no street lights on Town Center Boulevard. It is dark for vehicle and pedestrians."
At-grade rail separation/ crossing improvements	"Bradley Rd"
Willard airport expansion/ capacity increase	"Possible Port of Entry at Willard"
	"I am the director of Willard. I am looking to expand air cargo. All community help would be excellent"
	"More direct flight destinations"

Transportation Issues	Comments
Other (Please specify)	"None"
	"Better signage on I-57 to help direct traffic to avoid Bradley / Prospect"
	"We don't move freight"
	"Close Olympia Drive "

**Question 8: What best describes your company's operation?**

Responses	Count	Percent
Long-haul moving between logistic nodes (grain elevators, factories, warehouses, packaging centers)	1	16.7
Short-haul for local pick-up and delivery	2	33.3
Construction/ sanitary/ recycling service in the Champaign-Urbana area	1	16.7
Other - Write In	2	33.3
<b>Total</b>	<b>6</b>	<b>100.0</b>

**Question 9: How many trucks go in and out of your facility on an average day?**

No of Trucks	Count	Percent
Less than 10	8	42.1
10-25	4	21.1
25-50	4	21.1
50-100	2	10.5
>100	1	5.3
<b>Total</b>	<b>19</b>	<b>100</b>

**Question 10: Where do your dispatches most commonly begin?**

Region	Locations	Count	Percent
Champaign County	Urbana, Champaign	8	40.0
Central Illinois Region	Danville, Arcola, Mattoon	4	20.0
The Midwest	Covington, IN; Pekin, IL; Peoria, IL; Rochelle, IL; Franklin Park, IL; Burr Ridge, IL ; Indianapolis, IN; Kentucky, OH; Dayton (Dayton Freight Terminal)	4	20.0
Elsewhere in the U.S.		4	20.0
International		0	0
<b>Total</b>		<b>20</b>	<b>100.0</b>



**Question 11: Where do your dispatches most commonly end?**

Region	Locations	Count	Percent
Champaign County	Urbana, Champaign	7	53.8
Central Illinois Region	Tuscola, Decatur	2	15.4
The Midwest		3	23.1
Elsewhere in the U.S.		1	7.7
International		0	0
<b>Total</b>		<b>13</b>	<b>100.0</b>

**Question 12: Where do your inbound commodities come from?**

Region	Locations	Count	Percent
Champaign County		6	18.8
Central Illinois Region		6	18.8
The Midwest	Chicago; Salem OH	8	25.0
Elsewhere in the U.S.	Gulf States; Tennessee	6	18.8
International	Canada, Netherlands, Norway, Ukraine, China, Hungary	6	18.8
<b>Total</b>		<b>32</b>	<b>100.0</b>

**Question 13: Where do you ship your goods?**

Region	Locations	Count	Percent
Champaign County		5	19.2
Central Illinois Region		3	11.5
The Midwest	Wisconsin, Indianapolis, Illinois, Iowa, Minnesota, Michigan, Missouri	7	26.9
Elsewhere in the U.S.	California, Texas, Arizona, Washington, Pennsylvania, Nevada, Florida, North Dakota, Kansas, Nebraska, Virginia, Colorado, Oklahoma	6	23.1
International	Canada, UK, France, Bulgaria, Netherlands, Switzerland, Spain, S. Korea, Australia, Thailand	5	19.2
<b>Totals</b>		<b>26</b>	<b>100.0</b>

**Question 14: What percentage of your freight volume is transported by each mode?**

Company Name	Mode of Transport		
	Roadway Percent	Railroad Percent	Air Percent
Bank Champaign, NA	100	0	0
Clarkson Soy Products LLC	90	8	2
Kraft Heinz Company	90	10	0
Litania Sports	95	0	5
Not Provided	50	49	1
Not Provided	90	0	10
Not Provided	0	0	100
Not Provided	100	0	0
Not Provided	25	50	25
Not Provided	100	0	0

**Question 15: How do you anticipate your business in Champaign County will change in the next 10 to 25 years?**

Responses	Count	Percent
Expansion	19	86.4
Contraction	1	4.5
Relocation within region	0	0.0
Relocation to another region	0	0.0
Other - Write In	2	9.1
<b>Totals</b>	<b>22</b>	<b>100.0</b>

**Question 16: Which freight mode does your company expect to use the most in the next 10 to 25 years?**

Freight Mode	Count	Percent
Truck	9	81.8
Rail	0	0.0
Air	2	18.2
<b>Totals</b>	<b>11</b>	<b>100.0</b>

**Question 17: Does your company have a recent development plan that will increase its reliance on the freight transportation system in Champaign County? Can you share it with us?**

No responses

**Question 18: What technology/vehicle/infrastructure changes are likely to influence your freight movement in the next 10 to 25 years?**

The following lists all the responses collected through online and mailed survey:

- "Rail freight speed / transfer improvements"
- "More efficient trucks, trailers"
- "Electronic Logging, lack of semi-truck parking, Hours of service, driver recruitment and retention"
- "Buildup of the Carle at the Fields campus"
- "Add vehicles as needed"
- "Driverless trucking, Trucking log mandates, highway improvement (locally and in Chicago area)"
- "Online shopping"

**Question 19: Does anything make you uncertain about continuing to operate your business in Champaign County? If yes, what can be done to address it, if anything?**

The following lists all the responses collected through online and mailed survey:

- "Taxes"
- "Taxes, regulation, contraction of industry in Champaign County"
- "Federal Banking Regulations"
- "Scarcity of drivers and dispatchers"
- "State of IL"
- "If the City of Champaign designates that certain roads can't be used by semi-truck traffic"
- "No ~ I think we're here to stay"
- "Not at this time"

**Question 20: What is your company's name?**

- Associated Transfer and Storage, inc.
- BankChampaign, NA
- Carle Foundation Hospital
- CDC Paper
- Clarkson Soy Products LLC
- Federal Companies
- Kraft Heinz Company
- Leerkamp Farms
- Litaniasports
- Market Place
- Willard Airport
- Yellow Checker Cab and Yellow Transport

**Question 21: About how many people does your business employ at your Champaign County location?**

No of Employee	Count	Percent
<25	7	35.0
25-50	3	15.0
50-100	2	10.0
100-200	3	15.0
200-500	2	10.0
>500	3	15.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

## 2. Key Survey Responses

### 2.1. Associated Transfer and Storage

#### Features

- Has own truck fleet
- Carrier or third-party logistics provider
- Short-haul operation for local pick-up and delivery
- 30 daily trucks
- 15 employees

#### Concerns

- In general roads have potholes and many patches, rough condition

#### Recommendations

- Pavement improvements at Wilber Ave. Champaign, IL

### 2.2. CDC paper

#### Features

- Has own truck fleet
- Shipper or receiver operating private fleet
- 4 daily trucks
- 8 employees
- Receives - 200 tons and ships - 200 tons of freight annually

#### Concerns

- Traffic congestion - Campus streets difficult to maneuver
- Delivery/ loading zone issues - Have to wait for loading zones to open

## 2.3. Carle Foundation Hospital

### Features

- Has own truck fleet
- Shipper or receiver operating private fleet
- 10 semis; 20 box trucks, 50 vans
- Receives - 400 packages/day on UPS/Fedex and scheduled trucks (16 skids a day)
- Ships less than a ton annually
- 6000 employees

### Concerns

- Traffic bottlenecks at downtown Champaign and Prospect Ave
- Tries to take alternate routes but it's not always possible
- Potholes are always an issue, but especially on Route 45 coming into Urbana

### Recommendations

- Pavement improvements

## 2.4. Clarkson Soy Products

### Features

- Doesn't have own truck fleet
- 2 to 5 daily trucks
- Receives – 14,400 tons and ships - 14,400 tons of freight annually
- 5 to 10 employees

**Concerns** – Not provided

**Recommendations** – Not provided

## 2.5. Federal companies

### Features

- Has own truck fleet
- Carrier or third-party logistics provider
- 10 daily trucks
- Receives –5000 tons and ships - 5000 tons of freight annually
- 30 employees

### Concerns

- Traffic bottlenecks at Prospect Ave and Neil Street
- Bridge geometry issues (e.g. height/weight restrictions, etc.) at Springfield Ave and Green Street
- Delivery/loading zone issues at downtown Champaign and Urbana
- Parking issue in campus area
- Railroad underpasses – height and other structural issues



- Rail System condition issues - Railroad crossing at Neil St, State St, Randolph St, Bradley Ave, Prospect Ave during the day

#### **Recommendations**

- New/expanded roadways at prospect Ave between Bradley and Kirby Street
- Traffic signal timing reconfiguration at North Prospect/North Neil Street

## **2.6. Kraft Heinz**

#### **Features**

- Doesn't have own truck fleet
- 325 daily trucks
- Receives –1.2 billion pounds and ships - 1.2 billion pounds of freight annually
- 925 employees

#### **Concerns**

- Roadway geometry issues (e.g. turn lanes, lane drops, etc.)
- Truck wayfinding/ signage issues
- Rail system condition issues

#### **Recommendations**

- Additional rail spur lines
- Better signage on I-57 to help direct traffic to avoid Bradley / Prospect

## **2.7. Litanía Sports**

#### **Features**

- Doesn't have own truck fleet
- 10 daily trucks
- 150 employees

**Concerns** – Not provided

#### **Recommendations**

- New/expanded roadways
- Traffic signal timing reconfiguration
- New/improved rail yards

## **2.8. Willard Airport**

#### **Features**

- Doesn't have own truck fleet
- 0 daily trucks
- 25 employees

**Concerns** – Not provided

### **Recommendations**

- Willard airport expansion/capacity increase

## **2.9. Yellow Checker Cab and Yellow Transport**

### **Features**

- Doesn't have own truck fleet
- 11 daily trucks
- Receives –1500 small packages annually
- 30 employees

### **Concerns**

- Roadway condition issues
- Traffic congestion
- Regulatory issues

### **Recommendations**

- Pavement improvements
- Bridge improvements (weight/height related)
- Street lighting improvements
- Willard airport expansion/ capacity increase

## **2.10. Leerkamp Farms**

### **Features**

- Has own truck fleet
- Shipper or receiver operating private fleet
- 10 daily trucks
- Receives – 10,000 tons and ships - 10,000 tons of freight annually
- 11 employees

### **Concerns**

- Traffic bottlenecks at I-74 (University Ave to Prospect Ave) and Route 150 (from Route 130 to I-74)
- Regulatory issues - Staley Road needs to 80,000 from Monticello Road to Route150 for access to The Anderson's

### **Recommendations**

- Safety improvements at the I-74. I-74 entrance from University Ave is very sharp, trucks are down to 25mph at the ramp and then trying to merge into 70 mph traffic at I-74.

## 2.11. Market Place

### Features

- Doesn't have own truck fleet
- 20 daily trucks
- 1500 employees

### Concerns

- Roadway condition issues – I-74 and I-57 Interchange
- Roadway geometry issues (e.g. turn lanes, lane drops, etc.) – I-74 and I-57 Interchange
- Bridge condition issues - Narrow bridges over I-57
- Traffic congestion at I-74 from Mahomet during commute hours
- Truck wayfinding/ signage issues at Northbound Walnut Street, where the one-way ends is not marked adequately to note left lane needs to turn left and two way traffic ahead.

### Recommendations

- New/expanded roadways especially at the I-74 through Champaign needs to be a full three (3) lanes not just 3rd turn lane.
- Roadway/ curb/ ramp geometry changes at the I-74 through Champaign needs to be a FULL three (3) lanes not just 3rd turn lane.
- Street lighting improvements on Town Center Boulevard







## Appendix D

### Reviewed literature

## List of literature reviewed

A wide range of existing freight related plans, studies, and initiatives conducted by different organizations at federal, state, and local levels were reviewed by staff to identify relevant elements, best freight planning practices, and proposed strategies/recommendations that may aide the Champaign-Urbana Region Freight Plan. [Table D-1](#) shows the title, author, and year of publication information for the studies, plans, and initiatives reviewed.

**Table D-1: List of Literature Reviewed**

	Plan/Study Title	Agency/Entity	Publication Year
1	2012 Commodity Flow Survey	U.S. Census Bureau	February, 2015
2	2016 Freight Quick Facts Report	Federal Highway Administration	September, 2016
3	Bloomington-Normal Urbanized Area and McLean County Long Range Transportation Plan 2040	McLean County Regional Planning Commission	November, 2013
4	City of Seattle Freight Master Plan	Seattle Department of Transportation	September, 2016
5	CORE MPO Freight Study	Coastal Region MPO	December, 2015
6	Effects of Heavy Vehicle Characteristics on Pavement Response and Performance	University of Michigan Transportation Research Institute	August, 1992
7	Eight County Freight Study	East Central Intergovernmental Association	March, 2018
8	Factoring freight into complete streets plans	Karl Villanova	September, 2017
9	Forecasting Metropolitan Commercial and Freight Travel	Transportation Research Board	May, 2008
10	Freight Planning: Innovations, Scenarios, and Environmental Justice; TR News	Transportation Research Board	April, 2017

Plan/Study Title		Agency/Entity	Publication Year
11	Freight Resource Guidebook	Florida Department of Transportation	September, 2008
12	Freight Story 2008	Federal Highway Administration	August, 2008
13	Freight Study for Bloomington-Normal, IL Metropolitan and McLean County Region	McLean County Regional Planning Commission	February, 2018
14	Freight Trip Generation and Land Use	Transportation Research Board	September, 2012
15	Grain and Soybean Industry Dynamics and Rail Service	Northwestern University Transportation Center	September, 2017
16	Greater Memphis Regional Freight Plan	Memphis Urban Area Metropolitan Planning Organization	August, 2017
17	Go To 2040: Comprehensive Regional Plan	Chicago Metropolitan Agency For Planning (CMAP)	July, 2013
18	Guidebook for Freight Policy, Planning, and Programming in Small- and Medium-Sized Metropolitan Areas	National Cooperative Highway Research Program	June, 2018
19	Guide for Identifying, Classifying, Evaluating, and Mitigating Truck Freight Bottlenecks	Transportation Research Board	September, 2017
20	Guidebook for Understanding Urban Goods Movement	National Cooperative Freight Research Program	June, 2017
21	Hazardous Material Commodity Flow Study	Champaign County Regional Planning Commission	October, 2014
22	Idaho Statewide Freight Study	Idaho Transportation Department	February, 2013
23	Identifying State Freight Plan Best Practices	American Transportation Research Institute	February, 2018
24	Illinois Freight Plan	Illinois Department of Transportation	October, 2017
25	Illinois Freight Mobility Plan 2012	Illinois Department of Transportation	December, 2012

	Plan/Study Title	Agency/Entity	Publication Year
26	Illinois Long Range State Transportation Plan	Illinois Department of Transportation	December, 2012
27	Improving Freight System Performance in Metropolitan Areas: A Planning Guide	National Cooperative Freight Research Program	July, 2015
28	Indiana Multimodal Freight and Mobility Plan	Indiana Department of Transportation	December, 2014
29	Kansas Statewide Freight Plan	Kansas Department of Transportation	September, 2017
30	Las Vegas Region Freight Data Collection Study	Regional Transportation Commission of Southern Nevada	August, 2013
31	Long-Range Vision for Freight	Delaware Valley Regional Planning Commission	April, 2017
32	L RTP: Sustainable Choices 2040	Champaign County Regional Planning Commission	December, 2014
33	Minnesota Go: Statewide Freight System Plan	Minnesota Department of Transportation	May, 2016
34	Municipal Implementation Tool; Freight Transportation	Delaware Valley Regional Planning Commission	October, 2010
35	Performance Measures for Freight Transportation	Transportation Research Board	September, 2011
36	Peoria-Pekin Urbanized Area Transportation Study: Heart of Illinois Long-Range Transportation Plan 2040	Tri-County Regional Planning Commission	March, 2015
37	Quick Response Freight Manual II	Federal Highway Administration	September, 2007
38	Regional Freight Study	Gainesville-Hall Metropolitan Planning Organization	February, 2018
39	St. Louis Regional Freight Study	East-West Gateway Council of Governments	June, 2013
40	The Final 50 Feet Urban Goods Delivery System	Seattle Department of Transportation	January, 2018

	Plan/Study Title	Agency/Entity	Publication Year
41	Using Commodity Flow Survey Microdata and Other Establishment Data to Estimate the Generation of Freight, Freight Trips, and Service Trips: Guidebook	Transportation Research Board	September, 2017
42	Will County Community Friendly Freight Mobility Plan	Will County and Center for Economic Development (CED)	September, 2017
43	Willard Airport Strategic Business Plan	University of Illinois, Willard Airport	November, 2014





## Appendix E

### System Performance (PM3) Champaign-Urbana MPA 2017 baseline

Figure E-1: Percent of Person-Miles Traveled on the Interstate that are Reliable, Champaign-Urbana MPA, 2017

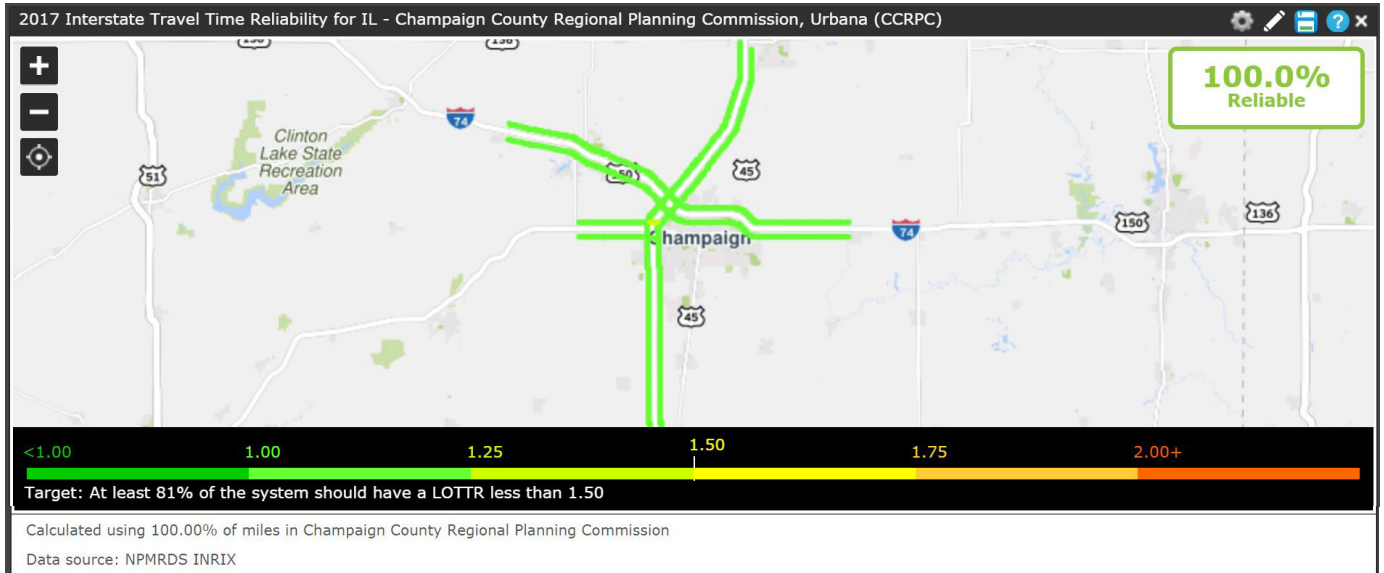


Figure E-2: Percent of Person-Miles Traveled on the Non-Interstate NHS that are Reliable, Champaign-Urbana MPA, 2017

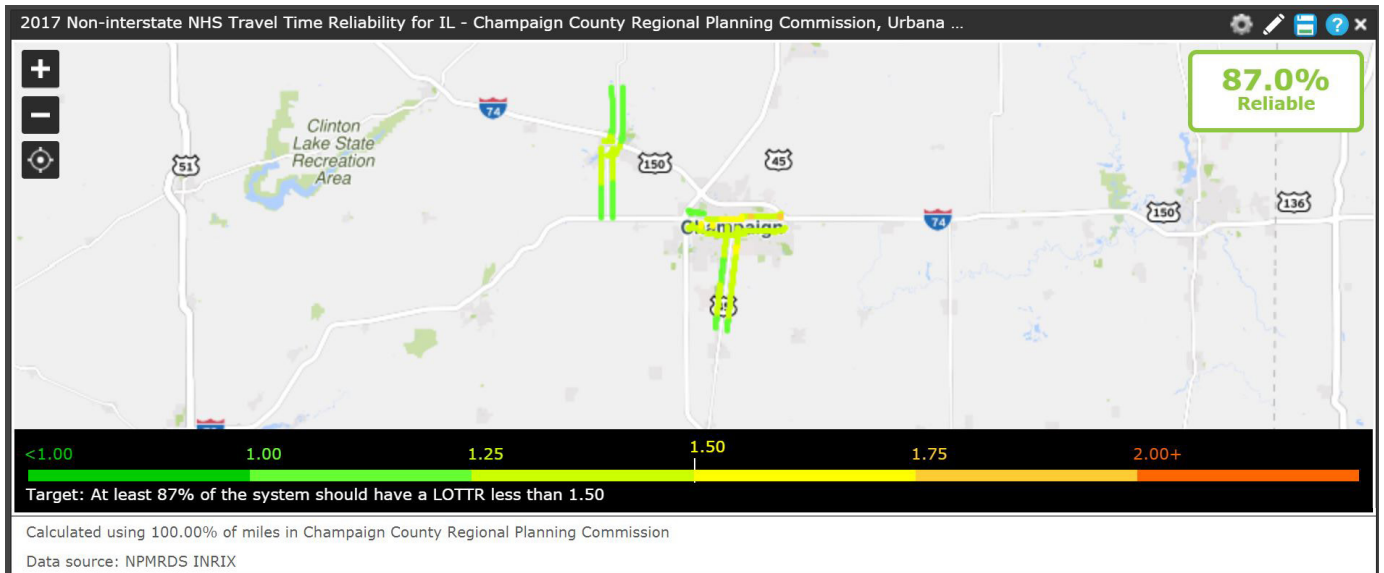
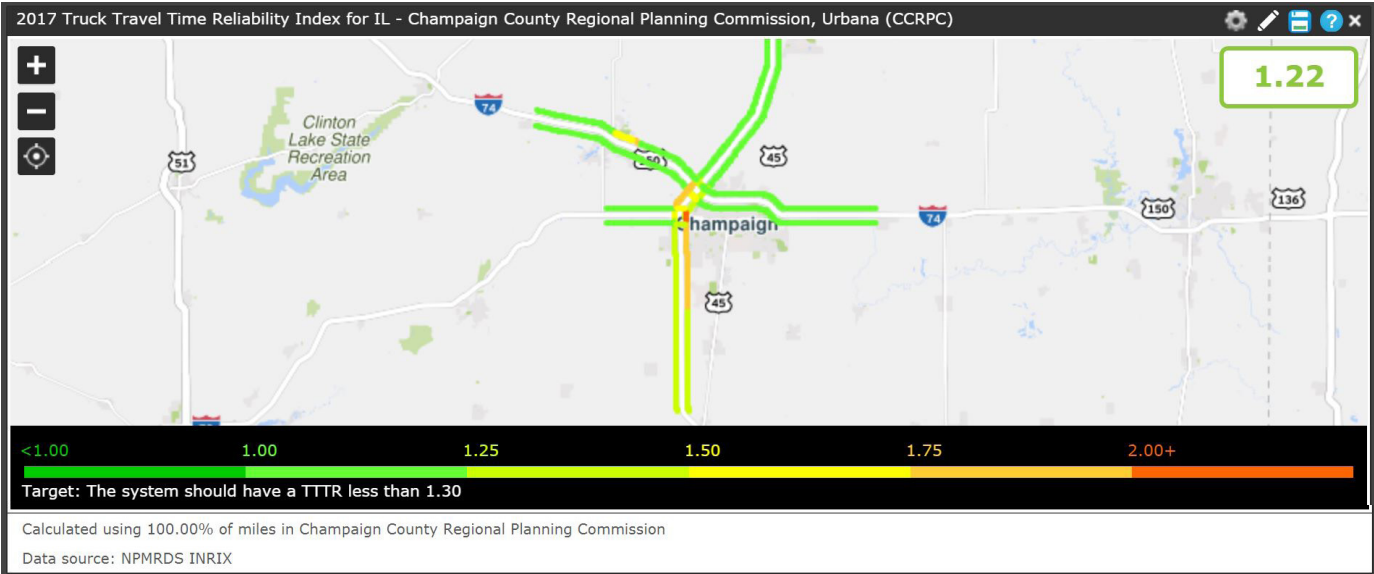


Figure E-3: Truck Travel Time Reliability Index, Champaign-Urbana MPA, 2017





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