DUPAGE TRANSIT CONNECTIVITY STUDY

Market Conditions Report

August 2016

CONTENTS

OVERVIEW

Purpose

DuPage County is interested in assisting employers and employees in DuPage County to improve commuting options and opportunities. With the RTA, DuPage County has initiated the ***DuPage Transit Connectivity Study*** to assess business' public transit needs by identifying first and last mile transportation gaps. The County recognizes there is growing demand for reverse commute and that there are more people who come from Chicago or from other suburban areas with limited mobility options. The County seeks to reduce commute times and improve access to jobs for these inter-county and longer range commuters. The goal is to make DuPage County jobs more accessible by improving commuting options, to improve employee attraction and retention for DuPage County employers, and to sustain that accessibility.

The DuPage Transit Connectivity Study is part of the 2016 RTA Community Planning Program. It begins with the task of assessing the current market conditions in two study areas. With a strong understanding of the market conditions, area employers, employees, stakeholders will be identified for outreach activities to better understand both the impediments to corporate participation in public-private transportation partnerships and the transportation-related barriers that prevent employers from attracting and retaining employees.

Following these activities, DuPage County will gather employers, government and service board staff, ride-sharing and technology company representatives and other local stakeholders to participate in a day-long workshop to discuss the transit connectivity challenges facing DuPage and develop potential ideas for bridging the transit gaps unique to the individual study areas.

Recommendations for mobility improvements, potential public-private partnerships, technology implementations, environment access improvements, a mobility hub concept or other ideas that result from the workshop will be identified specific to the study areas. Methods of funding these improvements will be researched and a final report identifying opportunities, associated costs, and implementation options will be delivered to DuPage.

Market Conditions

The first task in the DuPage Transit Connectivity Study is to complete a market conditions assessment for the study areas below. For the study area corridors, this report includes an assessment of the total trips attracted, transit potential for those trips based origin location and demographics, transit availability near locations of employment, pedestrian environment, travel time analysis, and potential for last-mile improvement. Analysis of these characteristics will help identify gaps in transit access and any potential for improved transit connectivity. The market assessment will ultimately inform the type of improvements that make sense given the unique characteristics of the study areas and narrow the focus of the project moving forward.

Study Areas

The two selected study areas of Itasca-Addison-Wood Dale and Warrenville Road offer a different set of challenges and opportunities.

The Itasca-Addison-Wood Dale area is predominately light manufacturing and industry. It includes an industrial park in Addison that is the fourth largest in Illinois with more than 17 million square feet of industrial and warehousing businesses. Less than ¼ of this industrial park is within a ½ mile of a Pace fixed bus route. The geographic area is large and has been split into two more narrowly defined areas of Addison and Wood Dale for this market conditions assessment.

The Warrenville Road corridor is typified by corporate offices, technology companies and white collar employment. Over 12 Million square feet of office and over 2 Million square feet of hospitality and university campus exist in this 6 mile corridor. This corridor is within 1-3 miles of both the Lisle and downtown Naperville Metra stations.

These three study areas (Addison, Wood Dale, and Warrenville Road) are evaluated individually for transit-readiness and mobility solutions in the next section. In the Conclusion Section that follows, the three corridors are compared for their relative favorability and a framework for potential transit connectivity improvements unique to each corridor is discussed.

Previous Studies

DuPage County has completed a wide variety of transportation and transit studies on a regional and localized level. While each study has refined analysis topics, the overall goal is to increase the mobility and access to opportunities for residents and workers in DuPage. The studies discussed below highlight the wide range of efforts DuPage has completed.

The DuPage Local Circulators project was a multi-municipality coordination to help improve transit access for local residents. This plan, which was approved in 2009, would make scheduled stops throughout the participating areas. It relied on funds from both the RTA as well as the local areas. It was initially proposed to four municipalities, though only the Village of Addison and the Village of Lombard participated. The market analysis report identified potential markets for circulator service by analyzing population, employment, activity centers, commute travel patterns and potential demand.

The Addison Advantage Transit Improvements Study was a research plan put together for the Village of Addison in an attempt to better understand and expand upon current strengths. The research focused primarily on Lake Street/Route 20 corridor. There were a diverse set of recommendations but the

primary concern was making the area more accessible, increasing pedestrian use, and helping to encourage and stimulate local business. The plan was completed in July 2010 and later adopted by the Village Board. It is currently seeking funding to complete recommended improvements.

The 2016 Choose DuPage Workplace Survey funded by Choose DuPage and delivered by Jones Lang LaSalle was conducted to better understand current business conditions in DuPage as well as areas for future growth. The focus of the study was on employees in the area. Some of the questions asked were on how workers traveled to their jobs and the number one improvement requested was a change in job location or commute. The survey did find that transportation is a considerable challenge. Interestingly, 7.9% of those surveyed take public transportation to work, while 22.3% would prefer to take public transit to work.

DUPAGE SETTING

Location

DuPage County is located west of the City of Chicago and is surrounded by the counties of Cook, Will, Kendall, and Kane. It encompasses an area of 336 square miles, roughly nine percent of the total geographic area of the six-county RTA region. DuPage County is home to thirty-nine municipalities, the largest of which is Naperville, located in the southwest quadrant of the county.

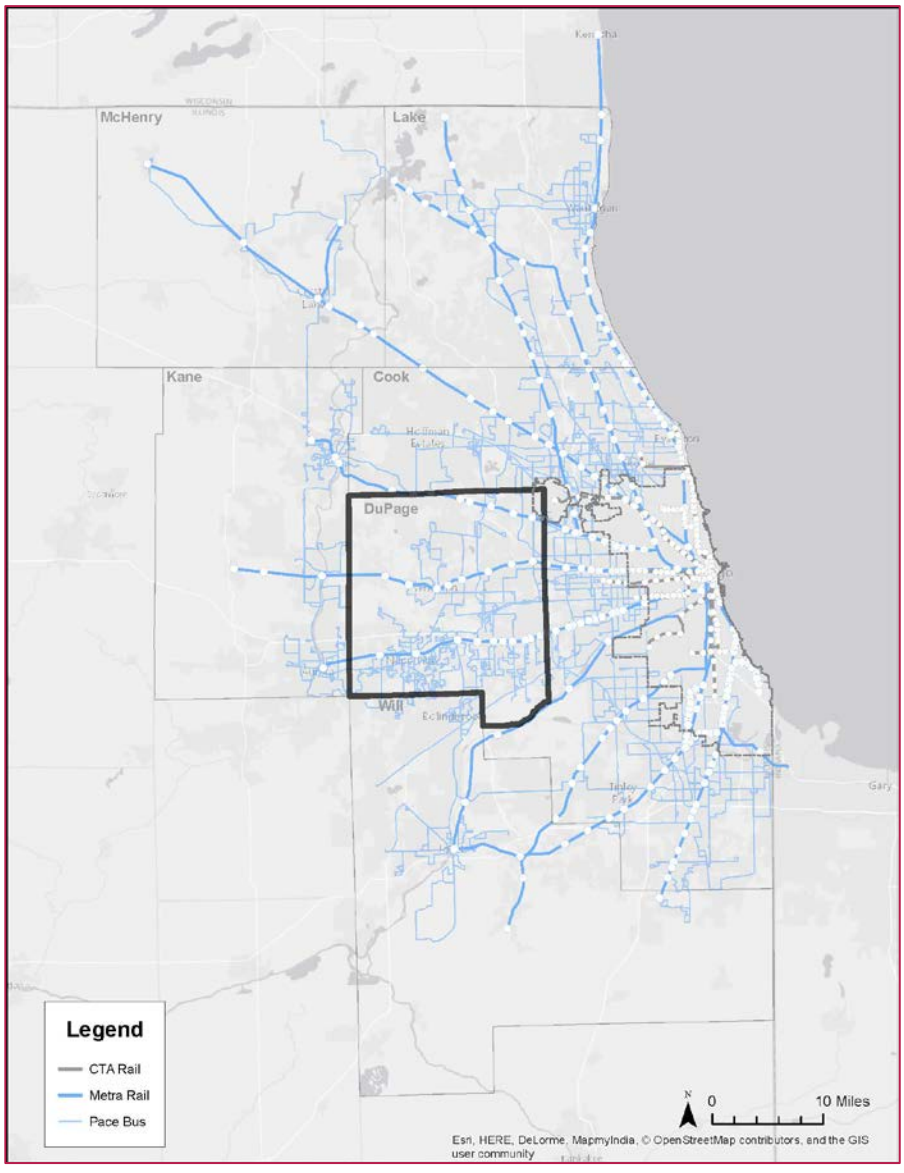


Figure 1 DuPage County regional setting

Population

Outside of Cook County, DuPage has the highest population and employment density of any county in the region. In fact, it is one of the 50 most densely populated counties in the United States. The population of DuPage County has continued to grow steadily, adding over 15,000 residents during the 5-year period ending in 2014.

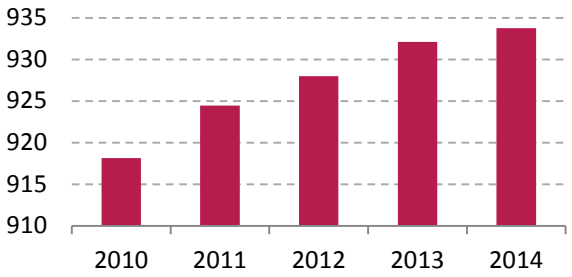


Figure 2 DuPage County residential population (thousands). Source: 2014 Census Annual Resident Estimates

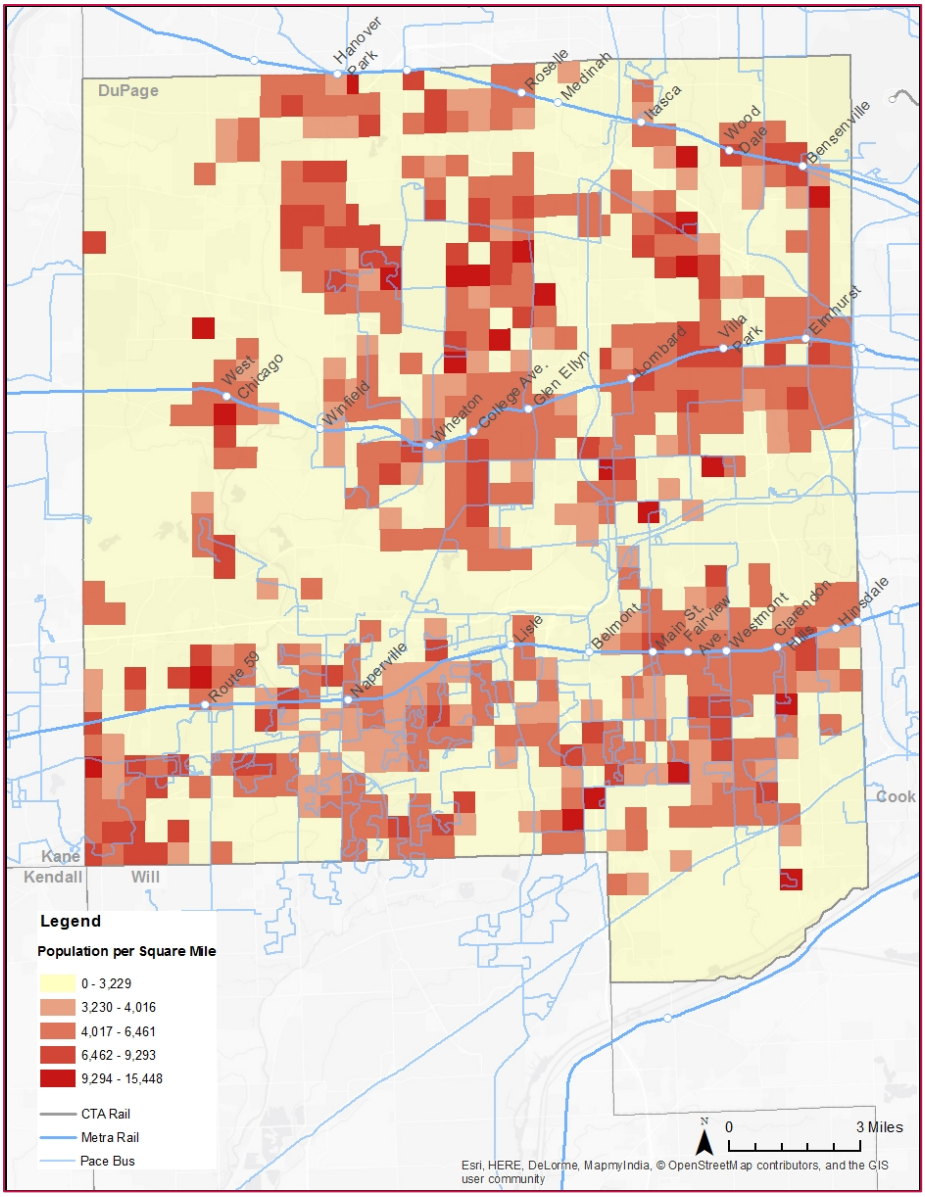


Figure 3 Population density concentrations in DuPage County

Employment

Similar to its population growth, DuPage continues to increase the number of workers it employs, adding an average of 10,000 jobs per year between 2010 and 2014. By 2014, DuPage employed 595,352 workers – nearly 80,000 more workers than reside within the county itself – making DuPage a net importer of workers.

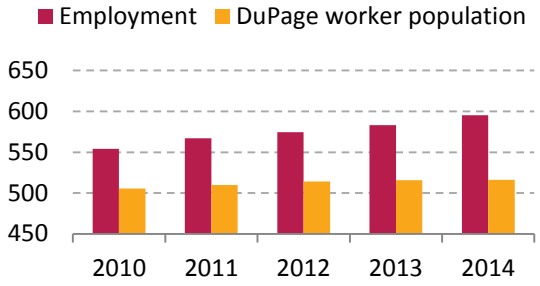


Figure 4 DuPage County employment & worker pop. (thousands). Source: Census County Business Patterns, ACS 1-year Employment Status

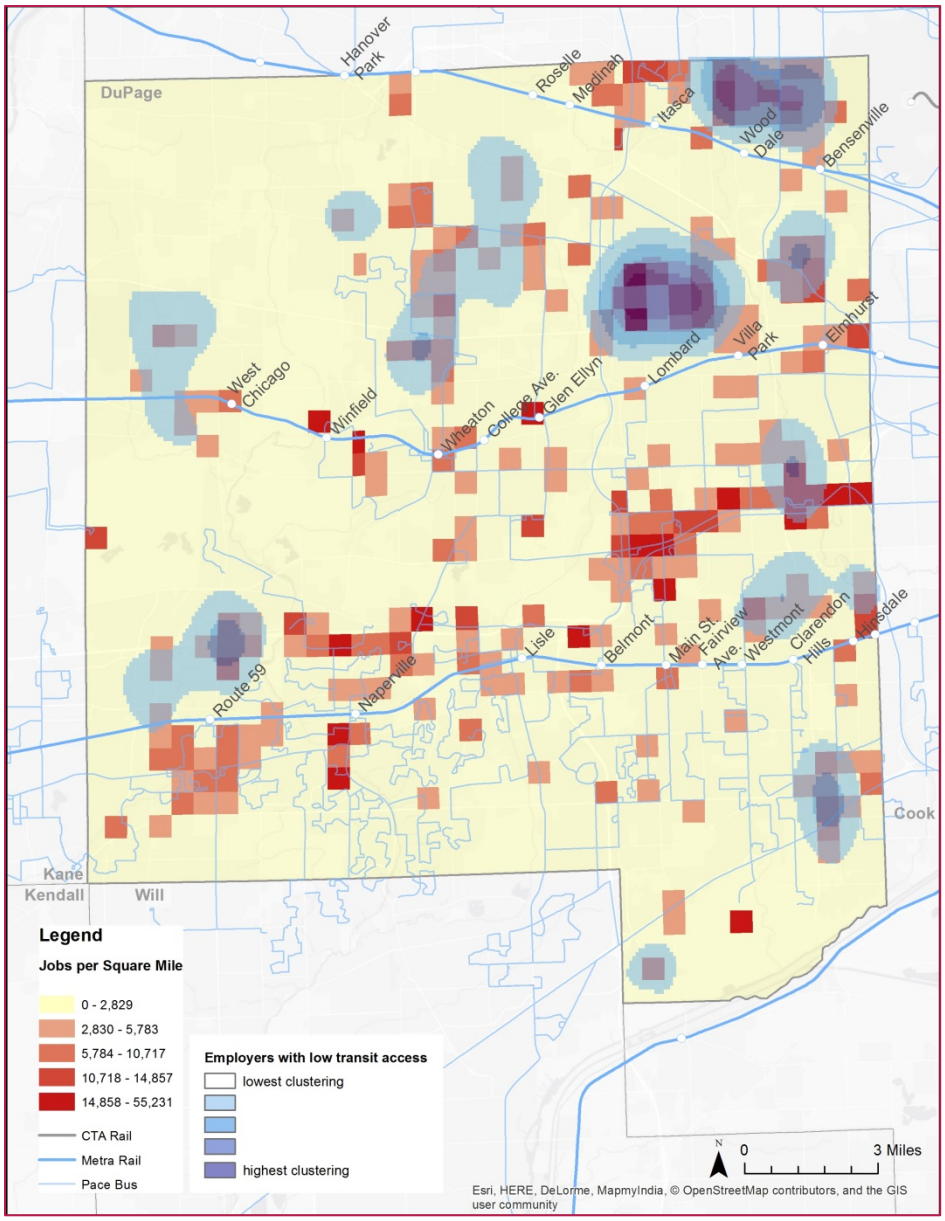


Figure 5 Employment density concentrations in DuPage County & clusters with low transit access

Worker Inflow/Outflow

The majority, 66%, of trips destined to jobs in DuPage County originate outside of the county making the county a net importer of trips. The county also exports more work trips than those that occur within the county. While residential densities are high for DuPage workers that live within the county, the residential locations for DuPage workers throughout the region are very dispersed, as shown in Figure 6 making transit connectivity challenging.

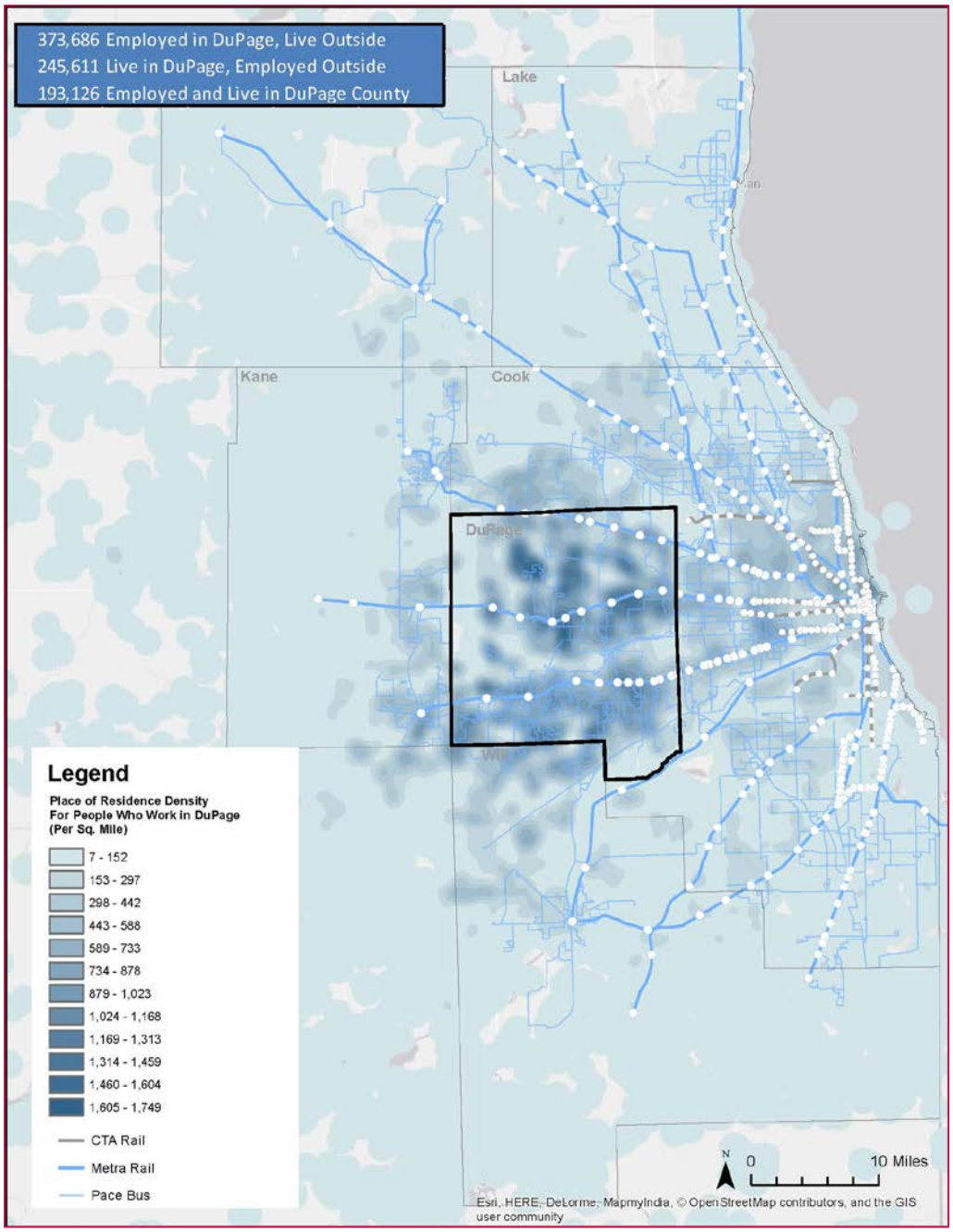


Figure 6 Place of residence concentrations for workers who work within DuPage County

Transit

Figure 7 shows Pace and Metra public transit services operated within the county. Pace's suburban bus network connects residents and workers via 63 routes that traverse the county's borders, providing approximately 16,000 average weekday passenger trips. In addition to fixed-route bus service, there is an extensive system of local Dial-a-Ride services and flexible route Call-N-Ride service in Wheaton and Winfield. Three Metra commuter rail lines traverse the county with 26 stations, providing over 36,000 average weekday passenger trips. DuPage has the 2nd highest concentration of Metra commuter rail stations in the region, after Cook County.

In part due to relatively higher densities of transit, DuPage residents use public transit as a means of commute more often compared to residents of all counties in the RTA 6-County Region other than Cook. Excluding Chicago Loop Metra stations, DuPage is home to the top three Metra stations in the region by ridership (Route 59, Naperville & Main Street Downers Grove). In fact, half of the top 10 highest ridership stations on the Metra system outside of the Loop are within DuPage's borders.

The population and employment density maps shown in Figure 3 and Figure 5 highlight how residential populations tend to be more concentrated near commuter rail, while employment densities tend to be more concentrated in areas further from commuter rail. For these reasons, DuPage County presents an interesting test-bed for a comprehensive transit connectivity pilot and has shown interest in partnering to improve transit connections in employment-rich corridors.

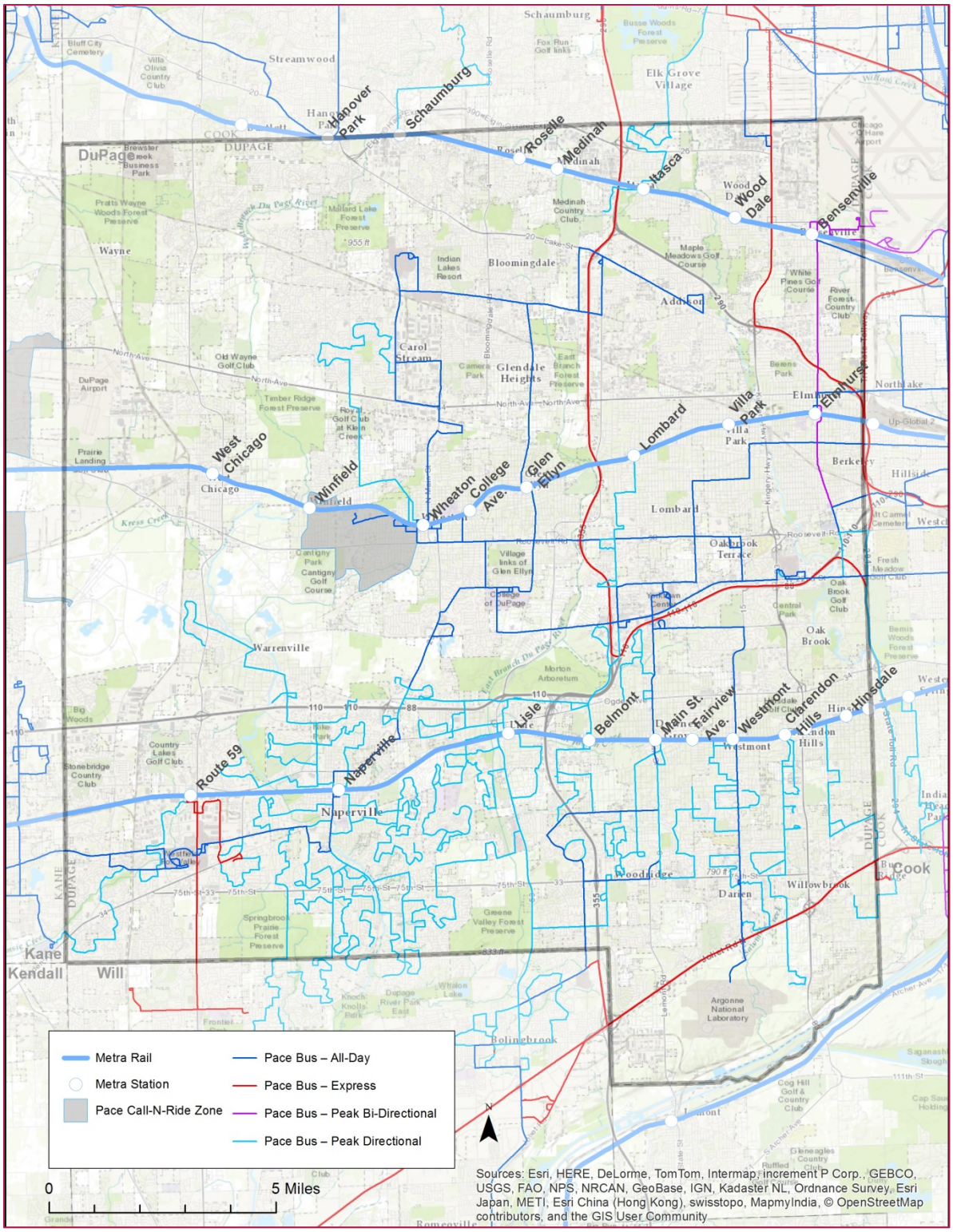


Figure 7 Transit services within DuPage

CORRIDOR ASSESSMENT

Methodology

Identifying Transit Potential Corridors

Successful transit corridors have several common characteristics. Of primary importance are a critical mass of potential riders to enable efficient operation, a physical environment conducive to walking, and travel times that are an acceptable tradeoff to those experienced by driving a personal vehicle.

Trip Density & Characteristics

Transit is most effective in areas with high concentrations of trip destinations or origins. For this reason, it is important to identify the total trips coming to an area and the potential for those trips to begin with transit based on location and demographic characteristics of the origins. Additionally, land use near transit is an important aspect in deciding what types of transit might be appropriate for an area as it directly relates to likely trip densities. RTA has developed a simple guide (Figure 8) that helps highlight land use characteristics generally needed to support specific types of transit service.

Work trip density is measured in this report using Chicago Metropolitan Agency for Planning's (CMAP) origin-destination tables. In the following section, each of the corridors are analyzed and evaluated against measures of income, vehicle availability, and transit accessibility to Metra. Land use characteristics are discussed in general terms alongside pedestrian access factors.

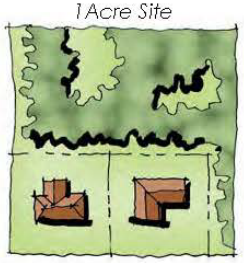
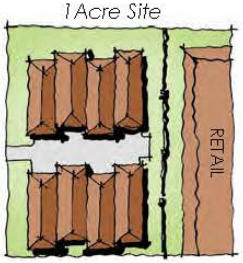
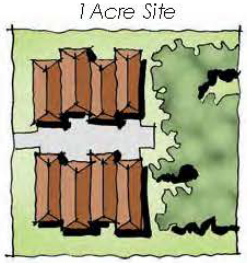
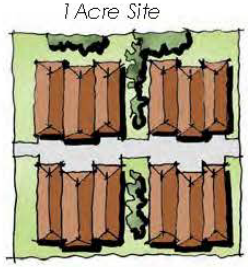
Pace Community Based Transit	Pace Fixed Route Bus	CTA Fixed Route Bus	Arterial Bus Rapid Transit	CTA Rail	Metra Commuter Rail
					
CHARACTERISTICS					
• Curb-to-curb service • Flexible routing • Short trips • Scheduled or "on demand"	• Operate on set schedules • Frequencies tailored to demand • Variety of bus sizes • Frequent stops • Operates primarily in suburbs	• Frequent service • High capacity buses • Frequent stops • Operates primarily in City of Chicago	• Frequent service • Enhanced stop and vehicle comfort • Transit priority treatments on streets and intersections.	• Frequent service all day • High capacity and speed • Dedicated right-of-way • High fixed and operating cost	• Commuter oriented • Long trip distances • High capacity and speed • Wide station spacing
OPTIMUM DENSITY NEEDED					
2 - 6 DU PER ACRE *- and/or -* ***Employment Density Varies***	**4 - 10 DU PER ACRE** *- and/or -* ***30 Employees Per Acre***	**8-14 DU PER ACRE** *- and/or -* ***75 Employees Per Acre***	**10-16 DU PER ACRE** *- and/or -* ***75 Employees Per Acre***	**14+ DU PER ACRE** *- and/or -* ***125+ Employees Per Acre***	**10+ DU PER ACRE** *- and/or -* ***Employment Density Varies***
1 Acre Site 	*1 Acre Site* 	*1 Acre Site* 	*1 Acre Site* 	*1 Acre Site* 	*1 Acre Site* 
2 DU* Per Acre	4 DU* Per Acre	8 DU* Per Acre + Retail	8 DU* Per Acre	15 DU* Per Acre + Retail	12 DU* Per Acre
EXAMPLES					
Lake-Cook Shuttle Bug; Joliet Call-n-Ride; Vanpools	Niles, Harlem Ave; Cermak Rd; Metra Connecting Services	Lawrence Ave, Chicago	Jeffery Blvd. Corridor, Chicago; several others planned	Downtown Skokie/Oakton Street Station	143rd Street Metra Station, Orland Park; Tinley Park; Arlington Heights

Figure 8 Service Comparisons. Source: RTA Setting the State for Transit Guide
https://www.rtachicago.com/files/documents/plansandprograms/landusetod/TransitGuide_Interactive.pdf

Transit Availability & Pedestrian Access

Frequency and span of both rail and bus services are important considerations in determining whether someone is likely to forego use of a personal vehicle to access a destination. These factors contribute to the general desirability of transit service. For corridors served by rail, destinations generally need to be within a half-mile of stations to provide a short enough walk for riders stepping off a train. Alternatively, connecting bus service from the station must meet the train schedule with reasonable wait times and high reliability, and provide access to within a quarter-mile of destinations. Destinations should also be safe and comfortable for walking which includes sidewalks, lower-speed roadways, highly interconnected streets, and direct access to buildings.

Transit availability is analyzed by examining existing transit services near key zones in the corridors. Pedestrian access is measured in this report using CMAP pedestrian environment factor (PEF) and aerial analysis of typical land use patterns. Additional consideration is given to location of existing transit service availability and location of large employers in the corridors.

Travel Time

Though not always the case, transit trips are likely to take longer from beginning to end than the same trip made by personal vehicle. Most people who take transit to work in the region have a commute of less than 60 minutes; whereas, most people who drive alone have a commute of less than 30 minutes (see Figure 9). Given this, transit times to work of up to 60 minutes may generally be considered reasonable, but should be compared relative to the alternative modes for similar trips. While some people are willing to accept a longer trip if they feel it is valuable to them either by saving money or making their travel time more productive, transit is likely to be most successful where the gap between personal vehicle and public transit travel times can be minimized.

Travel time is measured in this report using scheduled transit times to the corridors from existing trip origins inclusive of wait times due to transfers and transit headways. It is compared with actual drive times in traffic for the same trips. A modeled last-mile service is also measured for its potential ability to reduce the gap between transit and drive times.

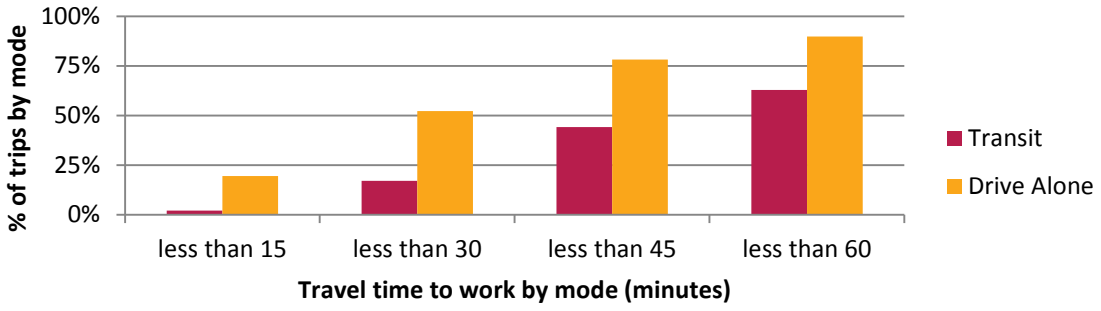


Figure 9 Six-county region travel times to work as a % of all trips by that mode.
Source: 2014 Census Journey-to-Work

Corridor Study Areas

Figure 10 displays the three corridors considered for analysis in DuPage County: Wood Dale, Addison, and Warrenville Road. Wood Dale and Addison were defined as sub-corridors of the larger Itasca-Wood Dale-Addison study area due to trip attraction concentrations. The map (Figure 10) displays densities of home-based work trip destinations for each zone in DuPage County to highlight areas that attract a high number of trips from origins throughout the Chicagoland region. Each of the three selected corridors contains zones that attract some of the highest trip densities, outside of Oak Brook.

Key Zones

In order to provide a detailed analysis at a more granular scale, key zones in each corridor were selected. These zones were chosen based on the following factors:

- Attract a relative high number of trips compared to other zones within the corridor
- High Metra capture potential (as defined below)
- Home to identified large employers or high concentrations of employers
- DuPage County staff comments

Metra Capture Potential

In order to understand the relative potential for reverse commute transit, Metra capture potential origin zones were identified for each corridor and key zones. These are origin zones with a 30 minute or less travel time to reverse commute Metra stations that serve the corridor (see Appendix 1).

Wood Dale

Located in the north east corner of DuPage County, the Wood Dale corridor contains zones that are in the following municipalities: Wood Dale, Bensenville, Itasca and Elk Grove Village. The corridor is loosely bounded by I-290 on the east, Irving Park Road on the south, Devon on the north, and O'Hare on the west. Key zones identified for this corridor are 1392 & 1397 and 1394 & 1399.

Addison

Located south of the Wood Dale corridor, the Addison corridor contains zones that are in the following municipalities: Addison, Elmhurst, Bensenville, Bloomingdale, Villa Park, Glendale Heights, and Lombard. The corridor is loosely bounded by Bloomingdale Road on the east, North Avenue on the south, Army Trail Road on the north, and York Street on the west. Key zones identified for this corridor are 1418 & 1424.

Warrenville Road

The Warrenville Road corridor is located in the southwestern portion of DuPage County and contains the municipalities of Warrenville, Naperville, Lisle, and Aurora. The corridor is bisected by I-88 and is bounded by IL-53 on the east, the BNSF on the south, Route 59 on the west, and Warrenville/Butterfield Road on the north. Key zones identified for this corridor are 1306 & 1376.

Corridor Assessment Outline

The following assessment is broken into three sections, each dedicated to one of the corridor study areas. As described above, key zones are analyzed across the factors outlined earlier that contribute to a potentially viable transit corridor. The sections are outlined in the following way:

A. Corridor Trip Density
B. Key Zone Trip Density & Characteristics[1]
C. Key Zone Transit Availability & Pedestrian Access[1]
D. Corridor Travel Time
E. Corridor Summary

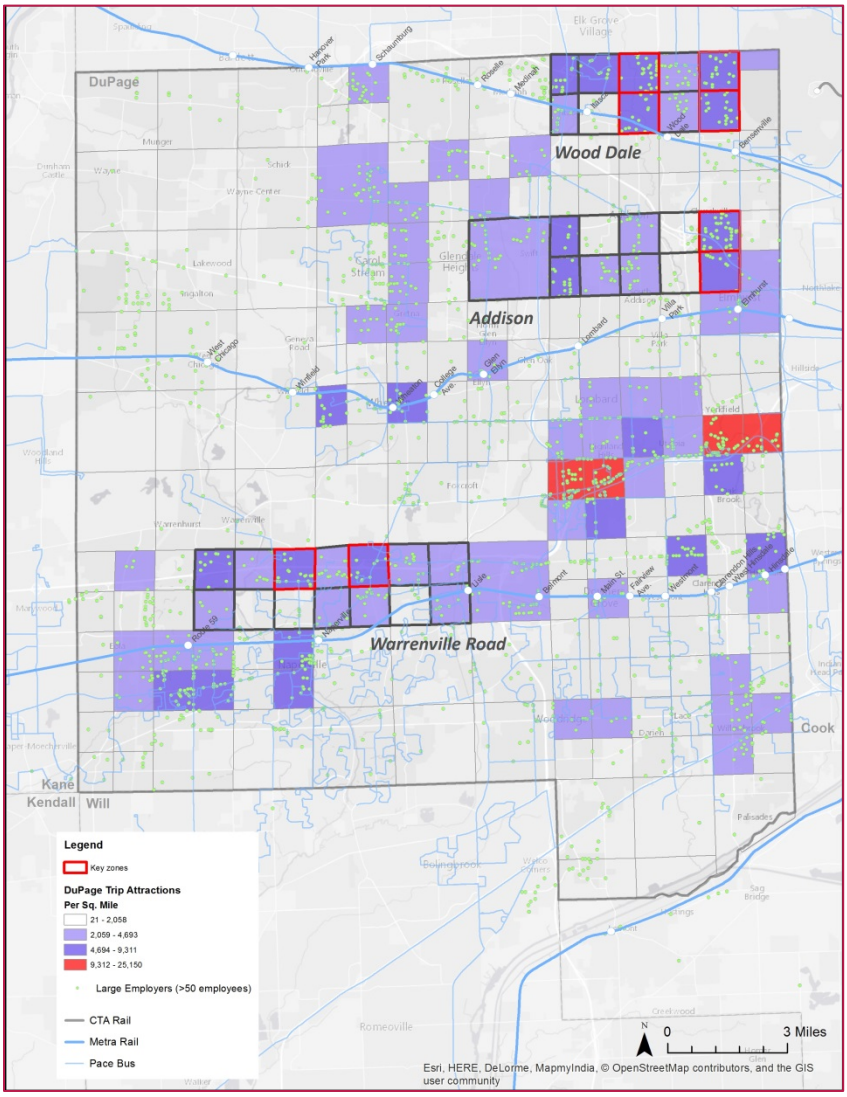


Figure 10 DuPage corridors & zones within each corridor for analysis

[1] Wood Dale has 2 groups of key zones, thus B & C are repeated for each group

Wood Dale Corridor

A. Corridor Trip Density

The Wood Dale corridor attracts 73,441 work trips from throughout the region. High densities of trip origins are clustered from surrounding areas in northern DuPage County, northwest and western portions of Cook County. Many of these origin zones are located along Metra's Milwaukee District West (MD-W) line.

The Wood Dale corridor is adjacent to the new Elgin-O'Hare Western Access Tollway. In addition, Pace is currently evaluating service concepts for the proposed "J Route." This corridor is densely occupied by smaller light manufacturing and industry in business parks, and not large campus style developments. Many of the businesses are located off of major arterials on smaller roads difficult to serve by traditional fixed route bus service. The corridor is also adjacent to the O'Hare International Airport and contains many supporting industries.

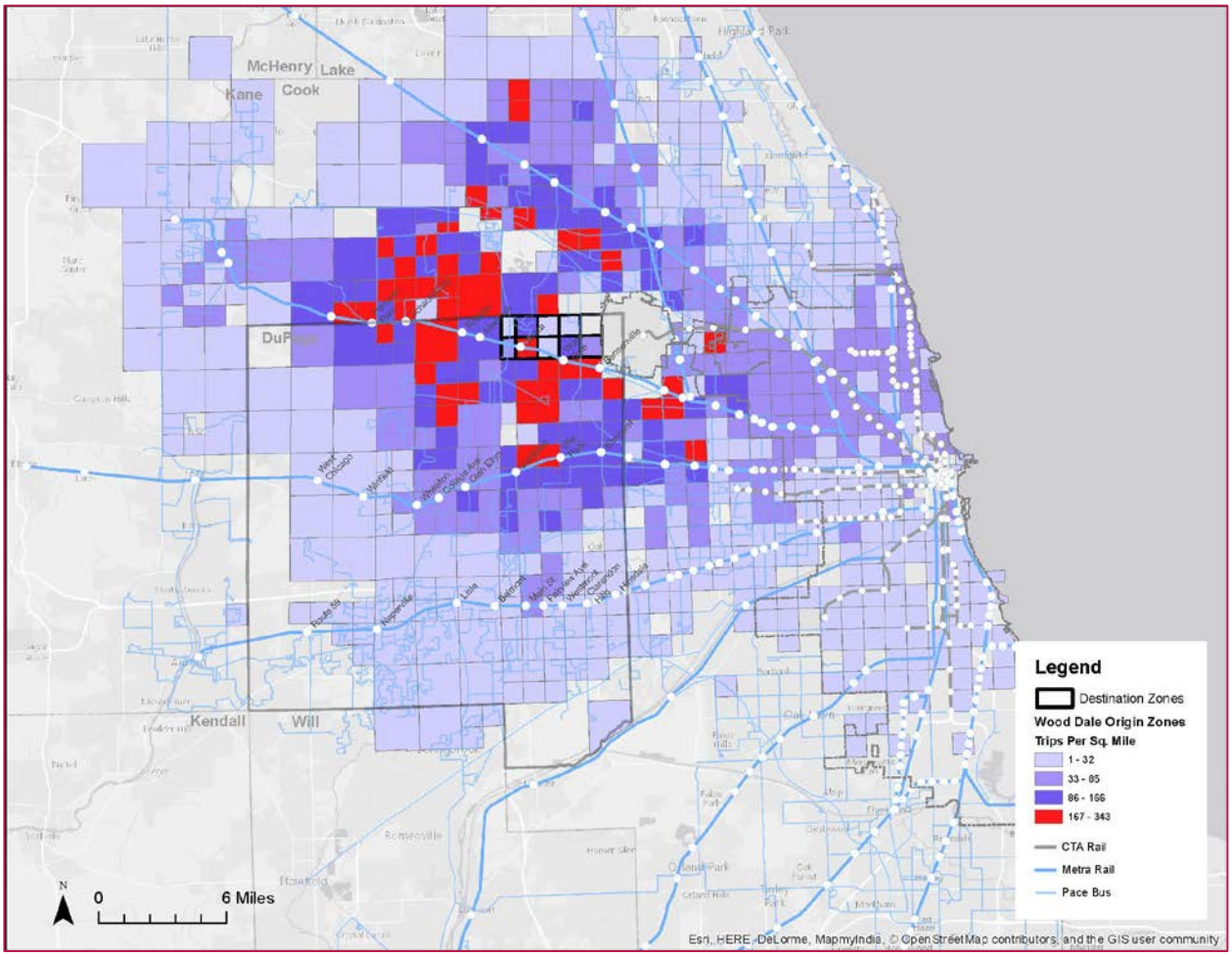


Figure 11 Density of trip origins to Wood Dale corridor

Metra Capture Potential

The Wood Dale corridor has a Metra capture potential (as defined on page 16) of 7.6% of total trips. The corridor is served by the Metra Milwaukee District West Line (MD-W) with nearby stations of Bensenville, Wood Dale, and Itasca. Zones with the highest originating trip densities are located just outside of the Chicago city boundary near River Grove and Franklin Park with the exception of one zone in the northwest side of the city.

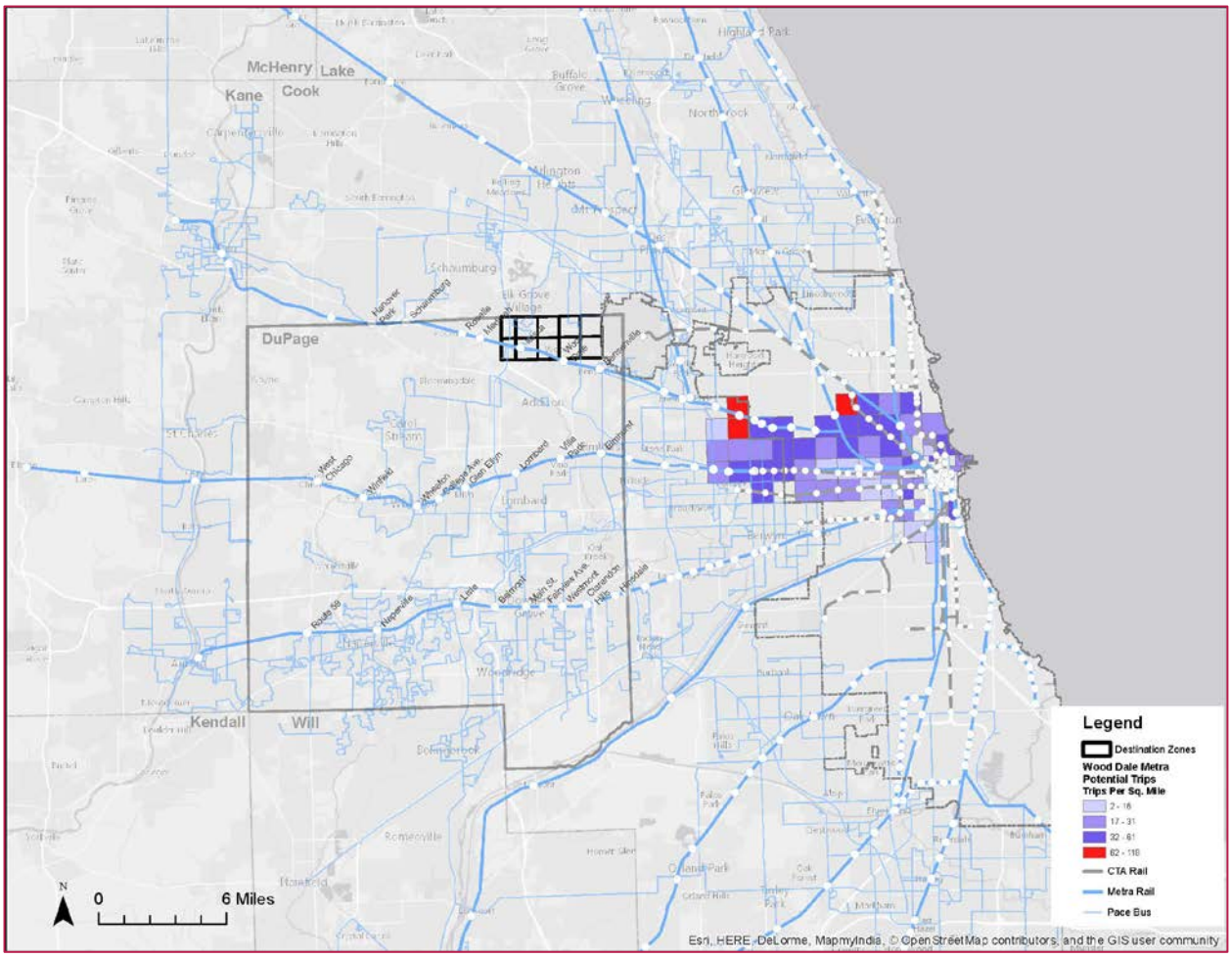


Figure 12 Density of trip origins to Wood Dale corridor – from Metra capture potential origins

B1. Key Zone Trip Density & Characteristics (1392 & 1397)

Zones 1392 and 1397 attract a similar number of trips from zones throughout the region at 10,025 and 10,608, respectively. These key zones attract trips spatially dispersed similar to the corridor as a whole: from northern DuPage County, and northwest and western portions of Cook County. The majority of high trip origin density zones are located northwest of the destination zone in northwestern Cook County. The origin zone dispersion has a northwest/southwest trip making orientation. There are adjacent zones in DuPage County that are also high trip origin densities. Large employers in these zones include VideoJet, CH Robinson Freight, Continental Web Press, and AAR International.

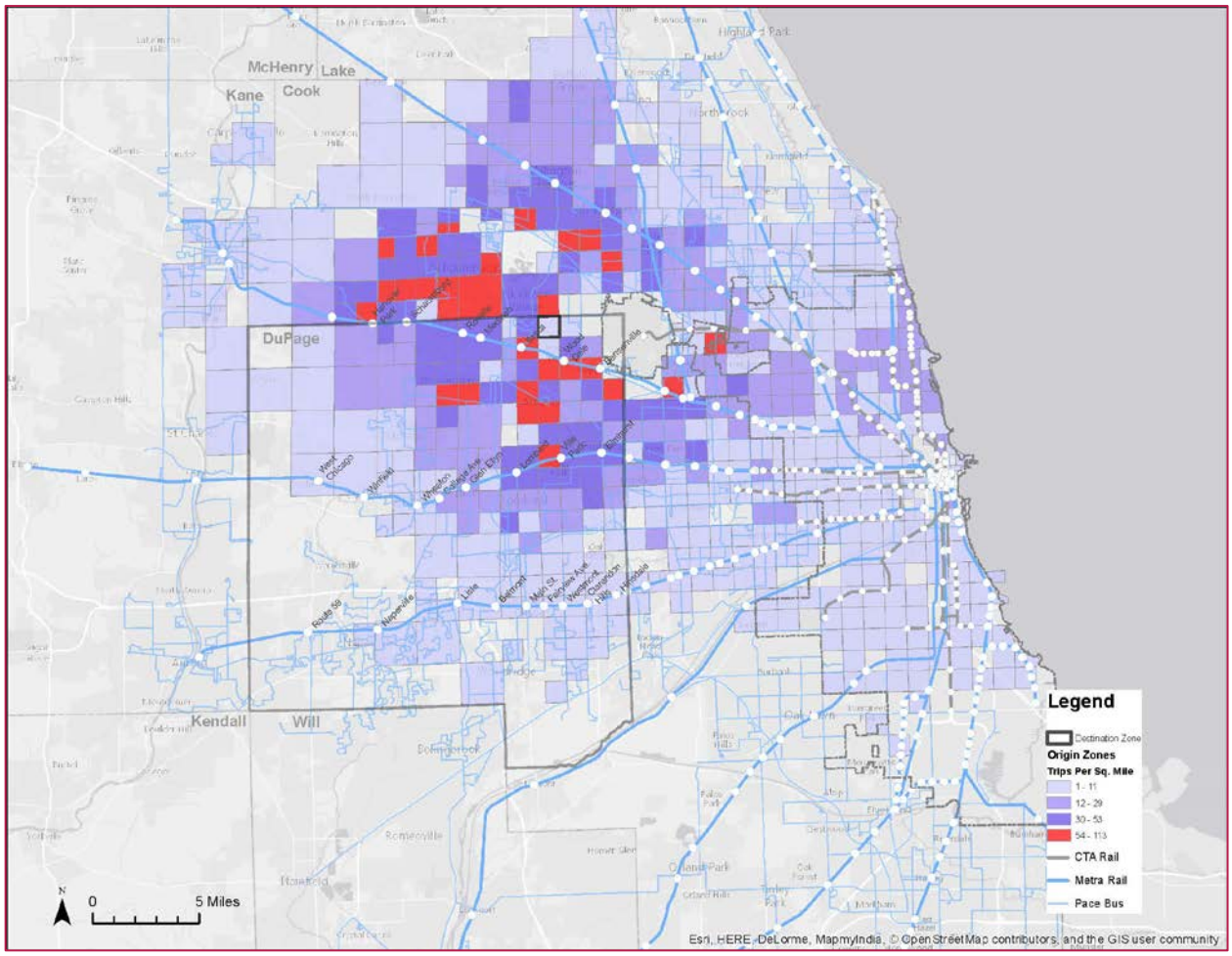


Figure 13 Density of trip origins to zone 1392

Demographics

Trip origin zones destined to key zones 1392 and 1397 have similar demographics. Generally, the highest producers of trips to these key zones originate from areas of greater than or average income and a low ratio of zero vehicle households, as shown in Figure 14. The zones directly north of the Chicago central business district produce a moderate number of trips to the destination zone and have above average wages and high rates of zero vehicle households.

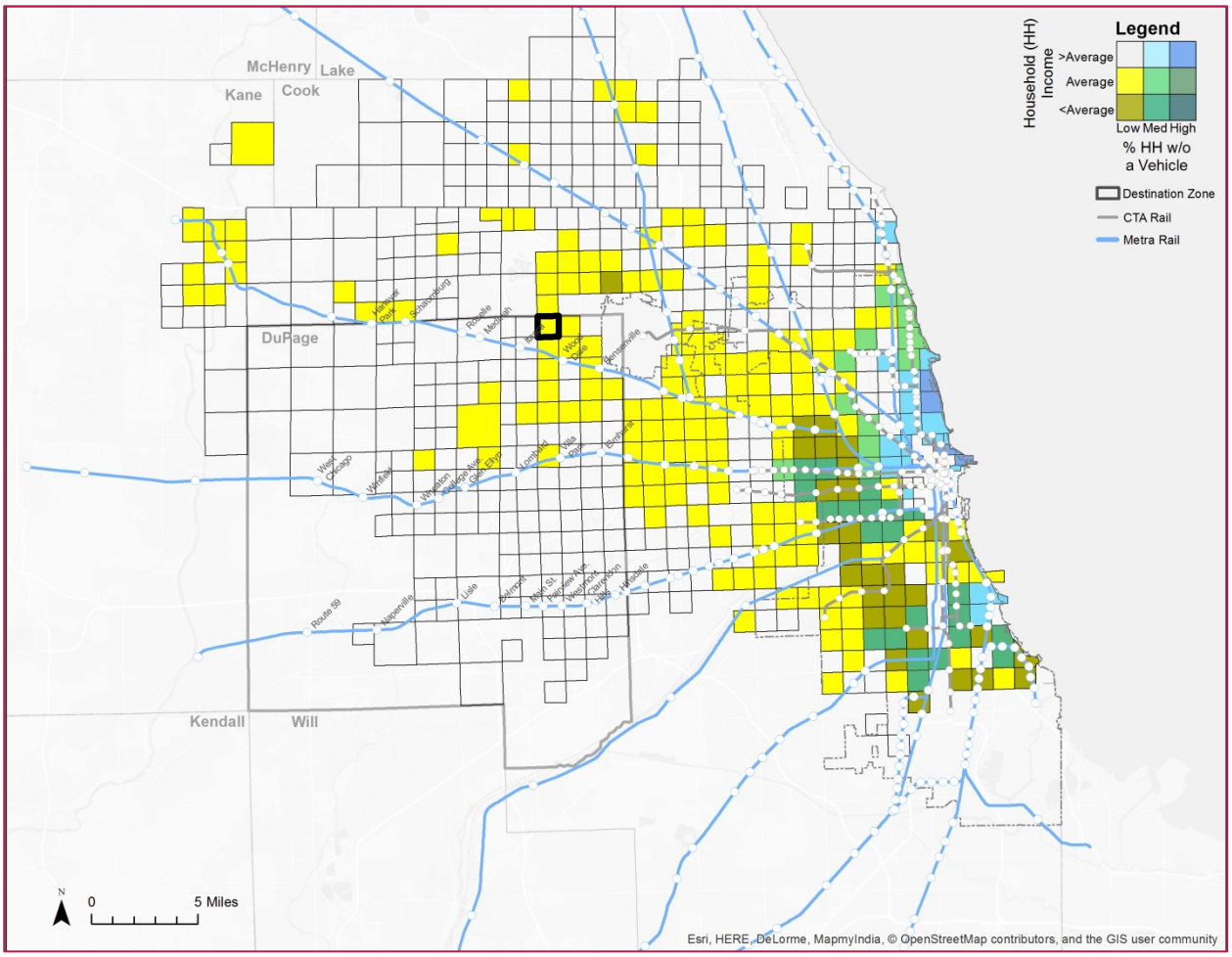


Figure 14 Demographics of origins zones to zone 1392

Metra Capture Potential Trips

Zones 1392 and 1397 have a similar Metra capture potential (as defined on page 16) of 7.4% and 6.9%, respectively. These trips are primarily originating from the northwest side of Chicago, with the highest origin densities near River Grove and Franklin Park.

When compared to Figure 14 it is evident that the majority of origin zones that produce a relative high density of trips to the key zones have average income and a low ratio of zero vehicle households.

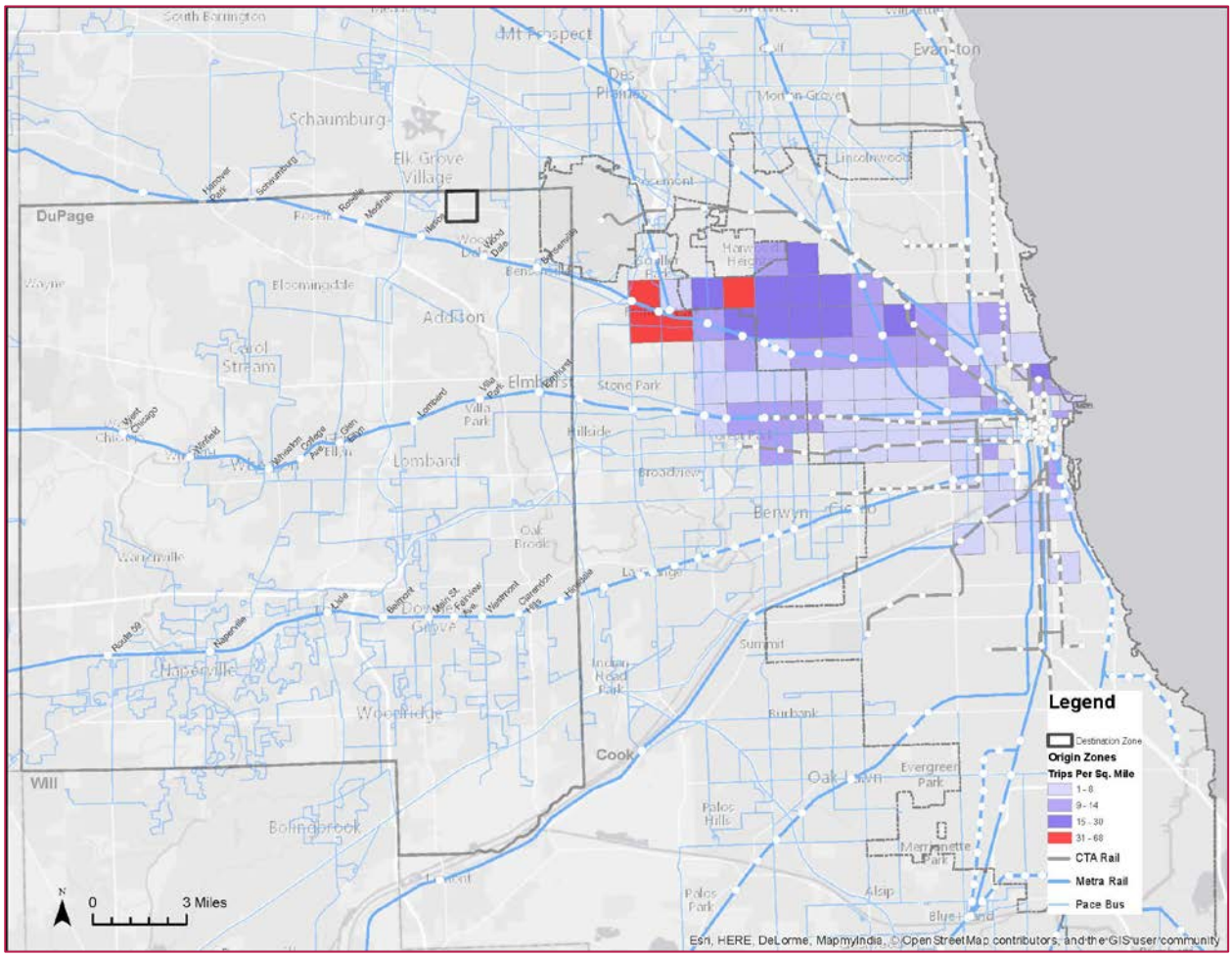


Figure 15 Density of trip origins to zone 1392 – from Metra capture potential origins

C1. Key Zone Transit Availability and Pedestrian Access (1392 & 1397)

Zone 1392

Zone 1392 does not have any transit services directly serving it. However, Pace routes 223 and 616 provide 10 and 30 minute weekday peak service, respectively, within a ½ mile of the zone's boundary. Route 223 also provides midday and weekend service, connecting to the CTA Blue Line station at Rosemont which connects to some of the trip origins shown in Figure 15. The zone is just over a mile from the nearest Metra Milwaukee District-West stations at Itasca and Wood Dale.

The zone has a below average pedestrian environment overall, characterized by large blocks and winding roads. Roads that lead to employer entrances generally do not have sidewalks. Buildings are low-rise and have large footprints with moderate land area dedicated to surface parking facilities.

Employment is concentrated on the eastern side of the zone and spills over into neighboring zones to the east and south.

Table 1 Transit services near zone 1392

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
616	M-F	Peak only	30 / ---	13
223	Daily	5am – 1am	10 / 60	117
MDW	Daily	5am – 1am	30 / 60	48

Zone 1397

Zone 1397 does not have any transit services directly serving it. However, Pace route 616 provides 30 minute peak service within a ½ mile of the zone's boundary. The zone is about a quarter-mile from the Wood Dale Metra stop along the Milwaukee District-West Line and just under one mile of the Itasca stop.

The zone has a below-to-average pedestrian environment overall, characterized by large blocks and winding roads. Roads that lead to employer entrances generally do not have sidewalks, but sidewalks are more built out in the southwest quadrant near retail businesses. Buildings are low-rise and have large footprints with moderate land area dedicated to surface parking facilities.

Employment is spread between the northeast and southwest quadrants of the zone.

Table 2 Transit services near zone 1397

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
616	M-F	Peak only	30 / ---	117
MDW	Daily	5am – 1am	30 / 60	48

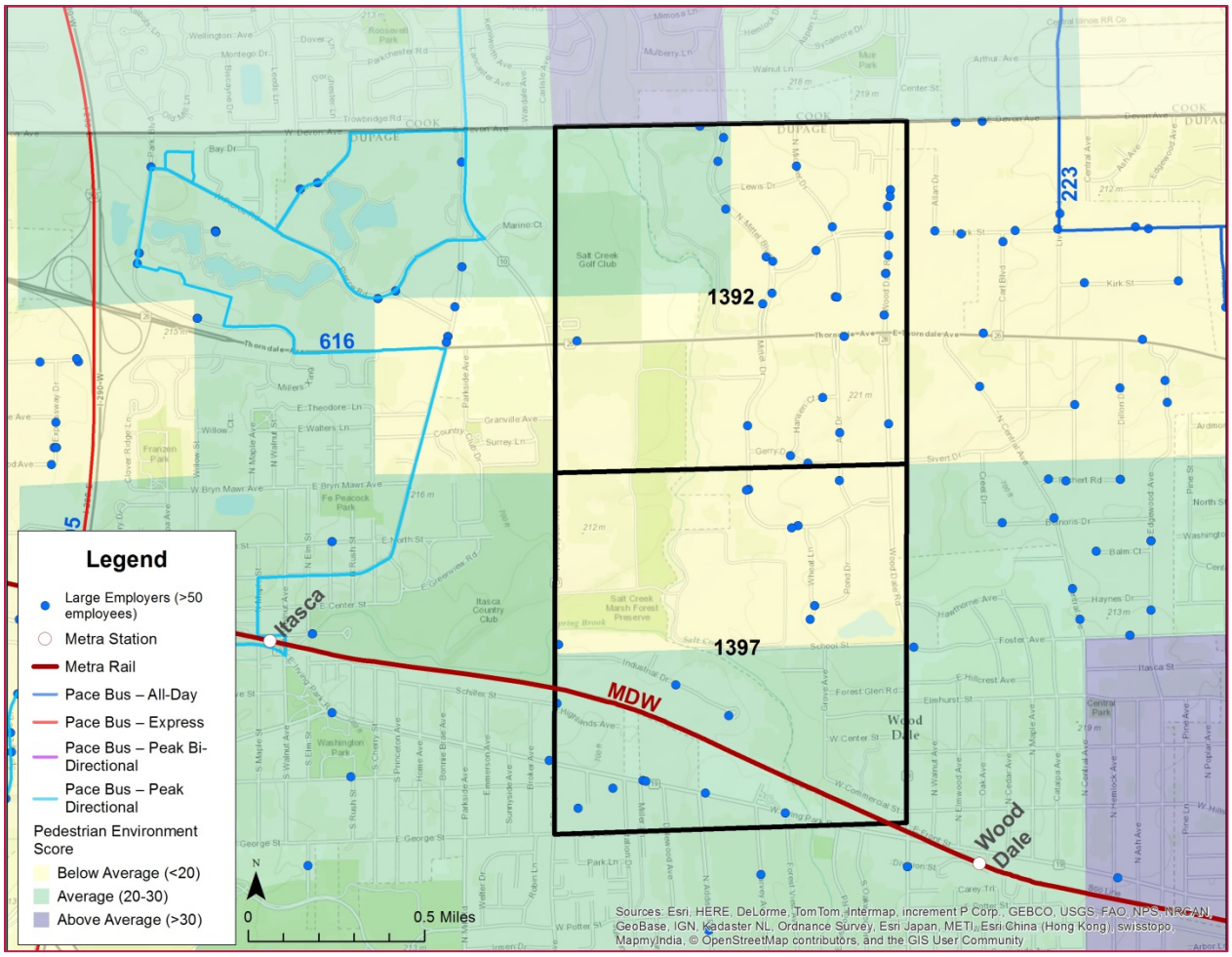


Figure 16 Transit, pedestrian environment, and large employers in zones 1392 & 1397

Figure 17 3D Aerial of typical development in zones 1392 & 1397

B2. Key Zone Trip Density & Characteristics (1394 & 1399)

Neighboring O'Hare, zones 1394 and 1399 attract a similar number of trips from zones throughout the region at 10,279 and 9,548 trips, respectively. These zones attract trips from zones spatially dispersed similar to that of 1392 and 1397: from northern DuPage County, and northwest and western portions of Cook County. The origin zone dispersion also has a northwest/southeast trip making orientation. However, these key zones have higher trip origin densities located in areas to the east near the city of Chicago boundary, likely due to proximity. Home to the O'Hare Metropolitan Industrial District, the majority of the employers identified in these key zones have between 50 to 100 employees and are smaller in employee size than key zones 1392 and 1397.

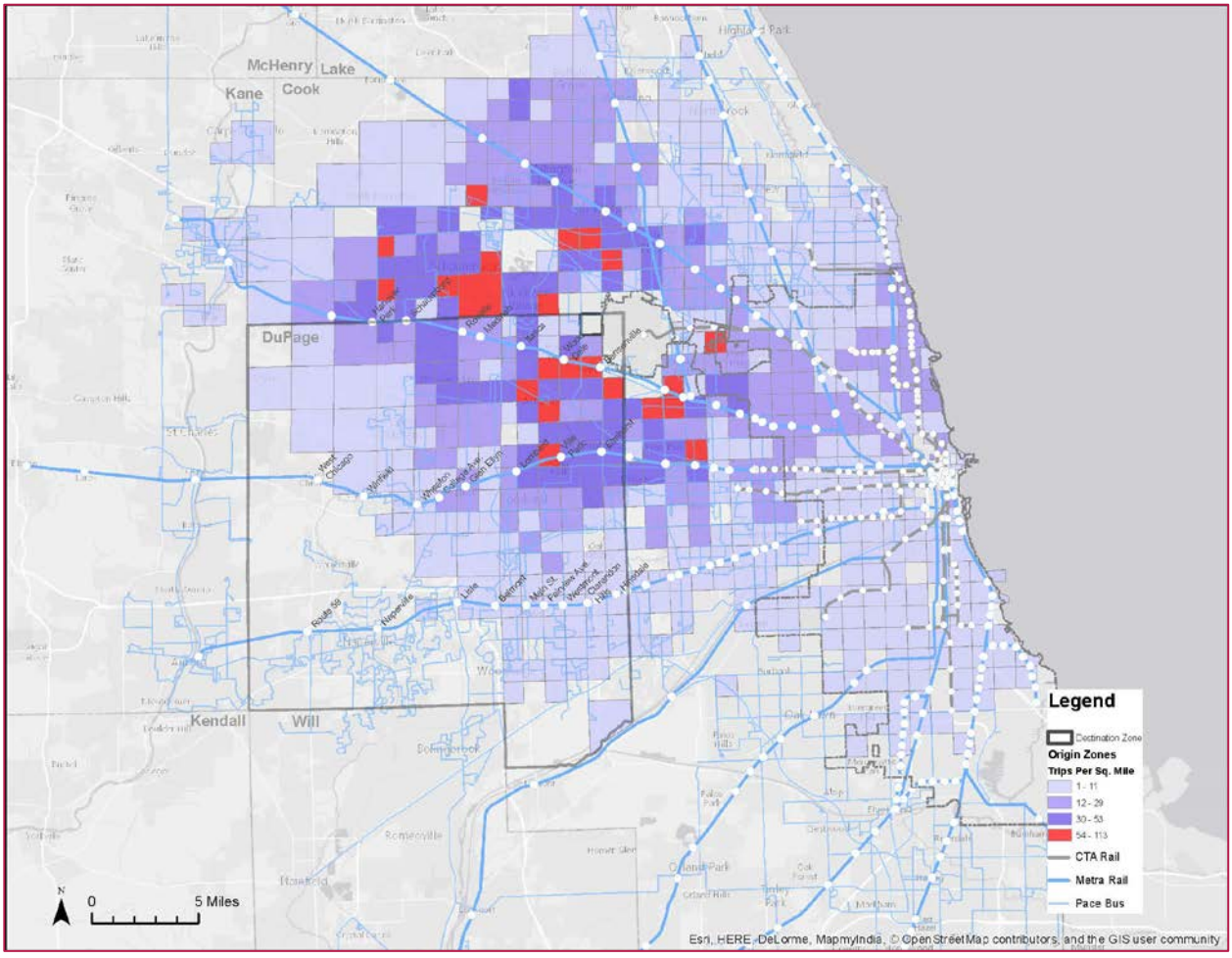


Figure 18 Density of trip origins to zone 1394

Demographics

The demographic analysis of origin zones destined to key zones 1394 and 1399 are consistent with that of zones of 1392 and 1397. Generally, the highest producers of trips to zones 1394 and 1399 originate from areas of greater than or average income and a low ratio of zero vehicle households, as shown in Figure 19. The demographic analysis of origin zones does highlight two areas which produce a moderate amount of trips to the corridor: one directly north of Chicago and one towards the southwest and south. The zones directly north of the Chicago central business district have above average wages with high rates of zero vehicle households. The zones southwest and south of Chicago have below average income with medium rates of zero vehicle households.

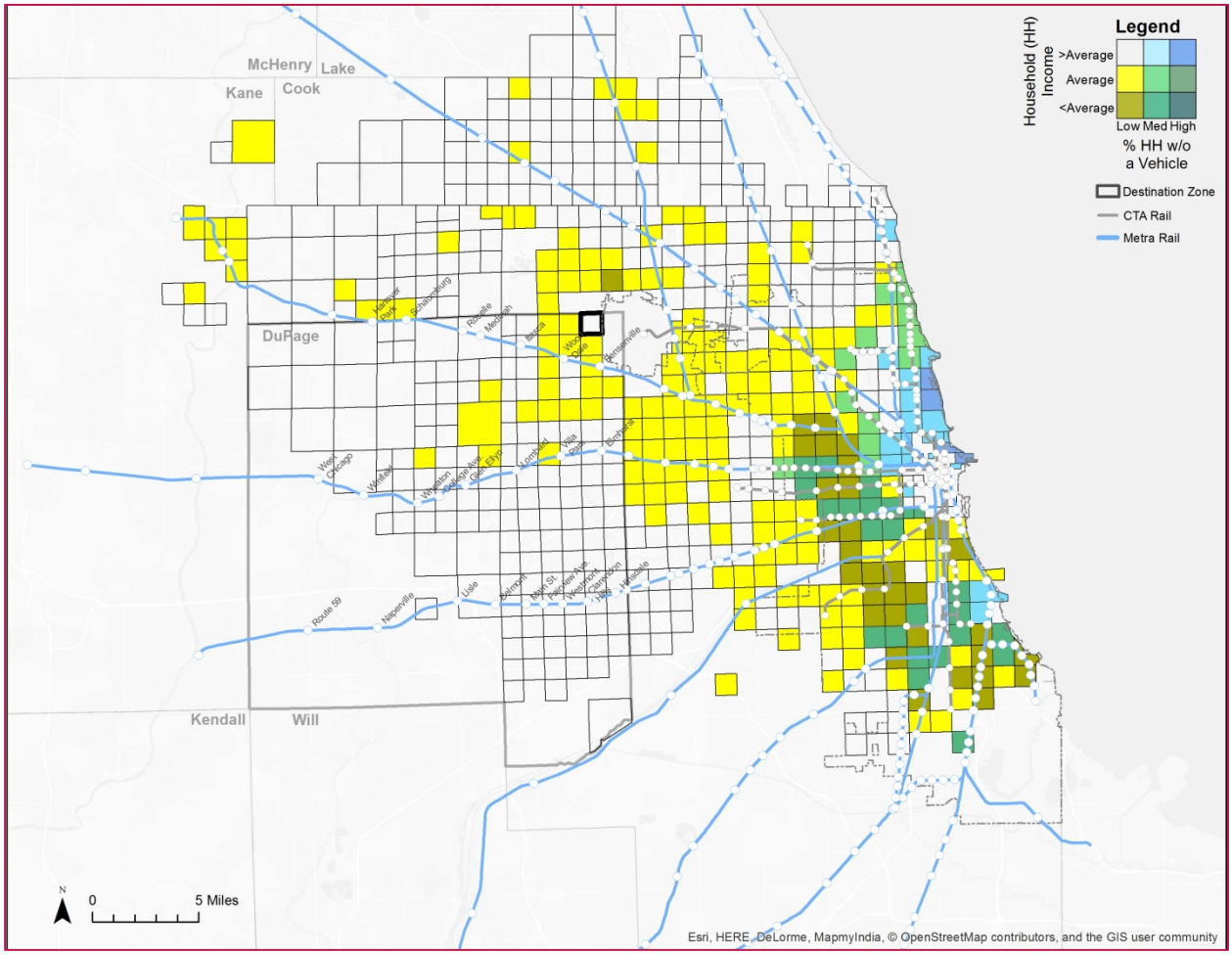


Figure 19 Demographics of origins zones to zone 1394

Metra Capture Potential

Zone 1394 and 1399 have a similar Metra capture potential (as defined on page 16) of 9.5% and 10.2%, respectively, from similarly dispersed origin zones. These trips primarily originate from the northwest side of Chicago, with the highest origin densities near River Grove and Franklin Park.

When compared to Figure 19 it is evident that the majority of origin zones that produce a relative high density of trips to the key zones have average income and a low ratio of zero vehicle households.

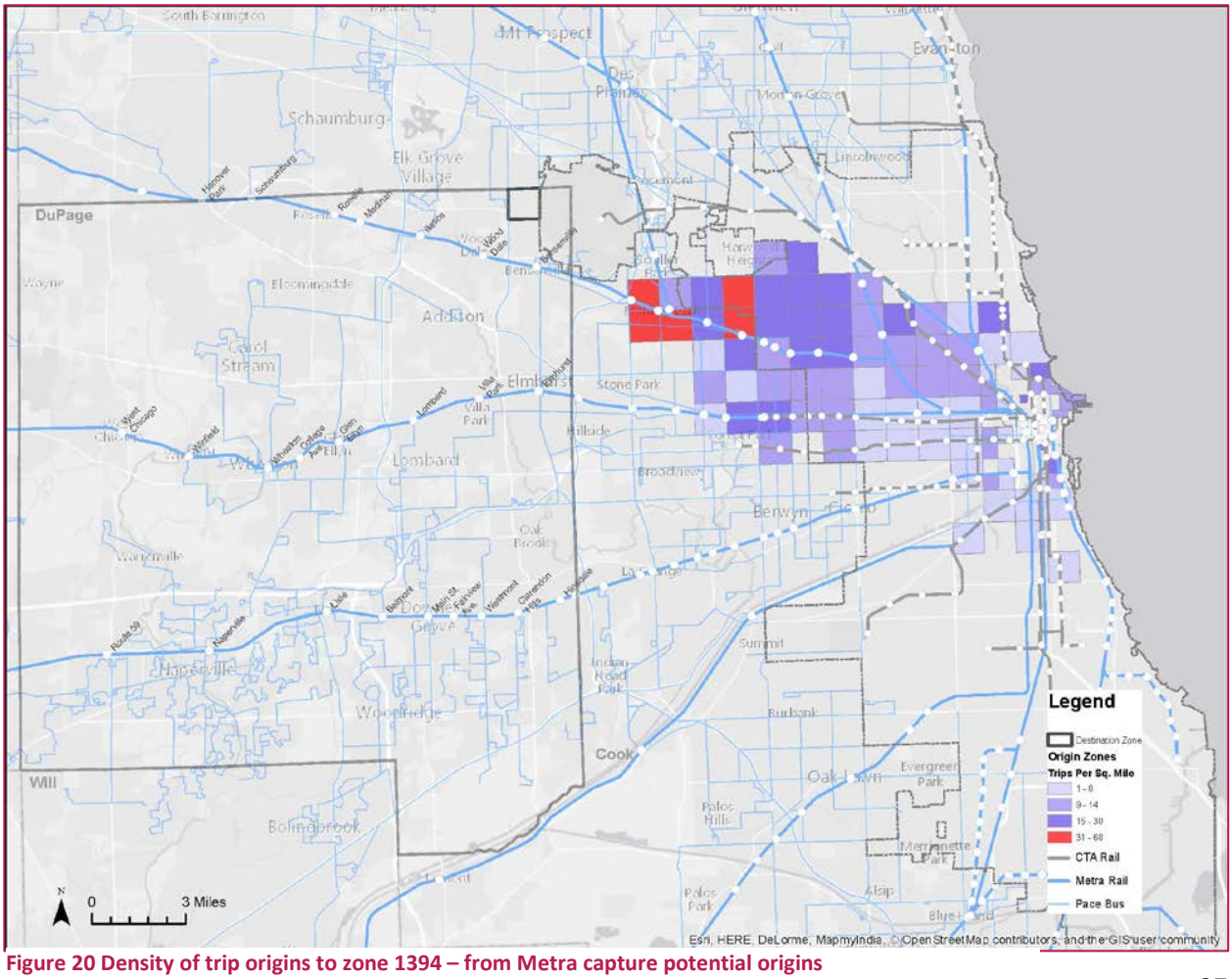


Figure 20 Density of trip origins to zone 1394 – from Metra capture potential origins

C2. Key Zone Transit Availability and Pedestrian Access (1394 & 1399)

Zone 1394

Zone 1394 is directly served by Pace routes 223 and 757 along its western border. During weekday peak periods, these routes provide 10 and 30 minute service respectively and 223 provides additional midday and weekend service. The zone is about a mile-and-a-half from the Bensenville and Wood Dale Metra stops along the Milwaukee District-West Line.

The zone has a below average pedestrian environment, characterized by large blocks. Many of the roads that lead to employer entrances do have sidewalks, but the road geometry makes traversing the zone difficult. Buildings are low-rise and have small to large footprints.

Employment is scattered throughout the zone with similar levels of employment in zones to the south and west. O'Hare International Airport abuts the eastern edge of the zone.

Table 3 Transit services near zone 1394

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
223	Daily	5am – 1am	10 / 60	117
757	M-F	Peak only	30 / ---	10
MDW	Daily	5am – 1am	30 / 60	48

Zone 1399

Zone 1399 is directly served by Pace route 757 along its western border. During weekday peak periods, route 757 provides 30 minute service to the western half of the zone. Pace route 332 also provides weekday peak service to within a ¼ mile of the zone's southern boundary. The zone is about a half-mile from the Bensenville and Wood Dale Metra stops along the Milwaukee District-West Line.

The zone has a below average pedestrian environment overall, characterized by large blocks broken up by rail lines. Many of the roads that lead to employer entrances do not have sidewalks, and the road geometry makes traversing the zone difficult. Buildings are low-rise and have large footprints.

Employment is scattered throughout the zone and with similar levels of employment in zones to the north and west. O'Hare International Airport abuts the eastern edge of the zone.

Table 4 Transit services near zone 1399

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
332	M-F	Peak only	60 / ---	21
757	M-F	Peak only	30 / ---	10
MDW	Daily	5am – 1am	30 / 60	48

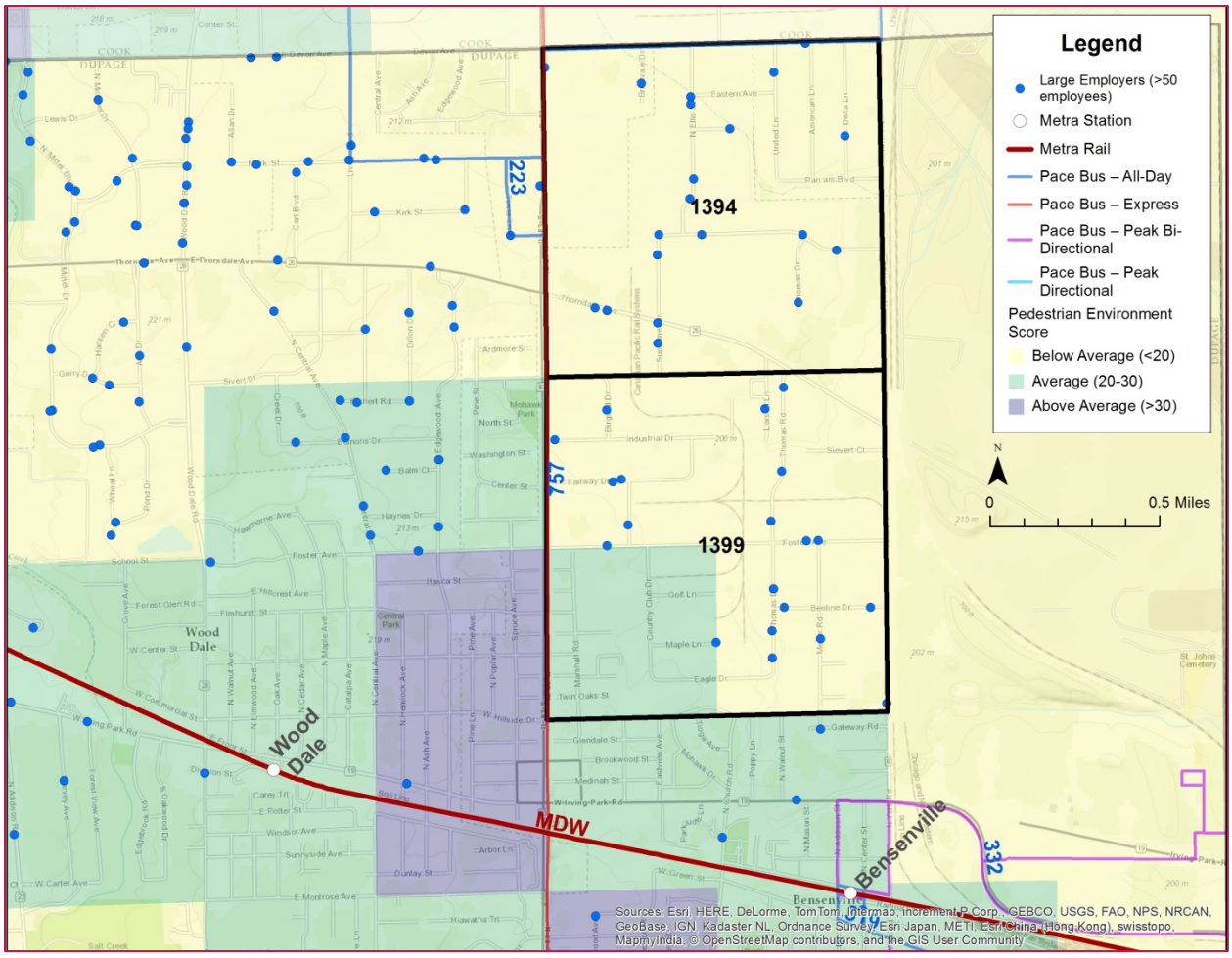


Figure 21 Transit, pedestrian environment, and large employers in zones 1394 & 1399

Figure 22 3D Aerial of typical development in zones 1394 & 1399. Source: 2016 Google Maps

D. Corridor Travel Time

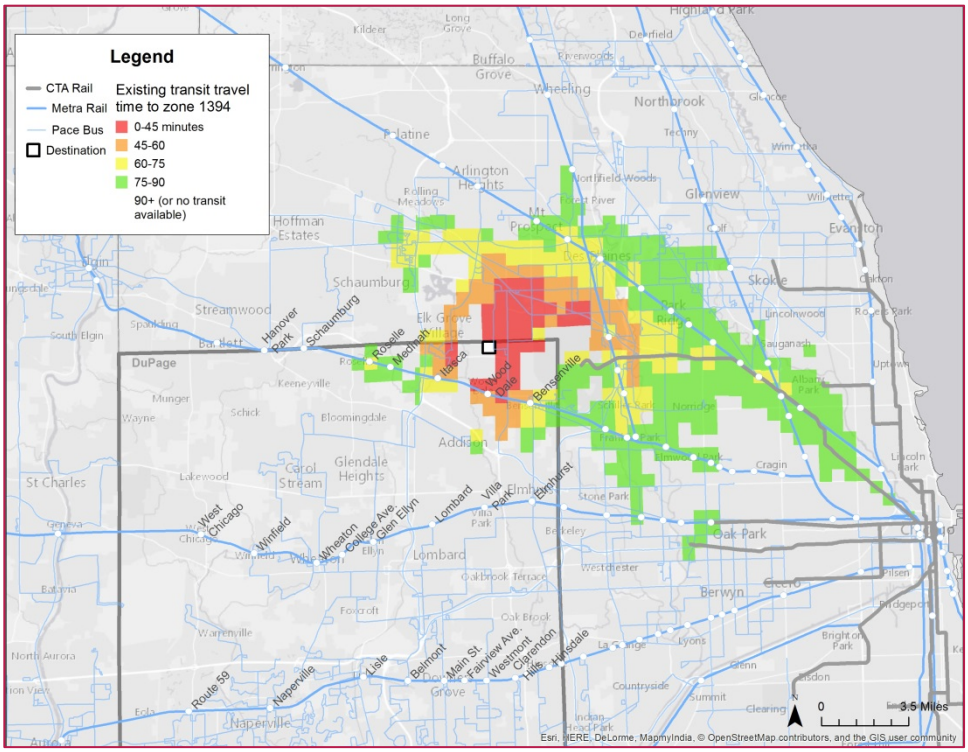


Figure 24 Existing transit travel times to the Wood Dale corridor

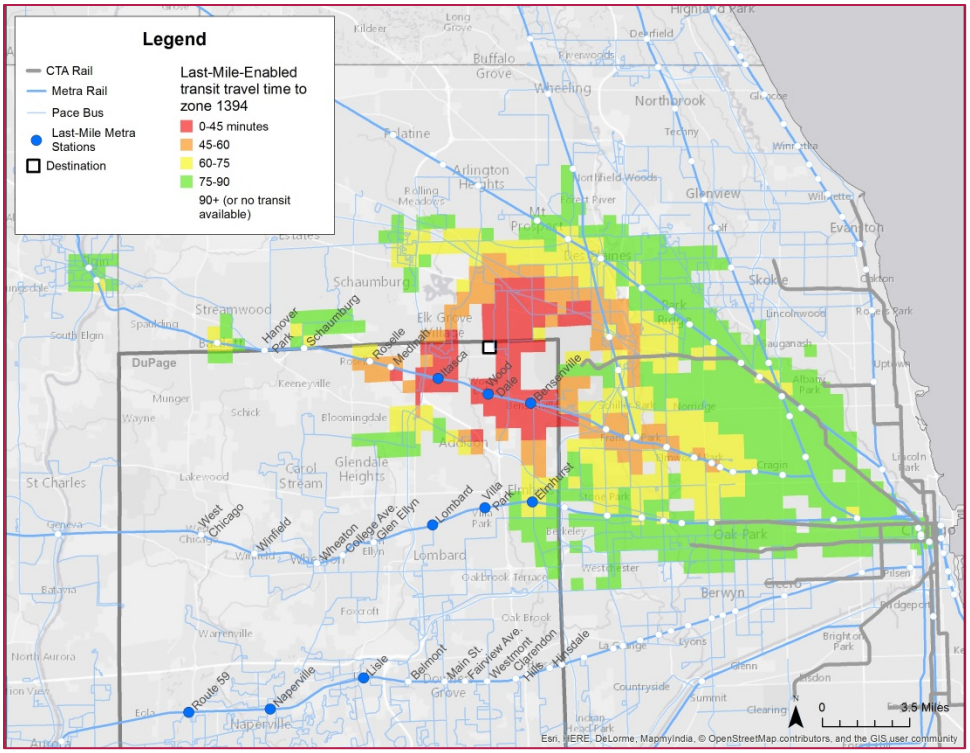


Figure 23 Potential transit travel times to the corridor with a comprehensive last-mile service from nearby Metra stations

The Wood Dale corridor can be accessed within a reasonable travel time of less than 60 minutes on transit from areas directly surrounding it and to the northeast as shown in Figure 23. O'Hare International Airport is a significant barrier for access to the corridor from the east, reducing the geographic area that has access to the corridor in a shorter period of time. And, the western portion of the corridor does not have walk access to transit facilities, creating a gap directly to the west as well. However, service from the northeast connects to the Rosemont Blue Line station, which provides 75 to 90 minute access to the corridor from locations all along O'Hare branch of the Blue Line, stretching almost into the Chicago central business district.

The addition of a comprehensive last-mile transit service at Bensenville, Wood Dale, and Itasca Metra stations results in an increase in geographic access to the corridor as shown in Figure 24. New access is the result of quicker connections via reverse commutes along the Milwaukee District West Metra line. Large areas of northwest Chicago, west Chicago, and municipalities of western suburban Cook County gain transit access to the corridor. Figure 25 highlights potentially significant transit travel time reductions between 15-30 minutes in these connecting corridors with added last-mile service.

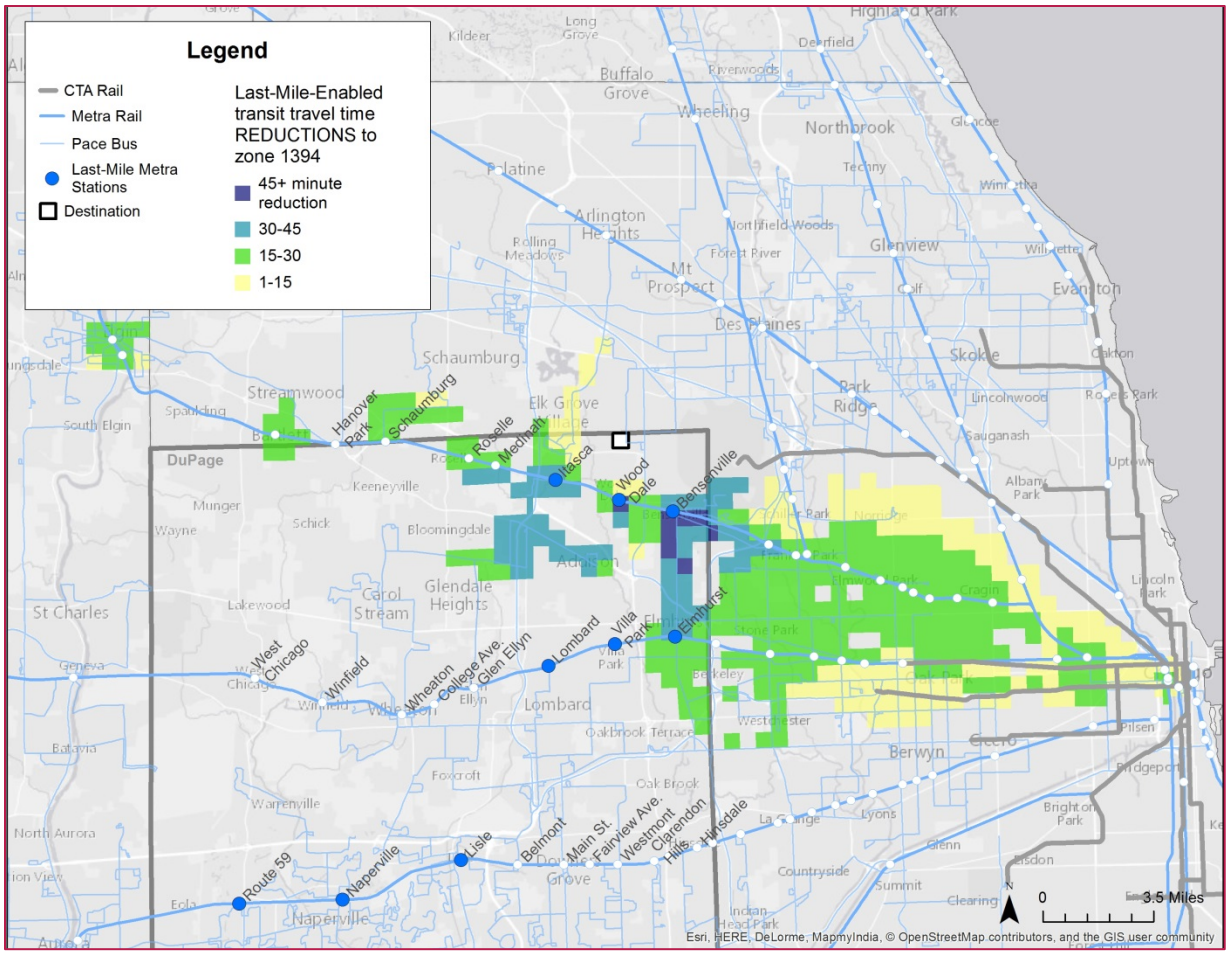


Figure 25 Potential reductions in transit travel time to the corridor with a comprehensive last-mile service from nearby Metra stations

E. Corridor Summary

Trip Density & Characteristics

Each of the key zones in the Wood Dale corridor attracts a relatively similar number of trips and has homogenous trip origin demographics as shown in Table 5. Table 6 shows Metra capture potential shares are highest for key zone combination of 1394 and 1399.

Table 5 Wood Dale trips and origin characteristics - all trips

Zone	Total Trips Attracted	% of households with zero vehicles	% of working age population* ages 21-34 (Millenials)	% of households below poverty line
1392	10,025	4.4%	32.8%	9.4%
1397	10,608	4.0%	32.5%	9.4%
1394	10,279	4.8%	32.8%	9.9%
1399	9,548	4.9%	32.6%	9.9%

Table 6 Wood Dale trips and origin characteristics - Metra capture potential origins

Zone	% of All Trips Attracted that are within Metra Capture	% of households with zero vehicles	% of working age population* ages 21-34 (Millenials)	% of households below poverty line
1392	7.4%	12.4%	39.8%	15.4%
1397	6.9%	11.5%	38.8%	15.3%
1394	9.5%	12.7%	39.3%	15.6%
1399	10.2%	12.8%	39.6%	15.5%

Transit Availability & Pedestrian Access

The corridor is served by three stations along the Metra MD-W line, though most of the corridor is beyond walking distance. Daily Pace bus service that connects to the CTA Blue Line at Rosemont serves a portion of the corridor and is well utilized. Pedestrian access can be characterized as below average with incomplete sidewalk networks and large blocks.

The three Metra stations serving the Wood Dale corridor have average total ridership compared to the Metra system at large. Between Itasca, Wood Dale, and Bensenville, 351 passengers alight from trains in the AM peak or midday, a large majority from reverse-commute outbound trains. In total, these non-traditional passengers represent about 23% of the total daily activity for the stations. These stations thus serve a sizeable ratio of potentially non-traditional commuters at nearly a quarter of all trips.

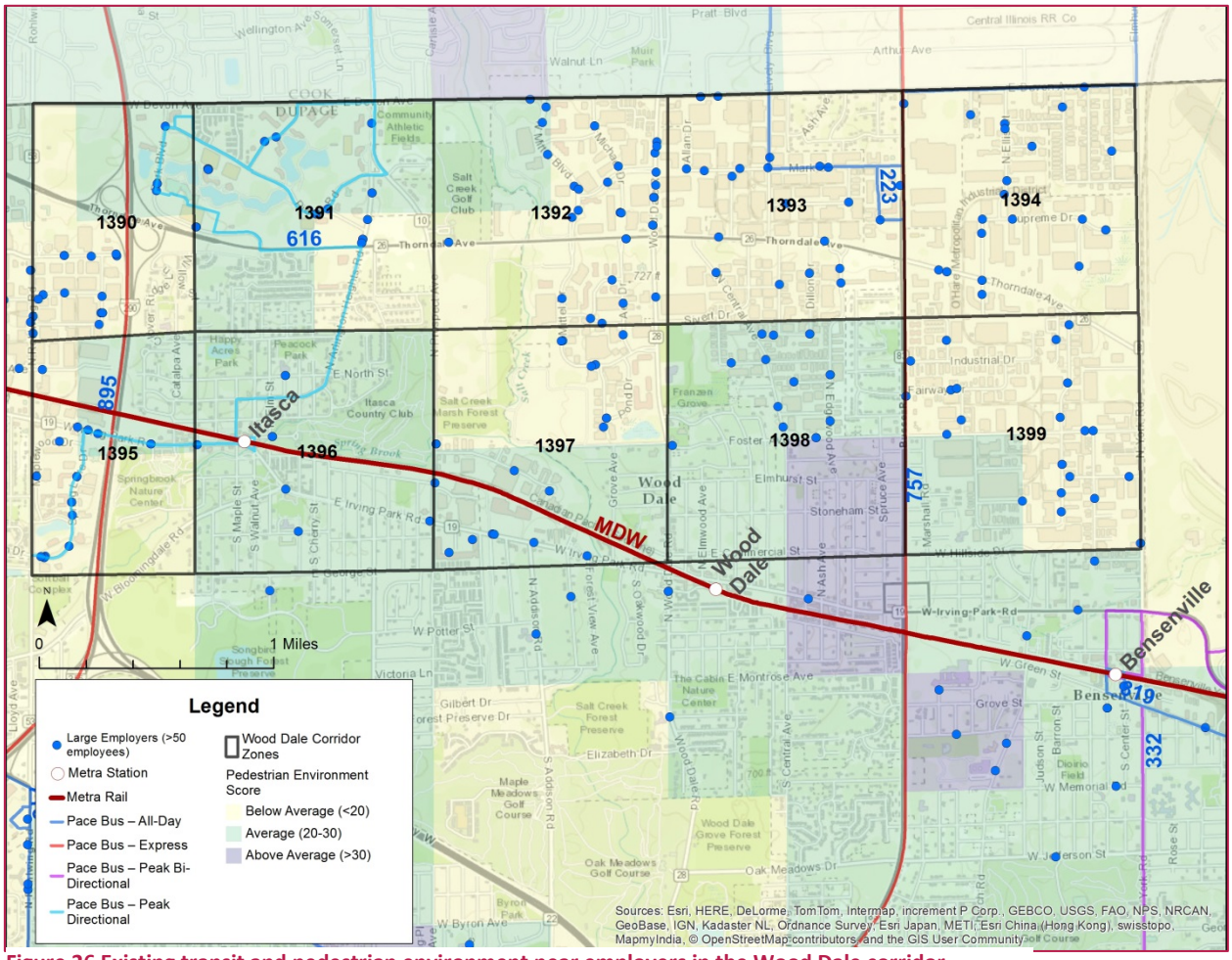


Figure 26 Existing transit and pedestrian environment near employers in the Wood Dale corridor

Table 7 Weekday boardings at Metra stations near corridor

Weekday Boardings										
	Inbound Trains					Outbound Trains				
Station	AM Peak	Midday	PM Peak	Evening	Total	AM Peak	Midday	PM Peak	Evening	Total
Itasca	398	59	71	15	**543**	4	3	14		**21**
Wood Dale	412	65	66	22	**565**	5	4	32	2	**43**
Bensenville	239	62	57	15	**373**	13	13	25	9	**60**

Table 8 Weekday alightings at Metra stations near corridor

Weekday Alightings										
	Inbound Trains					Outbound Trains				
Station	AM Peak	Midday	PM Peak	Evening	Total	AM Peak	Midday	PM Peak	Evening	Total
Itasca	8	5	3	5	**21**	51	44	354	50	**499**
Wood Dale	13	6	3	5	**27**	59	36	377	65	**537**
Bensenville	24	8	22	8	**62**	37	60	240	38	**375**

Travel Time

Current transit times to the Wood Dale corridor are roughly three times as long as average drive time. The addition of a last-mile service could significantly improve transit times by as much as 19 percent, bringing the transit times closer to the regional average of 60 minutes and more in line with the regional gap of transit times to work roughly double that of drive times (see page 15).

Table 9 Wood Dale average travel time characteristics

Zone	Avg Drive Time to zone (minutes)	Avg Transit Time to zone - current (minutes)	Avg Transit Time to Zone - w/ Last Mile Solution (minutes)	Travel Time Reduction (%)
1392	Similar to Zone 1394			
1397	Similar to Zone 1399			
1394	34	92	77	-16%
1399	31	91	74	-19%

*average times are calculated by weighting each origin subzone by the number of trips originating from it

Addison Corridor

A. Corridor Trip Density

The Addison corridor attracts 86,019 trips from throughout the region. High densities of origins are primarily located in adjacent areas in central DuPage County with some high densities in western and northwest Cook County. Addison also attracts a high density of trips from within the corridor due to the corridor's mix of business and residential areas.

The Addison corridor lies along IL-64 North Avenue, a 6-7 lane state highway which has a moderate to high level of congestion as it traverses through both DuPage and Cook County. Currently there are a number of initiatives underway including an interchange reconfiguration and operational improvements for Elgin O'Hare Western Bypass at IL-64/County Line Road/I-294 and Pace's North Avenue Corridor Study in Cook County. The corridor is densely populated with smaller employers in office parks, with many of the businesses located off of major arterials. The corridor is home to the Addison Industrial area which is a major activity center for the Chicagoland region.

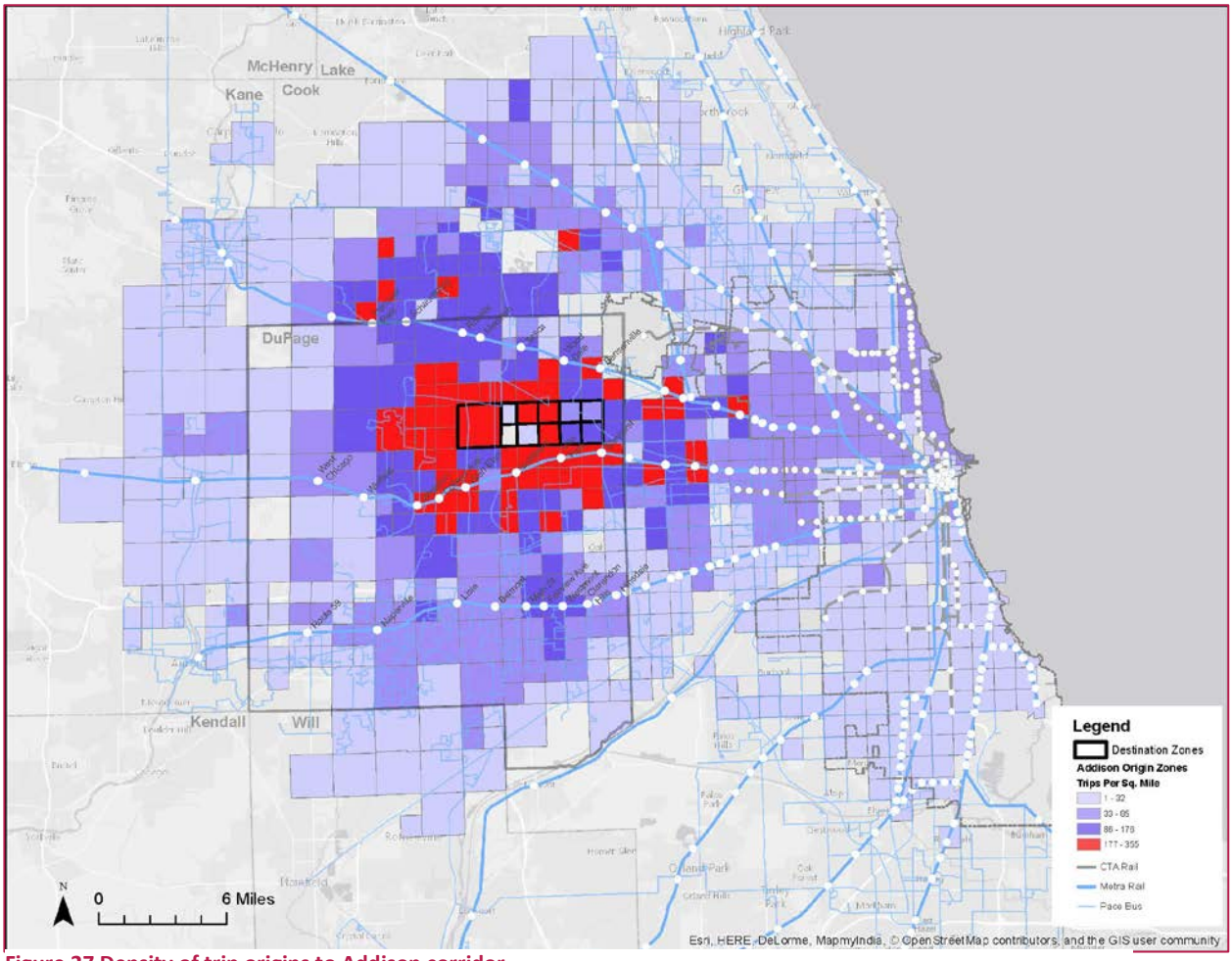


Figure 27 Density of trip origins to Addison corridor

Metra Capture Potential

The Addison corridor has a Metra capture potential (as defined on page 16) of 11.1%. The corridor located between the Metra Milwaukee District West Line (MD-W), with nearby stations of Bensenville and Itasca, and the Union Pacific West Line (UP-W), with nearby stations at Elmhurst and Villa Park. The highest trip densities are from zones located just outside of the Chicago city boundary in River Grove and zones along with UP-W near the Melrose Park.

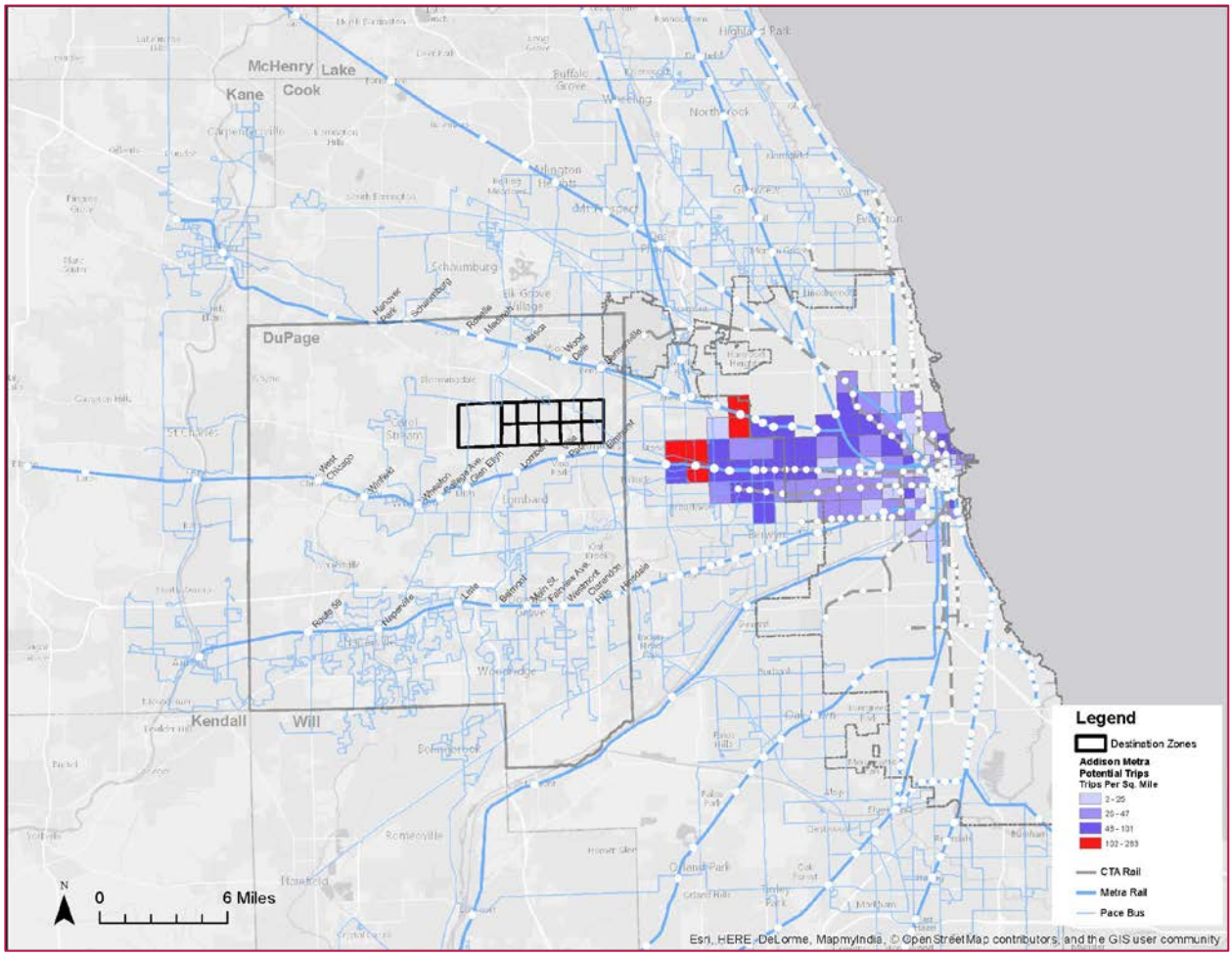


Figure 28 Density of trip origins to Addison corridor – from Metra capture potential origins

B. Key Zone Trip Density & Characteristics (1418 & 1424)

Zone 1418 and 1424 attracts 14,280 and 9,603 trips, respectively, primarily from zones located in close proximity to Addison and western Cook County. There is clustering of high density origin zones along Fullerton and Grand Avenue to the east of the destination zone. Large employers in these zones include Sterling Staffing and Chamberlin Group. These zones are unique when compared to the aggregate corridor because it attracts fewer trips from areas within DuPage County. While zone 1347 on the western most edge of the corridor contains large employers, such as Pampered Chef, the zone attracts a relatively small number of trips per square mile.

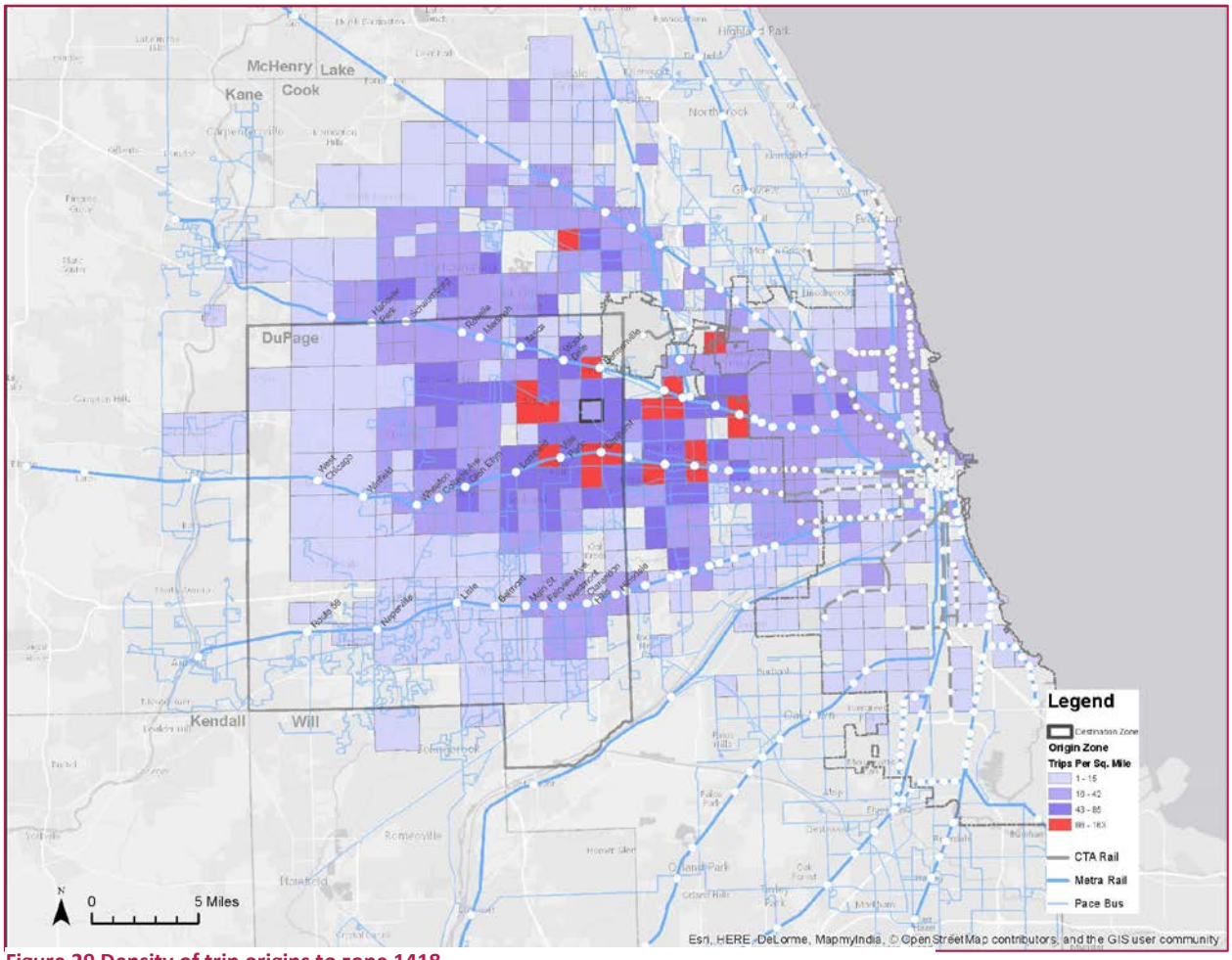


Figure 29 Density of trip origins to zone 1418

Demographics

The demographic analysis of origin zones destined to key zones 1418 and 1424 highlights zones in northern Chicago, as well as zones to the west and south. Zones in northern Chicago have above average incomes with high zero vehicle household rates and produce a moderate amount of trips as shown in Figure 30. The west and southern zones have below average income and medium to high shares of households without a vehicle, with the western zones in the city producing a moderate amount of trips in greater concentrations.

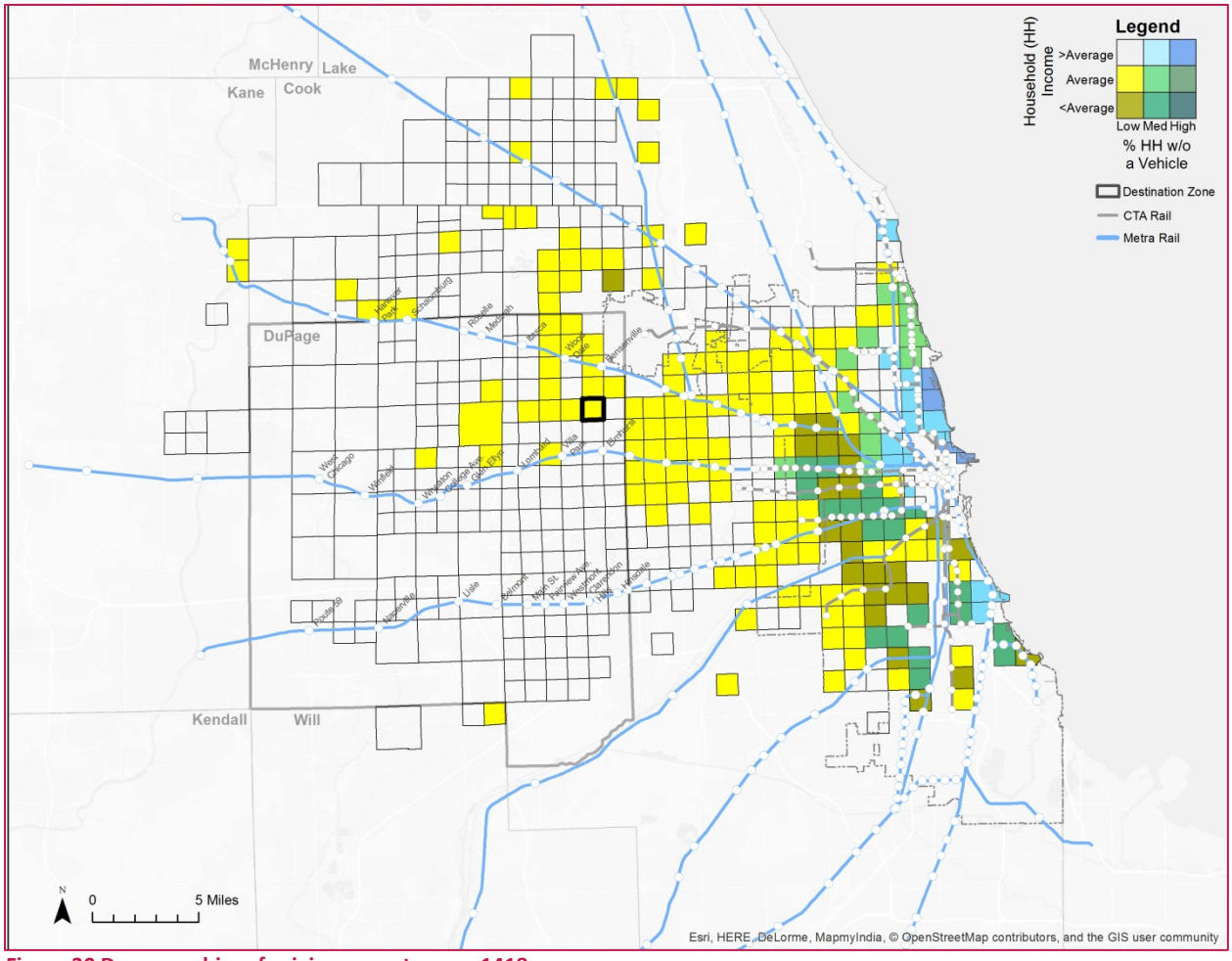


Figure 30 Demographics of origins zones to zone 1418

Metra Capture Potential

Zones 1418 and 1424 have a similar Metra capture potential (as defined on page 16) of 19.6% and 20.1%, respectively, primarily originating in western Cook County near residential areas in Melrose Park and Elmwood Park.

When compared to Figure 30 it is evident that the majority of origin zones that produce a relative high density of trips to the key zones have average income and a low ratio of zero vehicle households. However, a number of trips are drawn from city of Chicago zones that have lower incomes and a higher ratio of zero vehicle households. Additionally, there are a few origin zones near the north lakefront of Chicago that produce a high number of trips and have higher than average income and many zero vehicle households.

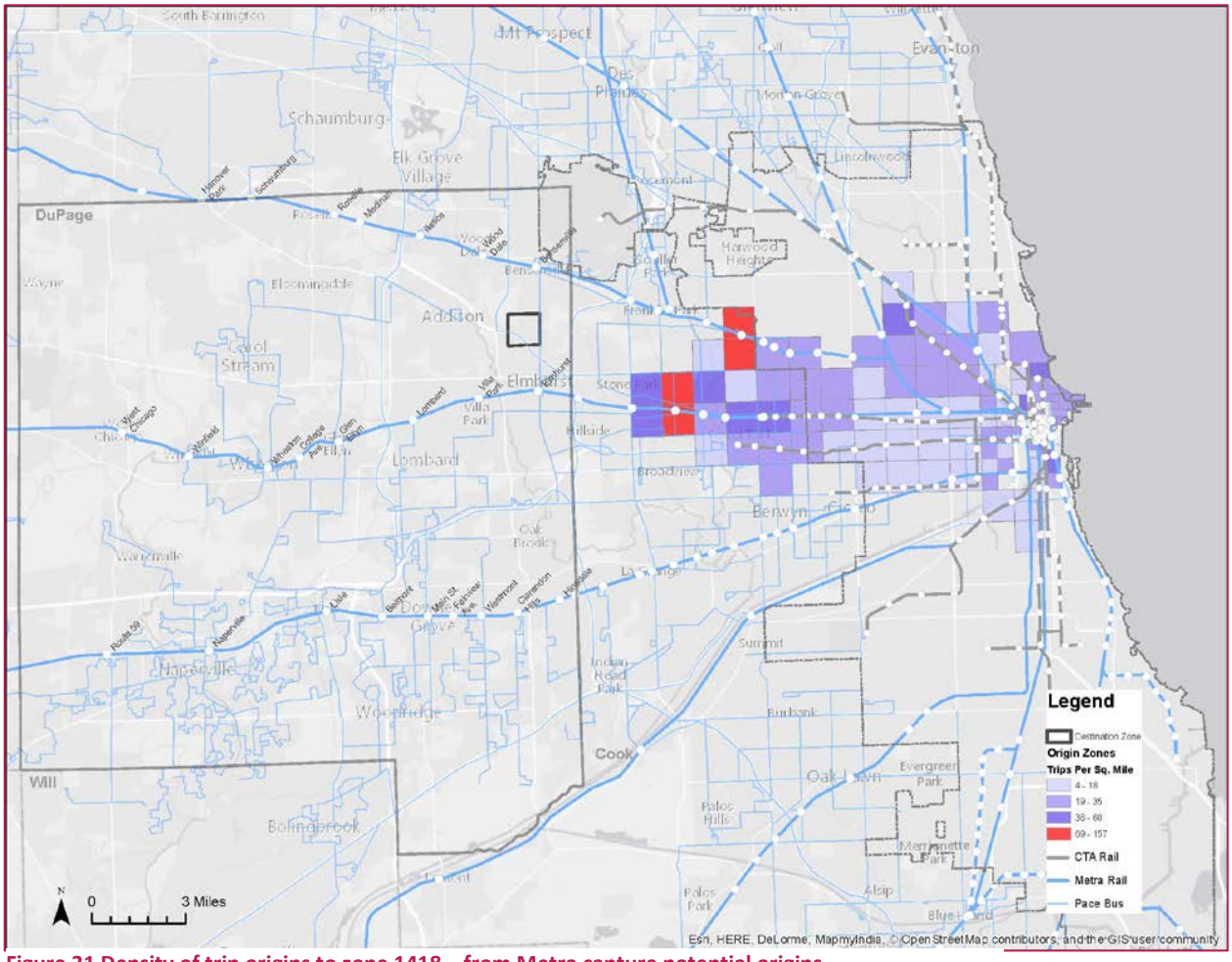


Figure 31 Density of trip origins to zone 1418 – from Metra capture potential origins

C. Key Zone Transit Availability and Pedestrian Access (1418 & 1424)

Zone 1418

Zone 1418 is directly served by Pace route 332 along its eastern border. During weekday peak periods, route 332 provides 60 minute service to the eastern half of the zone. Pace route 757 traverse the zone along I-290, not making any stops near the zone. The zone is about a mile-and-a-half from both the Bensenville Milwaukee District-West and the Elmhurst Union Pacific-West Metra stations, both of which connect to zones of high trip origin concentrations in western Cook.

The zone has a below average pedestrian environment overall, characterized by large blocks and a road geometry that makes traversing the zone difficult. Roads that lead to employer entrances generally do not have sidewalks. Buildings are low-rise and have large footprints with moderate land area dedicated to surface parking facilities.

Employment is scattered throughout the zone with similar levels of employment spilling into areas immediately to the south and west, but not much further which is mostly residential land uses.

Table 10 Transit services near zone 1418

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
332	M-F	Peak only	60 / ---	21
MDW	Daily	5am – 1am	30 / 60	48
UPW	Daily	6am – 1am	20 / 60	56

Zone 1424

Zone 1424 is directly served by Pace route 332 along its eastern border and 309 at its southeast boundary. During weekday peak periods, route 332 and 309 provide 60 and 30 minute service to the eastern and southeastern portions of the zone, respectively. The zone is about a half-mile from the Elmhurst UP-W Metra station and 2.5 miles from the MD-W Bensenville Metra station, both of which connect to zones of high trip origin concentrations in western Cook.

The zone has an average-to-above average pedestrian environment overall, characterized a gridded residential street network on the southern half and more typical broken-up street network of large blocks on the northern half near employment. Roads that lead to employer entrances generally do not have sidewalks. Buildings are low to mid-rise and have large footprints with moderate land area dedicated to surface parking facilities.

Employment is concentrated on the northern side of the zone abutting employment in zone 1418.

Table 11 Transit services near zone 1424

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
309	Daily	6am-10pm	30 / 60	46
332	M-F	Peak only	60 / ---	21
MDW	Daily	5am – 1am	30 / 60	48
UPW	Daily	6am – 1am	20 / 60	56

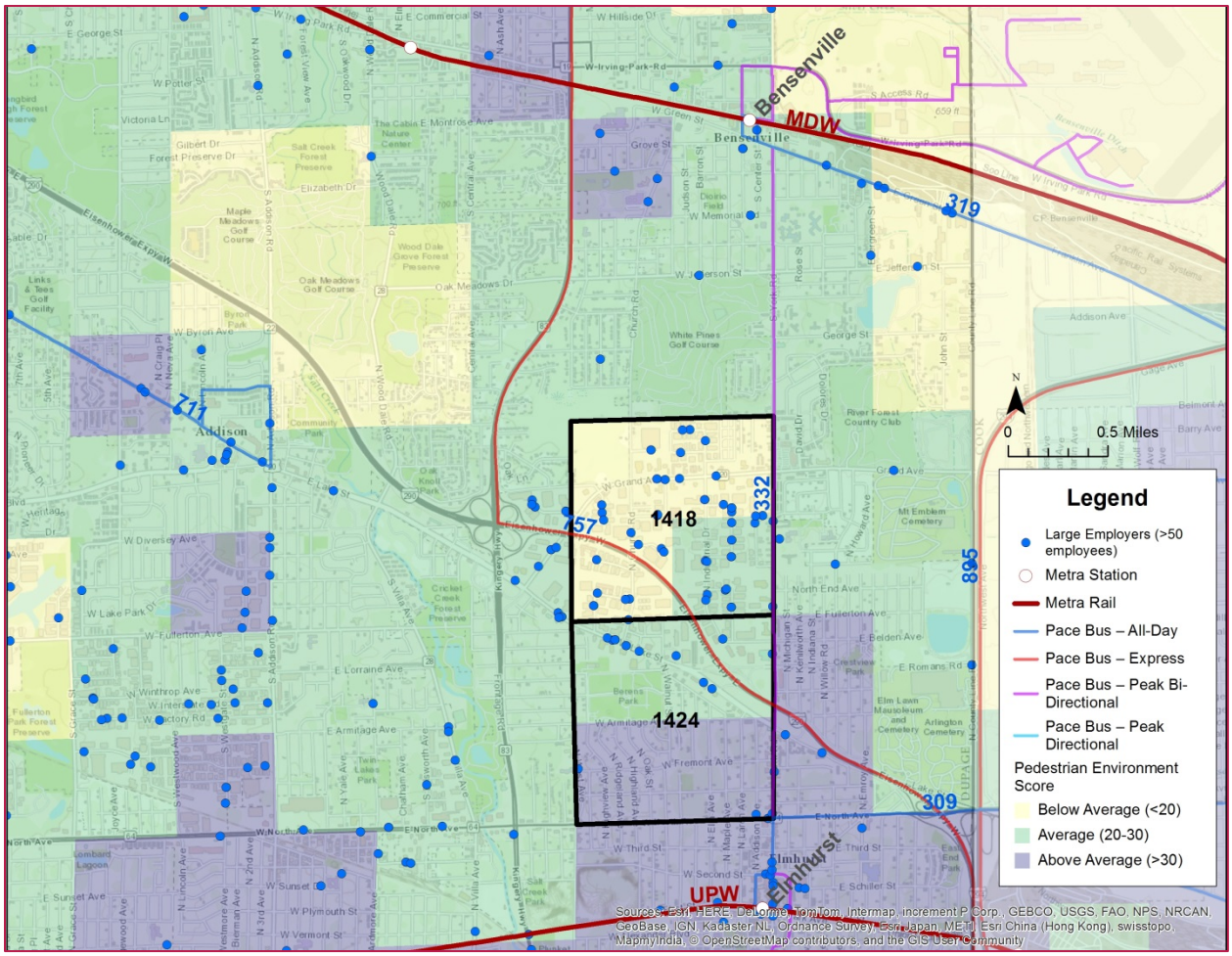


Figure 32 Transit, pedestrian environment, and large employers in zone 1418 & 1424

Figure 33 3D Aerial of typical development in zone 1418 & 1424. Source: 2016 Google Maps

D. Corridor Travel Time

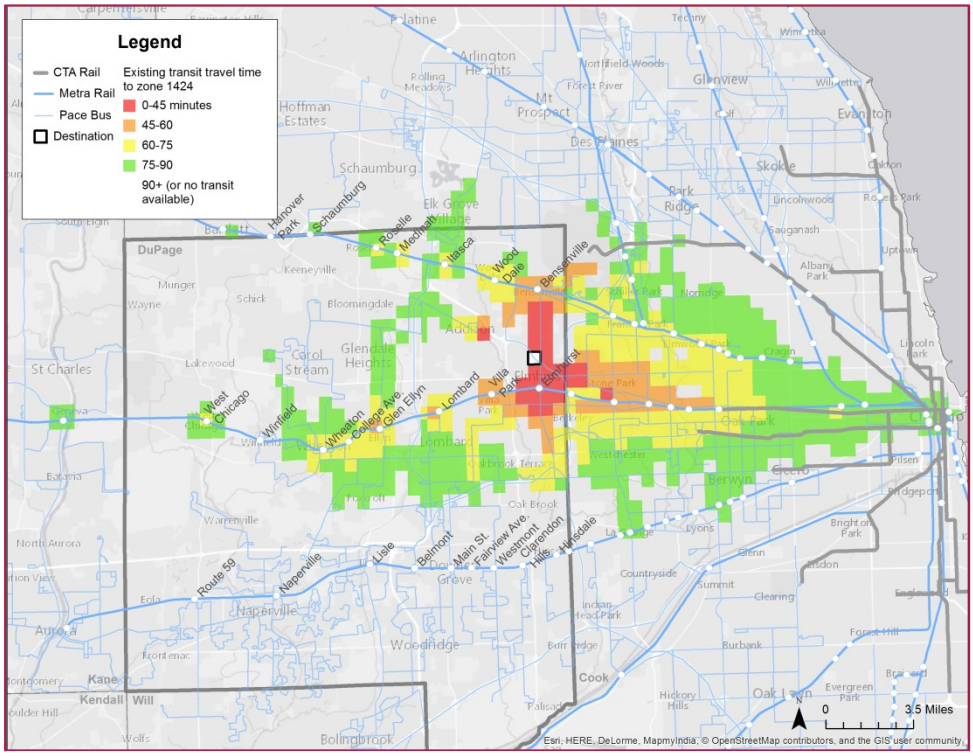


Figure 34 Existing transit travel times to the Addison corridor

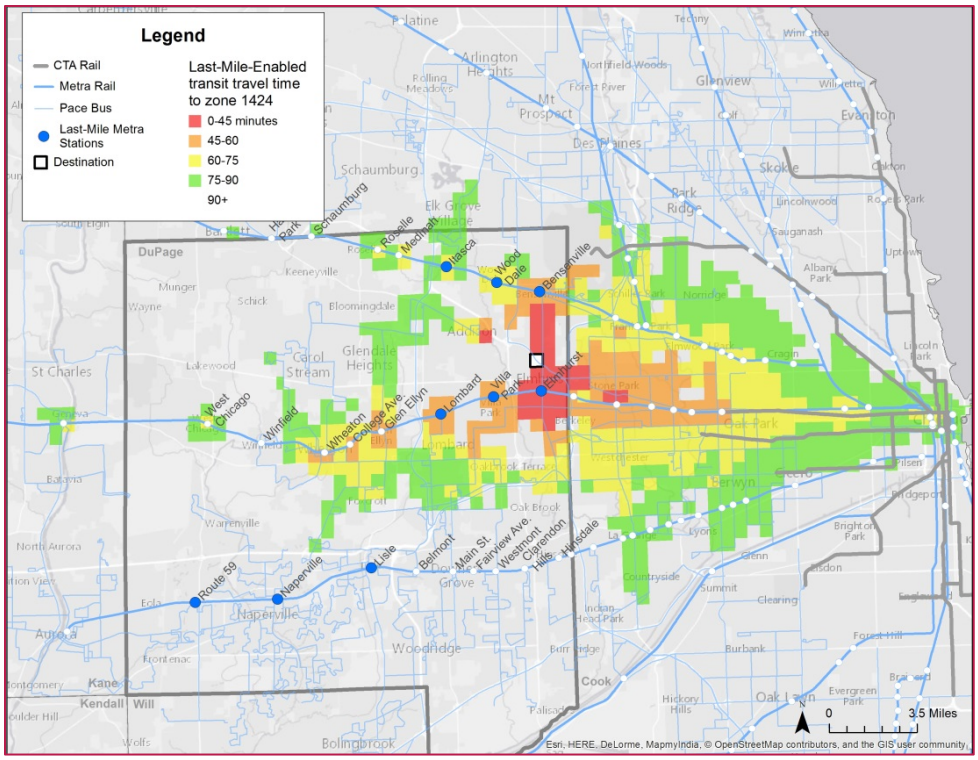


Figure 35 Potential transit travel times to the corridor with a comprehensive last-mile service from nearby Metra stations

The Addison corridor can be accessed within a reasonable transit travel time of less than 60 minutes from areas directly surrounding it and from areas east and west along UP-West and MD-West Metra lines as shown in Figure 34. Additional access from the east is from connecting Pace bus routes, where available. Access to this corridor within 90 minutes extends all the way into the Chicago central business district and all the way west to Geneva.

The addition of a comprehensive last-mile transit service at Elmhurst, Villa Park, Lombard and Bensenville would provide increased access to the corridor, but mostly in terms of a travel time reduction to areas already able to access to corridor. Figure 36 shows that nearly all areas with existing 90-minute or less access to the Addison area would see a slight (1-15 minute) improvement in transit travel times to the corridor.

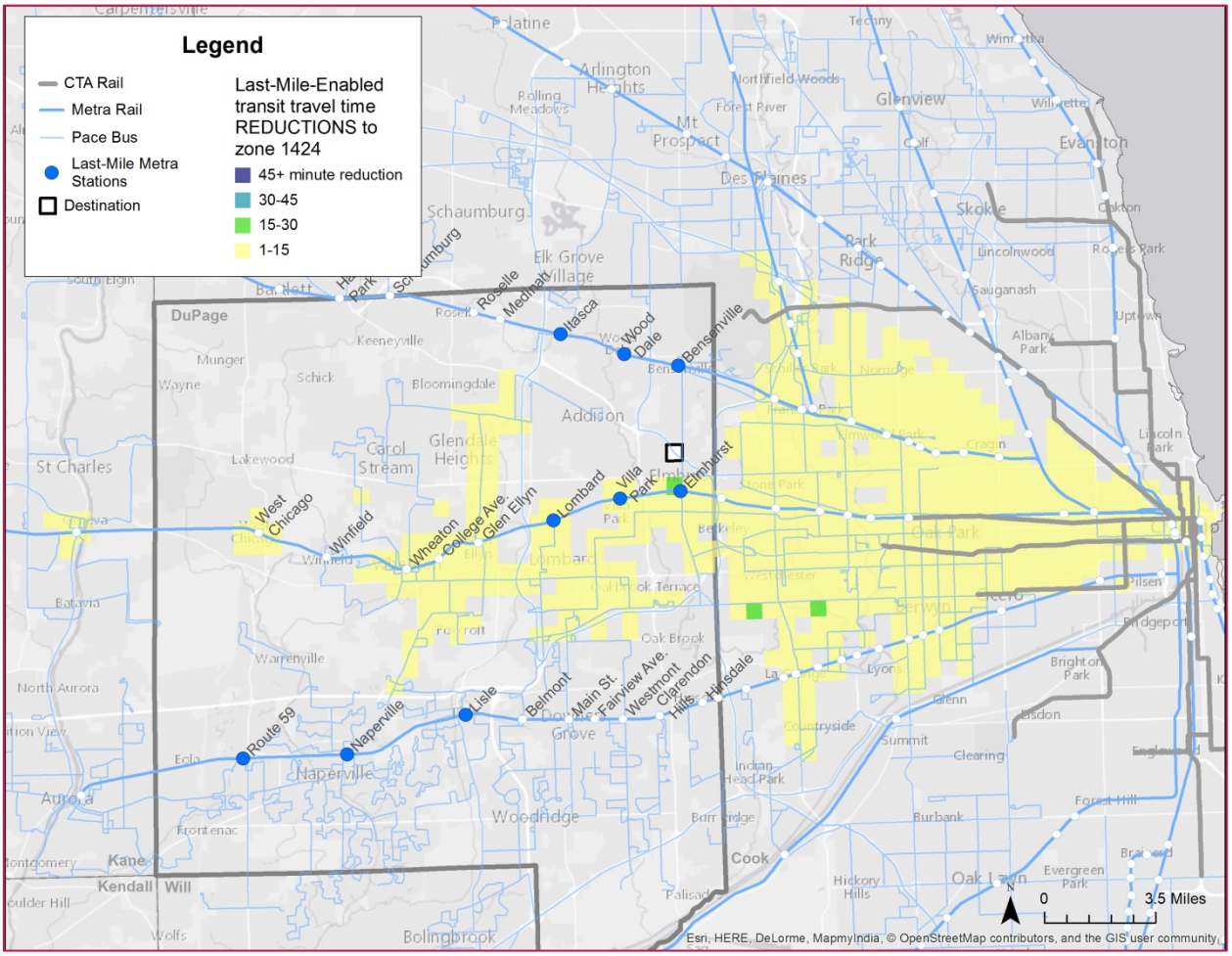


Figure 36 Potential reductions in transit travel time to the corridor with a comprehensive last-mile service from nearby Metra stations

E. Corridor Summary

Trip Density & Characteristics

Zone 1418 attracts more trips from throughout the region than zone 1424. The demographics of the trip origin zones are similar. While, zone 1424 has a slightly higher share of trips that originate in Metra capture potential zones.

Table 12 Addison trips and origin characteristics - all trips

Zone	Total Trips Attracted	% of households with zero vehicles	% of working age population* ages 21-34 (Millenials)	% of households below poverty line
1418	14,280	6.8%	34.0%	10.9%
1424	9,603	7.1%	34.1%	11.0%

Table 13 Addison trips and origin characteristics - Metra capture potential origins

Zone	% of All Trips Attracted that are within Metra Capture	% of households with zero vehicles	% of working age population* ages 21-34 (Millenials)	% of households below poverty line
1418	19.6%	18.5%	44.2%	15.9%
1424	20.1%	18.7%	44.1%	15.9%

In summary, Zones 1418 and 1424 were selected to further analysis at the zone level because the zones attracted a high density of trips (trips per square mile) and each had high Metra capture potential shares when compared to other zones in the corridor. Adjacent zones, such as 1417, also contain large employers that could be targeted in outreach efforts when examining transit connectivity solutions for the corridor.

Transit Availability & Pedestrian Access

The Addison corridor is served by Metra UP-W and MD-W lines, though all stations nearest the corridor are beyond walking distance. Daily Pace bus service is available on the edges of the corridor only. Pedestrian access is generally average, though sidewalk completeness and network connectivity are better in the more residential areas than in the areas of greater employment.

Elmhurst is in the top ten of stations for total ridership in the Metra system outside of the Loop. Between the six stations potentially serving the Addison corridor, 1,001 passengers alight from trains in the AM peak or midday, a large majority from reverse-commute outbound trains. In total, these passengers represent about 17% of the total daily activity for the stations. These stations thus serve a reasonable ratio of potentially non-traditional commuters at approximately one-sixth of all trips, with Elmhurst the most active of the group.

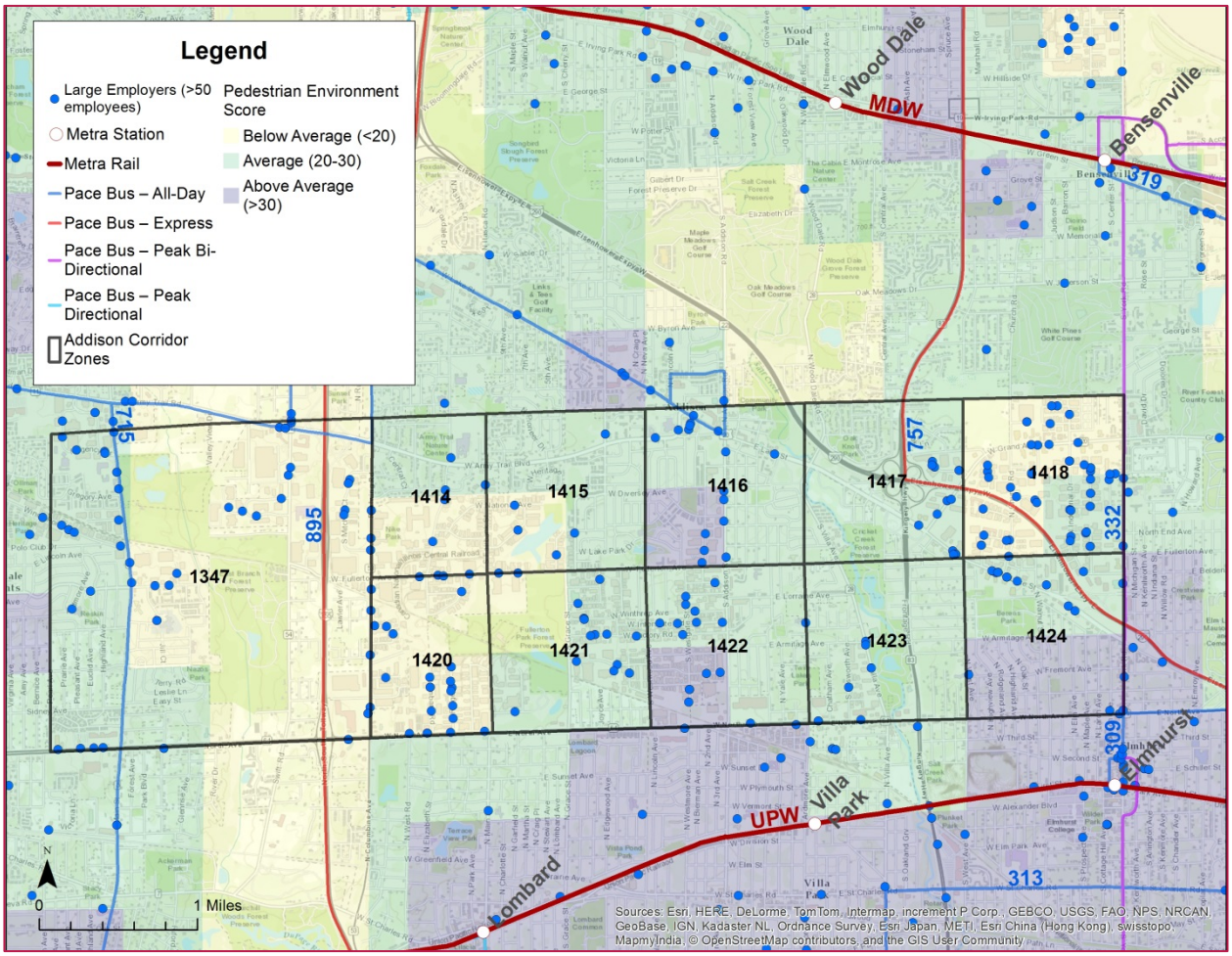


Figure 37 Existing transit and pedestrian environment near employers in the Addison corridor

Table 14 Weekday boardings at Metra stations near corridor

	Weekday Boardings										
		Inbound Trains					Outbound Trains				
	Station	AM Peak	Midday	PM Peak	Evening	Total	AM Peak	Midday	PM Peak	Evening	Total
UP-W	Lombard	1079	115	49	22	**1265**	28	15	10	3	**56**
UP-W	Villa Park	661	79	42	22	**804**	17	8	10	2	**37**
UP-W	Elmhurst	1739	201	132	86	**2158**	18	33	77	27	**155**
MD-W	Itasca	398	59	71	15	**543**	4	3	14		**21**
MD-W	Wood Dale	412	65	66	22	**565**	5	4	32	2	**43**
MD-W	Bensenville	239	62	57	15	**373**	13	13	25	9	**60**

Table 15 Weekday alightings at Metra stations near corridor

	Weekday Alightings										
		Inbound Trains					Outbound Trains				
	Station	AM Peak	Midday	PM Peak	Evening	Total	AM Peak	Midday	PM Peak	Evening	Total
UP-W	Lombard	12	14	10	7	**43**	35	90	1037	126	**1288**
UP-W	Villa Park	9	14	12	13	**48**	22	85	644	99	**850**
UP-W	Elmhurst	38	28	16	15	**97**	123	180	1582	205	**2090**
MD-W	Itasca	8	5	3	5	**21**	51	44	354	50	**499**
MD-W	Wood Dale	13	6	3	5	**27**	59	36	377	65	**537**
MD-W	Bensenville	24	8	22	8	**62**	37	60	240	38	**375**

Travel Time

Current transit times to the Addison corridor are roughly three times as long as average drive time, which is a relatively short 23 minutes. The addition of a last-mile service has a small impact of seven percent reduction in average transit travel time.

Table 16 Addison average travel time characteristics

Zone	Avg Drive Time* to zone (minutes)	Avg Transit Time to zone - current (minutes)	Avg Transit Time to Zone - w/ Last Mile Solution (minutes)	Travel Time Reduction (%)
1418	Similar to Zone 1424			
1424	23	76	71	-7%

*average times are calculated by weighting each origin subzone by the number of trips originating from it

Warrenville Road Corridor

A. Corridor Trip Density

The Warrenville Road corridor attracts 91,919 work trips from zones throughout the region. The corridor is served by the Metra Burlington Northern Santa Fe (BNSF) with nearby stations at Lisle, Naperville, and Route 59. High densities of trip origins are primarily found in adjacent or neighboring zones to the south and southwest of the corridor. Warrenville Road has a distinct and concentrated origin market from residential areas in southern DuPage and Aurora with few trips coming from the city of Chicago.

This corridor is also unique as it contains many large, campus style employers such as BP, Office Max, Molex, and Navistar.

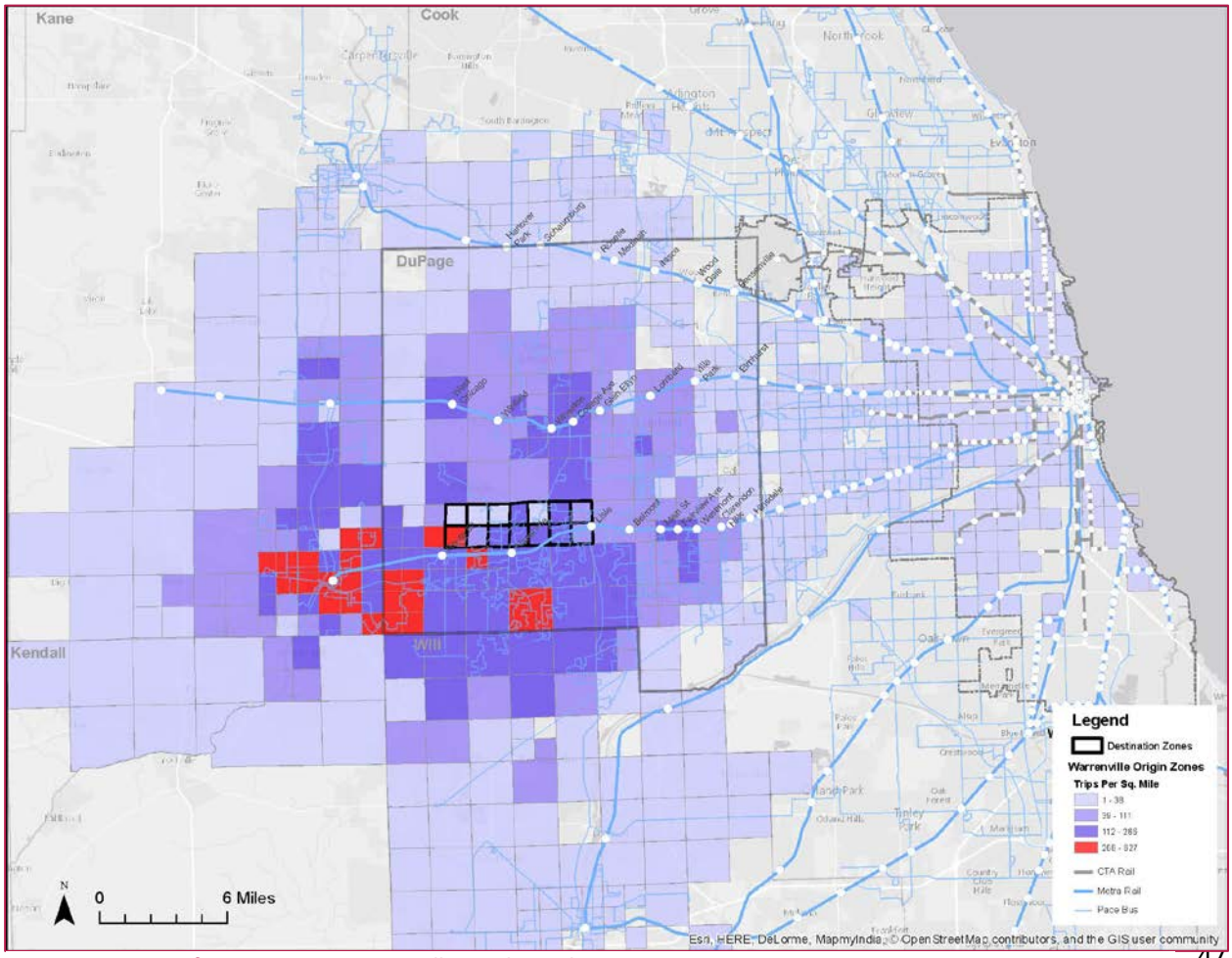


Figure 38 Density of trip origins to Warrenville Road corridor

Metra Capture Potential

Warrenville Road has a Metra capture potential (as defined on page 16) of 0.4%. The zones with the highest densities are located throughout Chicago – but have low trip magnitudes and concentrations of trip densities which highlights that the market for reverse commuters is small. However, the high density of trip origins in areas southwest of the corridor, as seen in Figure 39, are not included in the Metra capture potential (as defined on page 15).

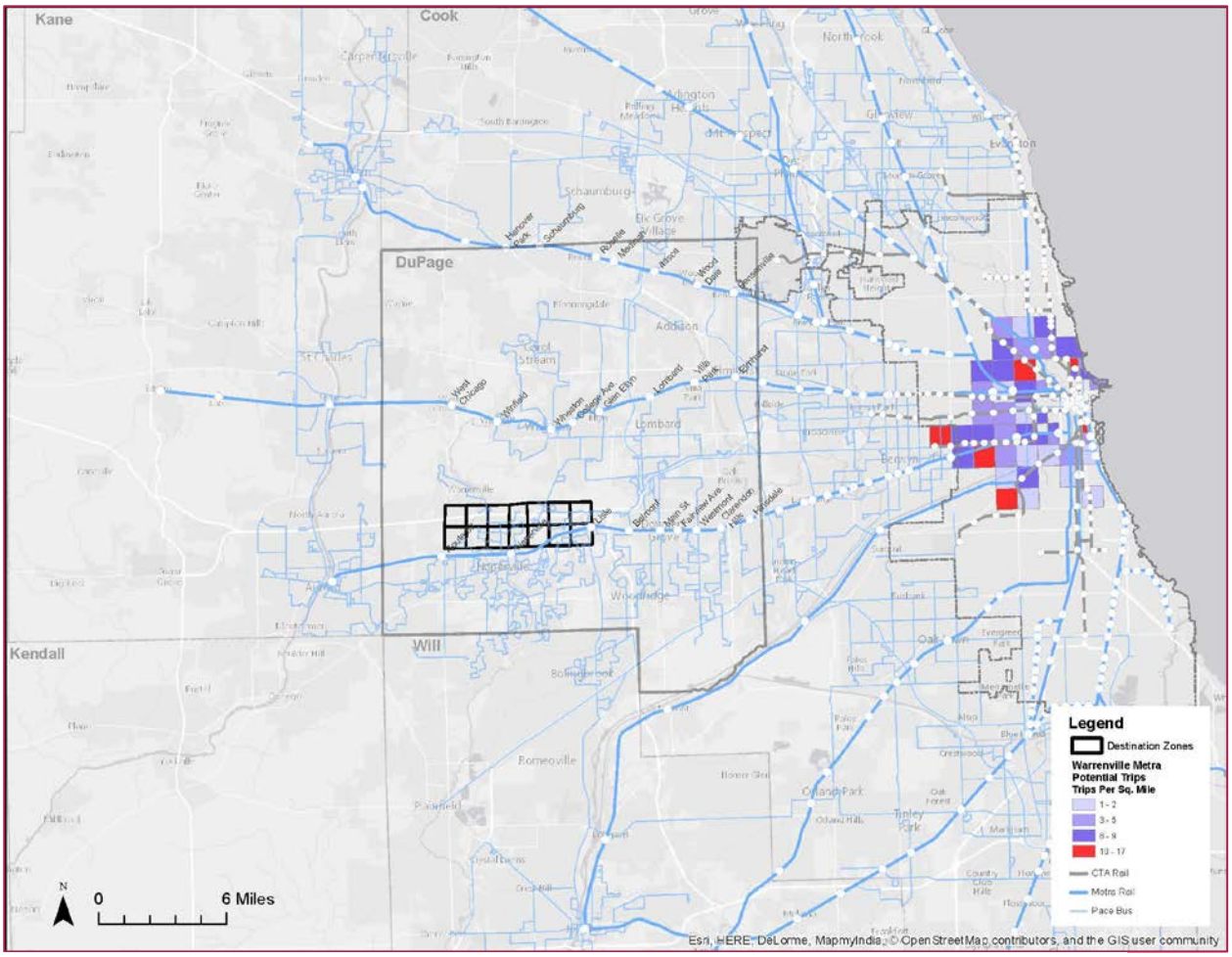


Figure 39 Density of trip origins to Warrenville Road corridor – from Metra capture potential origins

B. Key Zone Trip Density & Characteristics (1306 & 1376)

Zone 1306 and 1376 attracts a relative high number of trips at 14,448 and 17,206 trips respectively. The spatial distribution of trip origins are very similar to that of the aggregate Warrenville Road corridor with origins primarily in southern DuPage county and Aurora. However, zone 1376 has a higher density of trip origins in Naperville when compared to zone 1306. Large employers in this zone include Charles Rutenberg Realty, United Asset Coverage, Armour-Eckrich Meats, McAfee, and Navistar on the zone boundary of 1376.

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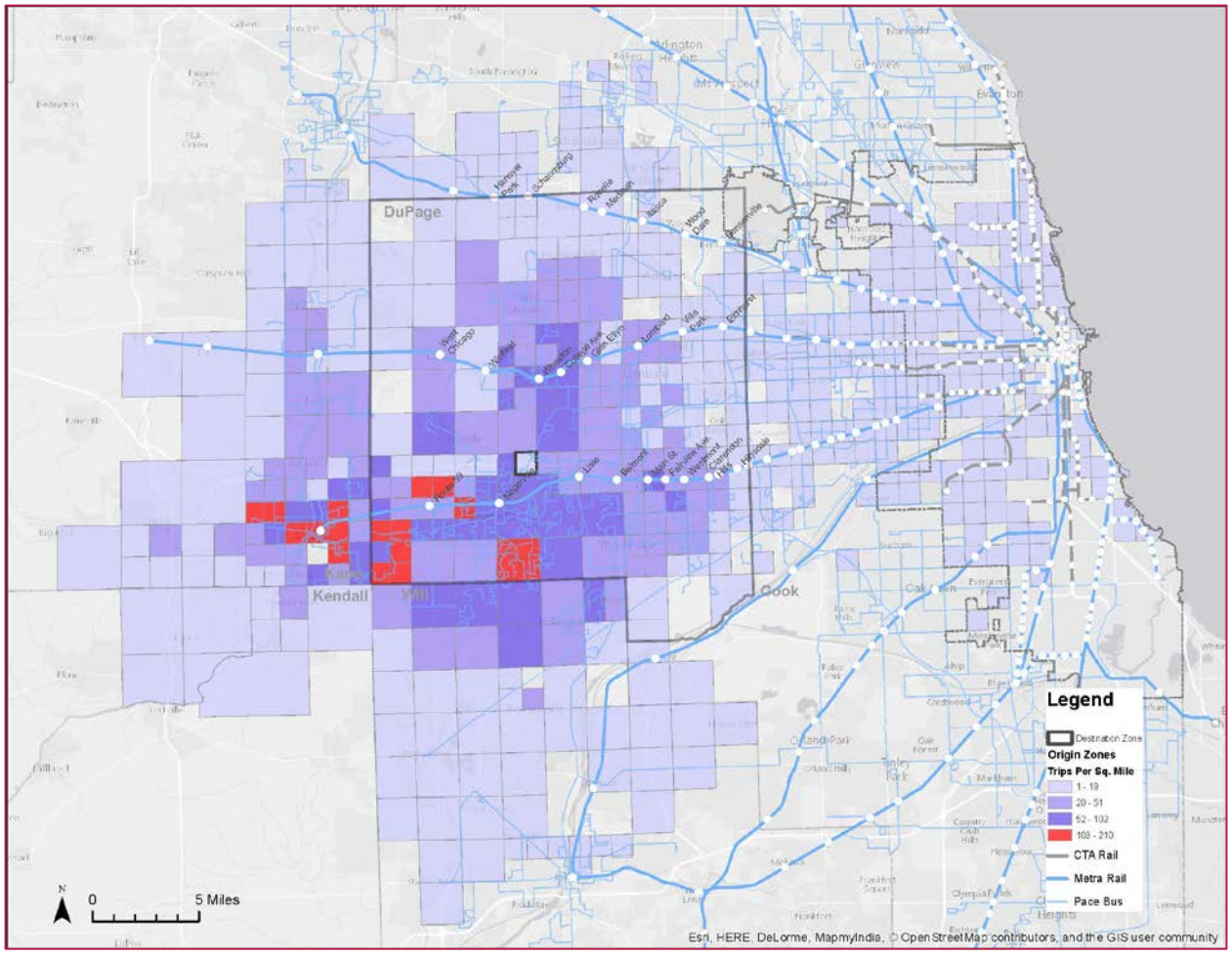

Figure 40 Density of trip origins to zone 1376

Demographics

The demographics of trip origin zones destined to key zones 1306 and 1376 are similar and distinct. Generally, the highest producers of trips to the zone, as shown in Figure 41, originate from areas of greater than or average income and a low ratio of zero vehicle households with the exception of one below average income zone in Aurora. The demographic analysis of origin zones does highlight trips from zones just north and east of Chicago's central business district and to the southwest and south of Chicago. The areas north and east have above average income and medium and high rates of zero vehicle households. The zones southwest and south of Chicago are also notable because of their below average income and medium rates of zero vehicle households. However, trips made from these areas of Chicago are relatively small in magnitude compared to the concentration of trips originating in southwest DuPage County.

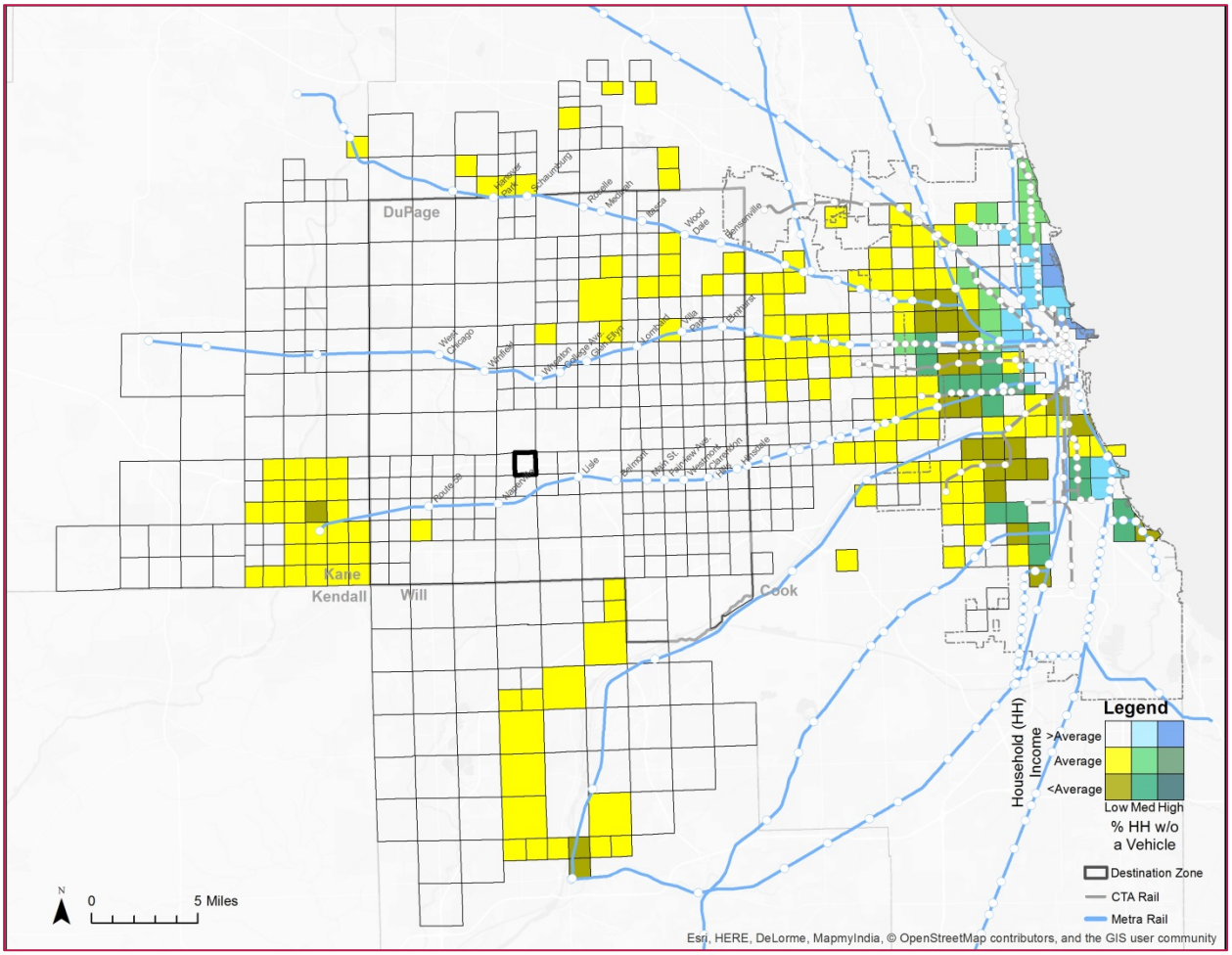

Figure 41 Demographics of origins zones to zone 1376

Metra Capture Potential

Zones 1306 and 1376 have a Metra capture potential (as defined on page 16) of 0.4% and 0.6%, respectively, from zones throughout the city of Chicago with clusters of higher trip densities in the north and west side of Chicago.

When compared to Figure 41 it is evident that the majority of origin zones that produce a relative high density of trips to the key zones have average to below average income and a low to medium share of zero vehicle households. However, a number of trips are attracted from zones near the lake that have above average income and higher rate of zero vehicle households.

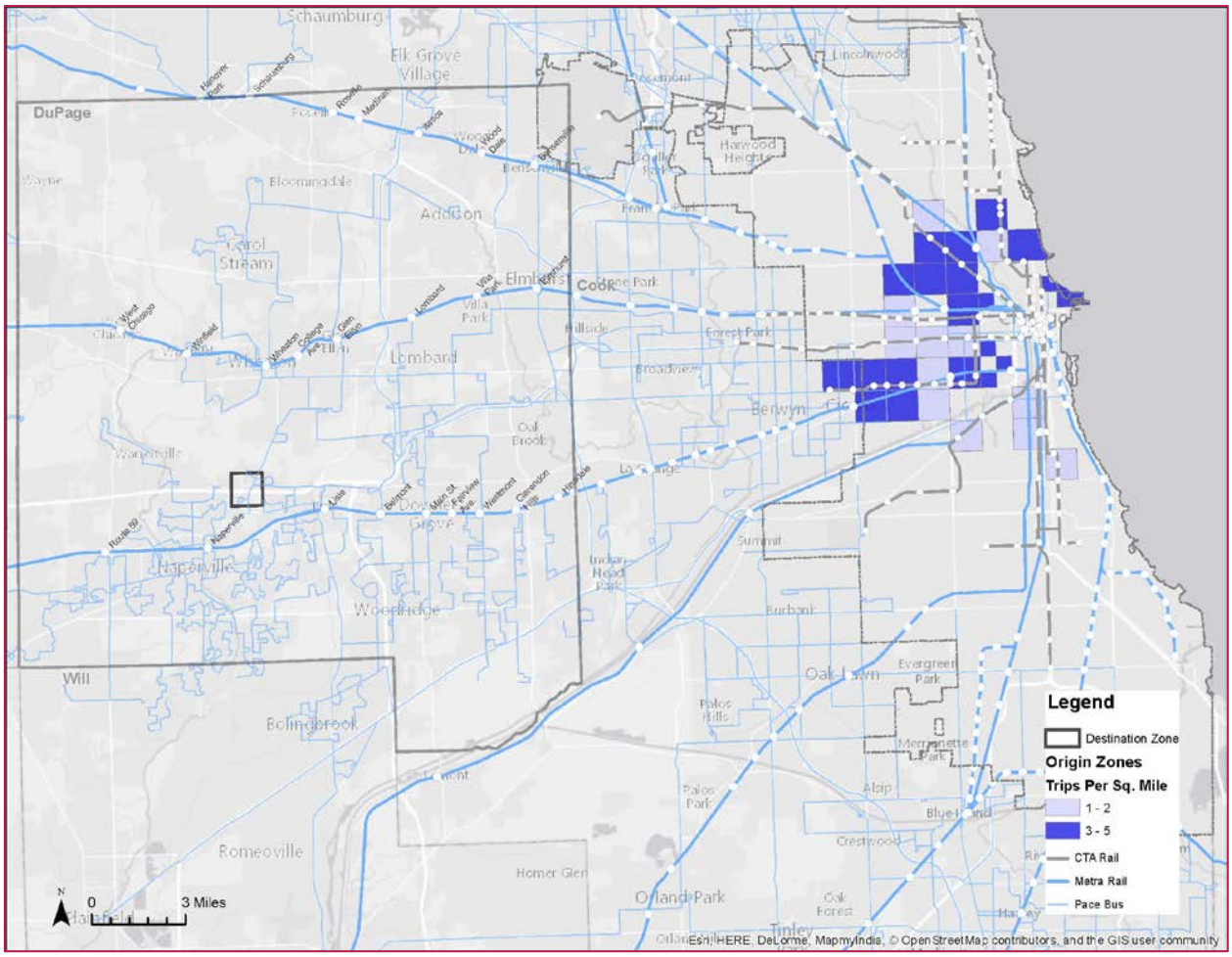

Figure 42 Density of trip origins to zone 1376 – from Metra capture potential origins

C. Key Zone Transit Availability and Pedestrian Access (1306 & 1376)

Zone 1306

Zone 1306 is directly served by Pace routes 676 and 681; however, these routes provide limited, peak-only service connecting to inbound Metra trains. The zone is about 1.5 miles from the nearest station on Metra's BNSF line, which serves Aurora where some of the highest concentrations of trips to the corridor originate.

The zone has a below-average pedestrian environment, characterized by wide, winding roads, some having higher speeds with I-88 splitting the zone. Roadway geometry is not gridded, making pedestrian travel lengthier and bus stops do not have shelters. Roads that lead to employer entrances generally have sidewalks on at least one side of the street, but large parking lots separate the major roads from the buildings themselves. Buildings are mid-rise and have medium footprints with significant land area dedicated to surface parking facilities.

Table 17 Transit services near zone 1306

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
676	M-F	Peak only	limited	9
681	M-F	Peak only	limited	6
BNSF	Daily	5am – 1am	15-30 / 60	64

Zone 1376

Zone 1376 is directly served by Pace routes 714, 721, 828, and 888. Routes 714 and the soon to begin service 721 will provide 30 minute peak and all-day service, respectively. Routes 828 and 888 provide limited peak only service for specific trips. The zone is about a mile-and-a-half from the Naperville BNSF Metra station and about two miles from the Lisle station – both of which connect to Aurora origins.

The zone has a below-average pedestrian environment, characterized by wide, winding roads, some having higher speeds with I-88 splitting the zone. Roadway geometry is not gridded, making pedestrian travel lengthier. Warrenville Road does not have sidewalks in many places, and large parking lots or landscaping elements generally separate the major roads from the buildings themselves. Buildings are mid-rise and have medium footprints with significant land area dedicated to surface parking facilities.

Employment for both zones is located along Warrenville and Diehl Roads.

Table 18 Transit services near zone 1376

Route	Service Days	Service Span	Frequency (peak / off-peak)	# of weekday trips (in either direction)
714	M-F	6am – 6pm	30 / 60	34
721 (new)	M-Sa	6am–10pm	30 / 30	61
828	M-F	Peak only	limited	12
888	M-F	Peak only	limited	8
BNSF	Daily	5am – 1am	15-30 / 60	64

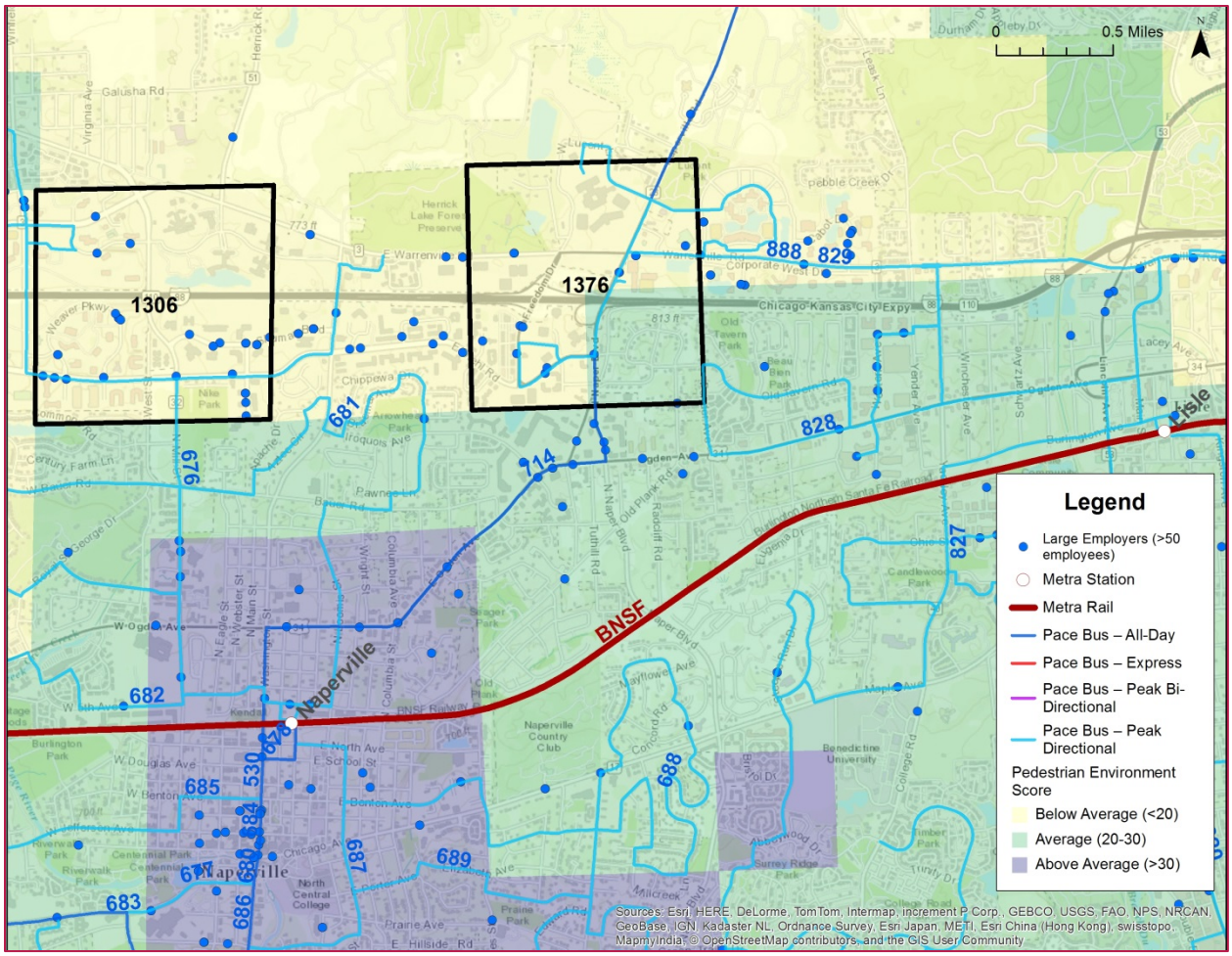

Figure 43 Transit, pedestrian environment, and large employers in zone 1306 & 1376

Figure 44 3D Aerial of typical development in zone 1306 & 1376. Source: 2016 Google Maps

D. Corridor Travel Time

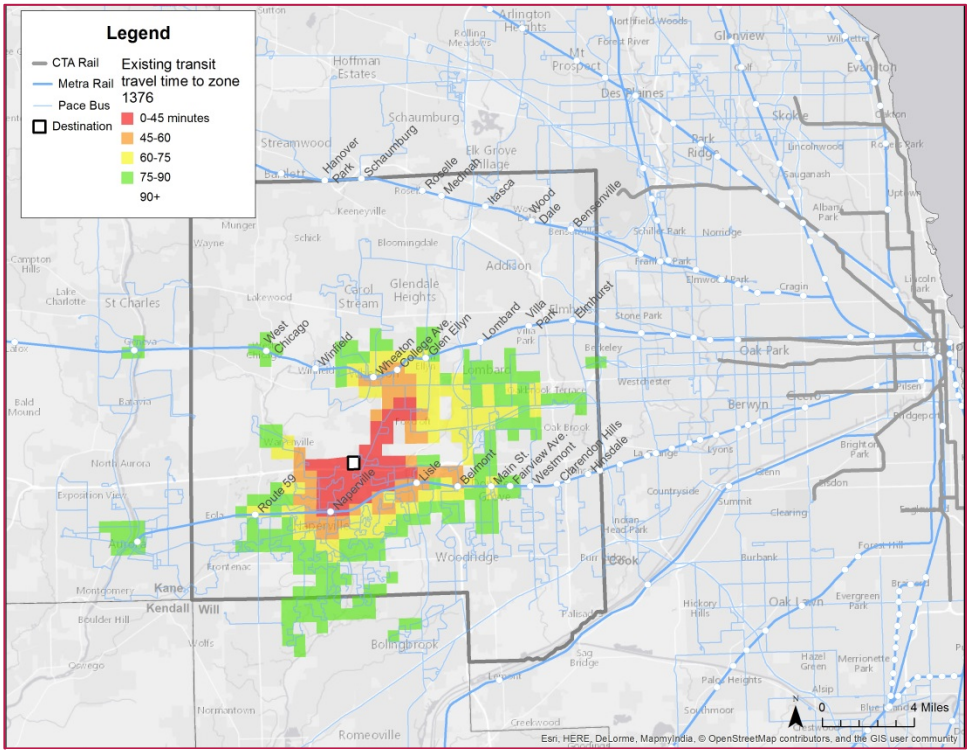

Figure 45 Existing transit travel times to the Warrenville Road corridor

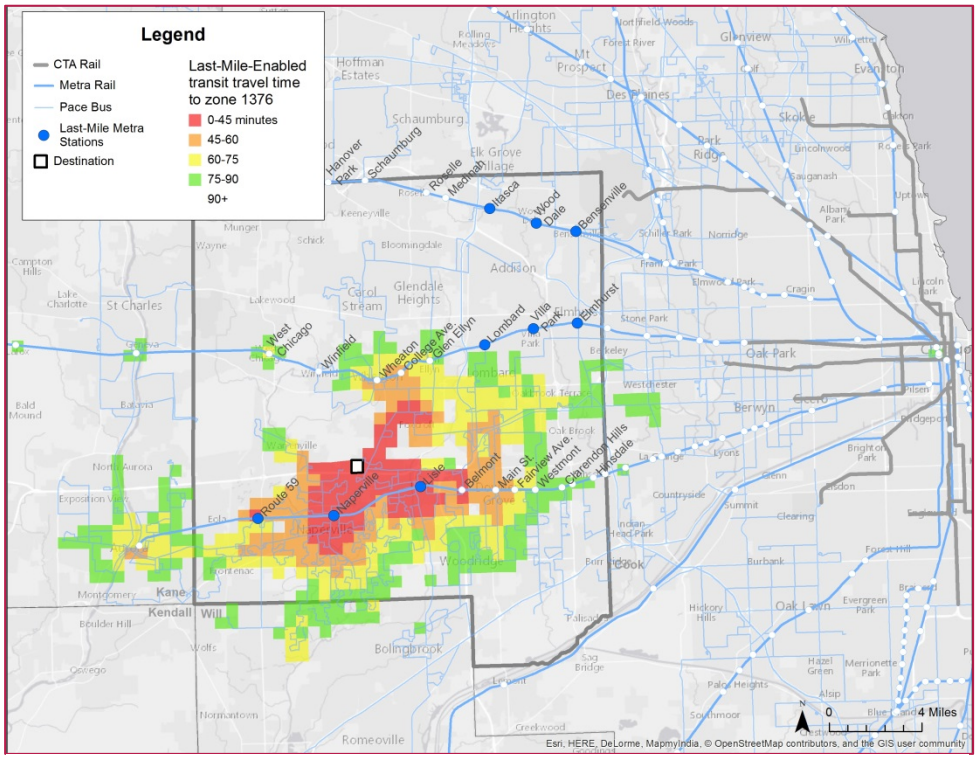

Figure 46 Potential transit travel times to the corridor with a comprehensive last-mile service from nearby Metra stations

The Warrenville Road corridor can be accessed within a reasonable transit travel time of less than 60 minutes from areas directly surrounding it to the south and via a northeast access corridor as shown in Figure 45. However, travel times quickly increase for areas just a few miles of the corridor and are beyond 90 minutes or inaccessible much further out. Unlike the other two corridors, access to the Warrenville Road corridor within a 90 minute average transit trip is not possible from the City of Chicago.

Due to express Metra service from Chicago to the corridor, transit travel times from station areas between the central business district and DuPage County are long and do not generally improve from a comprehensive last mile solution. However, the corridor does become accessible within 90 minutes from areas directly surrounding Union Station as seen in Figure 46. Most of the improvement in access to the corridor from a last-mile solution would be in the form of reduced travel times for areas that already have some access by transit. Specifically, Figure 47 highlights residential areas from Westmont to Aurora which could see a significant reduction in transit time to the corridor (15-30 minute average).

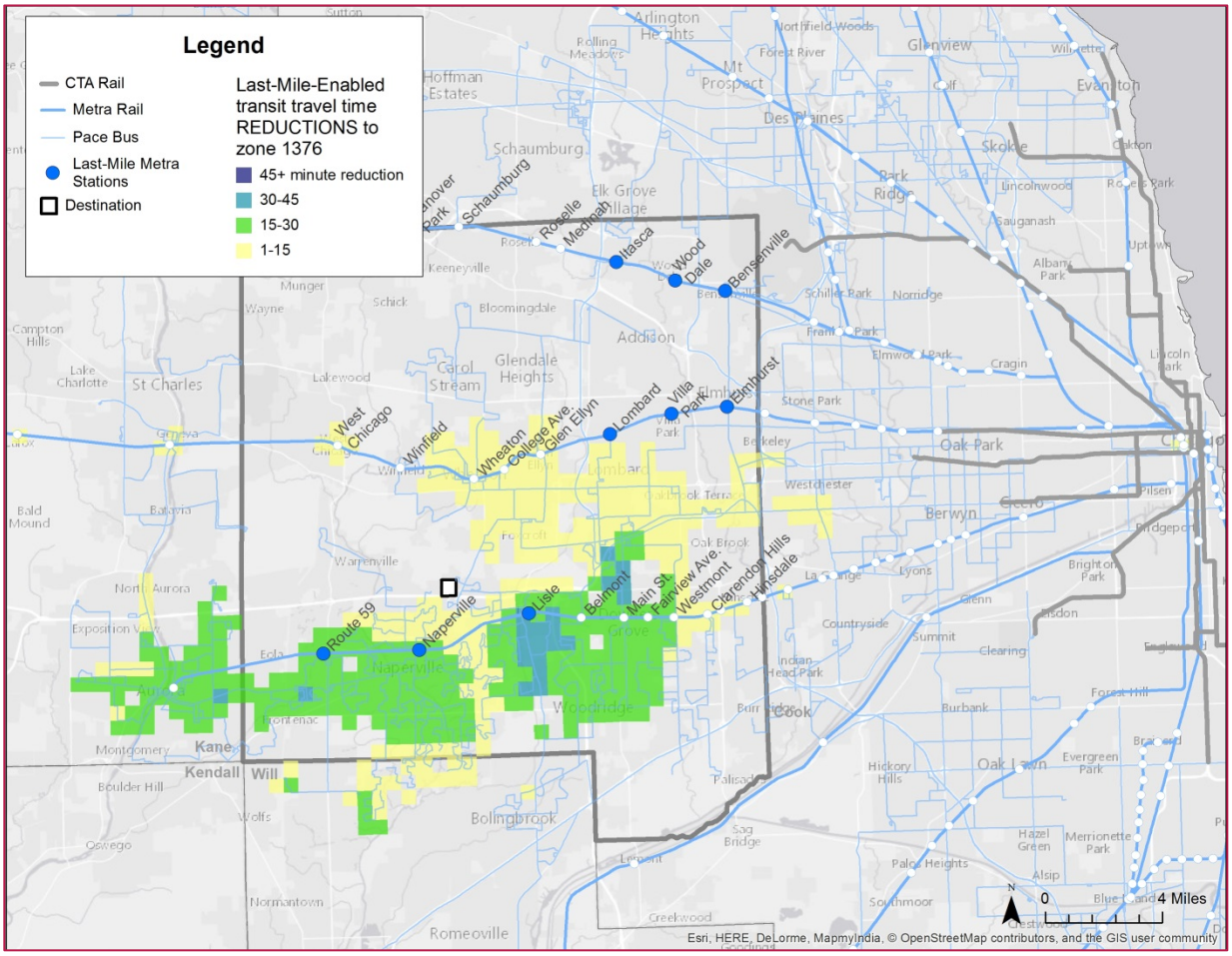

Figure 47 Potential reductions in transit travel time to the corridor with a comprehensive last-mile service from nearby Metra stations

E. Corridor Summary

Trip Density & Characteristics

Zone 1376 attracts a higher number of trips when compared to zone 1306, but both zones have homogenous trip origin demographics. The share of households with zero vehicles originating from Metra capture potential zones is higher for trips destined to zone 1376. However, both zones have a Metra capture potential of less than 1% of the total trips destined to each zone.

Table 19 Warrenville Road trips and origin characteristics - all trips

Zone	Total Trips Attracted	% of households with zero vehicles	% of working age population* ages 21-34 (Millenials)	% of households below poverty line
1306	14,448	2.2%	32.2%	9.6%
1376	17,206	2.4%	32.0%	9.4%

Table 20 Warrenville Road trips and origin characteristics - Metra capture potential origins

Zone	% of All Trips Attracted that are within Metra Capture	% of households with zero vehicles	% of working age population* ages 21-34 (Millenials)	% of households below poverty line
1306	0.4%	19.4%	46.7%	22.8%
1376	0.6%	22.2%	48.8%	21.1%

Transit Availability & Pedestrian Access

The Warrenville Road corridor is served by three stations along Metra's BNSF line, though none are within walking distance of the core employment areas along Warrenville and Diehl Roads. Pace operates many routes in the area, most of which serve the traditional commute market. The introduction of new route 722 will provide Monday-Saturday 30 minute service to Warrenville Road. In the high employment areas, pedestrian access is generally below average characterized by higher speed roads, limited sidewalk connectivity, and difficult or lengthy access to buildings from bus stops.

Route 59, Naperville, and Lisle represent three of the top ten stations in the Metra system for total ridership outside of the Loop. Between Route 59, Naperville, and Lisle, 1,498 passengers alight from trains in the AM peak or midday, nearly all from reverse-commute outbound trains. While a high number of trips, only one-third of these occur during the AM peak as opposed to the midday period when most of these non-traditional trips occur. In total, these passengers represent about 13% of the total daily activity for the stations. These stations thus serve a relatively small ratio of potentially non-traditional commuters, though their absolute non-traditional ridership is high.

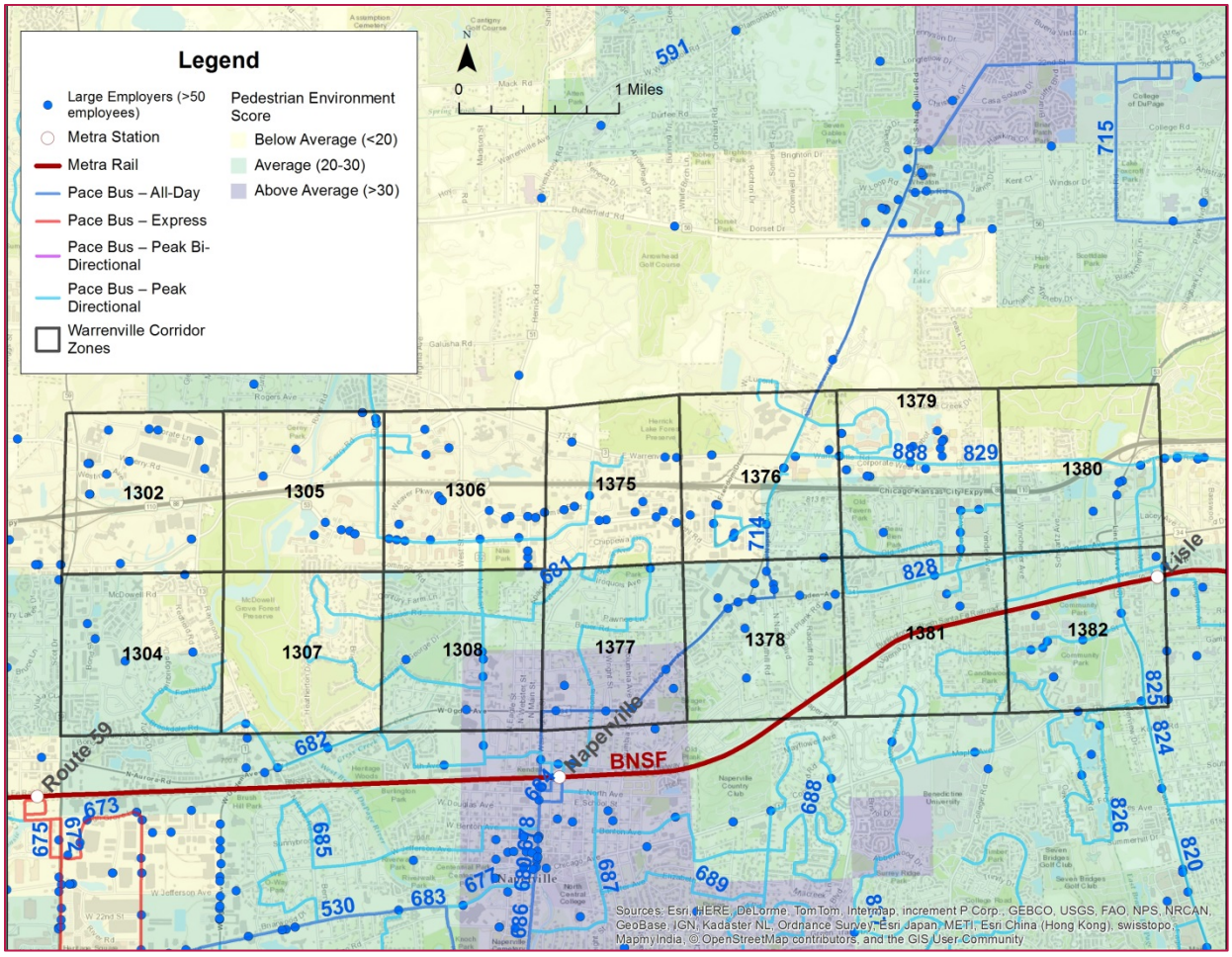

Figure 48 Existing transit and pedestrian environment near employers in the Warrenville Road corridor

Table 21 Weekday boardings at Metra stations near corridor

Weekday Boardings										
	Inbound Trains					Outbound Trains				
Station	AM Peak	Midday	PM Peak	Evening	Total	AM Peak	Midday	PM Peak	Evening	Total
Route 59	5472	182	150	54	**5858**	3	6	4	3	**16**
Naperville	3444	194	243	55	**3936**	18	5	36	7	**66**
Lisle	1641	95	180	25	**1941**	16	12	20	4	**52**

Table 22 Weekday alightings at Metra stations near corridor

Weekday Alightings										
	Inbound Trains					Outbound Trains				
Station	AM Peak	Midday	PM Peak	Evening	Total	AM Peak	Midday	PM Peak	Evening	Total
Route 59	3	8	4	4	**19**	105	427	4347	465	**5344**
Naperville	19	9	9	4	**41**	189	385	3142	342	**4058**
Lisle	20	2	15	5	**42**	169	162	1462	186	**1979**

Travel Time

Current transit travel times to the Warrenville Road corridor are a little less than three times as long as average drive time, but are significant at nearly two hours. A last-mile solution results in a decrease in average travel times on transit by about 6% overall.

Table 23 Warrenville Road average travel time characteristics

Zone	Avg Drive Time to zone (minutes)	Avg Transit Time to zone - current (minutes)	Avg Transit Time to Zone - w/ Last Mile Solution (minutes)	Travel Time Reduction (%)
1306	Similar to Zone 1376			
1376	39	113	106	-6%

*average times are calculated by weighting each origin subzone by the number of trips originating from it

CONCLUSIONS

Comparison of Corridors on Transit Potential Factors

The Corridor Assessment provides a detailed look at factors unique to each study area that impact their potential for transit connectivity improvements. While important to understand these factors as they exist within the corridors, it is equally important to DuPage to understand the relative differences between those factors in a comparison across corridors. Such an analysis is useful in determining which study areas may have greater potential to connect riders and will help identify which corridors to prioritize for specific transit connectivity improvements. The following comparative analysis will highlight some of the relative last-mile-enabling strengths of each study area.

Trip Density & Characteristics

Table 25 summarizes data for the three corridors' key zones trip attractions. For key zone groupings within the study corridors, Addison attracts 18% more trips than Wood Dale. Addison also has the highest share of trips originating in Metra capture potential zones, nearly double that of each Wood Dale group. While the largest trip attracting zone grouping is Warrenville Road, which attracts 25% more trips than Addison, it attracts only a nominal share of trips originating from Metra capture potential zones.

Zero-Vehicle Households

Addison trips originate from zones with zero-vehicle household rates approximately 50-60% higher than either Wood Dale group and three times higher than Warrenville Road. Metra capture potential zones show a different pattern; Warrenville Road and Addison have similar shares of zero vehicle households at approximately 20%, which is higher than either Wood Dale group.

Income

Warrenville Road trips originate from zones with higher average income than either Addison or Wood Dale groups. While Warrenville Road trips originate from higher income zones, the Metra capture potential zones have lower average incomes. Interestingly, Addison Metra capture potential zones have average incomes higher than either Wood Dale or Warrenville Road groups.

Poverty

For each of the zone groupings, the share of households below the poverty line is relatively equal. Warrenville Road Metra capture potential zones have an approximately 30% higher share of households below the poverty line compared to the other zone groups.

Age

Age was not mapped in previous sections due to a lack of spatial pattern throughout the region, but DuPage is specifically interested in understanding the potential to attract younger workers, or Millennials. For each of the zone groupings, the share of workers that are between the ages of 21 to 34

is relatively equal. However, Warrenville Road and Addison Metra capture potential zones have higher shares of Millennials than the Wood Dale groups.

Transit Availability and Pedestrian Access

Transit Availability

While none of the zone groupings contain a Metra station, all are within 2.5 miles of the closest station. Unlike the other zone groups which are near one Metra line, Addison is situated between both the UP-W and MD-W lines.

Of the four zone groups, Warrenville Road has the greatest number of Pace bus routes serving it within a half-mile, though many of them are limited service and feeder routes for the traditional commute market that effectively could not be used for a non-traditional reverse commute. Wood Dale and Addison have similar levels of bus service to each other, but only one route in each group provides non-peak service; whereas Warrenville Road will be served by two all-day routes once the restructuring takes effect later in 2016.

Ridership

Metra stations near the Warrenville Road corridor have some of the highest ridership in the entire Metra system, however a smaller ratio of trips utilizing these stations are from non-traditional commute patterns compared to Addison and Wood Dale which have non-traditional trip ratios of 17% and 23%, respectively. The Elmhurst station in the Addison corridor is unique in that it has both a relatively higher share of non-traditional trips and a high number of boardings compared to the rest of the Metra system.

Pedestrian Access

Of the zone groups, Addison has the highest PEF score, suggesting it is the most pedestrian friendly. While Addison and to some extent Wood Dale have areas of gridded street networks, the Warrenville Road corridor is characterized by wide, winding roads, some with high speeds and limited sidewalk connectivity. Warrenville Road and to some extent Wood Dale have buildings offset further from the street, often separated by landscaping or parking facilities, thus making transit trips more challenging to complete.

Table 24 Average Pedestrian Environment Factor (PEF)

Zone Group	PEF Score
Wood Dale Grp 1	17.5
Wood Dale Grp 2	14.9
Addison	21.9
Warrenville Road	17.1

Table 25 Demographics of trip origins to key zones

Corridor	Zone	Total Trips Attracted		% of households with zero vehicles		Income Index (Median = 1)		% of households below poverty line		% of working age population* ages 21-34 (Millenials)	
		All zones	Metra capture zones (share)	All zones	Metra capture zones	All zones	Metra capture zones	All zones	Metra capture zones	All zones	Metra capture zones
Wood Dale Grp1	1392	10,025	7.4%	4.4%	12.4%	1.39	1.29	9.4%	15.4%	32.8%	39.8%
Wood Dale Grp1	1397	10,608	6.9%	4.0%	11.5%	1.41	1.28	9.4%	15.3%	32.5%	38.8%
Wood Dale Grp2	1394	10,279	9.5%	4.8%	12.7%	1.39	1.29	9.9%	15.6%	32.8%	39.3%
Wood Dale Grp2	1399	9,548	10.2%	4.9%	12.8%	1.42	1.31	9.9%	15.5%	32.6%	39.6%
Addison	1418	14,280	19.6%	6.8%	18.5%	1.42	1.46	10.9%	15.9%	34.0%	44.2%
Addison	1424	9,603	20.1%	7.1%	18.7%	1.44	1.48	11.0%	15.9%	34.1%	44.1%
Warrenville Road	1306	14,448	0.4%	2.2%	19.4%	1.56	1.20	9.6%	22.8%	32.2%	46.7%
Warrenville Road	1376	17,206	0.6%	2.4%	22.2%	1.58	1.38	9.4%	21.1%	32.0%	48.8%

Travel Time

Existing Travel Time

On average, transit travel time to the key zones is approximately three times longer than the average drive time. Of the zone groups, Warrenville Road has the longest travel time by transit and Addison has the shortest for trips originating from anywhere in the region.

Last-Mile Improvement Potential

The addition of a last-mile service to the key zones has the greatest impact on transit travel times in the Wood Dale area, reducing travel time by as much as 19%. The Warrenville Road group has the least reduction in travel times as a percent of the total travel time, but has a greater reduction in minutes than the Addison group because Warrenville Road trips are generally longer.

Table 26 Travel times and improvement potential

Corridor	Zone	Avg Drive Time to zone (minutes)	Avg Transit Time to zone - current (minutes)	Avg Transit Time to Zone - w/ Last Mile Solution (minutes)	Travel Time Reduction (%)
Wood Dale Grp1	1392		------- Similar to Zone 1394 -------		
Wood Dale Grp1	1397		------- Similar to Zone 1399 -------		
Wood Dale Grp2	1394	34	92	77	-16%
Wood Dale Grp2	1399	31	91	74	-19%
Addison	1418		------- Similar to Zone 1424 -------		
Addison	1424	23	76	71	-7%
Warrenville Road	1306		------- Similar to Zone 1376 -------		
Warrenville Road	1376	39	113	106	-6%

Summary of Transit Connectivity Potential for Each Corridor

The three corridors analyzed in this study all have unique transit needs that will be best addressed by different mobility solutions. This section summarizes the Corridor Assessment for each study area and provides a framework for the development of potential transit connectivity solutions.

Wood Dale

The Wood Dale corridor is primarily business oriented and contains little residential density. Pedestrian infrastructure is incomplete and existing transit service is commuter oriented, limiting mobility in the area. The corridor has the potential to attract a respectable amount of commute trips from Metra as well as CTA connections via Pace Rosemont service. However, while it attracts trips from throughout the region, the majority of the trips are from near or adjacent zones. While a last-mile service could potentially target commuters from Metra, a broad mobility concept might be challenging due to the nature of the destination zone. Considering the results of the last-mile access improvement analysis, solutions here should focus on improving connections from Metra stations and reducing fixed-route bus travel times from northwest Chicago.

Addison

The Addison corridor contains a mix of high-density employment and residential areas. Pedestrian infrastructure is more complete in residential areas than in employment areas, providing greater mobility opportunities for residents. Zones in the corridor are located between two Metra stations on different lines, connected by Pace fixed-route service, providing greater potential for increasing the reverse commute market; though the rest of the corridor largely lacks fixed-route bus service. Total trips attracted to the corridor are high and many are from origins with a high share of zero-vehicle households. The corridor has the potential to attract commuters from areas of Chicago that contain higher shares of Millennials. Due to the residential, pedestrian, and employment characteristics of the corridor, a broader mobility hub concept could be effective especially if centered near the Elmhurst station. Such a concept could include many connectivity solutions such as improved last-mile connections to Metra, non-motorized transportation options, or generalized ride-sharing opportunities.

Warrenville Road

The Warrenville Road corridor is characterized by low-density campus-style employment with little residential. Pedestrians have incomplete networks and have to traverse large building setbacks, parking, and landscape elements to access places of work. Pace fixed route service is substantial, though it is geared toward serving the strong traditional commute market. Newly restructured Pace bus route service will increase all-day mobility in the Warrenville Road corridor. While not a strong reverse commute market from Chicago, the corridor attracts a high number of trips, and trip origins are well-defined and concentrated from the southwest quadrant of DuPage and the Aurora area. Household income of workers and attraction of Millennials are high in the corridor suggesting that technology based efforts to enhance or market transportation alternatives could prove effective. While not in the Warrenville Road corridor as defined, the areas directly surrounding Naperville Metra station have higher residential densities and more mixed-use development. This environment could support a mobility-hub concept that includes localized circulation via non-motorized or shared-use services in and around the Naperville downtown, while including more targeted last-mile service to participating employers in the Warrenville Road corridor. Such a concept could be beneficial to existing reverse-commuters to area Metra stations but also could target the high concentrations of trips originating in the Aurora area.

APPENDIX 1 - METHODOLOGY DETAIL

Trip Analysis

In the subsequent sections, Chicago Metropolitan Agency for Planning's (CMAP) home-based work trip tables were utilized to understand origin-destination travel markets for each of the DuPage corridors. The tables are output from CMAP's current trip based model for the year 2015 and provide origin-destination data at the CMAP zone level for the Chicagoland region. It is recommended to analyze the data as order of magnitude and not actual trip totals. Trips were mapped by density (trips per square mile for each zone) to highlight concentrations of trip origins and destinations.

The goal of the origin-destination analysis is to understand where high densities of trips are destined within each corridor, where the associated high densities of trip origins are located in the region, and to help segment each origin-destination market by their respective socio-economic characteristics.

Based on the total number of trips attracted by zones within each corridor, key zones were identified for a disaggregated zone analysis.

Demographic Assessment

The demographic assessment of trip origins utilizes a combination of United States Census and CMAP data. Census (2014 ACS 5-year) data is used to determine the total number of zero vehicle households. For the demographic maps this number is converted into a share of households that are zero-vehicle for each zone. Using a share as opposed to a raw number helps control for differences in population among the various zones. The second variable examined is income, for which normalized zonal data indexed to the regional median income came from 2015 CMAP trip generation tables. For the maps, zonal average incomes between 80 and 120% of the regional median are considered average, while anything less than 80% of the median is below average and anything greater than 120% is above average. Together, these variables help illustrate the local area and provide for greater insight into the potential transit markets.

Bivariate maps are used to display these characteristics. More intense blue relates to zones with a greater share of zero vehicle households, while deeper yellow relates to zones with lower income. Layered on top of each other, the deeper the green that results relates to a greater share of zero vehicle households and a lower average income for the zone.

Metra Capture Potential

To better understand the trip characteristics and demographics of areas from which workers may access the corridors as reverse-commuters, "Metra capture potential" zones are identified. These zones represent origin locations for trips to the corridor that are within a reasonable walk or transit trip to a Metra station on the origin end of the trip. Zones within a 30-minute trip to a Metra station that has outbound service toward the employment corridor were considered as Metra capture potential zones.

Travel time is calculated using an average walk speed of 3 mph and 2016 scheduled transit service from Pace and CTA.

Pedestrian Environment Factor

To assess each corridor's pedestrian friendliness – an important element in a person's ability to effectively use traditional transit service – key zones were analyzed using CMAP's pedestrian environment factor (PEF). PEF is the average number of blocks for the zone, which generally indicates how easy it is to move around and access different parts of the zone on foot.

Transit Travel Time

Understanding the length of transit trips to the corridor helps understand the potential for transit to provide access to employment in the corridor. This data is calculated at a smaller geography than other analyses, utilizing subzones which are quarter-sections of zones. Transit times from all transit-accessible subzones in the region to a representative subzone for each corridor were calculated for an average weekday rush period (6:30am to 8:30am). Calculations are made using 2016 transit schedules for CTA, Pace, and Metra and an average walk speed of 3 mph. Trip times are calculated for departures every minute during the period and averaged to each destination.

Last-Mile Potential Improvements

To estimate the potential improvement a comprehensive last-mile solution could have on transit access to each corridor, a service was modeled in the travel time calculations to act as a proxy for an on-demand, shared, curb-to-curb transit service mimicking an "UberPool"-like service. From each Metra station in the corridor labeled "Last-Mile Enabled" a service was added to the schedule that would provide travel from the station to any destination within a 10 minute drive on the road network, calculated using peak-period traffic. In addition, 10 minutes were added to the service to act as a buffer for wait time and route diversions due to pooled-ride pickup and drop-offs for a maximum station-to-destination trip of 20 minutes which is in-line with existing last-mile services provided by Pace Shuttle Bugs.