

2017

Analysis of the Ridership Potential of a New Amtrak “Hiawatha Service” Stop at Lake Forest Station



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This report evaluates the market that would be served by an Amtrak Hiawatha Service stop at the Lake Forest (Milwaukee District North line) Station in Lake County, Illinois. The Hiawatha Service presently consists of seven daily roundtrips between Chicago, Ill., and Milwaukee, Wis., a distance of 86 miles. This Lake Forest facility, at 911 S. Telegraph Road, has never been a scheduled stop for Amtrak but is heavily used by Metra commuter trains.

This analysis consists of four components:

- An assessment of the potential “catchment area” of the station;
- A review of potential for the station and its unused parking capacity to expand ridership on the corridor;
- An analysis of the extent to which adding the stop would be consistent with Amtrak’s corridor-development strategies across the United States; and
- A summary of the employment and student clusters along the route that could enhance demand.

To complete this analysis, the research team conducted the following tasks: i) interviews with key stakeholders and experts familiar with the corridor, ii) geographic information system analysis drawing upon a variety of data sources, iii) field observations on parking availability, and iv) analysis of populations and stations along other rail-passenger corridors across the United States. A summary of these activities can be found in the appendix section.

The primary goal of the study is to summarize the *potential benefits* of a new station to allow for informed decision making, which ultimately must consider *all* factors—including the costs. The study below does *not* consider costs or operational considerations, including freight and passenger train traffic flow. It focuses on the potential benefits from the addition of this stop, with recognition that further analysis may be forthcoming after others, including Amtrak, have an opportunity to review the findings.

Figure 1: Amtrak’s Hiawatha Corridor
With the potential Lake Forest stop



Service Overview

The Hiawatha Service has the highest frequency of any corridor on the Amtrak system outside of the heavily populated coastal regions of the United States. The service operates with financial and planning support from the state governments of Wisconsin and Illinois. South of Rondout, Ill., a junction 4.3 miles north of Lake Forest, Amtrak trains operate primarily over tracks maintained by Metra, which is the Chicago region's largest publically operated commuter rail operator. North of that junction, trains operate over CP Rail, a Class I railroad with its headquarters in Calgary, Alberta.

Schedule changes on the Hiawatha Service require negotiations between all three rail operators and are particularly complex when changes involve the congested territory south of Rondout. Amtrak, the state governments, and the host railroads have nonetheless all demonstrated a strong commitment to improving service quality. The Hiawatha Service boasts on-time performance of 95%, which, along with the roughly 90-minute running times, make it attractive for commuters and non-commuters alike.ⁱ Traffic has grown sharply since 2009, when an additional coach was added to trains. Ridership is particularly strong on early morning inbound runs to Chicago and outbound late-afternoon runs.

In recent years, there has been discussion about moving Amtrak's Glenview stop to the Metra station at Lake-Cook Road, although that effort has apparently stalled. More recent attention has focused on keeping Glenview but adding a stop at Lake Forest Station, which is a two-platform facility (albeit without a pedestrian tunnel) built partially with funds provided by the City of Lake Forest. For many years, the station, which is approximately 28 miles from downtown Chicago and 11 miles north of Glenview, has been a prominent stop on Metra's Milwaukee North line.ⁱⁱ

The Lake Forest station has parking spaces for 548 motor vehicles (e.g., cars and vans), a bicycle parking area, and a large climate controlled waiting room equipped with spacious restrooms and ample seating. Nevertheless, the station remains somewhat underutilized. Since the present station was constructed, weekday boardings have never returned to the 700 passengers-a-day mark observed in 1999. More recent estimates put daily weekday boardings in the 550 – 575 range. The prospects for significant ridership growth dimmed following the launch of Metra's North Central service in 1996. The closest station to this newer route, Vernon Hills, is seven miles to the west and has abundant parking that presently is priced half that of Lake Forest (\$1.50 vs. \$3 per day). The North Central service, which has been gradually expanded, has reportedly siphoned away considerable traffic by providing an alternative route to downtown Chicago for the rapidly growing central part of the county.

A commercial bank that had formerly operated inside the Lake Forest station has closed, making the interior space somewhat oversized for its present traffic. As noted below, substantial excess capacity exists with respect to vehicle parking, creating a notable opportunity for the Hiawatha Corridor.

Key Findings

Four findings from the technical analysis stand out:

I. Lake Forest's "catchment area" would be largely distinct from Glenview's and encompass a population larger than any Amtrak station in Illinois that is outside the Chicago

metropolitan region. An estimated 190,292 people living within 15 minutes of the route would be brought closer to an Amtrak stop.

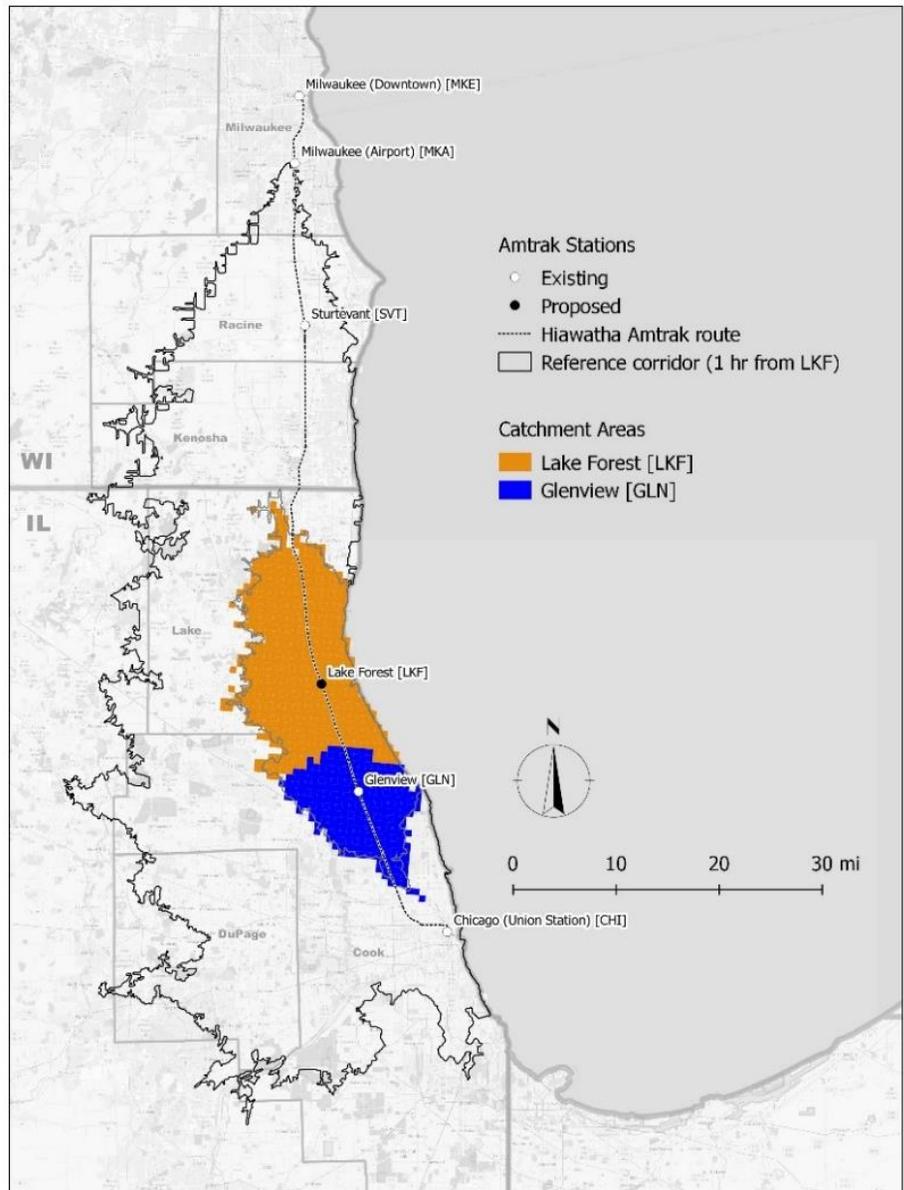
The 45-mile distance between the Glenview and Sturtevant, Wis., stops is unusually long for a highly urbanized intercity passenger corridor, a topic formally evaluated in Finding IV below. To understand the potential market that would be served by filling this gap with a Lake Forest stop, the study team evaluated the distribution of population and jobs both along the corridor and the state as a whole.

The analysis showed that:

The geographic area within a 15 minute drive of the Lake Forest station encompasses 254,304 residents and 218,855 jobs—a higher number than any other Amtrak stop in Illinois except for Chicago Union Station and three stations (Homewood, Glenview, and Naperville) in the Chicago metropolitan region (Figure 2). A summary of how Lake Forest compares to other Illinois stations appears on Figure 3 on the following page. Although Lake Forest’s 15-minute “buffer area” partially overlaps with that of Glenview (roughly 11 miles south), it is still larger than all downstate Illinois stations when this overlap (which encompasses 64,012 people) is removed.

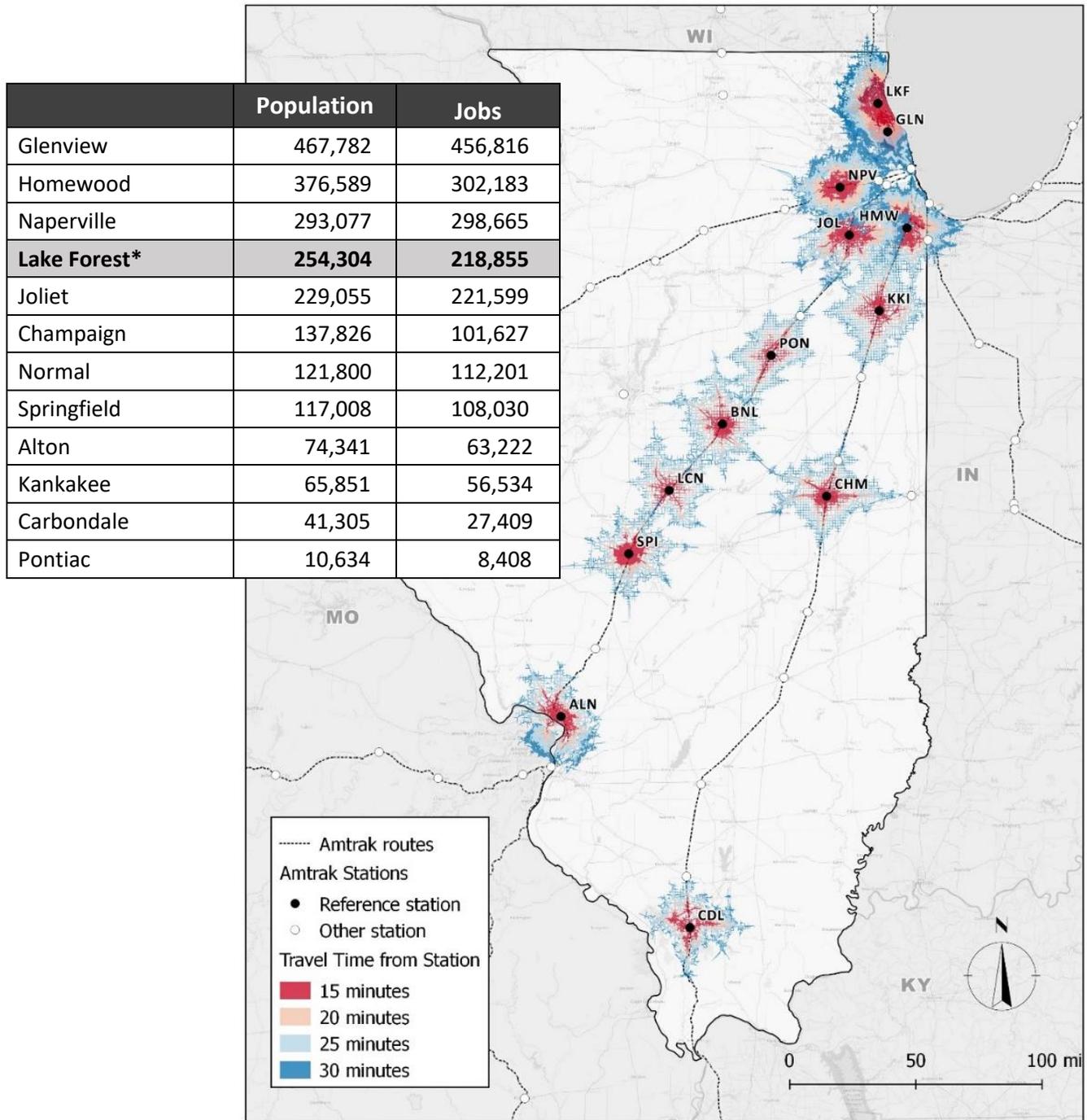
The Lake Forest station would give an estimated 190,292 people living within 15 minutes of the Hiawatha Service shorter driving distances to an Amtrak station. This population (which excludes of the overlap with Glenview) could reach Lake Forest faster than they could reach any of the other stations. The catchment area is several times the

Figure 2: Catchment Areas for Glenview and Lake Forest
30 minute travel time



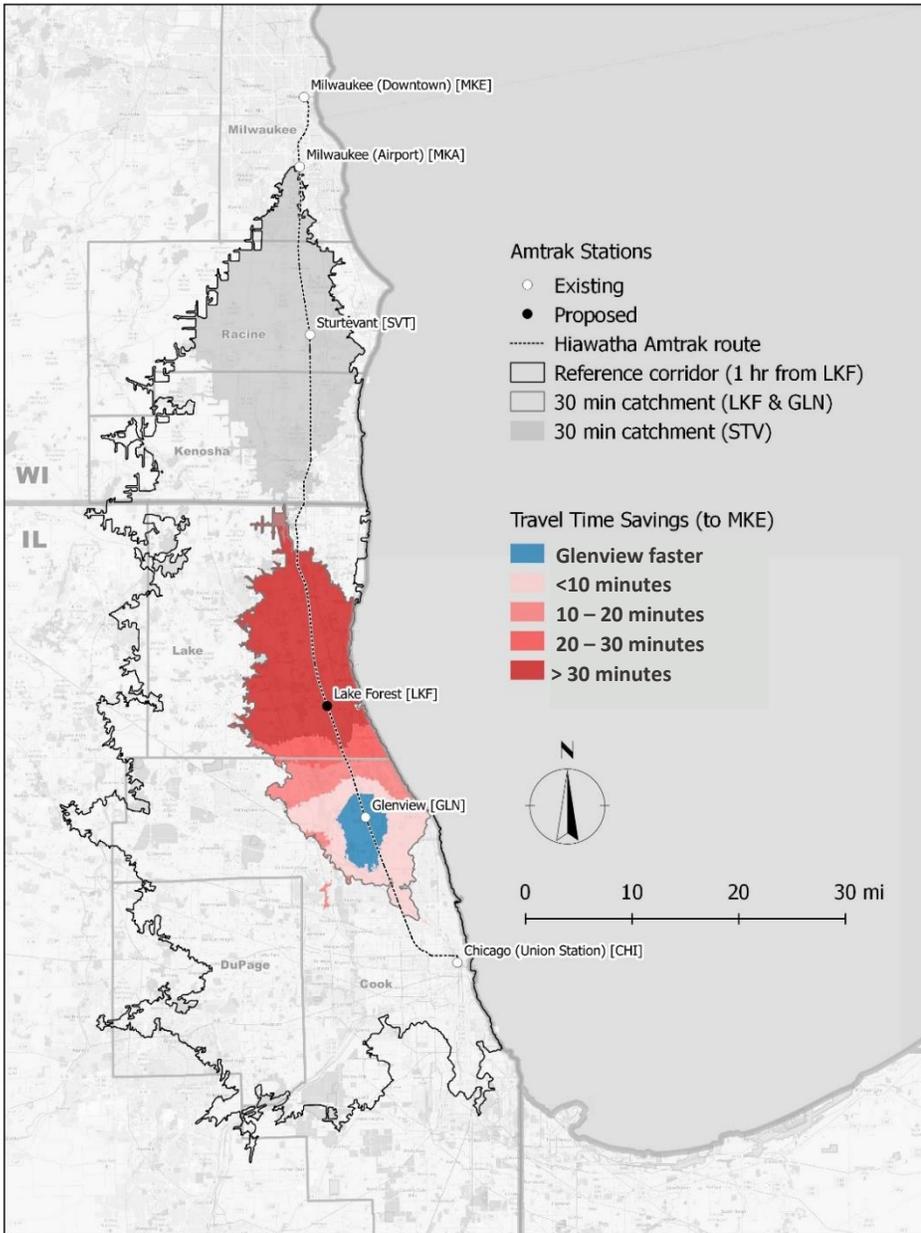
This figure shows the residential populations in which the nearest station is Glenview or Lake Forest based on 2015 U.S. Census estimates.

Figure 3: Populations within 15 minutes of Notable Amtrak Stations in Illinois



* When the population within the Lake Forest 15-minute buffer area that overlaps with the Glenview area is removed, that area's total is **190,292**. A similar proportion of jobs overlap. Note the population and job estimates are calculated using different methodologies due to varying aggregation methods by the U.S. Census (see Appendix)

Figure 4: Time Savings from a Lake Forest Station
 Populations Living within 30 minutes of Glenview or Lake Forest stations



The red shading denotes areas in which residents would save time on Amtrak trips to southeastern Wisconsin by driving to Lake Forest rather than Glenview. The area in blue denotes areas in which trips are faster via Glenview.

size of Sturtevant, WI, which is near Racine. It is also much larger than Champaign, Bloomington, Springfield and other downstate communities, which have catchment areas of less than 140,000 (Figure 3 on previous page). When a larger 30-minute driving radius is considered, the catchment area, inclusive of the overlap with Glenview, is 1,673,088 people, in a scenario without traffic congestion.

Rapid population growth of southeastern Wisconsin along the Hiawatha route suggests that the population and employment base served is likely to grow sharply.

Kenosha County is expected to be the third fastest-growing county in Wisconsin through 2040, based on a state-sponsored study published in 2010. Its population is expected to rise from approximately 166,426 to 291,670 over this period, and this growth trajectory is already underway, based on 2015 Census estimates.ⁱⁱⁱ The creation of thousands of jobs could transform Racine and Kenosha Counties. A Lake Forest station would be positioned to tap into this market.

II. A Lake Forest stop would help eliminate two notable limitations of the Hiawatha Corridor within the Chicago metropolitan area: i) the absence of a suburban station that can be conveniently reached from a major expressway, and ii) the shortage of available and affordable parking. For many travelers, the total travel time (time spent driving to the station and onboard the train) to southwestern Wisconsin would fall by more than a half-hour.

Analysis of travel times shows that a sizeable number of passengers in the northern part of the Chicago metropolitan region would enjoy reductions in travel time on trips to southeastern Wisconsin by traveling via a Lake Forest station rather than via the Glenview station. This is largely due to Lake Forest station's close proximity to I-94 (on northbound trips, it is 2.1 mile miles away) and the benefits of having a less circuitous journey. The Glenview station, located approximately five miles from I-294 and three miles from I-94 (based on most recommended driving routes), tends to be harder to reach from an expressway. For example, a passenger traveling from downtown Prospect Heights to Milwaukee would save about nine minutes using the Lake Forest station. Whereas Glenview is geographically closer for this passenger, the avoidance of the slower speeds of arterial roads and the more direct routing makes the total trip time via Lake Forest faster.

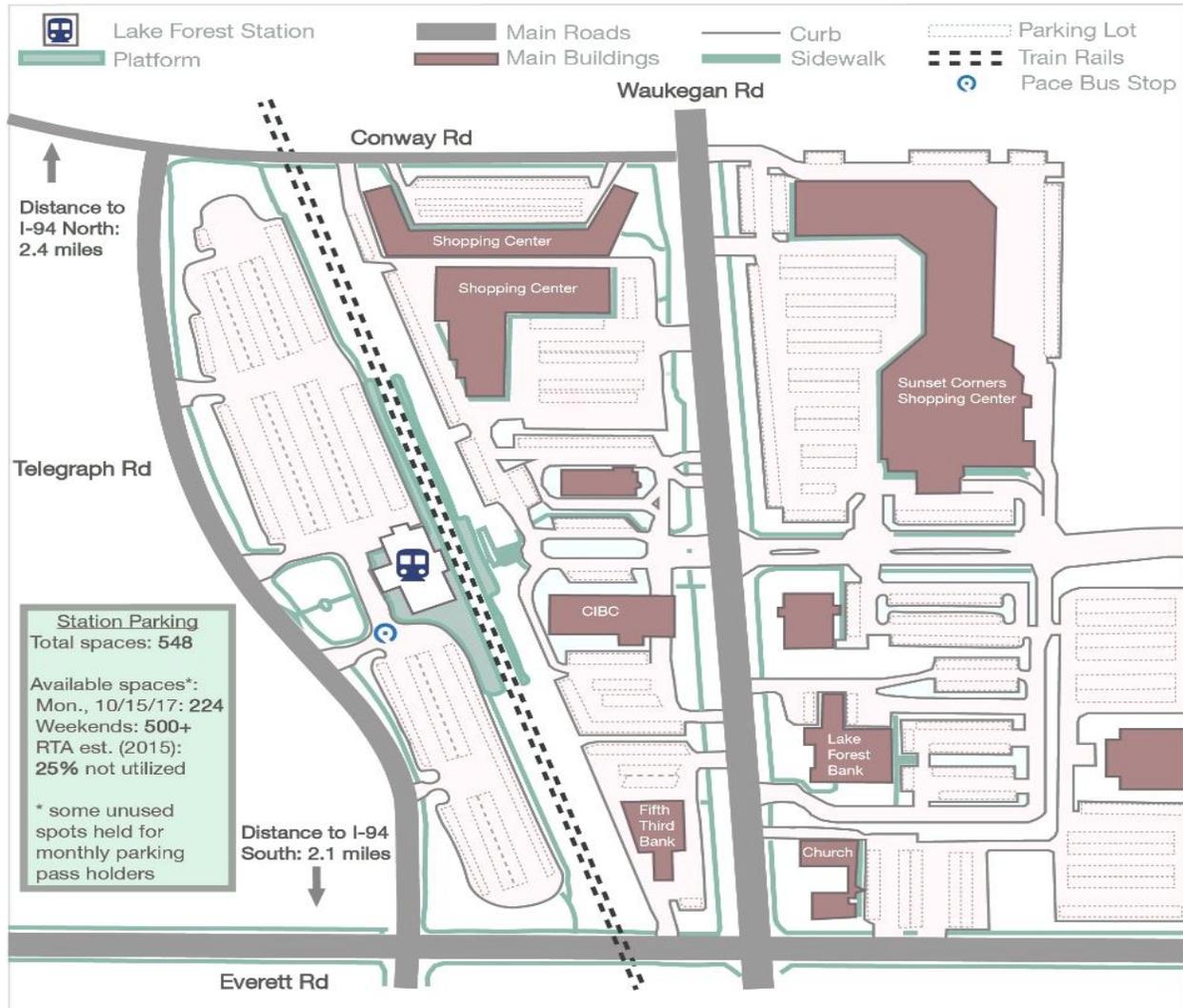
Measuring the Magnitude of Time Saving from adding the Station. Geographic analysis (using U.S. Census Data) of the spatial pattern of 3,116,649 people within *30 minutes* of either the Glenview or a new Lake Forest stop allowed the study team to measure the time savings (see Figure 4 on previous page). This enlarged study area, which is also measured without traffic congestion, includes certain urban neighborhoods in Chicago and its suburbs. An estimated 301,107 travelers would have faster journeys to southeastern Wisconsin using the Glenview stop, whereas 2,815,542—roughly nine times as many—would have faster journeys using Lake Forest. The Lake Forest station, conservatively estimated, would save at least 20 minutes for more than a half-million people.

As previously noted, these estimates take into account both driving time and the Amtrak portion of the trip, which was assumed to be 13 minutes less from Lake Forest than Glenview. Although these calculations are based on free-flow traffic conditions, there would also be benefits from the new stop during peak-periods, due to the fact congestion affects both expressways (including toll roads) and arterial roads.

Parking Availability Benefits. Analysis also suggests that the Lake Forest station's abundant parking could serve a role in increasing mobility. Presently:

- *Parking at Chicago Union Station* is \$24/hr. and requires traveling on urban expressways leading to the Jane Byrne Interchange, which is among the country's most congested interchanges.
- *Parking at Glenview* is not provided in coordination with Amtrak. On its website, Amtrak indicates that no short-term or longer term parking is available. Although passengers can use Metra parking facilities, these spaces are intensively utilized on weekdays and overnight stays are not permitted for non-permit holders. Similarly, RTA analysis indicates that Glenview's parking is at full capacity.^{iv} Customers without familiarity with these local facilities likely assume that parking is not an option.

Figure 5: Land Uses and Parking around Lake Forest Station



This drawing provides a summary of the audits of parking availability at Lake Forest Station as well as its adjacent businesses and drive distances to Interstate 94 (Tri-State Tollway).

Lake Forest, conversely, has significant excess capacity with respect to parking. To assess the extent of this, the study team audited the station’s parking lot utilization on three afternoons (Figure 5 and Note 3 in the Appendix) – twice on weekends and once on a weekday. On none of the occasions was there fewer than 200 parking spots available at Lake Forest; on the weekends, there were more than 500 spots available. Even when accounting for parking spots held for monthly permit holders (who do not always use their spots), the number of available spots appears to exceed 135 on weekdays. The RTA estimated in 2015 that, after taking into account permit holders, 25% of spots were not utilized.^v

Payment systems could be modified by the City of Lake Forest to allow for long-term (overnight) parking for Amtrak patrons, as is done at other Amtrak stations, such as at Anaheim, CA, as well as advance purchase sales. This would allow passengers to arrive with confidence that spaces are available.

Moreover, any shortages in parking for Metra users from rising use by Amtrak passengers could be mitigated by increased use of nearby commuter-rail stations, such as Lake-Cook Road, that are also underutilized. The RTA estimates that parking at this station was only about 56% utilized in 2015, resulting in more than 250 spots generally available. Other nearby stations also have only partially used lots.

Observation III. Even with the establishment of a Lake Forest stop, the Hiawatha Service would remain above-average with respect to the average distance between stops among Amtrak corridors. This suggests that adding at least one new stop would be consistent with Amtrak’s national strategy for corridor development.

Trains on the Hiawatha Service currently make three intermediate stops: Glenview, Sturtevant, and Mitchell Airport Railroad Station. As a result, with the inclusion of the final destination, there is a stop once every 21.5 miles. The Mitchell station, the most recent addition to the corridor, was established in 2005 and has emerged as one of the busiest stops in the state.

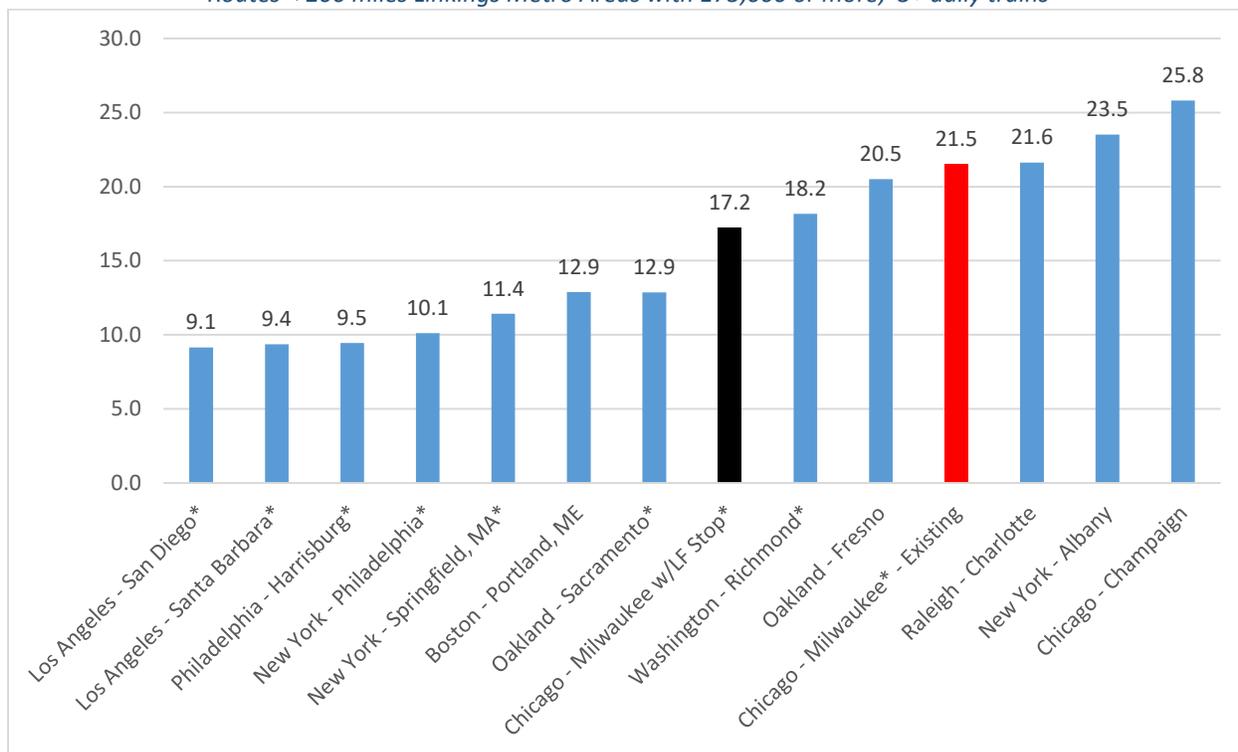
A tradeoff exists with respect to the number of stops and the speed of service. Each stop can be expected to add about three or four minutes to running time. Analysis of the Amtrak route network suggests that, in many other corridors, particularly urbanized ones, the carrier has at least as many stations per mile of route than are currently maintained on the Hiawatha Line.

To illustrate typical patterns across the country, the study team considered prominent Amtrak city pairs that i) have three or more daily trains, ii) are 200 miles or less apart, and iii) involve metropolitan areas with populations of at least 150,000. We denote corridors that are “highly urbanized”, i.e., with routes entirely traversing counties with population densities with more than 250 people per square mile.^{vi}

This analysis shows that, with a Lake Forest stop, the Hiawatha Corridor would continue to be near the midpoint of the sample of corridors considered with respect to the number of stops per mile (Figure 5). Moreover, it will still have approximately twice the distance between stops per mile as most other *highly urbanized* corridors, including the Los Angeles – Santa Barbara/San Diego routes (part of the Pacific Surfliner service) and the Harrisburg – Philadelphia (Keystone Service) route. It would also have longer distances between stops than the Oakland – Sacramento portion of the Capital Corridor and the New York – Springfield, MA route, which are also highly urbanized.

On the Hiawatha Corridor, trains make every stop, whereas on certain other corridors, trains skip certain stations. When the metric is changed from *average miles between stations* to the *average distance between stops* for the train making the most stops, however, the results are similar: with a Lake Forest stop, Hiawatha Service would rank below average among highly urbanized corridors in the number of stops per mile.

Figure 5: Distance Between Stations on Amtrak Corridors
 Routes < 200 miles Linking Metro Areas with 175,000 or more; 3+ daily trains



* denotes highly urbanized corridor in which all counties traversed have population densities of 250 or more

One key caveat to note is that the Hiawatha Service’s route is shorter than all the other corridors on the list, which makes the dynamics of travel decisions for its passengers different from the others. Moreover, some routes operate with electric propulsion, which allows for stops in less time. At the same time, the 45 mile distance between Glenview and Sturtevant is an outlier among highly urbanized corridors. On the Keystone and Pacific Surfliner routes, the longest gaps between stations are 12 and 26 miles respectively. The longest distance on the Oakland – Sacramento corridor is also 26 miles.

IV. A Lake Forest stop would put distinct clusters of employment and student populations within 10 miles of an Amtrak station, some of which already offer employee shuttles to Lake Forest. Demand for service to Milwaukee Mitchell Airport also appears to be appreciable and growing.

Conversations with area officials, including the Lake County Transportation Management Association and Lake County Partners, that there is strong interest in improved Amtrak service. For example, 12 Fortune 500 companies that are major employers with headquarters in Lake County would become closer to the Hiawatha Corridor with the new stop.^{vii}

Table 1: Time Savings for Notable Lake County Businesses from a Lake Forest Station

Fortune 500 Company	Distance to Lake Forest station (in miles)	Travel Time to Lake Forest station	Distance to Glenview Station (in miles)	Travel Time to Glenview Station	Time saved with Lake Forest station	Time saved to Milwaukee (drive and train time)
Abbott (Abbott Park)	6.1	13 min	21.6	29 min	16 min	29 min
AbbVie Inc. (North Chicago)	10.2	17 min	25	36 min	19 min	32 min
CDW Corporation (Vernon Hills)	5.8	12 min	16.3	26 min	14 min	27 min
Packaging Corporations of America (Lake Forest)	3.2	7 min	15.9	23 min	16 min	29 min
Tenneco (Lake Forest)	3.2	7 min	15.9	23 min	16 min	29 min
Essendant (Deerfield)	5.1	15 min	10.3	19 min	4 min	17 min
W.W. Grainger (Lake Forest)	3.6	8 min	15.4	23 min	15 min	28 min
Baxter International (Deerfield)	6.8	14 min	9.7	18 min	4 min	17 min
Mondelez (Deerfield)	5	14 min	10.4	18 min	4 min	17 min
Walgreens Boot Alliance (Deerfield)	4.9	13 min	8.5	21 min	8 min	20 min
Takeda Pharmaceuticals USA (Deerfield)	6.7	12 min	9	22 min	10 min	24 min
Discover Financial Service (Riverwoods)	6	14 min	9.5	17 min	3 min	16 min

* See Note 4, Appendix, for calculation details. Based on recommended Google Maps routes.

Six Fortune 500 companies in the station’s vicinity would be at least ten miles closer to Amtrak and save at least 27 minutes on trips to Milwaukee: Abbott, Abbvie, CDW Corporation, Packaging Corporations of America, and Tenneco (Table 1). Abbott also has a diagnostics facility with a significant employee presence 3.4 miles away in Lake Forest and would receive similar timesaving benefits.

Farther south in Lake County, five Fortune 500 companies in Deerfield (Assendant, Baxter International, Mondelev, Walgreens Boot Alliance, and Takeda Pharmaceuticals USA) and one in Riverwoods (Discover Financial Service) would be closer to an Amtrak station. Please refer to Note 4 in the appendix for a summary of how these computations were made.

Other major institutions also would benefit. Aon Hewitt, which employs several thousand in Lincolnshire, would be 6.2 miles away, while Great Lakes Naval Station, which has roughly 7,000 recruits on active duty at any one, would be eight miles away. Lake Forest College (four miles) has an enrollment of 1,592. Understanding the varying propensities of these institutions to use Amtrak would require additional research, but their proximity is favorable. Several already run shuttles to Lake Forest’s commuter rail stations.

Research indicates that General Mitchell Airport International Airport draws heavily from Lake County. A recent survey found that the share of travelers in northeast Illinois that had flown out of Mitchell rose 35% between 2008 and 2015.^{viii} Although it is unclear whether seven Amtrak trips per day is enough to foster heavy volumes of traffic to/from the airport, this option would likely be attractive to a certain segment of the market.

Conclusion

As previously noted, the above analysis focuses on the *market potential* of a station in Lake Forest. Additional research would be needed to assess the costs of establishing a stop and the operational and technical factors that affect the feasibility of a stop—or the effects of a new stop on existing passengers not using the station. It should also be reiterated that the Hiawatha Service is shorter than most other corridors considered for comparison purposes, so its travel dynamics may be different.

Nevertheless, the analysis indicates that the catchment area for the station would be sizeable, that Lake Forest has notable advantages over existing stations – particularly its expressway access and parking facilities – and that adding a stop would be consistent with Amtrak norms. The station would add 190,000 people to the market within 15 minutes of stop. More than a half million people living within 20 miles of either Glenview or Lake Forest would have shorter trips to southeastern Wisconsin when driving to reach a train station due to Lake Forest’s favorable location on such trips. Evidence also suggests there would be demand for airport trips and for travel in both northbound and southbound directions.



Appendix

Note 1: Interviews Conducted

- **C. Scott Smith**, mobility consultant
- **Tim Grzesiakowski**, executive director, TMA of Lake County (transportation management association)
- **Philip Martin**, consultant, former Amtrak and United Airlines. Mr. Martin was involved in planning for the Milwaukee Airport Station
- **Lake County Partners**, Kevin Considine and Barbara Prusila
- **Midwest High Speed Rail Association**

Note 2: Sources and Methodology

Employment data for areas proximate to the reference Amtrak stations were drawn from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program. The LEHD Origin-Destination Employment Statistics dataset (LODES), which is updated annually, provides estimates by place of residence and place of work at the census block-level. The report uses LODES data from 2015, the most recent available at the time of this writing.

Population data were drawn from the US Census Bureau's American Community Survey (ACS) 5-year estimates (2011-2015) at the census block group level, the finest level of geography and most current estimates available as of this writing.

Travel time calculations for this project were carried out using both OpenTripPlanner (OTP) software and Mapzen's API service. Employment and population for 15-, 20-, 25- and 30-minute travel times from select Amtrak stations were estimated via the simple areal weighting of target travel time catchment areas with respect to the proportional geographic overlap of corresponding source census blocks (employment) and census block groups (population). While more accurate than aggregating the entire population of the source census geography to a target catchment area, the method can produce errors when populations are not evenly distributed within an area. Errors can be more pronounced when simple areal weighting to estimate overlap across coarser source geographies such as, in the case of this research, census block groups (for population). In some instances, travel times include short walking distances to or from addresses reported in US Census data that are not situated directly on streets or roads. The analysis also assumes that drivers observe posted speed limits.

Sources:

U.S. Census Bureau. (2017). LEHD Origin-Destination Employment Statistics Data (2002-2015) [computer file]. Washington, DC: U.S. Census Bureau, Longitudinal-Employer Household Dynamics Program [distributor], accessed on October 10, 2017 at <https://lehd.ces.census.gov/data/#lodes>. LODES 7.3

U.S. Census Bureau. (2017) "Summary File." 2011–2015 American Community Survey. U.S. Census Bureau's American Community Survey Office, 2017. Web. 10 October 2017.

Mapzen.com, accessed on October 10, 2017 at <https://mapzen.com/documentation/mobility/isochrone/api-reference/#isochrone-service-api-reference>

Note 3: Dates of Parking Audits

Observations made on Saturday, September 30, 2017 (3:30 pm) and Sunday, October 1, 2017 (1 p.m.), when 25 and 20 cars were counted, respectively. On Monday, October 16, 2017 (1:30 p.m.), 309 cars answered counted. Vehicles that appeared to be permanently parked in the lot were included in count.

Note 4: Travel Time Savings - Fortune 500 Companies

Table 1 shows the potential time savings from a Lake Forest Station for 12 Fortune 500 companies and major employers in Lake County identified by Lake County Partners in 2016.^{ix} (The status of these companies may have changed since the list's publication). These estimates are based on a single mid-afternoon weekday (Wednesday) search with favorable weather conditions. Travel times and recommending routings will vary based on conditions, and results regularly change when using the Google Maps travel tool.

One caveat: although some companies have multiple locations, only a single location is considered. The times calculated for these institutions to both Amtrak stations tend to be shorter than the times shown on Figure 4 due to the fact the latter involves travel from *residential* locations, which are less likely to be on major travel corridors. The estimates of travel time to Milwaukee (in the far-right column) assume a 13-minute running time by Amtrak trains between Glenview and Lake Forest.

ⁱ The statistic about on-time performance was obtained from: <https://www.amtrak.com/hiawatha-train&mode=perf&overrideDefaultTemplate=OTPPageVerticalRouteOverview>

ⁱⁱ The RTAMs website lists Lake Forest as being at Milepost 28.4 and Glenview at Milepost 17.4. Other sources differ. See <http://rtams.org/rtams/home.jsp>

ⁱⁱⁱ For a summary of state of Wisconsin forecasts for county population growth, please refer to Page 19 of: http://www.doa.state.wi.us/Documents/DIR/Demographic%20Services%20Center/Projections/FinalProjs2040_Publication.pdf

^{iv} For information on parking and ridership levels, visit the RTAMs website at <http://rtams.org/rtams/home.jsp>

^v Ibid.

^{vi} Information about population density of corridors was obtained from the U.S. Census Bureau at <https://www.census.gov/dmd/www/pdf/512popdn.pdf>

^{vii} This information is obtained for Lake County Partners, accessible at <http://www.lakecountypartners.com/index.php/why-lake-county/economic-development-profile/lake-county-leading-employers>

^{viii} "Mitchell airport attracting more passengers from northern Illinois," Milwaukee Journal-Sentinel, <http://archive.jsonline.com/business/mitchell-airport-attracting-more-passengers-from-northern-illinois-b99639744z1-363552421.html/>

^{ix} For the Lake County Partners list, please visit <http://lakecountypartners.com/index.php/why-lake-county/economic-development-profile/lake-county-leading-employers>.