

Lake County Transportation Market Analysis

Executive Summary

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prepared for

Lake County Division of Transportation

prepared by

Cambridge Systematics, Inc.

with

MKC Associates

report

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1.0 Introduction

The Lake County Transportation Market Analysis project has three main objectives. First, conduct a detailed evaluation of the travel markets in the county, as characterized by the socioeconomic characteristics of the travelers and the magnitude, directionality, and type of their travel. Second, analyze the service profile of existing fixed route and demand-responsive transit services in Lake County. Third, develop transit service concepts that are consistent with travel market characteristics and responsive to the transportation needs of Lake County residents.

In order to fulfill these objectives, a market analysis study focusing on supply and demand of transportation services was designed. The study also was supported by a service planning component to develop ideas for improving existing transit service and to introduce new service options. A preliminary high-level assessment of these ideas was conducted to develop priorities. These ideas serve as a menu of options that Lake County and transit agencies serving the county may choose from to study further and to consider for implementation.

The project adopted a data-driven approach. Robust data analysis and findings supplemented with stakeholder input provide the basis for developing the service concepts. The approach emphasizes the size, geography and directionality of each travel market and views individuals as decision-makers whose attitudes and beliefs are assumed to play a significant role in their decisions. Three key activities included the following:

- Analysis of existing data on transit supply and demand helped us better understand the key characteristics of transit services and identified needs for collecting new data to support the development of service concepts.
- The service development methodology relied on the market analysis findings, and made use of new data and stakeholder input to refine and evaluate service concepts. The evaluation process helped to suggest priorities among the recommended service ideas.
- Finally, the study provided a repository of comprehensive travel demand and travel supply data for Lake County that can support further analysis of the recommended options and other planning studies.

The project was divided into eight distinct tasks to successfully implement these three key activities. The tasks are defined as follows:

- **Task 1** - Review of all Transportation Services
- **Task 2** - Review of Previous Transportation Market Analysis
- **Task 3** - Analysis of Transit Services and Performance Trends
- **Task 4** - Demographics, Land Use and Travel Pattern Analysis

- **Task 5** – Identification of Needs for New Data and Data Collection Planning
- **Task 6** – Survey Implementation, Data Analysis and Data Delivery
- **Task 7** – Service Concept Design and Service Recommendations
- **Task 8** – Final Report and Documentation

The results and findings are documented in detail in five standalone technical reports. The five technical reports include the following:

- **Technical Report 1** – *Review of Transportation of Services* (Tasks 1 and 2)
- **Technical Report 2** – *Lake County Service Analysis* (Task 3)
- **Technical Report 3** – *Analysis of Land Use, Socioeconomics and Travel Patterns* (Task 4)
- **Technical Report 4** – *Data Collection and Analysis* (Task 5 and 6)
- **Technical Report 5** – *Evaluation of Service Concepts* (Task 7)

In addition, data from various existing sources and the survey data collected during the study were also provided to Lake County and Pace.

The **Final Report** titled *Lake County Transportation Market Analysis* corresponds to Task 8 and provides a summary of key findings from each task.

Finally, this **Executive Summary** highlights the key activities and service recommendations along with a preliminary proposed phasing for these improvements.

2.0 Transportation Service Analysis

The first three tasks as detailed in **Technical Reports 1 and 2**, “*Review of Transportation of Services*” and “*Lake County Service Analysis*” concentrated on the documentation and analysis of characteristics and use of all modes serving Lake County with an emphasis on transit and paratransit services.

Transit service in Lake County includes four general travel modes:

- Metra Commuter Rail Service
- Fixed Route Bus Services, which include:
 - Pace Local Bus; and
 - Shuttle Buses.
- Demand Responsive Services, which include:
 - Dial-a-Ride (DAR) programs, including those which are supported by Pace (11 programs) and those that are not (37 programs);
 - Call-n-Ride (CnR) in one community (Greater Round Lake); and
 - ADA Paratransit.
- Vanpools

The analysis included an inventory of all transit modes in Lake County, documenting the span, frequency, geographical coverage, ridership, and productivity of each mode. The analysis was supported by existing operational and ridership data from Pace and municipal providers of demand responsive services. Where existing data permitted, information on route ridership and service productivity was tabulated.

Survey data, available for ADA Paratransit and for some dial-a-ride services, were used to identify key characteristics of riders and their trips. For fixed route bus services, Pace’s automatic passenger counts from Spring 2011 provided information on boardings and alightings by bus stop. These data were used to identify the utilization by bus stop and measure loads by route segment and time period. Interviews with operations staff provided additional insights to supplement the analysis of available data.

The findings from these tasks were used as a guide in developing service planning ideas and evaluating the alternatives.

3.0 Market Analysis

The market analysis task started with an in-depth analysis of available data on socioeconomic characteristics and travel patterns of in Lake County. Detailed results are presented in **Technical Report 3, "Analysis of Land Use, Socioeconomics and Travel Patterns"**.

A district structure with 45 districts was developed to summarize socioeconomic and travel data. The district structure is nested within the Chicago Metropolitan Agency for Planning (CMAP) traffic analysis zone system and has a finer level of detail in high population areas in Lake County. District size becomes larger for low-density population areas within the county and for areas farther away from Lake County.

Analysis of key land use and socioeconomic characteristics was accomplished by processing and examining the estimates of population and employment for 2010, and forecasted trends obtained from the CMAP model. Data from the 2005-2009 5-Year American Community Survey were used for customized summaries at the district level portraying key household, person, and commute characteristics.

Identification of travel markets relied on the analysis of the CMAP travel demand model trip tables at the district level of detail. Total and home-based work (HBW) trips were analyzed at the county and the district level of detail and results were used to identify a set of five key travel markets within Lake County.

These markets are as follows:

- *Intra Waukegan Districts* - trips within the City of Waukegan and vicinity;
- *Waukegan to Central Corridor* - trips starting from Waukegan and destined to employment site along Milwaukee Avenue Corridor and near Lake Cook Road;
- *Greater Round Lake to Central Corridor* - trips observed between Greater Round Lake and the Milwaukee Avenue Corridor and near Lake Cook Road;
- *Greater Round Lake - West Gurnee - W. Waukegan/Gurnee* - trips attracted to the Gurnee Mills area that were produced in Gurnee, western Waukegan, Antioch, and Greater Round Lake areas; and
- *Intra Central Corridor* - trips within the Milwaukee Avenue and Lake-Cook Road corridors.

Analysis of travel markets included a thorough study of CMAP home based work trip tables, 2000 Census Transportation Planning Package (CTPP) journey to work flows at the zonal level, and Dun & Bradstreet data on employment sites.

Characterization of Lake County's travel market is achieved by examining the readily available survey data from transit riders and non-riders in Lake County:

- The 2006 Metra Origin-Destination Survey was analyzed to understand trips and characteristics of Metra riders using stations in Lake County.
- Key characteristics of Pace riders in Lake County were determined by analyzing the 2007 Pace Customer Satisfaction Survey.
- The analysis of the 2009 Regional Transportation Authority (RTA) Attitudinal Survey provided insights about the trip characteristics of non-riders in Lake County.

Key observations about Lake County travel market characteristics are as follows:

- 19,000 trips were produced in Lake County daily and 3,800 trips were attracted to Lake County.
- Commuter rail riders are predominantly traditional commuters who travel to Chicago and typically access Metra stations by driving alone (82 percent). About 1.5 percent use Pace to access their stations. Non-motorized access has higher shares in the communities by Lake Michigan.
- Pace serves a variety of markets including local suburb-to-suburb travel especially in the Waukegan area and egress trips to employers for reverse commuters who arrive in Lake County using Metra's commuter rail service. Pace accounts for only a small portion of access service to Metra for the traditional commute to the City of Chicago.
- Over 70 percent of Pace riders reported that they do not own cars or do not have access to an automobile. Most riders use Pace for multiple purposes and at different times of the day.
- By design, Shuttle Bugs serve a unique market that consists predominantly of reverse commuters and, to a lesser extent, suburb to suburb commuters.
- According to Lake County respondents to the 2009 RTA Attitudinal Survey, about 40 percent of Lake County residents were unfamiliar with transit. The importance of this observation reflects the need to make transit service more visible to non-users.
- The analysis of respondents' attitudes indicates that driving is perceived as the fastest way to travel in Lake County and that respondents did not view themselves or their friends and family as typical transit users.
- Lake County commuters recognize the reliability and productivity benefits offered by premium transit services.
- While there is a general willingness to walk at either at the origin or destination end of a trip, the willingness to transfer is very low suggesting the advantage of direct "one-seat ride" transit service.

4.0 Data Collection

Following the development of a detailed inventory of available data sources, additional data needs to support the Service Planning task were determined. **Technical Report 4, "Data Collection and Analysis"** provides a detailed discussion of data that were collected to enhance our understanding of Lake County residents' transportation needs, preferences, and attitudes that affect their daily travel choices:

- a. A Resident Travel Survey in the Greater Round Lake, Antioch and Waukegan districts focused on the availability of transit services and attitudes towards using transit for daily travel.
- b. An Employee Survey focused on concentrations of employment sites in Lake County to better understand the origins of these employees.
- c. An Onboard Survey provided origin-destination data for riders of the Waukegan Pace bus routes.
- d. Focus groups examined Call-n-Ride (CnR) services and the concept of flexible bus services, such as deviating bus routes.

The Resident Survey

A total of almost 1,700 respondents provided valid responses to the survey. Some of the key findings from the survey include the following:

- Nearly half (48 percent) of the reported destinations are well-served by existing transit (within a quarter mile buffer along existing Pace routes), compared to 22 percent of reported origins.
- 86 percent of the respondents have never used transit.
- Unavailability of service and access to transit stops that are not close to respondents' homes are key barriers to transit use. Dependence on auto for ancillary activities is the second most important barrier to transit use.
- Existing transit users were generally satisfied with transit services. However, there were demands for faster service, more frequent service and higher quality amenities.
- Lake County riders and non-riders alike recognize the benefits of high quality transit and are likely to support transit investments. However, they are sensitive to delays and strongly prefer one-seat ride transit options.

The Employee Survey

A total of 1,031 respondents provided a valid response to the survey. Key findings from the employee survey can be summarized as follows:

- A great majority of the destinations (83 percent) are well served by existing transit (within a quarter mile buffer from existing Pace routes), compared to only 23 percent of origins.
- 86 percent of the respondents drove alone, 6 percent rode transit, and 8 percent shared a ride to their destination.
- 82 percent of the respondents stated they never used transit.
- Unavailability of service and transit stops that are far away from their homes were key barriers to transit use. Inconvenient schedules and longer travel times by transit compared to the automobile were additional barriers to transit use.
- Transit users were generally satisfied with existing transit service. However, existing transit users asked for more frequent service, more convenient schedules and higher quality amenities.

Pace Rider Survey

A total of 1,209 riders provided a valid survey response, resulting in an overall response rate of 37 percent. A thorough automated and manual geocoding process was implemented. This process yielded a dataset with 80 percent geocoded origins and destinations. Key findings from the Pace rider survey in Waukegan can be summarized as follows:

- Nearly 70 percent of the respondents were transit dependent riders without ready access to an automobile for their travel.
- Pace riders made frequent transfers; 48 percent of all respondents transferred at least once to reach their destinations.
- The spatial distribution of origins showed that the need for a transfer became more prevalent when origins were located further to the north or south from the east-west axis along Washington Street.
- 56 percent of the transit trips were for home-based other purposes, 32 percent for home-based work travel, and 12 percent for non-home based purposes.
- Respondents were satisfied with the existing Pace services. However, they asked for weekend services, improved on-time performance, and higher quality amenities.
- Respondents were satisfied with the existing pulse point and over 70 percent did not have any problem traveling to it. Finally, 89 percent of the respondents said they would definitely or likely recommend transit to friends and family.

Focus Groups

Fifteen stakeholders participated in the two focus groups. Nine participants attended the Mundelein/Vernon Hills/Libertyville group, and six participants attended the Antioch/Lake Villa/Lindenhurst group. Stakeholders were asked to identify the major transportation challenges faced by their constituents.

- The primary challenge in the Antioch/Lake Villa/Lindenhurst community appears to be transportation for medical appointments as there are very few medical facilities in the immediate area. Also cited were the lack of transportation options for senior citizens and young teens that often lack access to private vehicles, as well as the recent influx of low-income, Section 8 housing residents who are transplanted from relatively transit-rich environments.
- The Mundelein/Vernon Hills/Libertyville participants noted that access to transportation service is a major concern, particularly the ability to travel across dial-a-ride program boundaries, and that better coordination among the various programs may alleviate this problem. Getting to the destination on time was also viewed as a challenge.

Three types of flexible transit services were discussed in detail; (a) Call-n-Ride service, (b) Type 1 deviating bus (containing a fixed-route segment), and (c) Type 2 deviating bus (providing deviations along the entire route).

- Over half of the participants in both groups preferred the Call-n-Ride service, and most felt that the typical deviating bus service, (designated as Type 2), was impractical.
- The Mundelein/Vernon Hills/Libertyville focus group provided information that they felt supported two 10-square mile Call-n-Ride service areas, one to the north and the second to the south of Townline Road. A connection could be provided at Westfield Hawthorn Mall.
- The participants also supported the Type 1 deviating bus for any of the arterial roads in their area and felt that in some cases, multiple demand-response zones along a fixed route would be useful.
- The Antioch/Lake Villa/Lindenhurst focus group participants indicated that a Call-n-Ride area along the Route 59 corridor and including downtown Antioch was needed. This area may be too large for one CnR area.
- Both groups commented on the need for coordination among all the Dial-a-Ride services provided in the county. The clearest need appears to be the formation of agreements which would allow riders to travel across program boundaries.
- The need to coordinate fares, service hours and eligibility requirements was also mentioned.

5.0 Service Concepts and Evaluation

The service concepts that were evaluated in the study resulted from the analysis of services and markets in Lake County. Specifically, the approach to development and evaluation of service concepts included the following steps:

- Reviewing market findings;
- Identifying preliminary ideas;
- Vetting the preliminary ideas with Lake County and Pace staff;
- Narrowing the focus to the ideas that are considered most beneficial and feasible;
- Identifying additional data needs that were subsequently collected as part of this study;
- Refining and evaluating concepts using a set of evaluation criteria; and
- Drafting recommendations and a preliminary implementation phasing plan.

Several types of service improvements were evaluated and led to the final recommendations. This section provides a short description of service improvement options evaluated in the study. A more detailed discussion is included in **Technical Report 5** “*Evaluation of Service Concepts*”.

5.1 WAUKEGAN PULSE POINT RELOCATION

The passenger impacts of shifting the current Waukegan pulse point location were examined using information from the Pace fixed route origin-destination surveys conducted as part of this study. A sketch level methodology was developed to compare the primary travel time benefits and disbenefits. The analysis is based on the survey sample riders only.

The evaluation of three alternative pulse point locations (Washington and Lewis, Washington and West and Waukegan Metra station) suggests that overall passengers would disbenefit more than they would benefit. However, Waukegan officials have expressed a preference for relocating the pulse point to the Metra station. Thus, the feasibility of the proposed relocation needs to be analyzed from an operational and physical perspective.

5.2 FIXED ROUTE MODIFICATIONS

Four different changes to fixed route service were evaluated following the identification of candidate improvements to address deficiencies and

opportunities. The consultant team discussed these candidate improvements with Lake County and Pace staff and incorporated their suggestions.

Create an Hourly Pulse at College of Lake County (CLC)

The College of Lake County is a major destination for many trips in the county. For this reason, and to improve transfers between routes in central Lake County, it is proposed that an hourly “pulse point” be created at CLC. In order to achieve this, the proposal has several components:

- Convert part of Route 570 to Route 565;
- Increase frequency on Route 565 to 30-minute headways;
- Split Route 572 into east and south segments;
- Increase frequency on the eastern segment of Route 572 to 30 minute headways throughout the day; and
- Schedule timed transfers between Routes 570, 565, both segments of Route 572, and the Round Lake Area CnR to facilitate a timed pulse point at hourly intervals throughout the day.

Routes 564 and 568 Service to Fountain Square

After the boardings data revealed light passenger loads in the Fountain Square segment of each route, a suggested change was to consider serving Fountain Square with only one bus route, either Route 564 or 568, and to combine the remaining portions of the shortened route with another route. This proposal would allow Pace to save resources while still providing service to Fountain Square.

Pace Rider Survey data showed that 90 percent of passengers coming from or going to Fountain Square used, or had the opportunity to use, Route 568 on their trip while the rest are served by other Waukegan-area Pace routes.

Based on the analysis, removing service on Route 564 between Dugdale Road/ 14th Street and Fountain Square would have minimal impact on passengers traveling to or from Fountain Square. Additionally, it is estimated that this service change might result in operating cost savings if it could be realized through rescheduling.

Fixed Route Connections to Lindenhurst Medical Center

During the focus group discussions with stakeholders from Antioch, the importance of a connection from Antioch to the new Lindenhurst Medical Center was emphasized. In addition, there was interest in fixed route connections to other locations such as CLC, Gurnee Mills, and other medical facilities in Round Lake.

Three possible connections have been identified, as follows:

- Extend Route 570 from Round Lake to Lindenhurst Medical Center;
- Extend Route 565 from Gurnee to Lindenhurst Medical Center; and

- Split Route 572 at CLC and extend one of the resulting routes to Lindenhurst Medical Center.

A specific recommendation among these options would need to be based on further scheduling analysis conducted by Pace schedulers. Further discussion with stakeholders should focus on the relative importance of the connections that could be offered and any negative impacts that would be created. However, it should be noted that only the first option can be done without additional operating or capital costs.

Route 569 Lewis

A review of boarding count data identified that the southernmost segment of Route 569, between 14th Street and the Veterans Administration Medical Center North Chicago experienced low passenger loads. The VA Medical Center also is served by Route 563, which operates every hour from the downtown pulse point. Therefore, eliminating service to the VA Medical Center on every other Route 569 trip would still leave hourly service from the pulse point while half of the Route 569 trips continue to serve the VA Medical Center. This would result in half-hourly service to alternating destinations.

The on-board survey data indicated that some of the riders using Route 569 make transfers from other routes and could transfer at the pulse point to Route 563 instead. However, some riders do appear to have a shorter-distance trip using Route 569.

It does not appear that there would be large benefits to short-turning more buses and removing service from the VA Medical Center. While frequency on Route 569 could be improved to some degree if the route was shortened, a short turn would stop the route from serving a potentially significant travel generator in the Waukegan area. Furthermore, since riders tend to time their arrivals at bus stops where service headways are over 15 minutes, there is not expected to be a large savings in wait time from improving this frequency of service on Route 569. Before making any changes, ridership on the southernmost segment should continue to be monitored and discussions with the VA Medical Center should take place to promote ridership.

5.3 NEW EXPRESS ROUTE FOR JOB ACCESS

The rationale for this service is to provide improved access to jobs in the retail and service industries in the South Central Corridor of Lake County from lower-income residential areas in the north part of the county such as Waukegan. The focus of the service is to link prospective employees with jobs rather than to serve existing trips or to attempt to divert auto users to transit.

The proposed service would operate as a scheduled express “commuter” route with a distributor local segment in the South Central Corridor and potentially a collector local segment in Waukegan. The express portion would use

Interstate I-94. Service would operate during the commuting hours to serve retail and service employees.

The route would operate from Waukegan to the South Central Corridor. The proposed route would begin at the Waukegan pulse point and enter I-94 at the Belvedere interchange (IL 120). The route would exit I-94 at Town Line Road and proceed west to Westfield Hawthorn Mall. From there the route would proceed south on Milwaukee Avenue or smaller roadways such as Fairway Drive to Old Half Day Road, Half Day Road and Aptakisic Road (Lincolnshire Commons). A return trip could be made by accessing I-94 northbound at Half Day Road.

Because this route is designed to provide access to jobs, it is envisioned as a candidate for Federal JARC grant. Further planning efforts will need to be undertaken to determine the feasibility and design of this service option. It is recommended that additional planning activities precede implementation.

5.4 FLEXIBLE ROUTE MODIFICATIONS

Two different types of flexible service options were identified for potential implementation in various lower density portions of the county to serve identified target markets. Each is listed below, and described in greater detail in the **Technical Report 5, "Evaluation of Service Concepts"**, including maps for each proposed service changes. A consolidated map of all proposed flexible service changes is shown in **Figure 5.1**.

Call-n-Ride Services

A Call-n-Ride (CnR) is a demand-responsive, door-to-door bus service that operates within a specified area, serving the general public. Passengers call the driver directly to schedule a trip an hour or more ahead of time, and pay the same fares as on fixed-route services (\$1.75). Pace currently operates four CnR services in the Chicago metropolitan area, including the Round Lake Area Call-n-Ride in Lake County. CnR operates with one bus per service area, and therefore works best with compact zones - in the range of 5 to 10 square miles. Though cost per rider is relatively high compared to Pace's fixed-route service, the total cost of providing fixed route service is not cost-effective for such low-density areas.

Deviating Bus Services

Deviating bus services, sometimes called flex routes, comprise a range of transit options that are hybrids of demand responsive and fixed route services. Deviating bus services operate in rural, small urban and suburban areas where densities do not support a full network of fixed route services. Typical densities for suburban examples of deviating bus services range from 1,000 to 1,800 people per square mile. Typically, trip purposes that have high potential for deviating bus services include non-emergency medical, shopping, and social trips.

The options include two primary types. One type is *route deviation*, which operates on a regular schedule along a well-defined route and deviates on demand to make pick-ups and drop-offs at locations within a specified zone around the route. The second type is *point deviation*, a demand-responsive service without a defined route that serves a limited number of fixed bus stops as well as on-demand deviation stops within a specified zone.¹

Route deviation offers the opportunity to serve more trips on the fixed route since many fixed or flag stops can be served. However, since the route must return after a deviation stop to the point where it left the route, the ability to serve deviations is somewhat constrained. A point deviation service tends to have more flexibility to serve deviations while serving fewer large generators with fixed stops.

Funding Sources for Flexible Services

Potential funding opportunities for these flexible services include grants from the following programs: Job Access Reverse Commute (JARC); Innovation, Coordination; and Enhancement (ICE); Congestion Mitigation Air Quality (CMAQ); and Suburban Community Mobility Fund (SCMF). These public program funds support a project for a limited amount of time. Private subsidy of specific transportation services also is a possibility, but is much less common.

Service Applications in Lake County

The study team has identified nine potential flexible route service applications for various geographical areas of the county that include Call-n-Ride and/or deviating bus options. In cases where more than one option is identified, further evaluation with stakeholders is needed to determine the preferred approach.

Mundelein – Libertyville – Vernon Hills

In the Mundelein/Libertyville and Vernon Hills area, either Call-n-Ride or deviating bus services could be introduced.

Mundelein-Libertyville Call-n-Ride. The proposed Mundelein-Libertyville CnR would operate within the boundaries of Milwaukee Avenue, Townline Road, IL-83, Midlothian Road, Route 176, Butterfield Road, and Winchester Road. The area would provide service coverage to over 36,000 residents.

Vernon Hills Call-n-Ride. The proposed Vernon Hills Call-n-Ride would operate within the boundaries of Milwaukee Avenue, Townline Road, U.S. 45, Metra’s NCS line tracks, and Aptakisic Road. The CnR area would provide transit service coverage to 13,600 residents.

¹ The primary source for this section is: TCRP Report 140. “A Guide for Planning and Operating Flexible Public Transportation Services.” Transportation Research Board. 2010.

Milwaukee Avenue Deviating Bus. The proposed Milwaukee Avenue deviating bus service would act as a route deviation service between the Libertyville Metra station and the Buffalo Grove Metra station. The service would deviate up to three-quarters of a mile from Milwaukee Avenue on demand, while making scheduled stops at major activity centers along Milwaukee Avenue and at the two Metra stations serving as the route's endpoints.

Lake Forest

In the Lake Forest area, either Call-n-Ride or deviating bus could be introduced. Interviews with representatives of Highland Park indicated that there is a demand for more transit service in Lake Forest, and RTA staff also suggested that Lake Forest may be a candidate for CnR service. The 2010 *Forest Green Transit Study* cited congestion, housing costs, gas prices, environmental concerns, and changing demographics as the rationale for additional transit service.

Lake Forest Call-n-Ride. The proposed Lake Forest Call-n-Ride would operate within the boundaries of Waukegan Road, Westleigh Road, Lake Michigan, and Lake Forest's northern municipal boundary near East Sheridan Road. The CnR area would provide transit service coverage to 11,100 residents.

Townline Road Deviating Bus. The proposed Townline Road deviating bus service would operate as a route deviation service between the Westfield Hawthorn Mall in Vernon Hills and Lake Forest College in Lake Forest, a distance of 8 miles. The route would begin at the Westfield Hawthorn Mall, travel east along Townline Road to Waukegan Road, continue north on Deerpath Road, make a fixed stop deviation at the Northwestern Lake Forest Hospital, serve the Lake Forest Metra station, and end at Lake Forest College.

Antioch

In the Antioch area, either Call-n-Ride or deviating bus could be introduced. Currently, there is no bus service in this part of the county despite the presence of lower-income and senior populations.

Antioch Call-n-Ride. The proposed Antioch Call-n-Ride would operate within the boundaries of Deep Lake Road, the Illinois - Wisconsin state line, Channel Lake and Lake Catherine, and IL State Route 173. Additionally, the service would act as a fixed route along Deep Lake Road to Grand Avenue to serve the Lindenhurst Medical Center. The proposed Antioch CnR area would provide service coverage to over 9,500 residents.

Antioch to Gurnee Mills Deviating Bus. The proposed Antioch to Gurnee Mills deviating bus service blends the characteristics of a fixed route and a route deviation service since deviations would be permitted on a portion of the route. The route would extend from the Antioch Metra station in the northwest to the Gurnee Mills shopping center in the southeast. Between the Antioch Metra Station and the Lindenhurst Medical Center, the service would deviate within three-quarters of a mile from the designated route on demand, and then operate

as a fixed route service between Lindenhurst Medical Center and Gurnee Mills along Grand Avenue. This type of service design was chosen to provide demand responsive service as needed in Antioch while creating a connection from Antioch to the Lindenhurst Medical Center.

Waukegan and Gurnee

The study team examined a new deviating bus service that would replace Routes 573 and a portion of Route 562 in the Waukegan and Gurnee area of northeastern Lake County.

Green Bay Road Deviating Bus. This proposal converts Route 573 – Green Bay Road to a demand-responsive, deviating bus service. Route 573 runs from 10th/Lewis to the McCall School at Edgewood/Newcastle in Waukegan along Green Bay Road and only carries an average of 16 passengers per day – an average of less than one rider per run.

Another preliminary service concept was to eliminate the westernmost segment of Route 562, terminating it at a point just west of McAree Road. This suggestion was also driven primarily by the very low loads on the route during the midday. Loads on the western segment during the peak time periods were also low with fewer than 10 riders.

Considering both service concepts together, it was suggested that the area served by the western portion of Route 562 be incorporated into the service area of the proposed deviating bus service on Green Bay Road as shown in **Figure 5.1**.

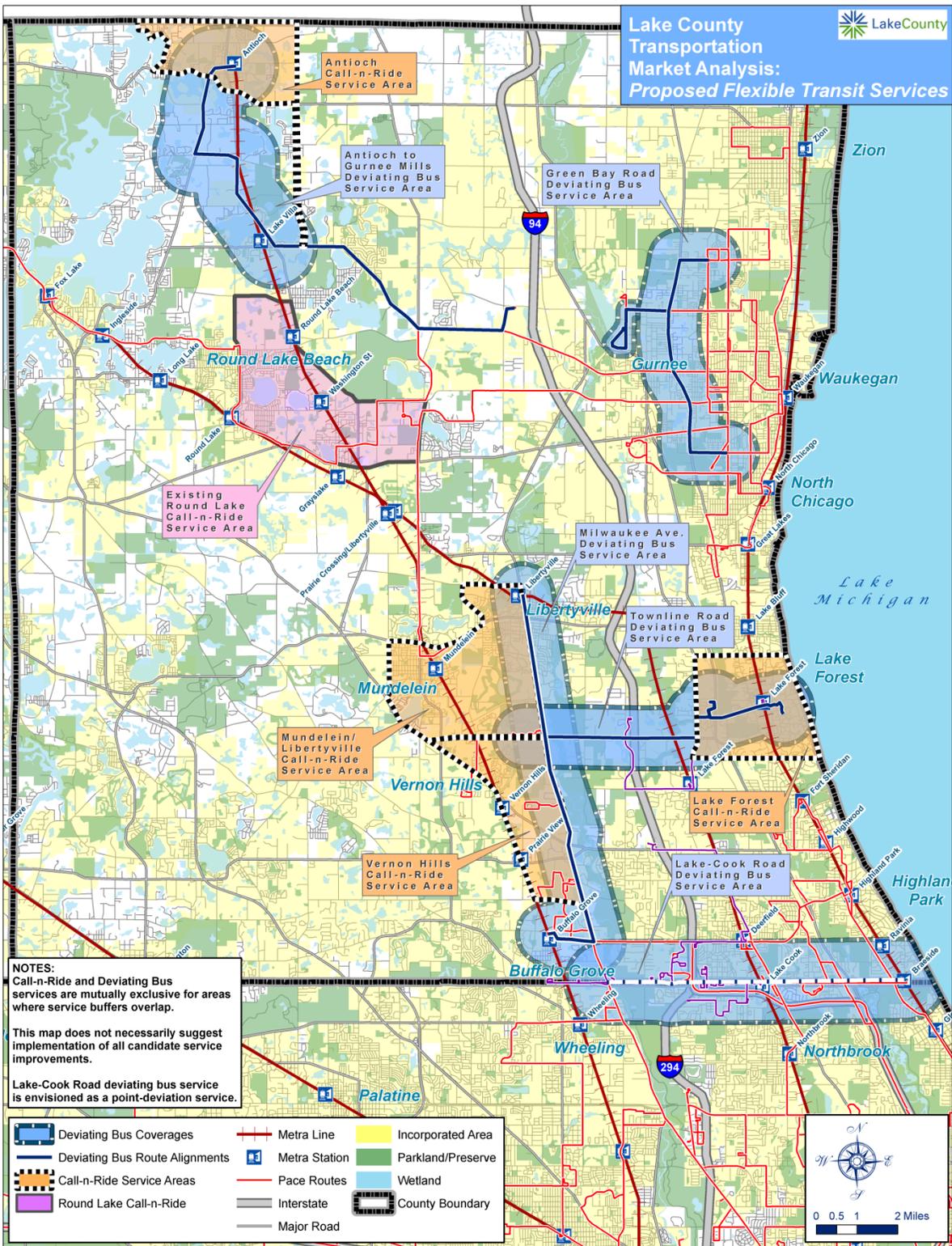
Lake-Cook Road Deviating Bus

The proposed Lake-Cook Road deviating bus service would act as a point deviation service between Milwaukee Avenue on the west and the Braeside Metra station on the east. Operating in a deviation service zone between Deerfield Road and Dundee Road (**Figure 5.1**), the route would provide on-demand midday transit service in southern Lake County and northern Cook County, one of the largest employment centers in the Chicago region.

A point deviation service in this corridor allows the transit vehicle to more easily serve what is likely to be irregular demand, and allows the flexibility to provide door-to-door rides in an area not well suited for pedestrian travel. Because of the location of corporate offices a distance from the roadway, there would be relatively little demand for an on-street fixed-route service on Lake-Cook Road.

Further discussion with key stakeholders, including the TMA, should take place to determine whether there is support for advancing this concept. It should be noted that several years ago the TMA tested midday Shuttle Buses with four to five companies, but the service was discontinued.

Figure 5.1 Proposed Flexible Transit Services in Lake County



Evaluation of Proposed Flexible Services

Ridership for the proposed CnR services was estimated using a regression model that forecasts productivity in CnR areas using five factors: population density, senior citizen population density, percentage of the population age 65 or older, the number of connecting bus routes, and the zone size. Operating costs were estimated using the contractor operating cost for demand responsive services.

The four proposed CnR service areas as characterized in **Table 5.1** have the potential to be successful CnRs within the Pace system. With area coverage ranging from 5.6 to 10 square miles, and populations ranging from 9,500 to 36,000, these areas each have their own unique characteristics and identities. The proposed Vernon Hills and Lake Forest CnRs appear to have the greatest ridership potential and are also projected to have the lowest subsidy per rider. The proposed Mundelein/Libertyville CnR would serve the largest population, bringing door-to-door access to the greatest number of people. The proposed Antioch CnR would bring bus transit to a part of the county that lacks fixed-route service while providing important access to a new medical facility.

Table 5.1 Summary of Proposed CnR Service Areas

CnR Name	Area	Population	Annual Ridership	Annual Operating Cost	Subsidy per Rider
Mundelein/Libertyville	10.0 mi ²	36,000	10,500-16,900	\$191,250	\$10.38-\$17.27
Vernon Hills	6.4 mi ²	13,600	18,500-24,900	\$191,250	\$6.74-\$9.40
Lake Forest	6.75 mi ²	11,100	18,800-25,200	\$191,250	\$6.65-\$9.23
Antioch	5.6 mi ²	9,500	12,100-18,500	\$191,250	\$9.40-\$14.87

Source: CMAP, U.S. Census, Pace, Cambridge Systematics analysis.

The five proposed deviating bus services were analyzed based on available data and stakeholder input. These services could provide a significant population with transit service coverage that does not currently exist. New connections would provide them with access to the broader transit network in the region. **Table 5.2** compares each of the proposed deviating bus services.

Table 5.2 Summary of Proposed Deviating Bus Services

Deviating Bus	Peak Vehicles	Annual Ridership* (range)	Annual Operating Cost	Subsidy per Rider (range)
Green Bay Road	1	8,160 to 14,300	\$122,400 to \$173,400 [^]	\$7.64 to \$20.31
Townline Road	2	25,500 to 44,600	\$382,500	\$7.64 to \$14.06
Lake-Cook Road	2	14,300 to 25,000	\$214,200	\$7.64 to \$14.06
Milwaukee Avenue	3	38,250 to 66,900	\$573,750	\$7.64 to \$14.06
Antioch to Gurnee Mills	3	38,250 to 66,900	\$573,750	\$7.64 to \$14.06

Source: CMAP, Pace, Cambridge Systematics.

*Based on productivity range of 4-7 passengers per revenue hour of service.

[^]Range given depends on if Pace-operated or private contractor-operated

Since the ridership estimate was based on typical productivities of deviating bus service, the ridership estimate is directly related to the vehicle hours of service. As a result, the subsidy ranges are quite similar.

In general, deviating bus would be more costly than the CnRs, as proposed. The subsidy per rider on the deviating bus is likely to be similar to the CnR. However, the deviating bus has the potential to serve a greater number of riders. Discussions with stakeholders should take place to determine which proposal is preferred by Pace and the community, and if funding can be identified to implement either the CnR or the deviating bus services.

5.5 DIAL-A-RIDE/PARATRANSIT POLICY COORDINATION

The current DAR programs present a disjointed and confusing impression to Lake County residents, especially in areas where programs overlap. The Lake County Coordinated Transportation Services Committee (LCCTSC) currently is focused on coordinating demand-responsive transit services in Lake County

This section identifies specific areas of opportunity for LCCTSC and Pace to focus their efforts. It is important to note that part of the coordination effort will also involve an educational component for the DAR program sponsors to explain the importance of coordination.

The elements most in need of coordination include administrative policies, fare policy, and service area boundaries. These coordination proposals are focused on the DAR programs, but may also have an indirect impact on ADA Paratransit services.

Administrative Policies

Each local governmental agency tailors its DAR program to the needs of its community. As a result, all the DAR programs function under different rules and policies. These include rules on eligibility requirements, cancellation policies, service hours, reservations, and fares. The policies were developed to respond to the program's goals and available budget. However, the differing policies create confusion among potential riders, especially in those communities that enjoy overlapping services.

The service provided to DAR riders can be improved through a coordination effort by all DAR programs. LCCTSC can help initiate and facilitate the discussion and Pace staff can provide their expertise. The policies recommended for coordination include cancellation policies, service hours, reservation types, and eligibility requirements. A review of each program's rules and operating policies is a first step towards coordinating these operating components. Improved customer information on DAR service and eligibility policies is desirable, since it will help the public understand these services and policies better.

Fare Coordination

Fare levels for each DAR program are determined by the local governmental unit sponsoring the service. Fares can be free while the maximum value is \$4. Fare levels are inconsistent among programs and most are lower than the ADA fare of \$3.

DAR and ADA Paratransit service are more costly to provide on a per trip basis than fixed route service due to the door to door nature of the service. It is therefore reasonable to enact a higher fare on these services to encourage the use of fixed route service when available. DAR fares should be equal to ADA Paratransit fares to avoid the over-consumption of DAR service by ADA-eligible riders, which decreases service to the remaining DAR-eligible population.

The coordination of fares among providers could be implemented in phases over a period of time to avoid excessive fare increases to a sensitive population. In addition, fare coordination should be advanced as part of a package of coordination efforts that increase rider mobility and understanding of the services. When combined with other coordination efforts, fare coordination has the potential to improve understanding of paratransit services in the county, which may lead to increased DAR utilization.

Service Area Boundaries

Each DAR program is managed by a local governmental agency which determines where the service will operate. The local government defines the service area boundaries to respond to the program's goals and available budget. However, these boundaries may not conform to the travel needs of riders, which may deter some riders from using the service.

Coordination among DAR programs to implement a transfer and communication network will allow riders the ability to cross program boundaries, expanding the range of destination possibilities. This will increase access and mobility for users of the system. When combined with other coordination efforts such as coordinated service hours or eligibility requirements, riders' understanding of demand responsive services in the county will be improved and may have a positive effect on the program's ridership.

It is recommended that Lake County, the LCCTSC and Pace continue working with stakeholders to implement all the above types of coordination.

5.6 IMPLEMENTATION PHASING

This section describes potential phasing of implementation of the study recommendations. Three phases are identified reflecting a preliminary assessment of priorities as well as the fact that some recommendations might take longer to implement. Ultimately, implementation phasing will depend on funding realities and further consultations with stakeholders. Therefore, the phasing recommendations provided here should be considered as preliminary.

Short Term Recommendations

Fixed Route Service Change

- Shorten Route 564.

DAR Policy Coordination

- Work with stakeholders to coordinate fares among DAR services.
- Work with stakeholders for coordination of service policies of DARs.
- Work with stakeholders to coordinate of DAR service area boundaries.

Metra Coordination

- Enhance coordination between Metra and Pace on delays and wayfinding at transfer stations.
- Investigate parking solutions at stations over capacity.

Mid-Term Recommendations

Call-n-Ride and Deviating Bus

- Implement new Mundelein/Libertyville CnR and/or new Vernon Hills CnR, or alternatively, a new Milwaukee Avenue Deviating Bus
- Implement new Lake Forest CnR or new Townline Road Deviating Bus

New Job Access Express Route

- Begin planning alignment, work with employers, and seek JARC grant.

Fixed Route Service Conversion

- Convert existing Route 573/portion of 562 to Green Bay Road Deviating Bus

Long-Term Recommendations

Call-n-Ride and Deviating Bus

- Implement new Antioch CnR, or new Antioch Deviating Bus route
- Implement new Lake-Cook Road Deviating Bus

Fixed-Route Service Change

- Provide fixed-route service to Lindenhurst Medical Center, in conjunction with Antioch CnR.
- Create an hourly Pulse Point at CLC
- Shift Route 565 and 570 terminus to CLC

Metra Service Change

- Increase service in both directions on NCS line as feasible.

Proposals Not Recommended

Route 569 Modification

- Reason: minimal benefit and potential negative impacts on a major travel generator

Waukegan Pulse Point Relocation

- Reason: moving the pulse point appears to have more disbenefits than benefits. Shifting the pulse point to West, Lewis, or the Metra station is not recommended due to impacts on passengers.
- However, Waukegan officials have expressed interest in relocation of the pulse point to the Metra station, so further stakeholder consultation needs to take place.