

# Lake County Transportation Market Analysis

# Final Report

*prepared for*

**Lake County Division of Transportation**

*prepared by*

**Cambridge Systematics, Inc.**

*with*

MKC Associates



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*final 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 further study and to consider for implementation.

## 1.1 APPROACH

The project has a data-driven approach. Robust data analysis and findings supplemented with stakeholder input provide the basis for developing 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 on their decisions. Three key activities were

- Analysis of existing data on transit supply and demand helps better understand the key characteristics of transit services and identifies needs for collecting new data to support developing service concepts.
- The service development methodology relies on the market analysis findings, and makes use of new data and stakeholder input to refine and evaluate service concepts. The evaluation process helped define a phasing to suggest priorities among the recommended service ideas.
- Finally, the study provides a repository of comprehensive travel demand and travel supply data 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.

These tasks were implemented by Cambridge Systematics staff with expertise in data analysis, travel demand modeling, and transportation system analysis and management. MKC Associates managed the design and analysis of focus groups and provided support for developing and evaluating service concepts.

The results and findings are documented in detail in five standalone technical reports. This final report highlights the key activities and service recommendations. 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).
- **Final Report** – *Lake County Transportation Market Analysis* (Task 8).

In addition, all data items used to document the land use, socioeconomics and travel patterns in **Task 4** and the new sources of survey data collected during **Task 6** are provided in the accompanying CD.

The remainder of this report is organized to provide highlights from each report in separate chapters. A set of sample survey instruments and the slides from the **Final Presentation** presented on August 9, 2012 are included in the Appendices.

## 2.0 Overview of Transportation Services

This chapter provides a brief overview of the transit modes and service coverage in Lake County. **Technical Report 1** titled, “*Transportation Services in Lake County*,” provides further details on these topics.

Transit service in Lake County includes four general travel modes as follows:

- 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.

### 2.1 TRANSIT SERVICE COVERAGE

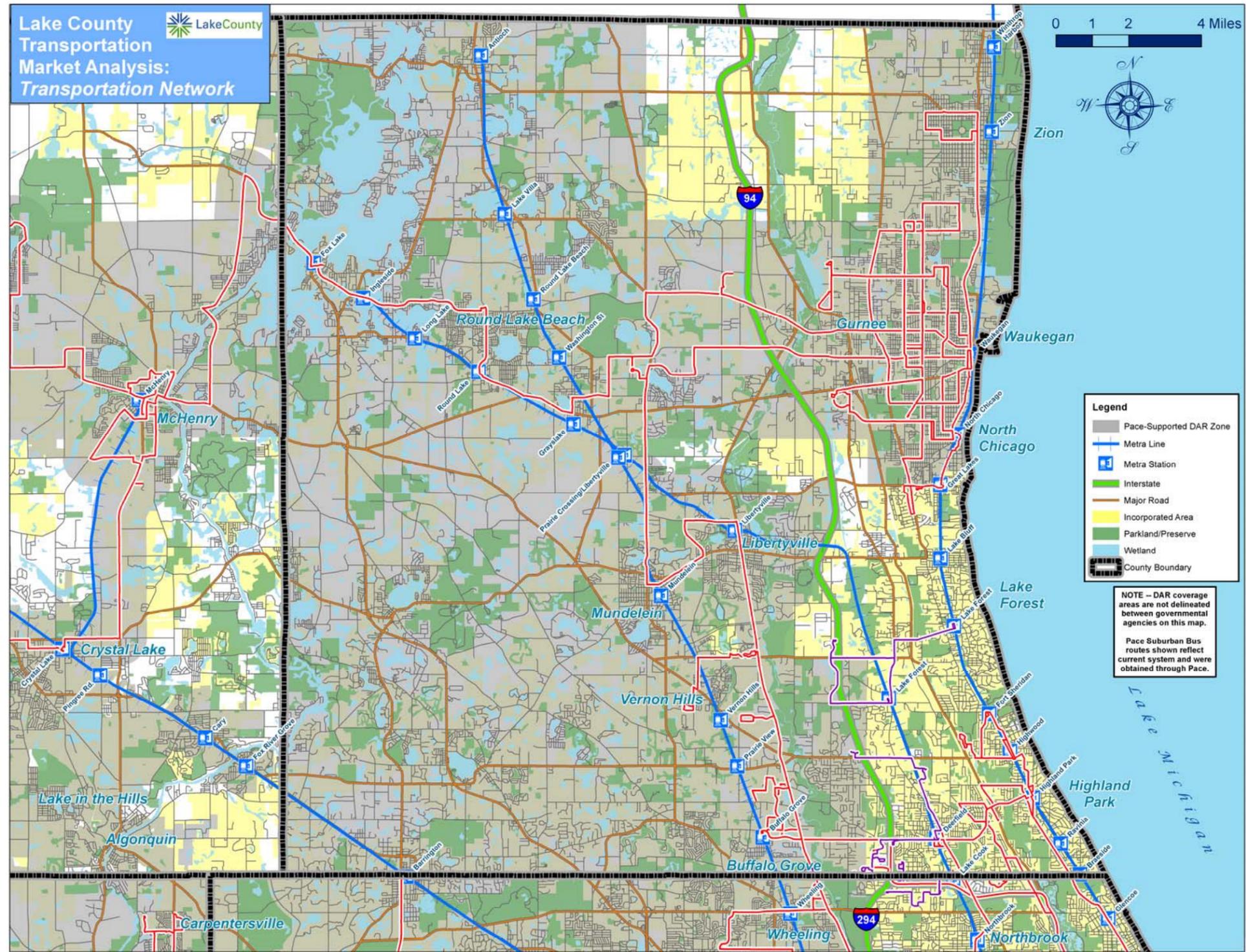
**Figure 2.1** provides an overview of the coverage of each transit travel mode, excluding vanpools and municipal Dial-a-Rides not supported by Pace. Three Metra lines (UP-N, MD-N and NCS lines) traverse much of the county and a 4<sup>th</sup> Metra line (UP-NW) has a station on the county line with Cook County and traverses a small corner of the County.

Pace fixed bus routes operate largely in Waukegan in the northeastern part of the county, supplemented by a smaller number of routes in the southeastern corner of the county, in the Central Corridor and extending west across the north central part of the county. There are 21 Pace fixed routes operating on weekdays, two of which operate only during peak hours. On Saturday, 12 Pace fixed routes are operated. Only 2 Lake County Pace routes operate on Sundays. Fixed route buses stop at designated stops and also can be flagged down by passengers along certain routes. Pace fixed route services cover virtually all areas with population densities over 2,500 persons per square mile. Gaps in coverage are most noticeable in the Mundelein area and in the southwest part of the county.

Lake-Cook Transportation Management Association (TMA) manages a very successful Shuttle Bug Program in Lake County, which provides employers shuttle service to nearby Metra stations on 12 Pace-operated routes. The service operates during peak hours to access jobs at major Lake County employers.

Fixed route bus service is complemented by demand responsive services. ADA Paratransit is provided within three-quarters of a mile of the regular fixed route service. Pace-supported Dial-a-Rides cover much of the county and there are many local Dial-a-Rides operating in other areas. Most Dial-a-Rides have unique fare structures, hours of service and eligibility restrictions.

Figure 2.1 Transit Services in Lake County



Source: Lake County, Pace Suburban Bus, and Chicago Metropolitan Agency for Planning



## 3.0 Service Analysis

A key first step of the study was to examine the characteristics and use of existing transit services in Lake County.

The analysis of existing services enabled the study team to identify some deficiencies in existing transit service. This information was used in combination with the market analysis data to identify opportunities for improvements. The preliminary improvement ideas were then vetted with Lake County and Pace staff before being subjected to further evaluation, as described in **Chapter 6**.

**Technical Report 2** of this study, “*Lake County Service Analysis*,” provides further details on these topics.

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 service. Where existing data permitted, information was tabulated on route ridership and service productivity.

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 were used to identify the utilization by bus stop and loads by route segment and time period. Interviews with operations staff provided additional insights to supplement the analysis of available data.

### 3.1 METRA COMMUTER RAIL

There are three commuter rail lines with 32 stations in Lake County. **Table 3.1** shows the key characteristics of each line. The MD-N and UP-N lines have the heaviest ridership and offer the highest level of service.

While Lake County has relatively low residential densities, the commuter rail service attracts riders who are primarily destined to Chicago, where parking costs and congestion are disincentives to using automobiles. Most riders access the Lake County stations by automobile. Parking is well utilized and some stations have parking capacity problems.

Parking is most constrained at the following stations:

- UP-N Line: Winthrop Harbor, Lake Forest, and Highland Park;
- MD-N Line: Long Lake, Libertyville, Fox Lake, Ingleside, Round Lake and Deerfield; and
- NCS Line: Washington Street/Grayslake.

Pace fixed route buses serve most stations on the UP-N and MD-N lines, but only two stations on the NCS line (Mundelein and Buffalo Grove). Few riders use Pace bus service to access the Metra stations.

Reverse commuters have more limited service frequency than riders commuting to Chicago. Although reverse commuters comprise a small share of the overall commuter rail market, their destinations are concentrated along key corridors and employment centers. Shuttle Buses operate at many stations to offer last-mile service to reverse commuters. Employers support the Shuttle Bug service, through the Transportation Management Association of Lake Cook (TMA), to attract workers who live in Chicago and work at locations in southern Lake County, particularly along Lake Cook Road. The Shuttle Buses have been successful at facilitating this reverse commute market.

NCS offers somewhat a lower frequency of service for the traditional commute market. NCS stations have fewer Pace bus connections and there is more available parking compared to the other two lines. Metra currently is constrained in providing a higher frequency of service on the NCS line. Freight rail operations and single track alignment south of Deerfield Station mainly limit Metra’s ability to increase service on this line. (Table 3.1).

The NCS line also does not provide convenient reverse commuter connections and Shuttle Bug service is not provided as a result.

**Table 3.1 Summary of Metra Service in Lake County**

Line	Stations	Weekday Boardings (2006)	Parking Spaces (2008)	Parking Usage	Connecting Pace Bus Routes	AM Inbound Trains
MD-N	10	7,209	3,916	83%	13	16
UP-N	13	5,396	2,702	79%	15	16
NCS	9	2,272	4,298	45%	4	8

**Service Recommendations to Metra Commuter Service in Lake County:**

- Improved signage at transfer locations between Metra, Pace, and CTA would benefit each agency by making wayfinding easier for customers unfamiliar with these transfer points.
- More information from Metra on train delays would enable Pace to improve day-to-day operations on Pace fixed routes and Shuttle Buses.

- At Metra stations where parking capacity does not meet demand or operate near capacity, municipalities should work with Metra and Lake County<sup>1</sup> to identify opportunities for additional parking and promotion of Pace Bus connections. As discussed in Section 3.1 of **Technical Report 1, “Review of Transportation Services in Lake County,”** 18 of the 32 Lake County Metra stations have Pace fixed-route or Shuttle Bug connections, and 10 stations have parking usage over 90% of capacity.
- Increased frequency of service on the NCS line would facilitate travel in both the traditional and reverse commute directions and increase ridership.
  - In the traditional direction, improved service would provide more options for Lake County residents to access commuter rail, allow for better use of parking capacity.
  - In the reverse direction, additional service coupled with Shuttle Bug connections to employers in this corridor would improve service availability and schedule flexibility and would increase ridership. Convenient and accessible commuter rail service would also help employers in the corridor stay competitive in the region.
  - Currently, single track alignment south of Deerfield station and freight rail operations that share tracks with Metra impede adding service on this line. Moreover, capacity improvements also affect the operations at the terminal. Collaboration with Metra is important to better understand the constraints and opportunities at Union Station and Ogilvie Transportation Center.

## 3.2 PACE FIXED ROUTE BUS SERVICE

This section describes key characteristics of Pace fixed route bus service.

### Productivity and Recovery Ratio of Fixed Routes

Characteristics of Pace fixed route services are shown in **Tables 3.2, 3.3** and **3.4** for weekdays, Saturdays and Sundays respectively and characteristics of Shuttle Bug service are summarized in **Table 3.5**.

Productivity is a key measure of the effectiveness of bus service. It is measured as the number of riders per revenue hour of service. Based on weekday data from the first quarter of 2011, fixed route productivity ranged from 2 to 46. The most productive fixed routes were Routes 571, 566, 562, 568, and 569, while the least productive routes were Routes 573, 234, 570, and 471 (service has since changed on Route 471).

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<sup>1</sup> Since parking lots are owned and operated by local governments, Lake County may play a coordinator or a facilitator role in increasing parking capacity and improving connectivity with Pace buses.

**Table 3.2 Weekday Pace Fixed-Route Services in Lake County**

Route	Route Name	Hours of Operation	Span of Service (hours:minutes)	Headway (minutes)		Recovery Ratio	Average Ridership	Productivity (riders per revenue hour)	Revenue Hours
				Peak	Off Peak				
213 Wk	Green Bay Road	5:40 a.m.-9:57 p.m.	16:17	15	30	22.8%	1,106	22.31	49.6
234 Wk	Wheeling – Des Plaines	5:20 a.m.-7:35 p.m.	14:15	30	60	12.7%	337	10.66	31.6
272 Wk	Golf Mill/Westfield Shoppingtown Hawthorn/ Milwaukee Avenue	5:25 a.m.-10:16 p.m.	16:51	25	60	14.2%	639	13.15	48.6
422 Wk	Linden CTA/Glenview/Northbrook Court	6:19 a.m.-10:38 p.m.	16:19	30	60	16.4%	753	14.76	51.0
471 Wk	Highland Park – Deerfield	6:22 a.m.-6:28 p.m.	12:06	20	60	36.0%	200	11.04	18.1
472 Wk	Highland Park – Highwood	6:26 a.m.-7:36 p.m.	13:10	15	60	36.0%	239	17.27	13.8
473 Wk	Highland Park – Northbrook Court	5:58 a.m.-6:33 p.m.	12:35	60	60	36.0%	145	13.51	10.7
561 Wk	Castlecrest via McAree	6:02 a.m.-6:43 p.m.	12:41	30	60	23.6%	391	21.51	18.2
562 Wk	Gurnee via Sunset	6:02 a.m.-6:43 p.m.	12:41	60	60	34.5%	418	32.79	12.7
563 Wk	Great Lakes Naval Station	6:02 a.m.-6:41 p.m.	12:39	60	60	18.6%	218	19.00	11.5
564 Wk	Jackson – 14 <sup>th</sup>	5:56 a.m.-7:01 p.m.	13:05	60	60	24.7%	274	23.14	11.8
565 Wk	Grand Avenue	5:28 a.m.-10:06 p.m.	16:38	40	40	34.7%	923	32.66	28.3
566 Wk	McAree – Keller	6:03 a.m.-6:13 p.m.	12:10	40	none	100%	371	39.00	9.5
568 Wk	Belvidere	5:23 a.m.-10:14 p.m.	16:51	30	30	36.0%	981	32.67	30.0
569 Wk	Lewis	6:06 a.m.-6:46 p.m.	12:40	20	30	29.6%	813	27.39	29.7
570 Wk	Fox Lake – Gurnee Mills via College of Lake County	5:36 a.m.-9:26 p.m.	15:50	60	60	10.7%	259	10.77	24.0
571 Wk	Zion	6:02 a.m.-7:07 p.m.	13:05	60	60	48.5%	537	46.45	11.6
572 Wk	Hawthorne Center Waukegan	5:32 a.m.-8:41 p.m.	15:09	30	60	25.1%	1,082	24.47	44.2
573 Wk	Green Bay Road	5:58 a.m.-6:34 p.m.	12:36	50	none	100%	16	2.47	6.5
626 Wk	Skokie Valley Limited	5:40 a.m.-7:22 p.m.	13:42	20	none	13.8%	400	15.31	26.1
806 Wk	Crystal Lake – Fox Lake	5:55 a.m.-6:19 p.m.	12:24	3 a.m. & 2 p.m. <sup>a</sup>	none	n/a <sup>a</sup>	62	n/a <sup>a</sup>	n/a <sup>a</sup>

Source: Pace Suburban Bus.

Note: Service hours and frequency as of early June 2011. Recovery ratio is quarter’s daily average revenue divided by cost, first quarter 2011. Daily average ridership is from April 2011. Productivity is ridership per revenue hour, first quarter 2011. Wk = Weekday, Sa = Saturday, Su = Sunday.

<sup>a</sup> Route 806 farebox recovery, service hours, and productivity data were not available. The route has 3 morning peak and 2 evening peak trips.

Table 3.3 Saturday Pace Fixed-Route Services in Lake County

Route	Route Name	Hours of Operation	Span of Service (hours:minutes)	Headway (minutes)		Recovery Ratio	Average Ridership	Productivity (riders per revenue hour)	Revenue Hours
				Peak	Off Peak				
213 Sa	Green Bay Road	6:55 a.m.-7:45 p.m.	12:50	30	30	17.4%	493	14.53	33.9
272 Sa	Golf Mill/Westfield Shoppingtown Hawthorn/ Milwaukee Ave	7:58 a.m.-7:36 p.m.	11:38	60	60	22.6%	342	21.14	16.2
471 Sa	Highland Park – Deerfield	8:05 a.m.-5:59 p.m.	9:54	60	60	36.0%	101	11.38	8.9
472 Sa	Highland Park – Highwood	7:46 a.m.-6:54 p.m.	11:08	60	60	36.0%	124	16.32	7.6
473 Sa	Highland Park – Northbrook Court	8:05 a.m.-6:28 p.m.	10:23	60	60	36.0%	123	13.08	9.4
561 Sa	Castlecrest via McAree	9:02 a.m.-5:53 p.m.	8:51	60	60	20.6%	148	20.00	7.4
564 Sa	Jackson – 14 <sup>th</sup>	8:32 a.m.-6:09 p.m.	9:37	60	60	20.8%	183	21.11	8.7
565 Sa	Grand Avenue	7:45 a.m.-10:59 p.m.	15:14	40	40	32.2%	829	30.44	27.2
568 Sa	Belvidere	7:50 a.m.-10:05 p.m.	14:15	60	60	51.4%	497	46.36	10.7
570 Sa	Fox Lake – Gurnee Mills via College of Lake County	7:46 a.m.-8:37 p.m.	12:51	60	60	8.95%	184	8.12	22.7
571 Sa	Zion	9:02 a.m.-5:53 p.m.	8:51	60	60	37.7%	269	36.49	7.4
572 Sa	Hawthorne Center Waukegan	7:22 a.m.-6:53 p.m.	11:31	60	60	14.4%	297	12.40	24.0

Source: Pace Suburban Bus.

Note: Service hours and frequency as of early June 2011. Recovery ratio is quarter's daily average revenue divided by cost, first quarter 2011. Daily average ridership is from April 2011. Productivity is ridership per revenue hour, first quarter 2011. Wk = Weekday, Sa = Saturday, Su = Sunday.

**Table 3.4 Sunday Pace Fixed-Route Services in Lake County**

Route	Route Name	Hours of Operation	Span of Service (hours:minutes)	Headway (minutes)		Recovery Ratio	Average Ridership	Productivity (riders per revenue hour)	Revenue Hours
				Peak	Off Peak				
565 Su	Grand Avenue	10:02 a.m.-8:11 p.m.	10:09	60	60	36.0%	310	29.13	10.6
568 Su	Belvidere	9:49 a.m.-8:19 p.m.	10:30	60	60	32.2%	261	28.65	9.1

Source: Pace Suburban Bus.

Note: Service hours and frequency as of early June 2011. Recovery ratio is quarter’s daily average revenue divided by cost, first quarter 2011. Daily average ridership is from April 2011. Productivity is ridership per revenue hour, first quarter 2011. Wk = Weekday, Sa = Saturday, Su = Sunday.

**Table 3.5 Pace Shuttle Bug Services in Lake County**

Route	Route Name	Span of Service	Number of Trips		Recovery Ratio	Average Weekday Ridership	Productivity (riders per revenue hour)
			AM Peak	PM Peak			
622 Wk	Shuttle Bug 12	7:23 a.m.-6:20 p.m.	2	3	78.8%	47	23.56
625 Wk	Lake Forest Shuttle Bug	6:31 a.m.-7:24 p.m.	3	4	69.6%	75	33.33
627 Wk	Discover – Takeda Shuttle Bug	6:59 a.m.-6:10 p.m.	4	5	80.3%	156	74.65
628 Wk	Braeside Station Shuttle Bug #8	6:27 a.m.-6:34 p.m.	3	3	81.3%	86	22.19
629 Wk	Braeside Station Shuttle Bug #9	6:27 a.m.-6:35 p.m.	3	3	95.2%	58	19.43
630 Wk	Takeda Shuttle Bug	6:27 a.m.-6:34 p.m.	3	3	20.0%	22	13.69
631 Wk	Lake Cook Road Shuttle Bug #1	6:59 a.m.-5:45 p.m.	4	4	72.6%	96	51.35
632 Wk	Lake Cook Road Shuttle Bug #2	6:59 a.m.-6:12 p.m.	4	5	91.3%	156	67.81
633 Wk	Lake Cook Road Shuttle Bug #3	6:59 a.m.-5:46 p.m.	5	4	84.0%	127	73.98
634 Wk	Shuttle Bug 4	7:23 a.m.-6:16 p.m.	2	3	88.7%	96	30.37
635 Wk	Lake Cook Road Shuttle Bug #5	6:24 a.m.-5:45 p.m.	5	5	97.6%	160	64.46
576 Wk	Deerfield – Buffalo Grove/Lincolnshire	7:25 a.m.-6:10 p.m.	2	2	67.5%	48	29.11

Source: Pace Suburban Bus.

Note: Service hours and frequency as of early June 2011. Recovery ratio is quarter’s daily average revenue divided by cost, first quarter 2011. Daily average ridership is from April 2011. Productivity is ridership per revenue hour, first quarter 2011.

Recovery ratio is a related measure of financial effectiveness that compares fare revenue on each route to the route's operating cost (as a ratio or percentage). Based on weekday First Quarter 2011 data, the recovery ratio varies from 11 to 49 percent, compared to the Pace service standard of 18 percent.

### Pace Fixed Route Nodes of Activity

The data available from Pace's automatic passenger counters (APCs) were used to identify the utilization of bus stops by riders, and in particular to highlight the most heavily utilized bus stops. **Table 3.6** shows the top ten bus stops as measured by the total of boardings plus alightings.

**Table 3.6 Ten Most Utilized Bus Stops**

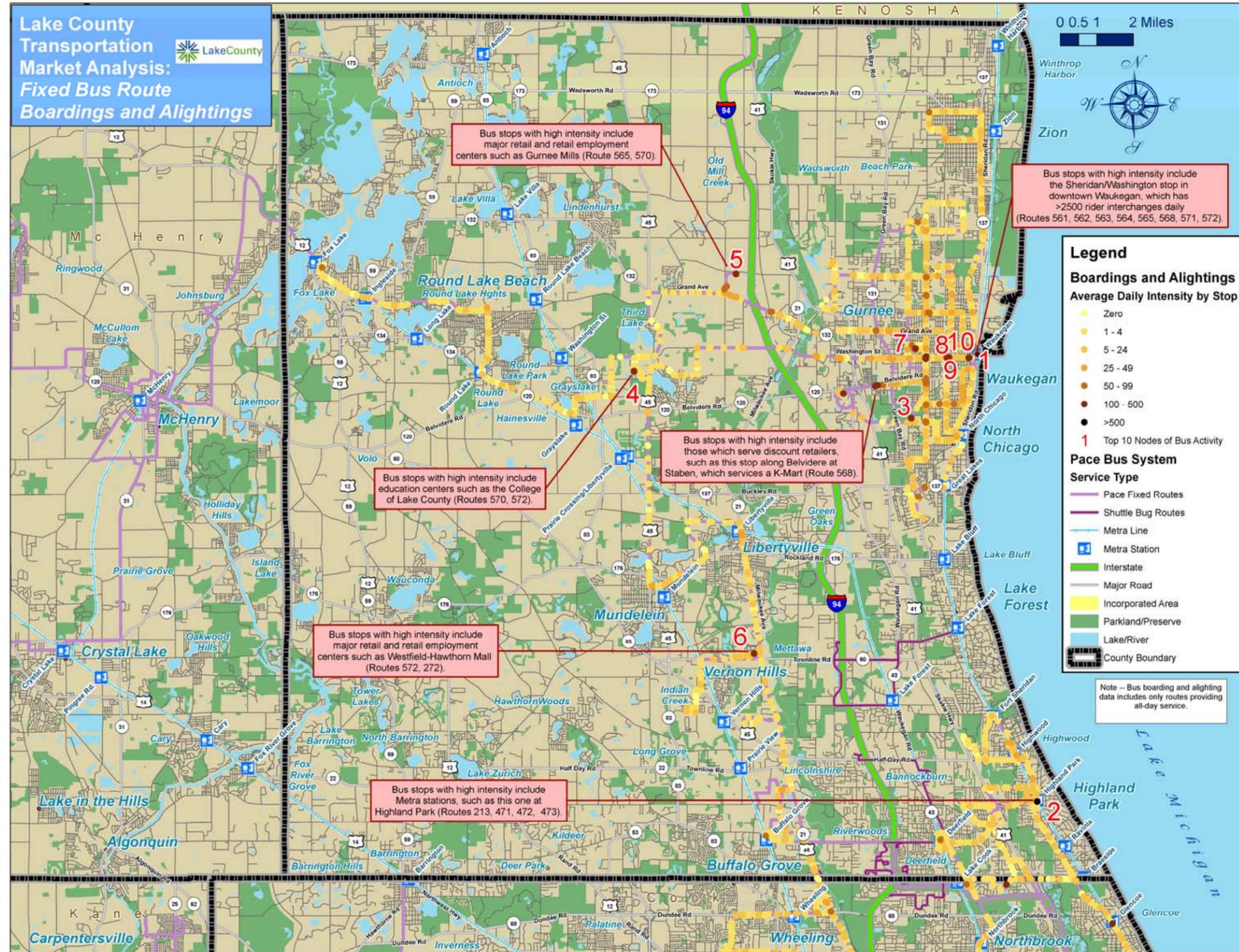
Rank	Stop Location	Total Average Daily Boardings and Alightings
1	Sheridan/Washington, Waukegan	2,513
2	Highland Park Metra Station	666
3	Dugdale/Whispering Oaks, Waukegan	496
4	College of Lake County, Grayslake	444
5	Gurnee Mills Mall	389
6	Westfield Shoppingtown Hawthorn Mall	311
7	Waukegan High School –Brookside Campus	215
8	Waukegan High School –Washington Campus	168
9	Washington/Victory, Waukegan	164
10	Washington/County, Waukegan	158

Naturally, the Waukegan pulse point is the most heavily utilized, since it is by design the primary transfer location and many riders board and alight there as a result of transferring. Other key locations include other transfer points, schools and shopping centers throughout the county, and other locations in the City of Waukegan. **Figure 3.1** illustrates the highest boarding and alighting bus stops.

### Pace Fixed Route Load Analysis

The APC data also were used to examine the passenger loads on each bus route by route segment, direction and time period (AM Peak period, PM Peak period and off-peak period). The data showed that there was generally adequate capacity and that few routes exhibited overcrowding. Heavy passenger loads were most common on school "trippers" that are inserted in the schedule to handle the Waukegan student trips to and from school. Only 1.4 percent of runs on routes operating all-day service reached a load of 30 or more passengers. On heavily loaded routes, a load of greater than 30 lasted for an average of 24 stops,

Figure 3.1 Fixed Route Boardings and Alightings in Lake County



Source: Pace Suburban Bus and Cambridge Systematics

which is on the order of two to four miles. Routes that are most frequently heavily loaded include Routes 569, 565, 572, 562, 213, and 568.

Several routes have segments that experience average loads greater than 15 passengers. These include:

- Route 562 eastbound in the AM Peak period;
- Route 562 westbound in the PM Peak period;
- Route 565 eastbound in the AM Peak period;
- Route 565 eastbound in the off-peak period;
- Route 565 westbound in the PM Peak period;
- Route 571 northbound in the PM Peak period; and
- Route 572 westbound in the AM Peak period.

These route segments are relatively productive. For segments where loads are highest, there may be a need to monitor for crowding or to increase frequencies.

The data for all routes *excluding school trippers* was used to examine the segments which have very light loads. Most significantly, segments with light loads that are candidates for service changes include:

- Route 561 – Castlecrest via McAree;
- Route 563 – Great Lakes Naval Station;
- Route 564 – Jackson – 14<sup>th</sup>; and
- Route 570 – Fox Lake – Gurnee Mills via College of Lake County.

## 6.2 DIAL-A-RIDE (DAR) SERVICES

Dial-a-Ride services in the county vary considerably in their policies with regard to eligibility, fare, service hours, advance reservation, etc. Generally they are geared towards senior and disabled populations and a few are open to the general public (Zion-Benton, Vernon, and Northwest Demonstration).

On Pace supported services, the vast majority of riders (86 percent) are ambulatory. Most Pace supported services operate on weekdays but some are limited to certain days of the week. Most require a reservation one day in advance. Fares are typically about \$1.00. A variety of trip purposes are served – medical, shopping, social, and work, based on surveys available from some of the Pace supported programs and some of the other programs.

Data on origins and destinations also show that they serve dispersed travel patterns. The average effective speed of travel on Pace supported DARs is just under 18 miles per hour. A majority of trips are under 20 minutes in duration, although about 10 percent of trips are more than 45 minutes long. Average pick-up dwell time is just over three minutes and average dwell time for drop-off is just under one minute. Average pick-up is about 8.5 minutes after the scheduled time; six percent were 15 or minutes late.

**Figure 3.2** shows trip destinations for DAR services with geocodable data available. This shows that trip patterns in most areas are very dispersed; this prevents replacing these services effectively with fixed routes. The most common destinations of Dial-a-Ride trips are concentrated in the northeast, central corridor and northwest areas, although this finding is influenced to some degree by the availability of data.

## 6.3 ADA PARATRANSIT

ADA Complementary Paratransit curb-to-curb demand responsive service is required by Federal law (Americans with Disabilities Act of 1990, as amended) to be offered to eligible persons with disabilities traveling to and from locations within three-quarters of a mile of regular Pace fixed route service. **Figure 3.3** shows this coverage area in Lake County.

While Lake County is home to 8.5 percent of the six county region's population, it is home to 3.0 percent of the ADA Paratransit registrants and about 2.0 percent of the ADA Paratransit trips taken in the region. ADA Paratransit registrants in Lake County make fewer trips per person than registrants regionwide.

ADA Paratransit ridership in Lake County has been quite stable with 53,000-56,000 trips per year. Four municipalities account for 47 percent of all trips – Waukegan, Zion, Highland Park and Gurnee. Most trips are within the county but 12 percent go outside the county.

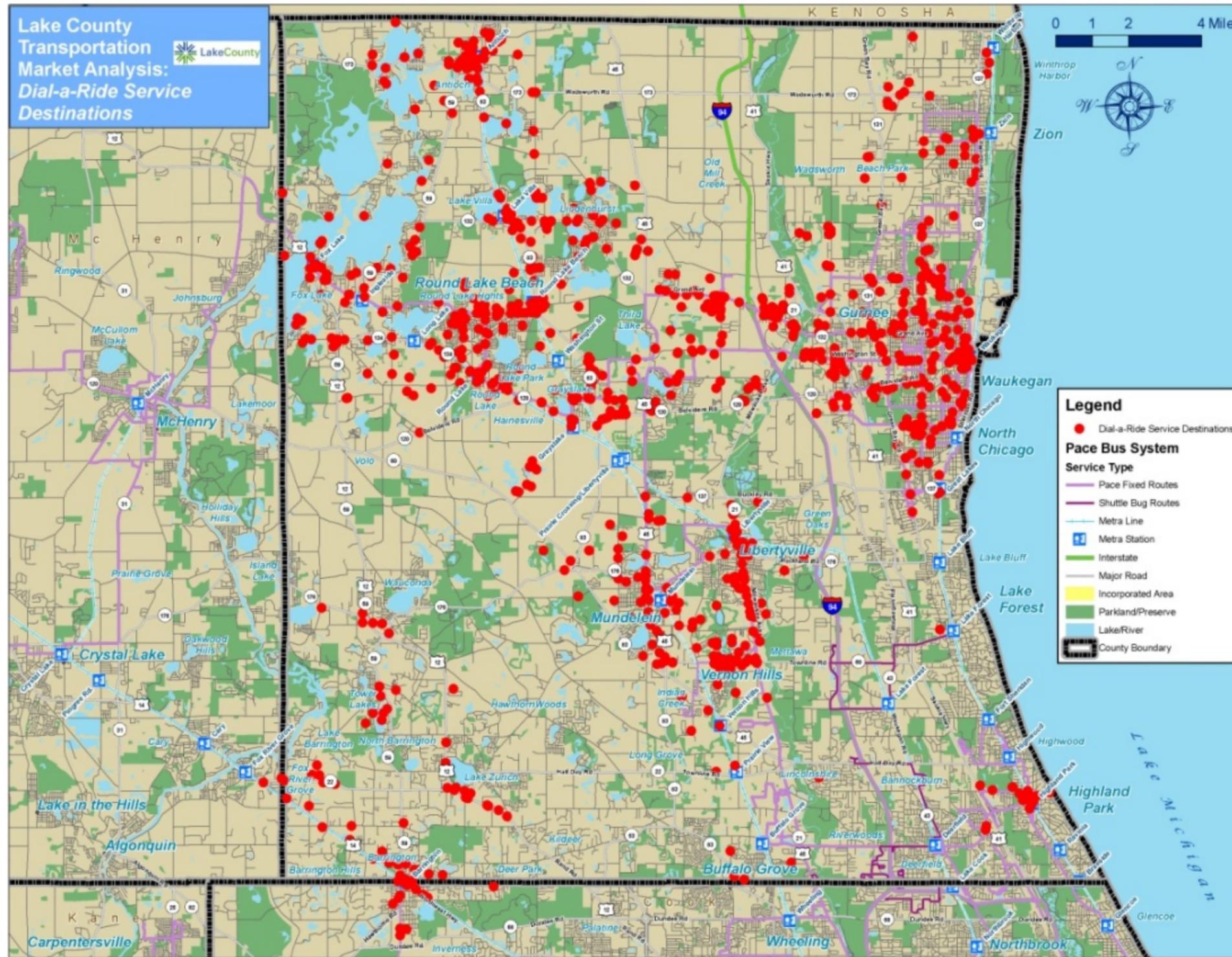
The fare on ADA Paratransit is \$3.00. Since the fare is higher than on Dial-a-Ride, ADA Paratransit registrants often prefer to use local DAR services if they are available.

## 6.4 ROUND LAKE AREA CALL-N-RIDE

Pace has introduced a new type of demand responsive service that is open to the general public, unlike ADA Paratransit or most of the Dial-a-Ride programs in the county. This new service is called Call-n-Ride (CnR), and operates in several low-density areas including the Round Lake area of Lake County. Unlike other demand responsive services, reservations are not made through a call center and are not required to be made a day in advance. Instead, the driver directly takes reservation calls on a cell phone and arranges his/her own schedule in response to demand. Since the driver takes the calls, the CnR service area is defined by the area that can be served by a single vehicle.

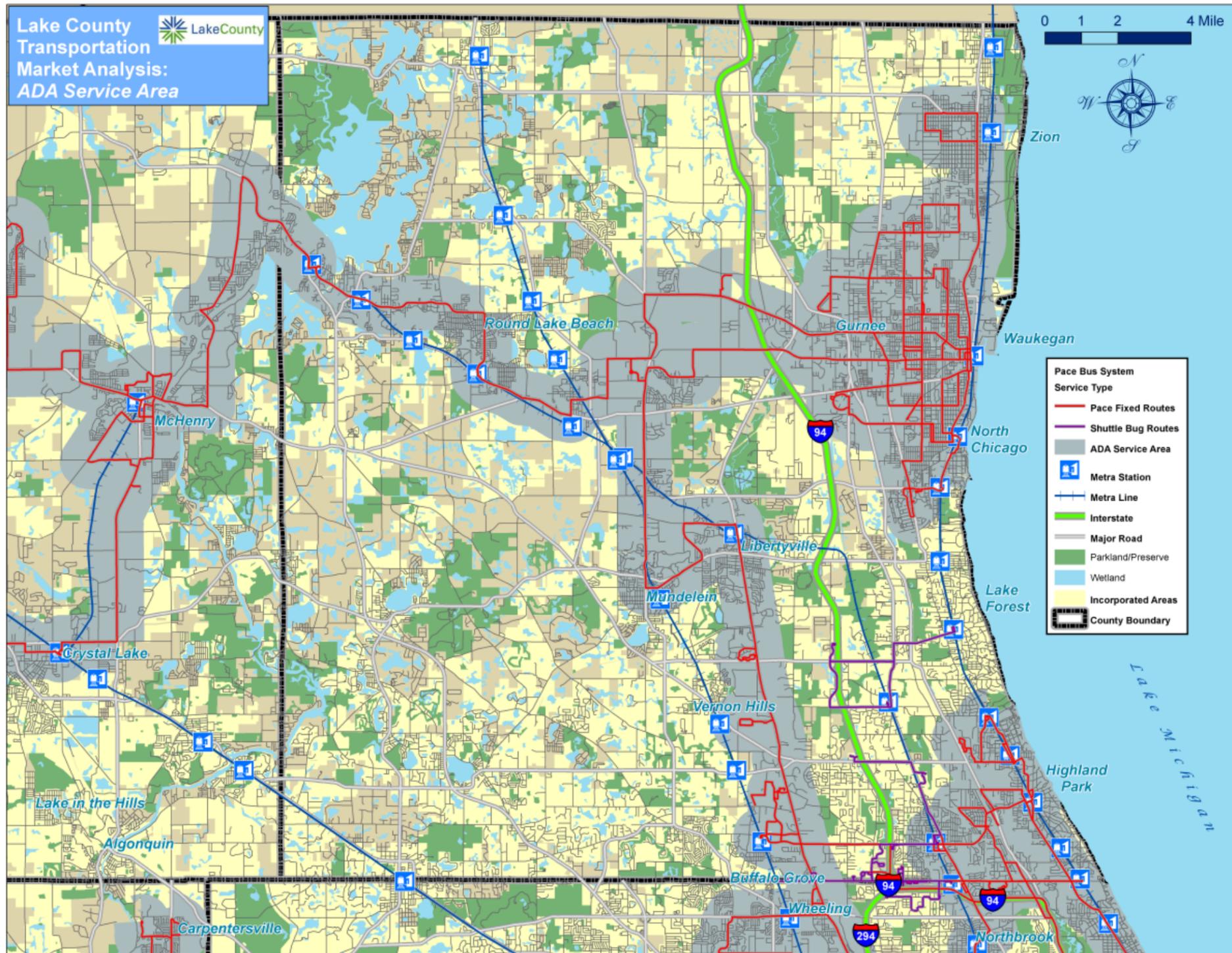
Originally introduced with a fixed schedule at the Round Lake Metra station in 2010, the service was reconfigured in 2011 to create a timed transfer point at the College of Lake County (CLC), resulting in significant ridership growth. As of 2011, about 36 riders per day used the Round Lake CnR – a productivity of nearly three passengers per hour.

Figure 3.2 Dial-a-Ride Service Destinations



Source: Lake County, Pace Suburban Bus and Local Jurisdictions

Figure 3.3 ADA Paratransit Service Area



Source: Lake County, Pace Suburban Bus, and Chicago Metropolitan Agency for Planning

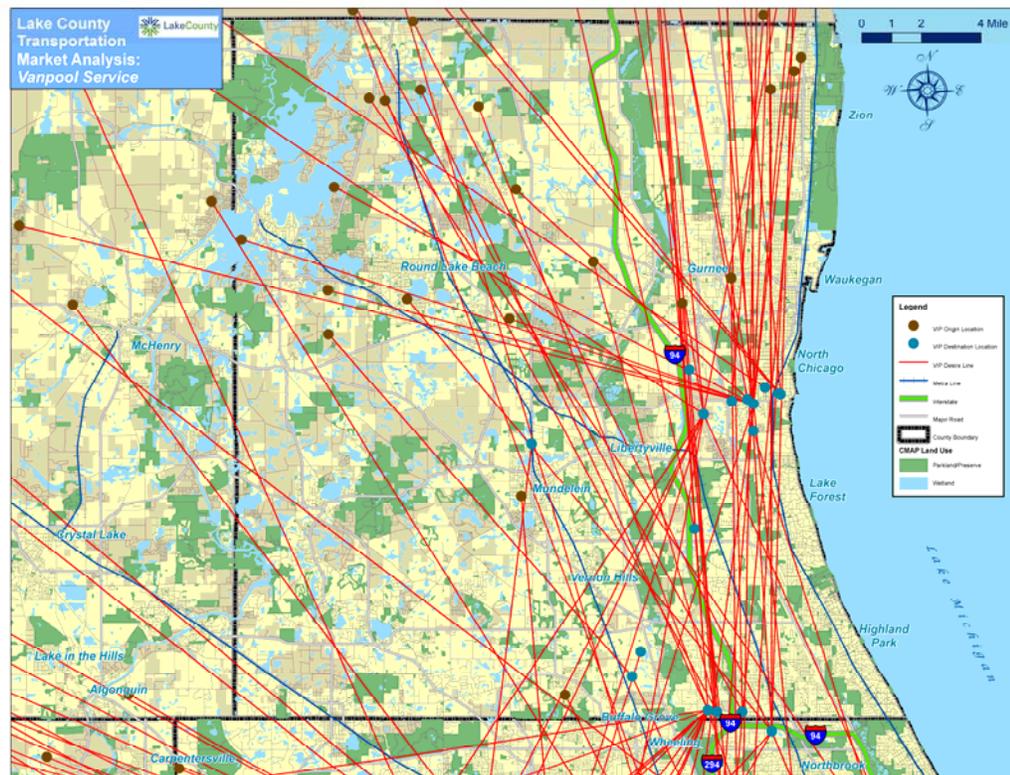
## 6.5 VANPOOLS

Pace has a robust vanpool program to address needs that cannot be met on regular routes. The vanpool program includes several subprograms to meet different needs. The largest of these programs is the traditional vanpool program which provides vans to groups of commuters who work at the same or nearby employer and live near each other. One of the commuters is the driver who is responsible for the van. The other commuters pay to use the service. The program is very efficient in eliminating the need to pay wages to a driver, which is a primary cost of providing transit service.

About 65 vanpools begin or end in Lake County. Vanpools in Lake County focus on 16 employers, 13 of which are in Lake County (including many vanpools to Discover and North Chicago Medical Center) and three of which are in Cook County (but whose employees live in Lake County).

Data on the vanpools was examined to see if there are strong clusters of vanpools that could be a market for transit service. The patterns are rather dispersed (**Figure 3.4**) and it did not appear that vanpools would be a source of riders for a new transit service. Given the efficiency of vanpools, there is no particular need to shift vanpool users to transit.

Figure 3.4 Lake County Vanpool Origins and Destinations





## 7.0 Market Analysis

The Market Analysis task focused on the analysis of current and readily available data from various sources that help characterize and quantify the travel markets in Lake County. These data sources and analyses informed the development of transit service concepts for the study and provide a reliable source of information that can be used in further planning studies in Lake County.

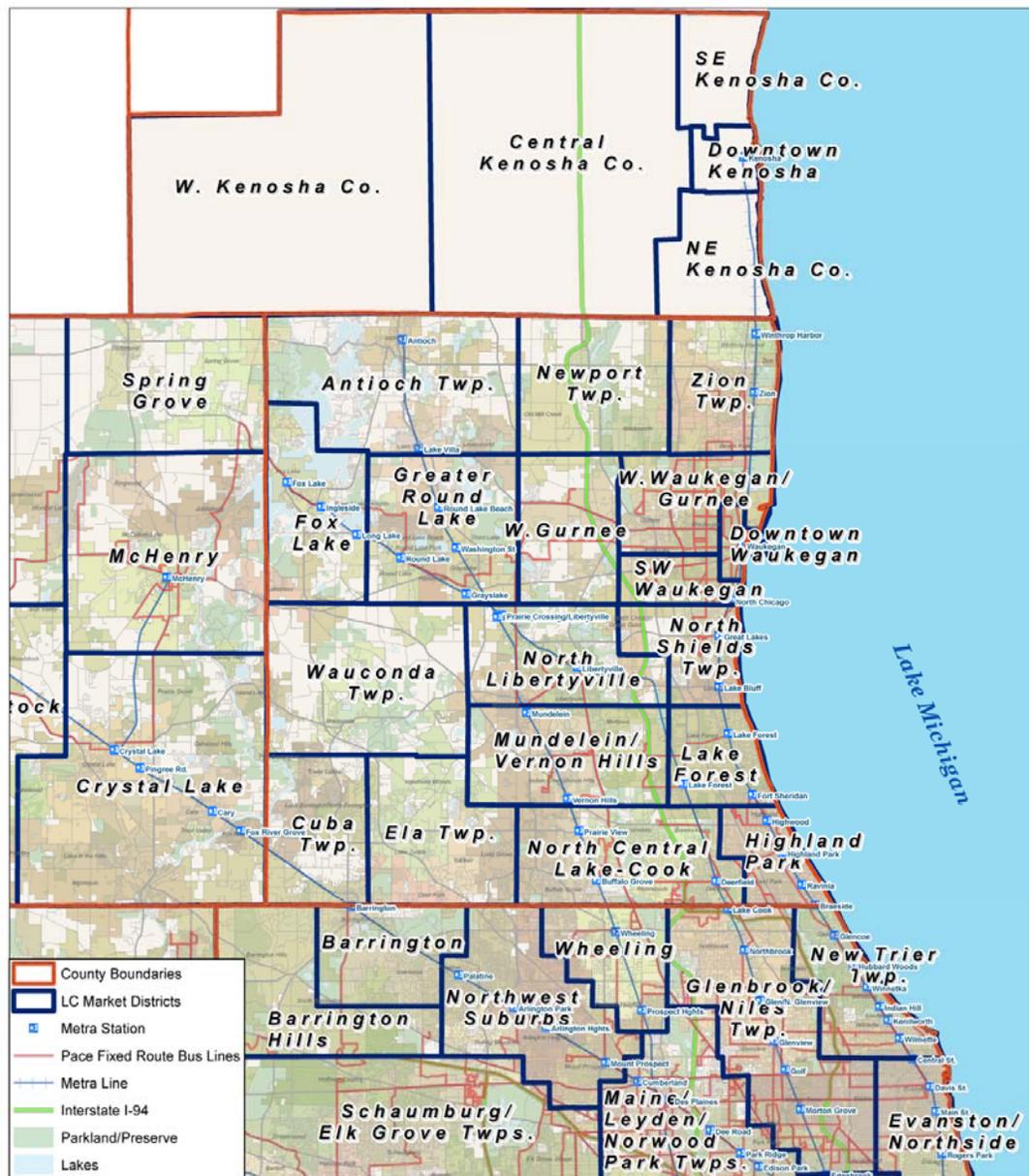
This chapter highlights the key activities and their findings. More detailed descriptions and analysis of data, tabulations and graphical depictions can be found in **Technical Report 3** titled “*Analysis of Land Use, Socioeconomic Characteristics and Travel Patterns*”.

The key steps in Market Analysis task included the following:

- **A new district structure** was designed to summarize the relevant disaggregate socioeconomic and travel data. The districts allow for an easier display and interpretation of the data, and maintain a level of detail that distinguishes key travel markets. A system of 45 districts was developed as shown in **Figure 4.1**
- **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 Chicago Metropolitan Agency for Planning (CMAP). Data from 2005-2009 5-Year American Community Survey (ACS) were used to produce customized summaries at the district level of detail 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.
- **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 the 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 better 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 data in Lake County.

Figure 7.1 Market Districts in Lake County and Vicinity



Lake County  
Transportation Market Analysis:  
Market Districts



## 7.1 SOCIOECONOMICS AND COMMUTING CHARACTERISTICS

The analysis of household *socioeconomic characteristics* suggests that districts located along the northeastern shoreline of Lake County include households with a greater need for transit service. Downtown Waukegan, SW Waukegan, W. Waukegan/Gurnee, and Zion Twp. households rely on alternative modes of transportation more than the rest of Lake County. Residents in these districts are likely to place a higher value on transit service and more likely to use transit for multiple purposes during the day, and may be more likely to support transit.

*Employment patterns* suggest two different types of transit markets with different needs and different characteristics of captivity. On one hand, a flexible transit service may be appealing to the older populations of the high-income suburbs in Lake Forest, Highland Park, and Cuba Township. On the other hand, transit service that links residents of districts with high unemployment rates to employment centers in Lake County may be appealing to transit dependent populations in Waukegan, Zion, Newport, Fox Lake and Greater Round Lake districts.

*Commuting characteristics* suggest distinct travel markets among Lake County residents where transit can offer different types of services to meet commuters' needs. At one end of the spectrum, eastern Lake County districts such as North Shields and the Waukegan districts are characterized mostly by shorter work trips. At the other end of the spectrum, districts in western Lake County face much longer work commutes. Commuters from these districts may benefit from improved access and egress to/from local Metra stations, and from premium transit services with higher levels of travel time reliability and amenities that may offer productivity during commuting. Reliable and timely travel time information would also be more important for commuters from these districts.

Finally, the 5-year ACS data indicated the presence of distinct population groups that are likely to require different types of transit services. Areas with higher shares of transit dependent populations may be served by local and combination of local/express bus services, while choice riders are likely to be served by premium transit services. The needs for older population particularly living in low density areas may be served by paratransit.

## 7.2 LAND USE CHARACTERISTICS AND TRENDS

The distribution of population and employment in Lake County and the expected growth patterns in the next 30 years highlight both the opportunities and challenges that transit is facing in this region.

The traditional commute by Lake County residents to the City of Chicago is currently well served by three commuter rail lines and will continue to be a strong market given the projected population growth and the continuing importance of Chicago as a major regional employment center.

The reverse commute from the City of Chicago to Lake County destinations will continue to be served by a combination of commuter rail and Pace Shuttle Bug routes. The concentration of employment centers in North Central Lake-Cook and Mundelein/Vernon Hills provides a critical mass of employees. The growth of population in Cook County and the projection of strong employment in these two districts will continue to support this market.

The profile of Waukegan residents and Waukegan transit users underscores the value of current transit service and the potential for future service enhancements in this part of Lake County. The higher population and employment densities coupled with the expected continued growth suggest the need to closely examine the sub-markets for transit in this part of Lake County.

Finally, a broadly defined market from the northwestern part of Lake County to the North Central Lake-Cook shows potential for transit services. The population growth projected in Greater Round Lake District and the current and projected level of economic activity in the Lake-Cook Road are likely to produce travel flows concentrated along corridors linking these areas.

## 7.3 TRAVEL PATTERNS

### *Total Trips*

Lake County residents produce a total of 2.08 million daily trips. The county attracts a total of 2.27 million trips, nearly 10 percent more than the trips produced in the county. This comparison indicates that Lake County is fairly balanced with respect to the distribution of residential and commercial activities.

A vast majority of trips (83.5 percent) produced in Lake County travel to destinations within the county.

Over 200,000 trips produced in Lake County are attracted to activities in Cook County. Lake County attracts nearly 17 percent of all trips (nearly 380,000 trips) produced in Cook County.

According to the 2006 Metra Boarding Counts, there were more than 29,000 trips using Metra stations in Lake County. Recent Pace ridership data indicate that over 10,000 riders use Pace daily in Lake County.

### *Work Trips*

Nearly 460,000 work trips were produced in Lake County. More than two-thirds of these trips (about 310,000 trips) traveled to workplaces within Lake County. About 22 percent (almost 100,000 trips) commuted to employment sites in Cook County.

Approximately 480,000 work trips were attracted to Lake County. Nearly 18 percent of those work trips attracted to Lake County were produced in Cook County (over 90,000 work trips).

### *District Level Patterns*

The analysis was conducted at a higher level of detail to help define travel markets within Lake County for in-depth analysis. Key observations from the district level analysis are as follows:

#### *Total Trips*

- North Central Lake-Cook, Mundelein/Vernon Hills, Greater Round Lake, W. Waukegan/Gurnee, and W. Gurnee districts produce the most trips in Lake County.
- Highland Park, North Libertyville, Ela Twp., Zion Twp., and North shield Twp. produce at least 100,000 total trips.
- North Central Lake-Cook, Mundelein/Vernon Hills are the greatest trip attractors in Lake County, with at least 400,000 trips. This accounts for nearly 43 percent of all trips attracted to Lake County.
- Highland Park, W. Gurnee, North Libertyville, Greater Round Lake, Ela Twp., North Shields Twp., and W. Waukegan/Gurnee districts are among those with almost 100,000 trip attractions.

#### *Work Trips*

- Greater Round Lake, North Central Lake-Cook, Mundelein/Vernon Hills, and W. Waukegan/Gurnee districts each account for over 30,000 HBW trip productions. In total, these districts accounted for 40 percent of (nearly 185,000) home-based work trips produced in Lake County.
- Zion Twp., W. Gurnee, North Libertyville, Ela Twp., Antioch Twp. were the other districts that produced at least 25,000 HBW trips.
- North Central Lake-Cook, Mundelein/Vernon Hills are also the greatest HBW trip attractors in Lake County. These districts attracted over 113,000 and 70,000 home-based work trips respectively and collectively account for 38 percent of the total HBW attractions in Lake County.
- North Libertyville, Highland Park, Greater Round Lake, Ela Twp., W. Gurnee, W. Waukegan/Gurnee, SW Waukegan, and North Shields Twp. districts are among those with over than 20,000 home-based work trip attractions.

## 7.4 TRAVEL MARKETS

A far more detailed discussion of travel patterns at the district level is provided in Chapter 5 of the **Technical Report 3**. These patterns were used to define a set of broad corridors or travel markets with the highest level of trip interchanges and the potential to grow in the future. The data sources used for identifying these markets include:

- The CMAP travel demand model trip tables at the district level of detail;
- CMAP's forecasted growth patterns; and

- Clusters of home-based work trip productions and attractions obtained from a spatial cluster analysis as shown in **Figure 4.2**.

This exercise yielded five distinct travel markets which were further analyzed to identify key trip productions and attractions within each market:

*Market 1 - Intra Waukegan Districts*

This market includes all Waukegan Districts and neighboring North Shields Township. The area is already served with a number of fixed route transit services. The eastern sections of W. Waukegan and SW Waukegan districts contain important home-based work productions while Downtown Waukegan and North Chicago Naval Training Center are key destinations. Some key observations include:

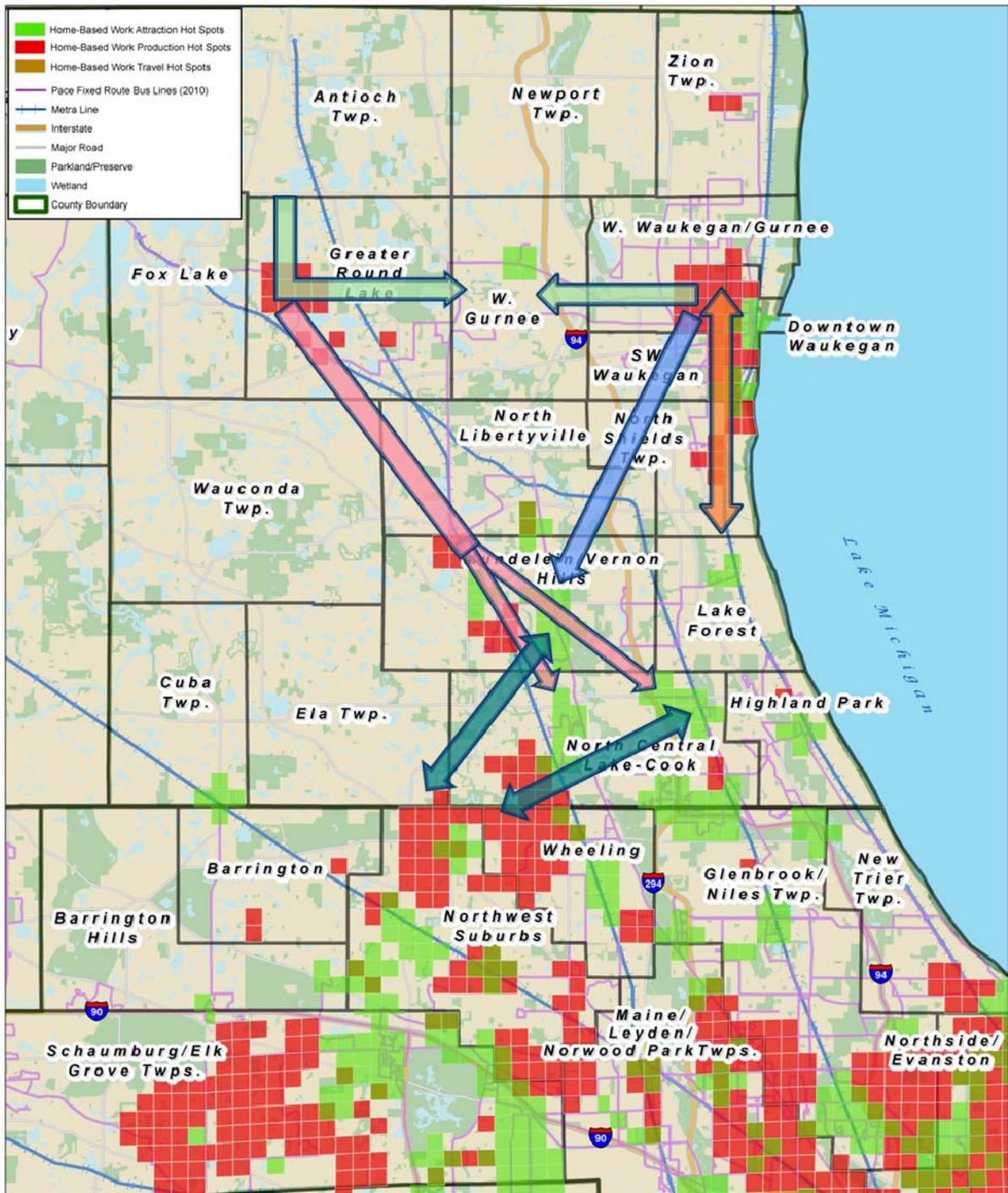
- The estimated market size is about 167,000 daily trips.
- Key attractions include Downtown Waukegan, Fountain Square and vicinity, Abbot Laboratories in North Chicago, and Gurnee Industrial Park.
- In general, the market is well served with existing bus and rail transit.
- Direct services can be considered between Abbot Laboratories and its vicinity and areas north of Washington Street.
- Another direct connection can be further studied between Park City and North Chicago destinations.

*Market 2 - Greater Round Lake to Central Corridor*

The boundaries of this market include on one hand the Greater Round Lake District and western sections of the North Libertyville and on the other hand the Mundelein/Vernon Hills and North Central Lake-Cook districts. The primary flows of interest are originating in the Greater Round Lake District and are destined to concentrations of work attractions within the Mundelein/Vernon Hills and North Central Lake-Cook districts. Antioch Township is also included as a trip origin and the boundary of the North Central Lake-Cook district is extended two miles to the south to include major flows just south of Lake-Cook Road. Some of the highlights include:

- Market size of 42,000 daily trips with 27,000 work trips.
- Relatively higher concentrations of productions are observed in the central and southern portions of the Greater Round Lake district (Grayslake-Round Lake Beach).
- A set of higher density of trip attractions was observed along the corridor between Milwaukee Avenue and the Metra NCS line starting from Mundelein Station to Lake-Cook Road.
- The existing trip production densities may not be able to support an efficient transit service. This market has a very modest market size for the near future transit service enhancements.

Figure 7.2 Boundaries of Key Travel Markets and Spatial Clusters for Work Trip Productions and Attractions in Lake County



Lake County  
 Transportation Market Analysis:  
 Major Home-Based Work  
 Trip Productions and Attractions



### *Market 3 - Waukegan Districts to Central Corridor*

This market consists of flows from Waukegan Districts to the same concentrations of home-based work attractions within Mundelein/Vernon Hills and North Central Lake-Cook districts:

- Market size of 36,000 daily trips with 14,000 work trips.
- Park City and areas near Fountain Square were noticeable trip producers.
- A few transit options were identified and can serve two or three different set of destinations:
  - An express service connecting employment centers along I-94 corridor starting from Waukegan to corporate parks in Lake Forest near Townline Road, to businesses and institutions near Half Day Road, and corporate headquarters and businesses along Lake Cook Road.
  - A new transit service in the east-west direction that would connect to Hawthorne Shopping Center via Townline Road.
  - An alternative new route starting from Waukegan and serving businesses along Waukegan Road between Half Day Road and Deerfield Road.

### *Market 4 - Intra Central Corridor*

This market focuses on slightly shorter distance travel flows occurring among key concentrations of home-based work productions and attractions in the Mundelein/Vernon Hills and North Central Lake-Cook districts and areas just south of Lake-Cook Road.

- These two districts include the highest level of travel activity. Market size is approximately 552,000 daily trips with 58,000 work trips.
- There are few zones with a high density of both productions and attractions.
- Two key corridors emerged:
  - Lake-Cook Road Corridor: An east-west corridor along Lake-Cook Road with high production and attraction densities stands out as a key travel route. This corridor is bounded by Route 83 on the west and Route 41 on the east.
  - Milwaukee Avenue Corridor: This corridor extends from Townline on the north to Lake Cook Road on the south and includes Westfield Shopping Center, several corporate parks and shopping centers.
- Lake-Cook Road Corridor is partially served by a set of Pace Shuttle Buses. The Milwaukee Avenue corridor is served by the NCS line and Pace Routes 272 and 572. Alternatives to create more direct services and supplement Shuttle Buses with fixed route transit options can be considered.

*Market 5 - Greater Round Lake - West Gurnee - W. Waukegan/Gurnee*

The employment near the Gurnee Mills Shopping Mall attracts a sizeable level of trips from the Greater Round Lake and W. Waukegan/Gurnee districts. The boundaries of the market can be expanded further to include Antioch Township since the district is interacting heavily with the W. Gurnee district. Primary focus was on inter-district flows destined to the W. Gurnee district.

- Market Size of 72,000 total trips with 8,000 work trips.
- As expected, the highest concentrations of trips were attracted to Gurnee Mills and vicinity and to the Tri-State Business Park area.
- Long Lake area had a high degree of interaction with these destinations.
- This market is already supported directly by two Pace Bus Routes, 565 and 570, and partially by Route 572.
- Minor modifications in the alignments and scheduling of the existing service might be considered.
- The trip production concentrations at the Antioch District seem quite low to be targeted for fixed route services. Therefore, a more flexible service to provide higher levels of access to transit services in Antioch, similar to the Call and Ride service in operation in Round Lake, can be further studied.

The recommendations from this analysis of travel patterns served as a preliminary set of ideas that were further refined with the collection of survey and operational data to evaluate service design concepts.

## **7.5 SURVEYS OF TRANSIT RIDERS AND NON-RIDERS**

### **Metra On Board Survey**

Metra's 2006 onboard origin-destination survey collected detailed trip information including rail line, boarding and alighting stations, modes of access and egress, time of travel, frequency of using Metra and origin and destination locations. The analysis of the survey data for respondents using Metra stations in Lake County indicated the following:

- Lake County is primarily an origin of commuter rail travel (19,000 daily trips produced) and to some extent a destination of commuter rail travel (3,800 daily trips attracted).
- Traditional inbound commute to Chicago is very strong. This market is about 90 percent of rail trips produced in Lake County.
- Seven Lake County stations serve more than 500 boardings during the AM period. Of these, five stations are on the MD-N line (Libertyville,

Deerfield, Grayslake, Round Lake and Fox Lake) and two stations are on the UP-N line (Waukegan and Highland Park). The Buffalo Grove station on the NCS line attracts over 450 riders.

- Deerfield and Libertyville on MD-N and Lake Forest, Waukegan and Highland Park on UP-N are the five stations that attract the highest number of reverse commuters (more than 200 in each station).
- Drive access is the dominant mode for accessing stations in Lake County (over 82 percent).
- UPN line stations have a slightly different profile, where 23 percent of the riders use non-motorized modes (walk or bike) to travel to stations.
- The share of station access by Pace is limited to 1.5 percent in Lake County.
- Transit access has a higher market share of three percent at the Waukegan and Highland Park UP-N stations.
- Besides transit (19 percent) and non-motorized (33 percent) modes, private shuttles operated by large employers (included as “other”) are quite common (27 percent) on all rail lines for traveling from stations to final destinations.

### **Pace Customer Satisfaction Survey**

The 2007 Pace Customer Satisfaction Survey data provided insightful information about Pace riders and the usage of Pace services in Lake County.

- Share of smaller of households is larger for Pace riders when compared to the household size distribution of entire Lake County.
- There is a high incidence among Pace riders of more than one working adult in the household.
- These patterns suggest two market segments served by Pace that have different profiles and needs.
- The majority (over 70 percent) of Pace users in Lake County have lower incomes.
- Additionally, over 70 percent of passengers report 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. These patterns suggest the importance of Pace to a segment of the Lake County population that depends on transit for its mobility needs.
- By design, Shuttle Bug services serve a unique market that consists predominately of suburb to suburb and reverse commuters. There is a relatively higher turnover rate in its market.

- Pace serves a variety of markets including local suburb-to-suburb travel especially in the Waukegan area and egress to employers for reverse commuters who arrive in Lake County using Metra's commuter rail service. Pace accounts only for a small portion of access service to Metra for the traditional commute to the City.

### **2009 RTA Attitudinal Survey**

The 2009 RTA Attitudinal Survey provided information on general characteristics of Lake County residents, how they feel about a variety of factors related to their daily travel, and their use of and familiarity with transit services. The findings can be summarized as follows:

- The Lake County sample of 200 respondents had a bias towards the portion of the population with higher incomes and vehicle ownership.
- About 40 percent of Lake County respondents were unfamiliar with transit. The importance of this relationship reflects the need to make transit service more visible to non-users.
- Attitudinal scores indicate that driving is the fastest way to travel in Lake County and respondents did not typically view themselves or their friends and family as typical transit users.
- There is potential to increase the awareness and level of familiarity especially for those areas where transit is currently available.
- Lake County commuters recognize the reliability and productivity benefits offered by premium transit services.
- Since travel time appears is the strongest attribute in evaluating travel options, the willingness to use transit depends on improved transit service.
- While there is a general agreement to walk more 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 service.



## 8.0 Surveys of Lake County Residents and Employees

The service planning options considered in the study generally include short-term improvements that do not require major capital investments. Changes in policy and operational characteristics that improve the efficiency and the effectiveness of existing services (particularly demand responsive services) were also considered.

Planning for service changes requires an understanding of: (a) trip patterns served by existing services, (b) current ridership on existing services, (c) ridership potential for new or revised services and (d) the public's views of and attitudes towards transit.

Following the development of a detailed inventory of available data sources, additional data needs to support the Service Planning task were determined. These data were collected to enhance our understanding of Lake County residents' transportation needs, preferences, and attitudes that affect their 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 use of 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.

### Resident Travel Survey

The main objective was to collect more information on **non-riders**, particularly on their current travel needs, perception of existing transit services and general attitudes.

- The northwestern portion of Lake County has some unique characteristics based on projected growth, substantial level of estimated interaction with the Central Corridor, and lack of direct transit services (except inbound Metra trains) to key employment sites in Lake County. The workers residing in these communities also have very long commutes.

- The preliminary service planning ideas included a Call-n-Ride service in several locations within the Greater Round Lake and Antioch Township districts. Moreover, the analysis of trip patterns suggested significant trip interchanges from this area to the Central Corridor and to Gurnee.
- In addition, the survey effort was extended to include residents of Waukegan districts to include data from non-riders in areas where there is a substantial level of transit service available.

The survey was conducted online between February 21<sup>st</sup> and March 23<sup>rd</sup>, 2012.

### **Employee Survey**

This effort focused on concentrations of employment sites in Lake County to better understand the origins of these employees and commuting characteristics. These data supplement travel patterns observed in the resident survey and the analysis helps identify clusters of workers who may be better served by new transit services.

There were two central themes to this effort:

- The most important goal was to establish the residential location of workers who work in Lake County. This analysis helps identify commute trips that may be better served by new transit services.
- The second objective was to learn about the preferences of Lake County workers for commuting and their attitudes towards transit.

Employers in Waukegan, near Milwaukee Avenue and the NCS line, and along Lake-Cook Road, were identified as establishments of greatest interest. The Lake County Division of Transportation implemented a successful outreach campaign to seek support for the study. The survey commenced online on February 21<sup>st</sup> and ended on March 30<sup>th</sup>, 2012.

### **Pace Rider Survey**

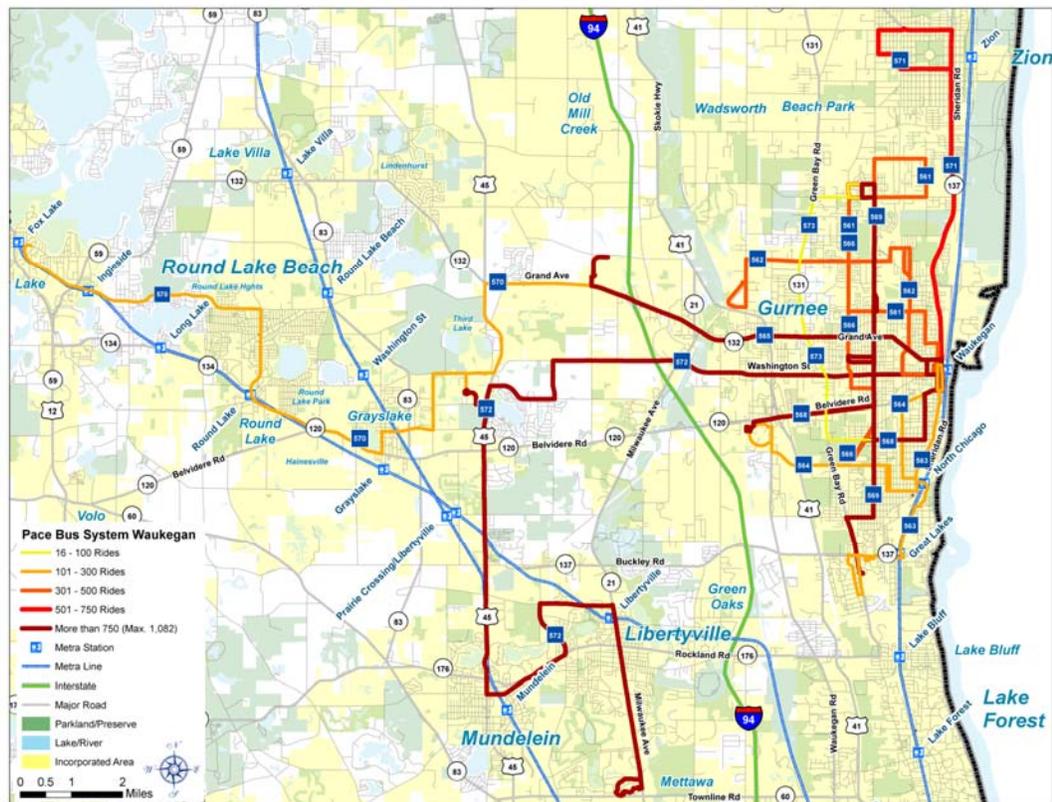
Existing Pace surveys provide a detailed assessment of boarding and alighting patterns of existing riders, but did not have adequate information to map and analyze the riders' origin and destination patterns.

The Pace Rider survey was designed to collect true origins and destinations of Pace riders to better understand and evaluate current Pace services and proposed service options in Waukegan. In addition, the survey collected valuable information about transfer activity including the extent of transfers, locations and patterns.

The survey also asked about trip purpose, frequency of use, length of time being a Pace rider, and a few questions on the level of satisfaction with Pace services, quality of amenities, and riders' comfort level with the existing pulse point at Washington Street and Sheridan Road.

A one-page survey instrument was designed and 12 Pace Bus routes serving Waukegan and providing connections to/from Fox Lake and Vernon Hills via Route 570 and 572, respectively were surveyed. **Figure 5.1** shows the Pace routes surveyed. The survey had a mail-back option for respondents to mail back the surveys later at no cost. Surveys were also translated into Spanish. The survey instrument is presented in the **Appendix A**.

**Figure 8.1 Pace Routes Serving Waukegan Area by Ridership Levels**



CmQue, as a partner to the Cambridge Systematics team, administered the survey during the AM peak (6:00 – 9:00 AM) and mid-day (9:00 AM– 03:00 PM) periods on weekdays between March 22 and April 6, 2012.

### Focus Groups

While surveys reach a wider audience about existing and well-known services, the examination of new concepts such as Call-n-Ride (CnR) services and flexible bus services, such as deviating bus routes, required more face-time with respondents to describe alternatives and collect in-depth views. The focus group approach fits well to this purpose since respondents can interact with the members of the project team freely.

A focus group is a qualitative market research technique where a group of people with predetermined characteristics are asked about their perceptions, opinions, beliefs and attitudes towards a product, service, or concept.

The key purpose of the focus groups was to obtain feedback on innovative service ideas so that the results can be used to further refine the concepts.

Listed below are the key objectives for the focus groups:

- Determine whether the participants' clients (constituents) are likely to use an alternative transit service and identify those demographic characteristics.
- Identify the potential trip purposes in order to determine probable span and day type coverage.
- Determine any barriers, opportunities, or preferences in relation to the services discussed.

MKC Associates successfully conducted the Mundelein/Vernon Hills/Libertyville focus group on May 2, 2012; and the Antioch/Lake Villa/Lindenhurst focus group on May 3, 2012.

Both focus groups were held at the Lake County Department of Transportation offices in Libertyville. Detailed notes from the discussions and the focus group interview guide are provided in the "*Lake County Transportation Market Analysis - Focus Groups Memorandum*" presented with **Technical Report 4**.

## 8.1 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:

- Origins were far more spread out than destinations.
- Nearly half (48 percent) of the destinations are well served by existing transit compared to 22 percent of origins that are within a quarter mile buffer along existing Pace routes.
- 87 percent of respondents drive alone and less than 4 percent ride transit.
- 86 percent of the respondents have never used transit.
- Average travel time is 31 minutes.
- 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 other activities is the second most important barrier to transit use.

- About one-thirds of the respondents stated that they could use transit if service improved. 25 percent of the respondents stated that they would never use transit.
- Existing transit users were generally satisfied with transit services. However, there were demands for faster service, more frequent service and higher quality amenities.
- When asked about whether they would recommend transit to friends and family, 83 percent of the transit users said they would definitely or likely recommend transit.
- Lake County riders and non-riders alike recognize the benefits of high quality transit and are likely to support transit investments.
- Although residents are willing to walk to transit, competitive transit travel times seem to be the key factor that would make them change their mode of travel.
- Lake County residents are not in favor of transfers and they are sensitive to delays.
- Finally, they rely on driving for other activities and driving is still the fastest way to travel.

## 8.2 EMPLOYEE SURVEY

Approximately 1,100 individuals logged in and a total of 1,031 respondents provided a valid response to the survey.

The following six employment sites made up 80 percent of the sample:

- Discover Financial Services - 207 responses
- Trustmark Insurance Company - 189 responses
- Walgreens Corporation - 110 responses
- Wolters Kluwer - 96 responses
- Baxter Healthcare - Round Lake - 95 responses
- Baxter Healthcare Corporation - 82 responses

The remaining 209 responses were spread out among 71 different employers in Lake County.

Key findings from the survey can be summarized as follows:

- The distribution of origins showed that there was no single employer with a unique concentration of commuter origins.
- In general, respondents were clustered in Mundelein, Round Lake, Grayslake, and spread across Waukegan. More modest size clusters were

observed in Buffalo Grove, Deerfield, Zion, Lindenhurst, Antioch and Kenosha, WI.

- Many destinations were located along Lake-Cook Road and clusters of some smaller employers were observed along Milwaukee Avenue near Tower Parkway and in Downtown Waukegan.
- Origins were far more spread out than destinations. A great majority of the destinations (83 percent) are well served by existing transit where only 23 percent of origins were within a quarter mile buffer from existing Pace routes.
- 86 percent of respondents drove alone, 6 percent transit, and 8 percent shared a ride to their destination.
- 82 percent of the respondents stated they never used transit.
- Average travel time was 36 minutes.
- Half of the return trips home during the PM took longer than the AM trips from home to the office.
- Unavailability of service and transit stops that are far away from their homes were mentioned as key barriers to transit use.
- Inconvenient schedules and longer travel times by transit compared to the automobile were additional barriers to transit use.
- About one-third of the respondents stated that they would use transit, if transit service improved. 26 percent still stated that they would never use transit.
- 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.
- Finally, 89 percent of the respondents who are currently using transit in Lake County said they would definitely or likely recommend transit to friends and family

### 8.3 PACE RIDER SURVEY

Almost 3,300 riders were intercepted and over 2,000 forms were distributed during the on-board survey. A total of 1,209 riders provided a valid survey response.

In general, the survey effort reached out to 61 percent of riders and 60 percent of those returned a valid response. Overall, the response rate was 37 percent.

Following data transcription, 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:

- 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 deviated further in the north or south from the east-west axis along Washington Street.
- Naturally, the pulse point at Washington Street and Sheridan Road witnessed the highest level of transfer activity. The survey indicated a total of 320 out of 462 (70 percent) transfers happen at the pulse point.
- 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.
- Route 572 had the most diverse market among the Waukegan routes. The route had a high share of home based university trips was followed by an almost uniform distribution of other purposes. This pattern suggests that Route 572 serves various market segments in this region.
- Nearly 70 percent of the respondents stated that they make the same trip at least 3 days a week. About 17 percent reported one or two trips per week and 13 percent reported a frequency of less than one trip per week.
- 38 percent of the respondents have been using Pace for more than five years, and another 18 percent were Pace customers for three to five years. Pace routes also served a sizeable share of relatively new riders (44 percent).
- Nearly 70 percent of the respondents were transit dependent riders without ready access to an automobile for their travel.
- 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 pulse point and over 70 percent did not have any problem traveling to the current pulse point.
- Finally, 89 percent of the respondents said they would definitely or likely recommend transit to friends and family.

## 8.4 FOCUS GROUPS

A total of 15 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.

The stakeholders represented a wide range of organizations including municipalities, townships, high schools, senior centers, recreational districts, healthcare organizations, social service agencies, and the College of Lake County. They were asked to consider the viewpoints of their constituents during the discussion and to respond to questions with answers that would reflect the constituency point of view.

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 was 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 between 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 services, (b) Type 1 deviating bus, and (c) Type 2 deviating bus.

Type 1 deviating bus service, combines a demand-response area generally at the residential areas with a fixed-route segment reaching to a key set of destinations. This type would provide a demand-response service within the designated areas, operating much like the Round Lake Call-n-Ride, and then operate along the fixed-route on a fixed schedule. A small bus would be used to provide the necessary maneuverability on residential streets in the demand response area.

The second example of a deviating bus route, Type 2, operates as a fixed-route service that deviates on demand to serve unscheduled stops that are just off the route or are very close-by. Type 2 also incorporates regular scheduled fixed stops along the fixed-route. To allow time for deviations, excess time is built into the schedule and the bus may need to wait at some scheduled stops until the scheduled departure time, if no (or fewer) unscheduled stops are made. The results of the discussions can be summarized as follows:

- 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. A number of participants praised regular fixed-route service and noted that it was the easiest mode for training clients on its use.

- 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 of Townline Road and the second to the south of Townline Road. A connection between the two 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.
- There was less enthusiasm for the Type 2 deviating bus, but the group agreed it could be useful along Milwaukee, if deviations were designated rather than allowing unlimited deviation points.
- In addition, the Type 2 deviating bus would work better if it was allowed only during non-peak time periods, and if the deviation points were scheduled or predetermined.
- 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 Call-n-Ride area, so multiple areas may be considered.
- The Call-n-Ride area(s) should not stand alone, but should be connected to the Lindenhurst Medical Center and the College of Lake County.
- Pace route 570 could be rerouted to make this connection, or that a Type 1 deviating bus route could fill the need.
- In order to accommodate multiple Call-n-Ride areas, the group suggested varying service hours, (such as no service during the middle of the day), to save money.
- The participants did not think that the Type 2 deviating bus was a practical solution to the transit needs in their 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.

# 9.0 Service Concepts and Evaluation

This section provides a description of service concepts designed to address deficiencies and opportunities for transit in Lake County. **Technical Report 5** of this study, “*Evaluation of Service Concepts*,” provides further details on these topics.

## 9.1 OVERALL SERVICE METHODOLOGY

The service concepts that are evaluated in this chapter of the report derive from the prior analysis of services and markets. Specifically, our 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 data needs to be addressed in the new market research task of this study;
- Refining and evaluating concepts using a set of evaluation criteria; and
- Drafting recommendations and a preliminary implementation phasing plan.

## 9.2 OVERVIEW OF CONCEPTUAL SERVICE IMPROVEMENTS

Several types of service improvements were evaluated and led to the final recommendations. These improvements are listed below and are described in the succeeding sections.

- Waukegan Pulse Point Relocation;
- Fixed Route Modifications;
- New Job Access Express Route;
- New Flexible Services (Call-n-Ride or Deviating Bus Service); and
- DAR/Paratransit Policy Coordination.

## 9.3 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. The following describes briefly the rationale behind moving the pulse point, the options considered and the results of the analysis.

### Background

The existing Waukegan pulse point is located on the northbound side of Sheridan Road between Washington Street and Madison Street in downtown Waukegan.

#### *Existing Pulse Point Deficiencies*

1. **Not Operationally Central** - The pulse point is at the far eastern end of the service area.
2. **Uncomfortable Location with Few Amenities** - Passengers have little protection from the elements in a location subjected to winds off the lake.
3. **Involves circuitous routing** - The location of the pulse point on one side of the street makes pedestrian connections easy but results in circuitous bus routing.
4. **Inconvenient Connection to Metra** - The current pulse point is located near the Waukegan Metra station but is separated from it by the Amstutz Expressway and involves a long circuitous walk connection. Some bus service directly serves the Metra station.
5. **Pace Finds it Difficult to Adhere to the Schedule During High-Traffic Periods** - Some routes have tight travel times and delays on any route can affect the timed connections.

#### *Options*

To address these concerns, two alternative locations were considered to the west of the current pulse point: 1) Washington at West and 2) Washington and Lewis. A third alternative, moving the pulse point to the Waukegan Metra Station, was also identified. These locations were discussed with the City of Waukegan, Pace, and Lake County, and approved for the analysis.

Finally, the baseline option is making no change or making improvements at the existing site. This option was not evaluated by the study team, but is the subject of other ongoing work by local partners.

#### *Methodology*

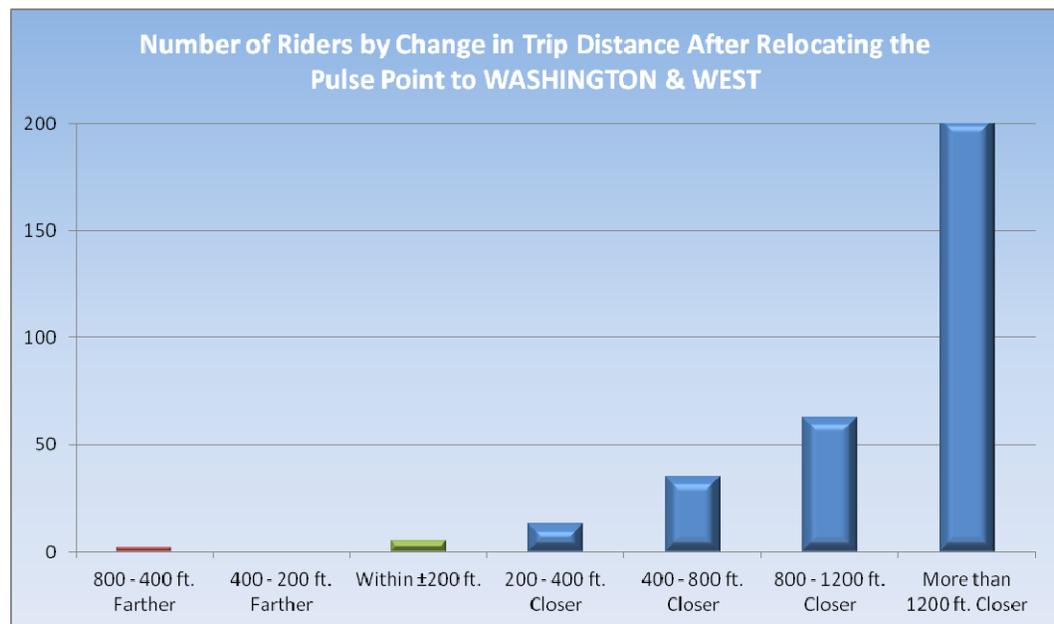
The market analysis focused on passenger impacts of the above ideas. The origin-destination survey conducted on Pace fixed routes in Waukegan provides data that is useful to examine impacts of relocation on travel time and walk time

for those transferring or destined to downtown Waukegan. The methodology was a high-level analysis that compared the primary travel time benefits and disbenefits. It was not based on a detailed route restructuring plan nor on the use of a network-based model; instead, some basic assumptions about route alignment were made and bus travel times were calculated based on point-to-point distances and average speeds. Walk and wait times also were considered. The analysis is based on the survey sample riders only.

### Relocation of the Pulse Point to Washington and West

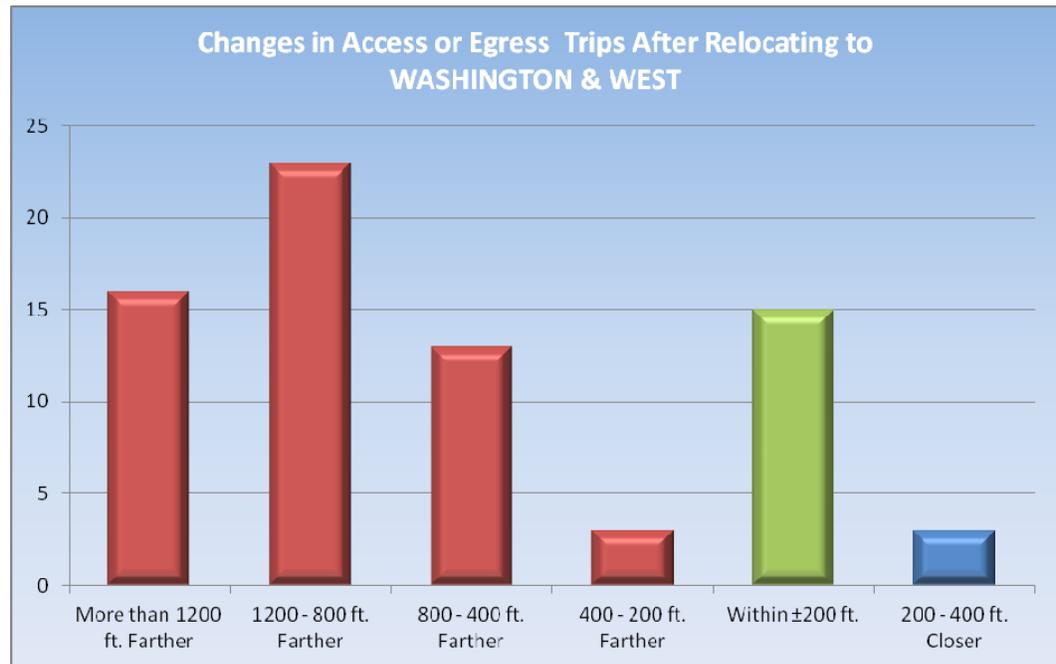
The proposed pulse point at Washington and West is just under one-third of a mile west of the current pulse point. The primary benefits of relocating the pulse point west of the current location are reduced travel times for transferring passengers. **Figure 9.1** below shows the impact on distance traveled to and from the pulse point for transferring riders.

**Figure 9.1** Distance Impacts on Transferring Travelers



While the above distance savings turns into time savings, those riders who are destined to (or originating at) downtown Waukegan locations, including the Metra station, are assumed to walk to their destination from the pulse point. **Figure 9.2** shows the access and egress distance impacts for these riders. The additional walk distance adds travel time, and consistent with demand modeling practice, is weighted by a factor of 2.5, to reflect the more onerous time spent walking rather than riding in a bus.

**Figure 9.2 Access and Egress Impacts on Downtown Riders Not Making a Bus Transfer**



As **Table 9.1** below shows, the disbenefits to the above riders outweigh the benefits to the transferring riders. Two measures were calculated: 1) Net benefits, 2) Ratio of benefits to disbenefits.

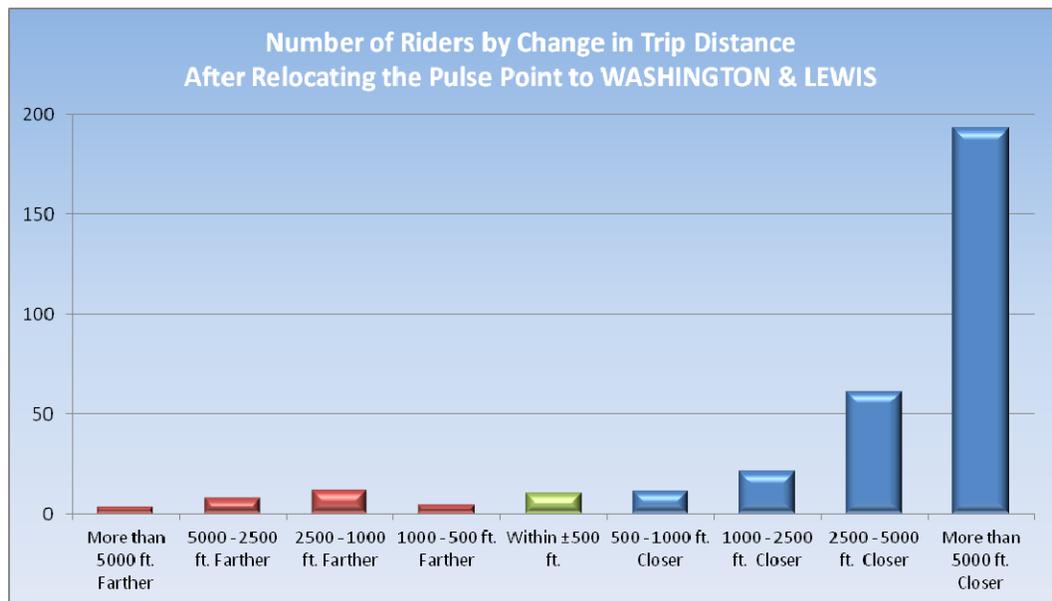
**Table 9.1 Evaluation of Benefits**  
*Relocation of the Pulse Point to Washington and West*

Measure	Values
Net Benefits (in minutes)	-124.1
Benefit/Disbenefit Ratio	0.76

### **Relocation of Pulse Point to Washington and Lewis**

The proposed pulse point at Washington and Lewis is about 1.4 miles west of the current pulse point. As in the previous option, the existing transfer trips are shorter, as shown in **Figure 9.3**.

**Figure 9.3 Distance Impacts on Transfer Riders**



However, moving the pulse point more than a mile west introduces many new transfers among those riders who are traveling to or from downtown locations, including the Metra station. The resulting additional time for making transfers and the associated wait times are more onerous than time spent riding on the bus and so this time is weighted by 2.5 consistent with standard demand modeling practice. The net result is even more disbenefit than in the case of Washington and West, as shown in **Table 9.2**.

**Table 9.2 Evaluation of Benefits**  
*Relocation of Pulse Point to Washington and Lewis*

Measure	Values
Net Benefits (in minutes)	1,200
Benefit/Disbenefit Ratio	0.63

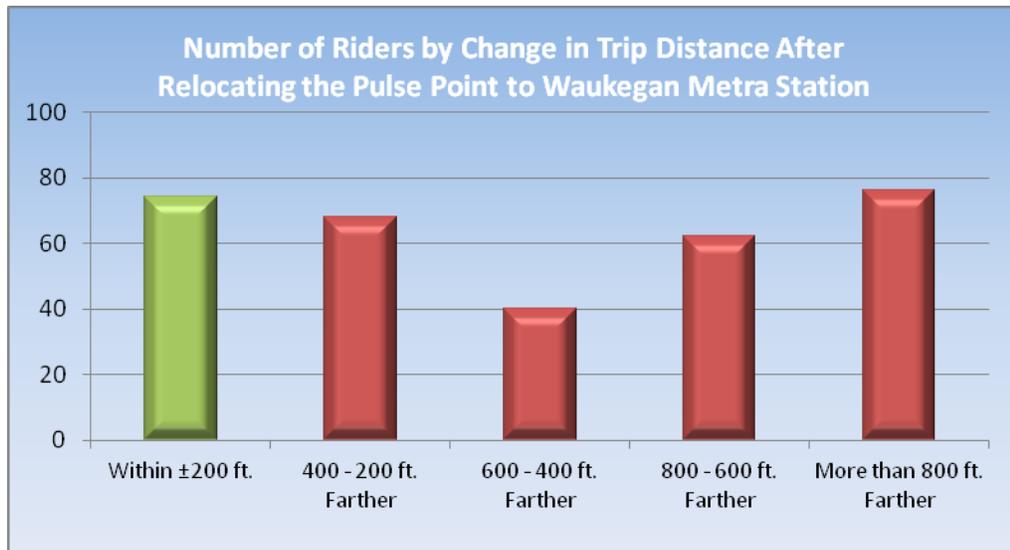
### Relocation of Pulse Point to the Metra Station

The relocation of the pulse point eastward to the Metra station, which adds nearly 1,300 feet to the trip distance each way, was evaluated using the same methodology. It was assumed that all buses would stop in downtown en route to the Metra station and after leaving the Metra station so that riders going downtown would not be affected. Riders transferring to Metra would benefit by

having a ride to the station eliminating their walk from the pulse point<sup>2</sup>. However riders who transfer at the pulse point would face a long ride time on both the trip to and the trip from the pulse point. An additional roundtrip riding time of 4 minutes was assumed. *Note that this analysis addresses only changes in rider trip distance; it does not address how the additional travel time would impact the bus schedules and operating cost.*

**Figure 9.4** shows the trip distance impacts on those riders who transfer at the pulse point.

**Figure 9.4** Distance Impacts on Riders Transferring at the Pulse Point



Euclidean Distances

As **Table 9.3** shows, the net impact to riders is a large disbenefit.

**Table 9.3** Evaluation of Benefits  
*Relocation of Pulse Point to the Metra Station*

Measure	Values
Net Benefits (in minutes)	-941
Benefit/Disbenefit Ratio	0.13

<sup>2</sup> Routes 571 and 565 already serve the Metra station.

## Waukegan Pulse Point Relocation Conclusion

The evaluation of three alternative pulse point locations 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 such a relocation from an operational and physical perspective needs to be analyzed. If not feasible, or if subsequent evaluation determines such a relocation to be undesirable, improvements at the existing pulse point location would be recommended.

## 9.4 FIXED ROUTE MODIFICATIONS

### Overview of Fixed Route Modifications

Four changes to fixed route service were evaluated, after identification of candidate improvements to address deficiencies and opportunities, and after obtaining input on these candidate improvements from Lake County and Pace.

- College of Lake County Transfer Point;
- Routes 564 and 568 Service to Fountain Square;
- Fixed Route Connections to Lindenhurst Medical Center; and
- Route 569 Lewis.

Other candidate rationalization improvements and span extensions are already being planned by Pace

### Create an Hourly Pulse at CLC

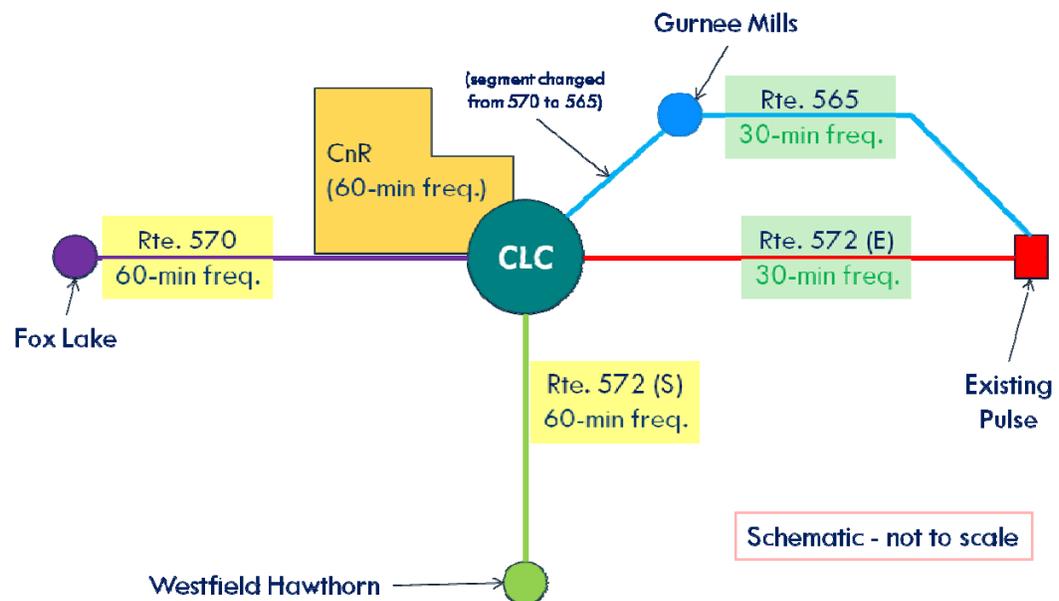
The College of Lake County is a major destination for many trips in the county. For this reason, and to improve transfers between routes in central Lake County, it is proposed that an hourly “pulse point” be created at CLC. In order to achieve this, the proposal has several components:

- 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;
- 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.

These changes are shown as a schematic in **Figure 9.5**. Under this proposal, the portion of Route 570 between CLC and Gurnee Mills would be incorporated into

Route 565 service. Additionally, service on Route 565 would increase from 40-minute headways to 30-minute headways, in order to make an hourly timed transfer at CLC possible – a change that will require additional financial resources. These steps, along with splitting Route 572 into eastern and southern segments, will allow for scheduling an hourly pulse point where these five services can come together, making transfers between these routes significantly easier and improving the overall passenger experience for travelers in central Lake County. It is also noted that scheduling for this pulse point, though not analyzed in detail within this study, will require interlining of these routes to accommodate a tightly-scheduled running time between CLC and the existing pulse point at Sheridan and Washington in downtown Waukegan.

Figure 9.5 Schematic of Routes and Pulse Point at CLC



### Routes 564 and 568 Service to Fountain Square

Two Pace routes provide service to Fountain Square in southwestern Waukegan: Routes 564 and 568. Formerly the site of Lakehurst Mall, the 1.1 million square-foot shopping center closed in 2001 and was demolished in 2004. The area is now home to a Walmart, the Lakehurst Apartments, and a small collection of retail, restaurants, and hotels.

After a review of boardings data earlier in this study 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 564 or 568, and 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.

Route 564 and Route 568 were among the routes surveyed during an onboard origin-destination survey conducted in early 2012. This survey recorded the nearest major intersection of both origins and destinations for Pace riders on routes in the Waukegan area, along with the Pace routes taken and where they transferred, providing an additional dataset for analysis of service changes in the area.

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 – and all others are served by other Waukegan-area routes in the Pace network.

Under this proposal the section of Route 564 between Dugdale Avenue and Fountain Square would be discontinued. Any passengers on-board Route 564 at Dugdale Avenue that wished to continue to Fountain Square could transfer to Route 568 at Woodland Village at 14<sup>th</sup> and Lewis, or simply use Route 568 from the pulse point at Washington and Sheridan.

Based on the analysis in this study, removing service on Route 564 between Dugdale Road/14<sup>th</sup> Street and Fountain Square would have minimal impact on passengers traveling to or from Fountain Square. Additionally, it is estimated that this service change would provide about \$89,225 in savings annually, if it could be realized through rescheduling. This is constrained with a pulsed operation. More realistically, the time savings would be used to cover other segments that are more productive. As part of a system restructuring, there could be a monetary savings realized.

### **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. Part of the reason to connect to CLC and Gurnee Mills would be to connect with other Pace bus routes. Particular interest was expressed in Route 570, which operates hourly service from Fox Lake to Gurnee Mills via Round Lake and CLC. If a choice had to be made between directly connecting to CLC or Gurnee Mills, CLC was viewed by focus group participants as more important in order to serve students. There seemed to be an understanding among participants that transfers would be required for travel to the more distant destinations.

The Antioch CnR and Deviating Bus proposals in this study (see Section 9.9) incorporated the direct connection to Lindenhurst Medical Center. The deviating bus proposal extended to Gurnee Mills. The study team concluded that the CnR service could not extend any farther than the Lindenhurst Medical Center and still maintain acceptable operations. Thus, the desire for connecting the proposed Antioch CnR to the fixed route system focused on possible extensions of fixed route service to Lindenhurst Medical Center.

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
- 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 on the relative importance of the connections that could be offered, and discussions on 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**

During the service analysis phase of this study, a review of boarding count data identified that the southernmost segment of Route 569, between 14<sup>th</sup> Street and the Veterans Administration Medical Center North Chicago (and the Captain James A. Lovell Federal Health Center) experienced low passenger loads. This was preliminarily identified as an opportunity to reduce frequency of service on this segment and use these resources more effectively on more heavily patronized segments of the route north of 14<sup>th</sup> Street.

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 Route 569 trip would still leave hourly service from the pulse point while eliminating service on half of the Route 569 trips would maintain service at the VA Medical Center about every half-hour to alternating destinations.

The on-board survey data was used to examine the origins and destinations of trips to and from the VA Medical Center using Routes 569 and 563. The data indicates that some of the riders using Route 569 make transfers from other routes, and so 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, 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. 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.

### **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. Currently, there is Shuttle Bug service from Metra stations serving corporate centers in the southern part of Lake County and direct local bus service from Waukegan to the central part of the county that extends as far south as Westfield Hawthorne Mall. More direct and faster service to the job centers in the South Central Corridor might create greater job opportunities for the lower-income residents in Waukegan.

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 for 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 internal 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. (The map in **Figure 9.6** shows one possible routing concept.)

Alternatively, the route could make a stop at Gurnee Mills to enable connections with Route 570 from Round Lake. In that case the route would use Grand Avenue to Gurnee Mills and then enter I-94 at the Grand Avenue entrance, which is a longer routing that heads somewhat north before heading south on the I-94. For this reason, the estimates below have been based on the more direct route via Belvidere without a stop at Gurnee Mills.

Service characteristics of the proposed Job Access Express bus are shown in **Table 9.4**.

**Table 9.4 Operating Characteristics of Proposed Express Bus**

Item	Value
Span of Service	7:00 a.m. to 9:30 p.m.
Frequency of Service	4 trips in each direction per day
Peak Vehicles Required	1
Vehicle Type	40-foot bus; Wheelchair-accessible
Vehicle Hours of Service	12 hours/day
Likely Operating/Maintenance Base	Pace

Figure 9.6 Proposed Job Access Express Route



Because this route is designed to provide jobs access, 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.

## 9.5 FLEXIBLE SERVICE OPTIONS

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 described below, accompanied by maps of proposed service changes. A consolidated map of all proposed flexible service changes can be found in **Figure 9.16** in **Section 9.6**.

### 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. 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.<sup>3</sup> Route deviation offers the opportunity to serve more trips on the fixed route since many fixed or flag stops can be served. But because the route must return after a deviation stop to the point 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. In this section, we identify which of these two types of service is proposed in each location.

Deviations to any point within three-quarters of a mile of a route can meet the requirements for complementary ADA service for the route. For a suburban area like Lake County, it is assumed that deviations would be made to any point in the deviation zone and we have defined deviation zones to be no shorter than three quarters of a mile. Examples of deviating bus services around the country

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<sup>3</sup> The primary source for this section is: TCRP Report 140. "A Guide for Planning and Operating Flexible Public Transportation Services." Transportation Research Board. 2010.

reveal a variety of possible service designs catering to specific local needs. The 2010 survey conducted by TCRP Report 140 revealed that nearly 40 percent of transit agencies operate some form of flexible transportation service, and the number is rising.

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 and other flexible, demand responsive services include non-emergency medical, shopping, and social trips for youth, the elderly, persons with disabilities, and low-income persons – and especially for trips serving major shopping centers and hospitals or clinics. As in the case of other demand responsive services with relatively low productivities, contract operators can be used to keep costs of deviating bus services low, and also perhaps to take advantage of existing paratransit reservation services.

### **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 are temporary in that they only support a project for a limited amount of time, e.g., one to three years. Private subsidy of specific transportation services also is a possibility, but is much less common.

### **Service Applications in Lake County**

The following sections describe options for various geographical areas of the county, including Call-n-Ride and/or deviating bus options. Typically, if more than one option is identified, further evaluation with stakeholders will be needed to determine the preferred approach.

#### **Mundelein – Libertyville – Vernon Hills**

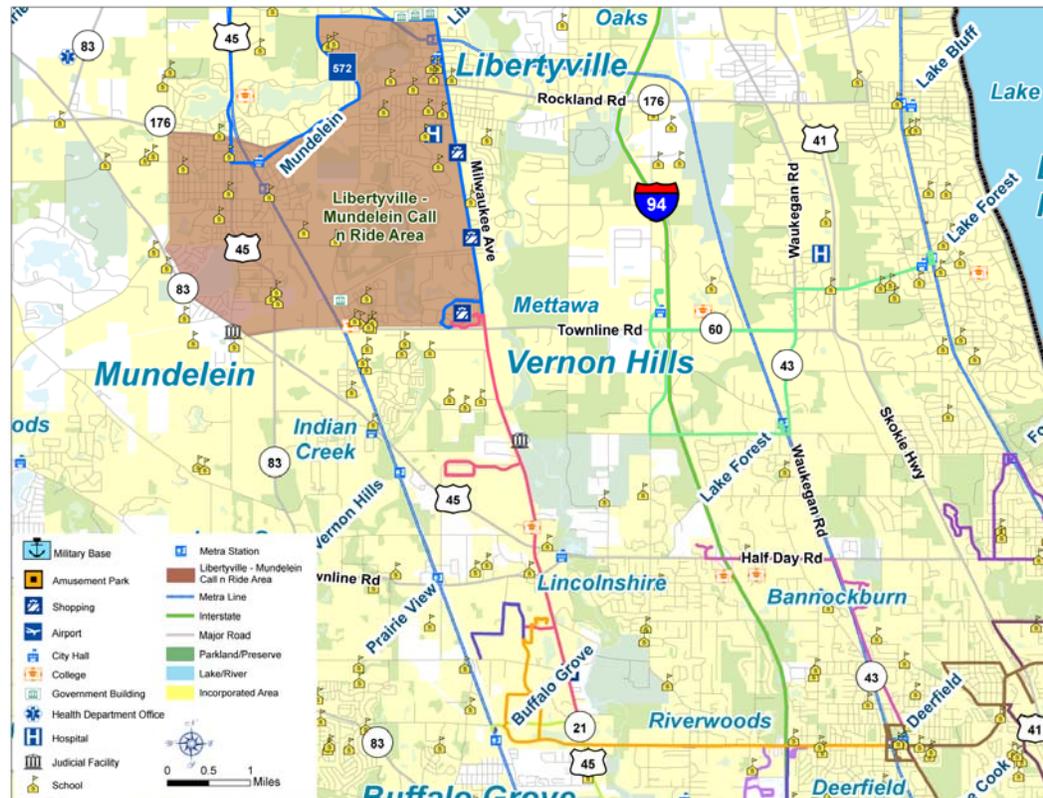
In the Mundelein/Libertyville and Vernon Hills area, either Call-n-Ride or deviating bus services could be introduced. The options are described below. Discussions with stakeholders should take place to determine which service option is preferred by Pace and the community, and whether funding can be identified to implement the project.

##### ***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, as shown in **Figure 9.7**. This 10.0 square-mile area includes two Metra stations, and connects with two Pace fixed bus routes, the Westfield Hawthorn Shopping Center with 13 million square feet of retail space, the 273-bed Advocate Condell Medical Center, downtown

Libertyville, downtown Mundelein, Libertyville and Mundelein High Schools, several corporate headquarters, including Motorola, Medline, Hollister, and Ruprecht Company, businesses along Milwaukee Avenue, the Cook Library, as well as residential areas. Proposed timed connections would be made at the Westfield Hawthorn Shopping Center with Pace Routes 572 and 272, as well as the proposed Vernon Hills CnR, if implemented.

Figure 9.7 Mundelein-Libertyville Call-n-Ride Map



Results from **Technical Report 3**, “*Analysis of Land Use, Socioeconomic Characteristics and Travel Patterns*,” suggested that Lake County’s central corridor was a major destination within the county for employment and other activities. **Table 5.10** of that report indicates that over 150,000 trips are made within the Mundelein/Vernon Hills district by motorized modes for all purposes. Further analysis, surveys of residents and a focus group of local stakeholders confirmed that mobility improvements in this area are needed.

It is proposed that the Mundelein-Libertyville CnR would have the same service characteristics as other Pace CnR services, as shown in **Table 9.5**.

The proposed Mundelein-Libertyville CnR area is a potential service that would provide service coverage to over 36,000 residents at a relatively low total cost, albeit at a high cost per ride. It would provide last-mile, door-to-door access for a large number of generators, including shopping malls, employment centers, schools, a hospital, and a significant residential population.

**Table 9.5 Operating Characteristics of Mundelein-Libertyville Call-n-Ride**

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., Weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	12.5 hours/day
Likely Operating/Maintenance Base	Private contractor

Note: Operating characteristics modeled on Pace's other CnR operations.

***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, as shown in **Figure 9.8**. This 6.4-square-mile area includes a Metra station, and connects with Pace fixed bus routes 572 and 272 and Pace Shuttle Buses 576 and 626. It also includes the 13 million square foot Westfield Hawthorn Shopping Center, the Corporate Woods business park, libraries, Adlai E. Stevenson and Vernon Hills High Schools, CLC Southlake Campus, a large business and retail area along Milwaukee Avenue, as well as residential areas. Proposed timed connections would be made at the Westfield Hawthorn Shopping Center with Pace fixed bus routes 572 and 272, as well as the proposed Mundelein-Libertyville CnR, if implemented.

Results from **Technical Report 3**, “*Analysis of Land Use, Socioeconomic Characteristics and Travel Patterns*”, suggested that Lake County’s central corridor was a major destination within the county for employment and other activities. Further analysis, surveys of residents and a focus group of local stakeholders confirmed that mobility improvements in this area are needed.

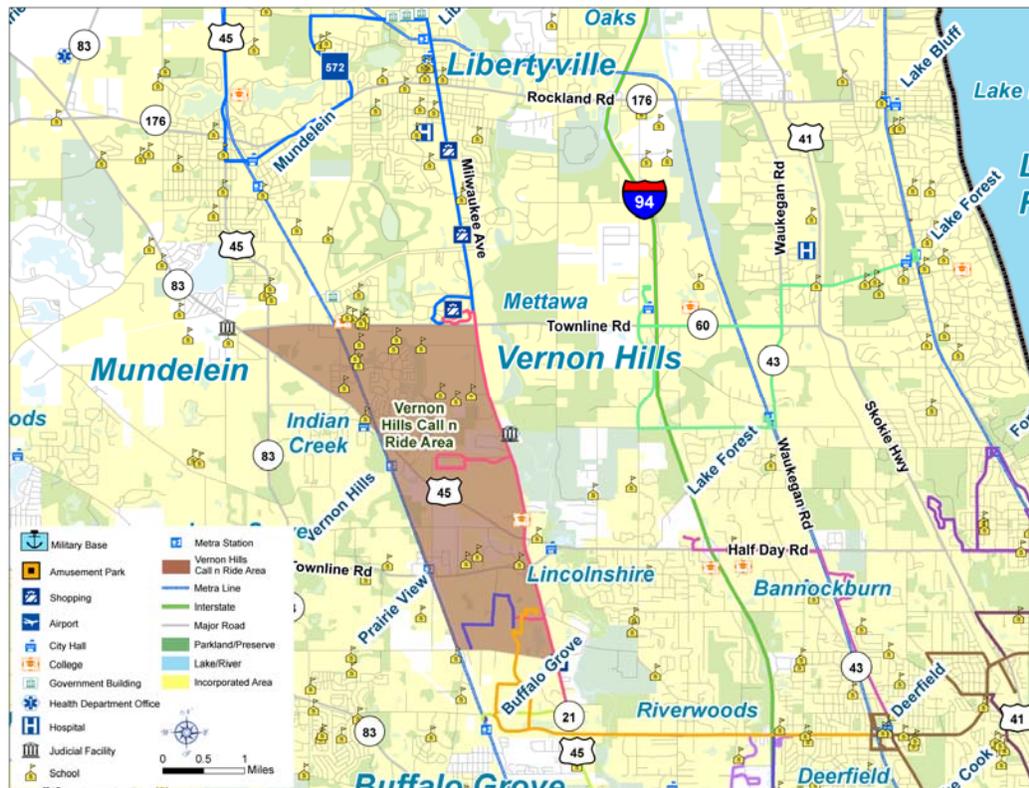
It is proposed that the Vernon Hills CnR would have the same service characteristics as other Pace CnR services, as shown in **Table 9.6**.

**Table 9.6 Operating Characteristics of Vernon Hills Call-n-Ride**

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., Weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	12.5 hours/day
Likely Operating/Maintenance Base	Private contractor

Note: Operating characteristics modeled on Pace’s other CnR operations.

Figure 9.8 Vernon Hills Call-n-Ride Map



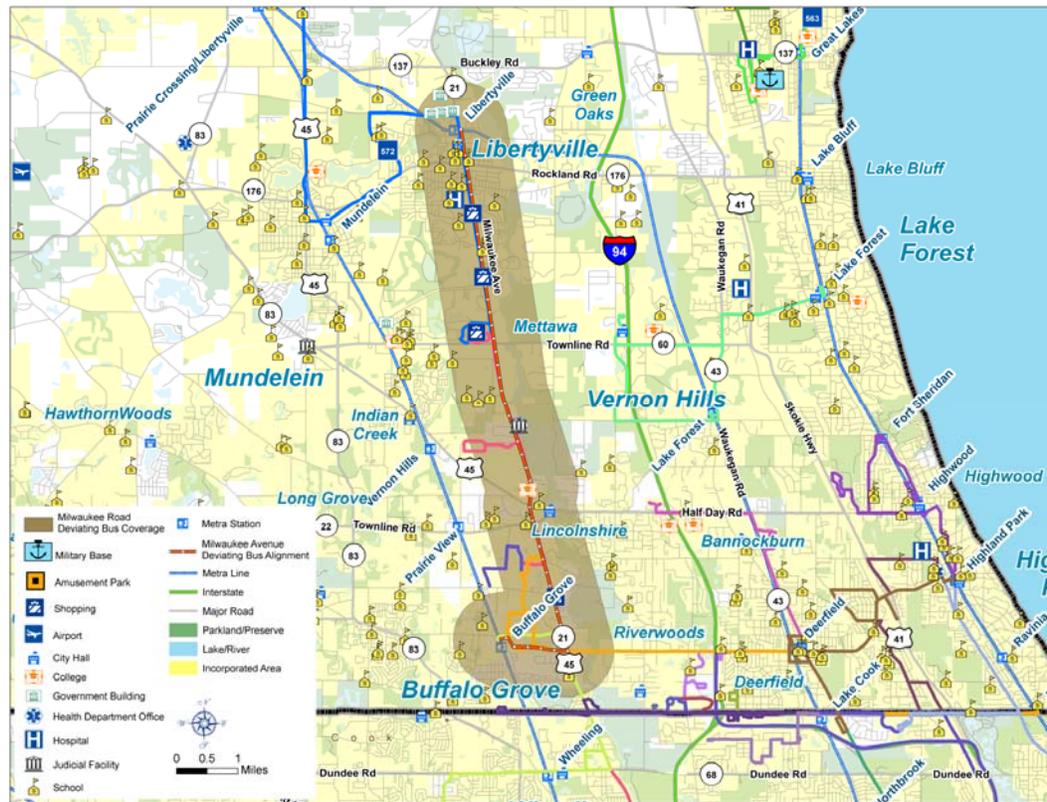
The proposed Vernon Hills CnR area is a potential service that would provide transit service coverage to 13,600 residents at a relatively low total cost, albeit at a high cost per ride. It would provide last-mile, door-to-door access for a large number of generators, including shopping malls, employment centers, schools, a hospital, and a significant residential population.

### *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 Libertyville Metra station on the MD-N line, Advocate Condell Medical Center, Westfield Hawthorn Mall, the Southlake Campus of College of Lake County (CLC), and the Buffalo Grove Metra station on the NCS line – as shown in **Figure 9.9**.

The Milwaukee Avenue corridor has a series of attractions that could make this route successful. Numerous businesses are located in Downtown Libertyville and along large segments of the Milwaukee Avenue corridor. The Westfield Hawthorn Mall, with about 13 million square feet of retail space, and other shopping locations outside the mall is a major attraction site as well as a location where the route could connect with other existing and proposed services. Vernon Hills High School, Libertyville High School, and Adlai E. Stevenson High School would all be within the service area. The 273-bed Advocate Condell Medical Center is both a large employer and a destination for medical trips.

Figure 9.9 Milwaukee Avenue Deviating Bus Map



Currently, Milwaukee Avenue is served by two Pace fixed bus routes. Route 572 serves the area from Westfield Hawthorn Mall to the north following a circuitous path ending in Waukegan. Route 272 serves the area from Westfield Hawthorn Mall to the south ending in Cook County at the Golf Mill Shopping Center in Niles. Many trips that could be served by the proposed route would be difficult with the existing Pace fixed routes due to the poor pedestrian environment. The need for deviations is primarily to the west of Milwaukee Avenue where businesses, institutions and residences are located. The proposed service will extend the reach of the existing fixed routes by providing “last-mile” trips similar to rail station feeder services. A demand-responsive service in this corridor allows the transit vehicle to more easily serve passengers with door-to-door rides in an area that is not always well suited for the pedestrian. This proposal could replace some or all of the fixed route bus service on Routes 272 and 572 between Libertyville Metra station and the Buffalo Grove Metra station, although consideration of long-term Pace ART plans would suggest continuing the fixed-route service. The operating characteristics of the proposed deviating bus on Milwaukee Avenue are shown in **Table 9.7**.

The Milwaukee Road Deviating Bus would be more costly than either or both of the Mundelein-Libertyville and the Vernon Hills CnRs, as proposed. The subsidy per rider on the deviating bus is expected to fall in between the subsidy per rider for these two CnRs. However, it may have the potential to serve a greater number of riders.

**Table 9.7 Operating Characteristics of Milwaukee Avenue Deviating Bus**

Characteristic	Value
Span of Service	6:00 a.m. to 6:30 p.m.
Frequency of Service	Hourly
Peak Vehicles Required	3
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	37.5 hours/day
Likely Operating/Maintenance Base	Private contractor

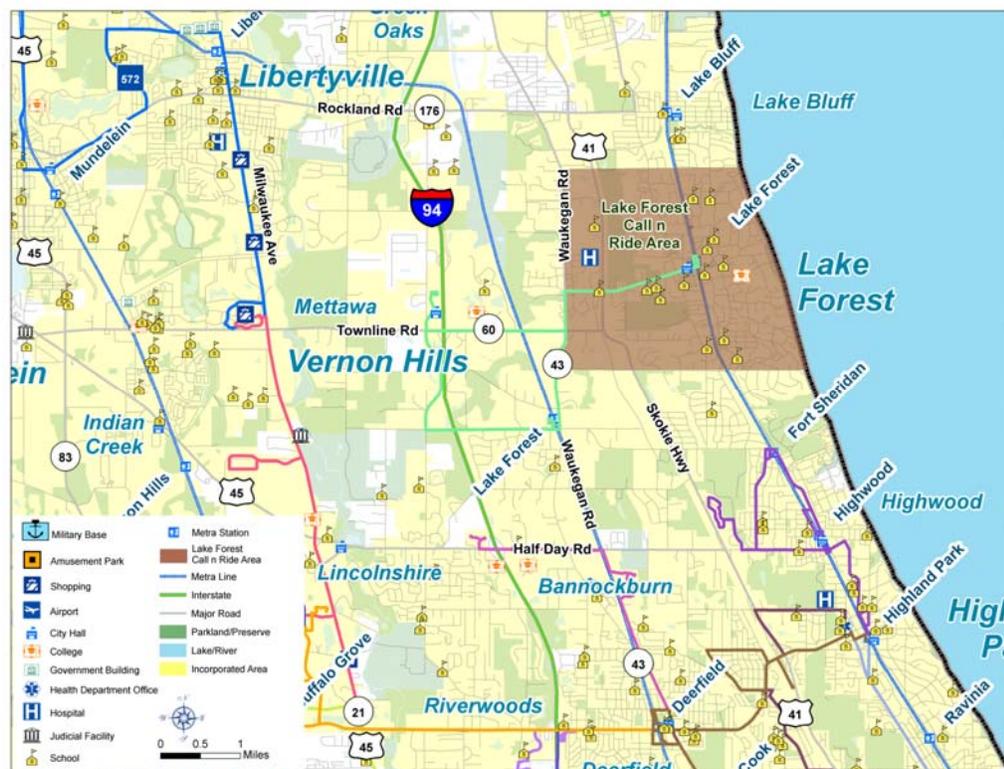
### Lake Forest

In the Lake Forest area, either Call-n-Ride or deviating bus could be introduced. The options are described below. Discussions with stakeholders should take place to determine which service option is preferred by Pace and the community, and whether funding can be identified to implement the project.

#### 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, as shown in **Figure 9.10**. This 6.75-square-mile area includes a Metra station, and connects with Pace Shuttle Bug 625, the 205-bed Lake Forest Hospital, businesses in downtown Lake Forest, the 1,400-student Lake Forest College, and Lake Forest Library, as well as residential areas.

**Figure 9.10 Lake Forest Call-n-Ride Map**



The high employment density in Lake Forest is an indication that a market for transit service exists in this area. 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.

It is proposed that the Lake Forest CnR would have the same service characteristics as other Pace CnR services, as shown in **Table 9.8**. The proposed Lake Forest CnR area is a potential service that would provide transit service coverage to 11,100 residents at a relatively low total cost, albeit at a high cost per ride. It would provide last-mile, door-to-door access for a large number of generators, including shopping malls, employment centers, schools, a hospital, and a significant residential population.

**Table 9.8 Operating Characteristics of Lake Forest Call-n-Ride**

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., Weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	12.5 hours/day
Likely Operating/Maintenance Base	Private contractor

Note: Operating characteristics modeled on Pace’s other CnR operations.

### ***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, as shown in **Figure 9.11**, a distance of 8 miles.

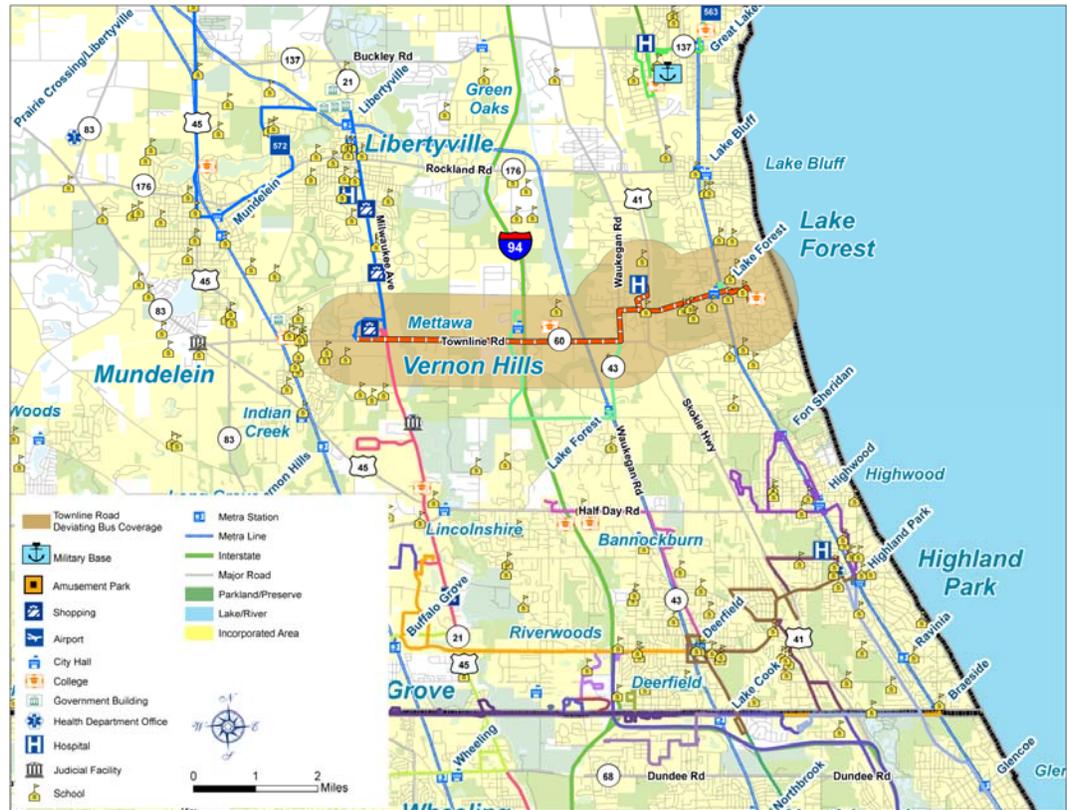
The route would begin at the Westfield Hawthorn Mall, travel east along Townline Road to Waukegan Road, north on Deerpath Road, making a fixed stop deviation at the Northwestern Lake Forest Hospital, serve the Lake Forest Metra station, and end at Lake Forest College. The route would make deviations to points within three-quarters of a mile of this route on demand.

Other notable destinations within the service area, other than those already mentioned, include Lake Forest High School – West Campus, Deer Path Middle School, Lake Forest Library, downtown Lake Forest, and corporate headquarters that include Abbott Laboratories, Solo Cup, Pactiv Corporation, and IDEX Corporation.

The county lacks a sufficient number of east-west transit routes to connect existing fixed route services. A transit map of Lake County illustrates that the only east-west directional services are in the northern part of the county and are

provided by route 572 and the combination of routes 570 and 565. Shuttle Bug routes do provide short stretches of east-west connections, but these are tailored for specific employment sites and operate only during peak time periods. The Mundelein/Vernon Hills area currently is a key destination for trips in the county, and is projected to experience continued growth. Additional east-west routes will be needed in the future to meet the increasing demand for transit trips to this area.

Figure 9.11 Map of Proposed Townline Road Deviating Bus



A summary of operating characteristics of the proposed Townline Road deviating bus service is shown in **Table 9.9**.

Table 9.9 Operating Characteristics of Townline Road Deviating Bus

Characteristic	Value
Span of Service	6:00 a.m. to 6:30 p.m.
Frequency of Service	Hourly
Peak Vehicles Required	2
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	25 hours/day
Likely Operating/Maintenance Base	Private contractor

The Townline Road Deviating Bus would be more costly than the Lake Forest CnR, as proposed, and is estimated to involve a higher subsidy per rider. However, it may have the potential to serve a greater number of riders. The deviating bus proposal serves a major travel generator (Westfield Hawthorn Mall), and may serve a different travel market than the CnR.

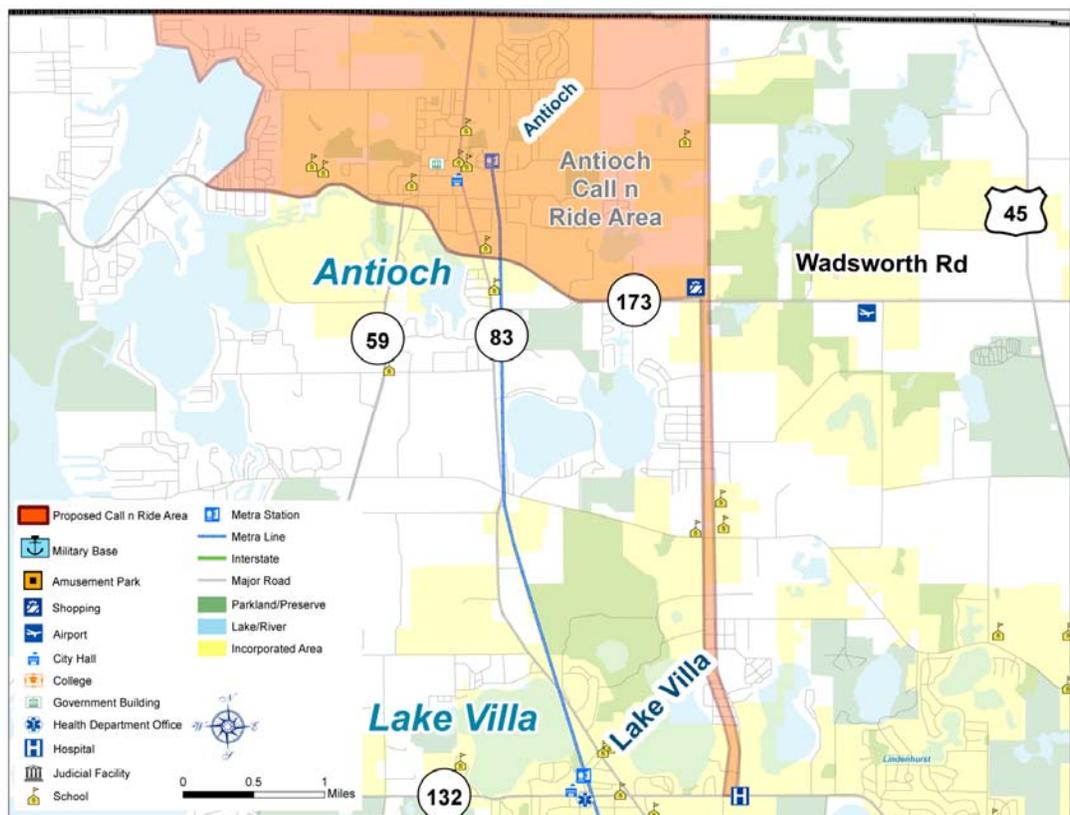
## Antioch

In the Antioch area, either Call-n-Ride or deviating bus could be introduced. The options are described below. Discussions with stakeholders should take place to determine whether the above CnR service or the alternative deviating bus service option is preferred by Pace and the community, and whether funding can be identified to implement the project.

### 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 will travel south from the service area, acting as a fixed route along Deep Lake Road to Grand Avenue to serve the Lindenhurst Medical Center, as shown in **Figure 9.12**.

Figure 9.12 Antioch Call-n-Ride Map



This route could make timed connections with the Antioch Metra Station or with an adjusted Route 570 at Lindenhurst Medical Center. This 5.6-square-mile area plus 3.6 mile linear extension includes one Metra station, and connects with the 40,000-square-foot Lindenhurst Medical Center, downtown Antioch, a Walmart Supercenter, the WC Petty Elementary and Antioch Upper Grade schools, as well as residential areas.

It is expected that implementation of the Antioch CnR would come in conjunction with changes to the fixed route network in order to provide a bus connection between Antioch and the rest of the county.

A review of the fixed bus network shows a lack of bus service in this part of the county despite the presence of lower-income and senior populations in this area. While other townships in Lake County may have slightly higher concentrations of low income and senior citizens than Antioch, they also have the benefit of some fixed route bus service. The lower population density in Antioch compared to the other townships indicates that demand response services may be more appropriate in this area. Also, as noted in **Table 5.10** of **Technical Report 3**, “*Analysis of Land Use, Socioeconomic Characteristics and Travel Patterns*,” there were over 13,000 trips made within Antioch Township by all motorized modes for all purposes.

It is proposed that the Antioch CnR would have the same service characteristics as other Pace CnR services, as shown in **Table 9.10**.

**Table 9.10 Operating Characteristics of Antioch Call-n-Ride**

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., Weekday-only
Frequency of Service	Hourly connections with Metra or Medical Center
Peak Vehicles Required	1
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	12.5 hours/day
Likely Operating/Maintenance Base	Private contractor

Note: Operating characteristics modeled on Pace's other CnR operations.

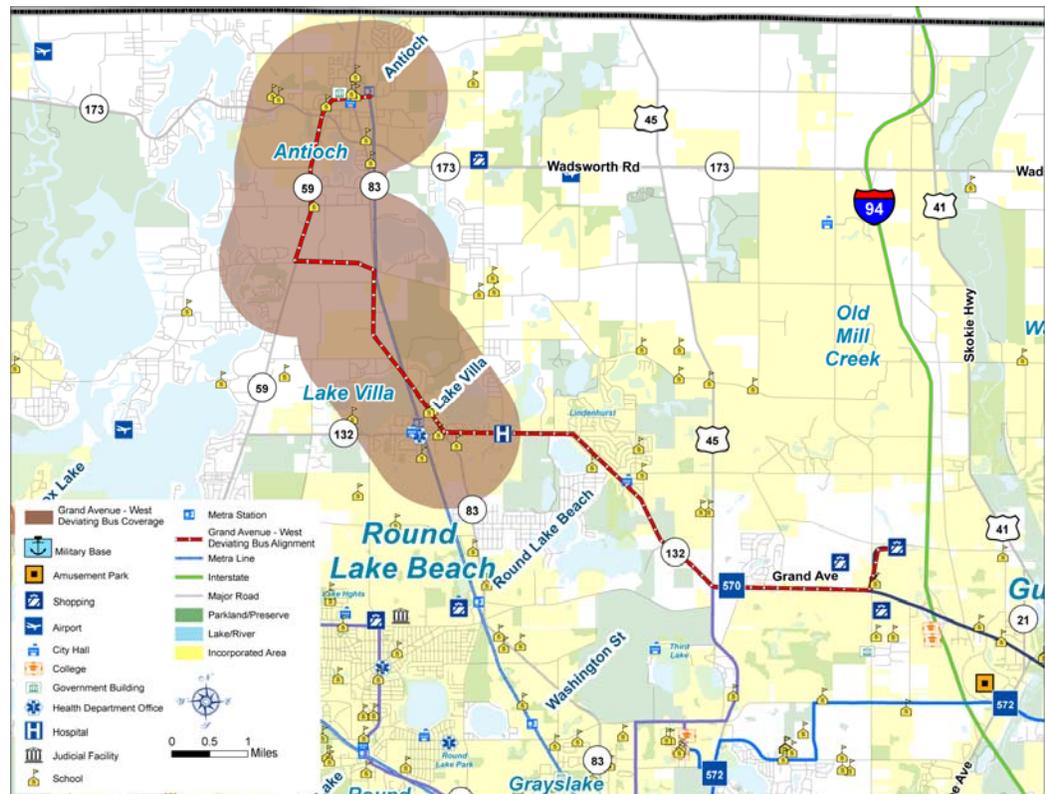
The proposed Antioch CnR area is a potential service that would provide service coverage to over 9,500 residents at a relatively low cost. It would provide last-mile, door-to-door access for a large number of generators, including a hospital, shopping, employment centers, schools, and a residential population.

### ***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 north and west to the Gurnee Mills shopping center in the south and east, as shown in **Figure 9.13**. Between 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.

Figure 9.13 Antioch to Gurnee Mills Deviating Bus



Focus group participants were interested in connecting to both CLC and Gurnee Mills. As Gurnee Mills is closer to the Lindenhurst Medical Center, and provides a shorter connection to the Waukegan bus network, that option is presented in this section as an example. Using CLC as a termination point rather than Gurnee Mills mall also could work, and could be considered during implementation planning.

A review of the fixed bus network shows a lack of bus service in this part of the county despite the presence of lower-income and senior populations in this area. While other townships in Lake County may have slightly higher concentrations of low income and senior citizens than Antioch, they also have the benefit of some fixed route bus service. The lower population density in Antioch compared to the other townships indicates that demand response services may be more appropriate in this area. Also, as noted in **Table 5.10** of the **Technical Report 3**, “*Analysis of Land Use, Socioeconomic Characteristics and Travel Patterns,*”

there were over 13,000 trips made within Antioch Township by all motorized modes for all purposes.

The meetings with focus group members, discussed below, highlighted the lack of medical facilities in the Antioch area and the need and difficulty for residents to access other parts of the county, in particular the new Lindenhurst Medical Center.

A summary of operating characteristics of the proposed Antioch to Gurnee Mills deviating bus service is shown in **Table 9.11**.

**Table 9.11 Operating Characteristics of Antioch to Gurnee Mills Deviating Bus**

Characteristic	Value
Span of Service	6:00 a.m. to 6:30 p.m.
Frequency of Service	Hourly
Peak Vehicles Required	3
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	37.5 hours/day
Likely Operating/Maintenance Base	Private contractor

The Antioch to Gurnee Mills Deviating Bus would be more costly than the Antioch CnR, as proposed. The subsidy per rider on the deviating bus is likely to be in a similar range as the CnR. However, the deviating bus may have the potential to serve a greater number of riders.

### **Waukegan and Gurnee**

This section describes introduction of 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.

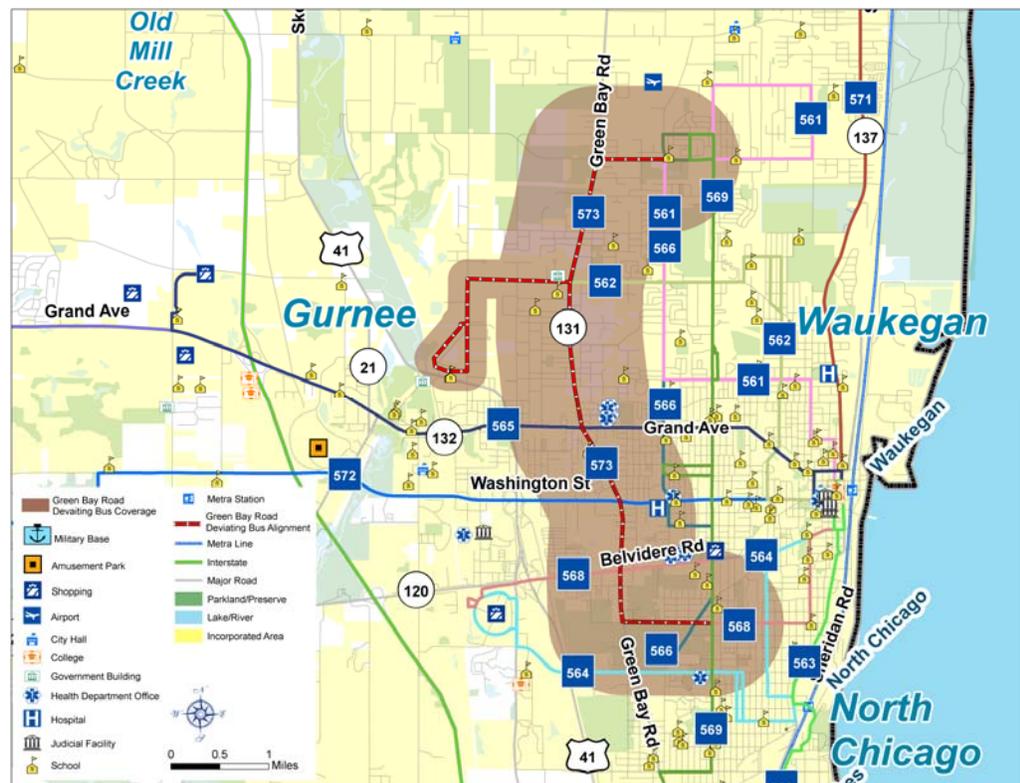
#### ***Green Bay Road Deviating Bus***

Converting Route 573 to a demand-responsive, “deviating bus” service was identified as a preliminary service concept earlier in this study. Route 573 – Green Bay Road runs from 10<sup>th</sup>/Lewis to the McCall School at Edgewood/Newcastle in Waukegan along Green Bay Road. The peak-period-only service currently has five morning peak and five evening peak period trips in each direction each weekday. This route only carries an average of 16 passengers per day, as shown in **Table 3.4 of Technical Report 1, “Review of Transportation Services in Lake County.”** With such low existing ridership – an average of less than one rider per run – it may be possible to get more use out of the same resources while maintaining transit service in this corridor using a deviating bus service concept. A deviating bus could cover a wider catchment area and might attract more riders.

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 driven primarily by observation of very low loads on the route during midday times, as shown in **Figure 3.15** in **Technical Report 2**, “*Lake County Service Analysis*”. The very low ridership during the midday does not justify operation of the service on this segment. Loads on the western segment during the peak time periods were also relatively low at less 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 9.14**. This proposal retains service to the Route 573 market area, as well as to the western segment of Route 562 during rush hours only.

**Figure 9.14** Map of Proposed Green Bay Road Deviating Bus



A deviating bus along the current alignment of Route 573 would allow for connections with nearly all fixed route buses in the Waukegan area. Adding in the Gurnee Industrial Park area to the service area allows trips to or from this area to access a large part of the Waukegan area either directly or through a single transfer.

A route deviation service in this corridor would provide door-to-door access from residences to the variety of businesses in the Gurnee Industrial Park area, the Vista Medical Center West, and shopping centers, including Lake Plaza and the Belvidere Mall Shopping Center. Waukegan High School - Brookside Campus also is located within this route’s service area.

The proposed service would have the same span of service as the existing Route 573, running between 6:00 a.m. and 10:00 a.m., and between 2:30 p.m. and 6:30 p.m. Functioning as a route deviation service, the bus would run along its designated route, picking up and dropping passengers at either posted stops or flag-stops along the way. Additionally, it would deviate up to three-quarters of a mile from the route, plus into the industrial park (a distance of about one mile), to either pick up or drop off passengers who have scheduled a deviation.

A summary of operating characteristics of the proposed Green Bay Road deviating bus service is shown in **Table 9.12**.

**Table 9.12 Operating Characteristics of Green Bay Road Deviating Bus**

Characteristic	Value
Span of Service	6:00 a.m.-10:00 a.m.; 2:30 p.m.-6:30 p.m.
Frequency of Service	80-minute headways
Peak Vehicles Required	1
Vehicle Type	Existing vehicle or preferably a 15-passenger; Wheelchair-accessible bus
Vehicle Hours of Service	8 hours/day
Likely Operating/Maintenance Base	Pace North Division or Private Contractor*

\* Transfer of an existing route to a private contractor may pose Section 13C issues.

### Lake-Cook Road Deviating Bus

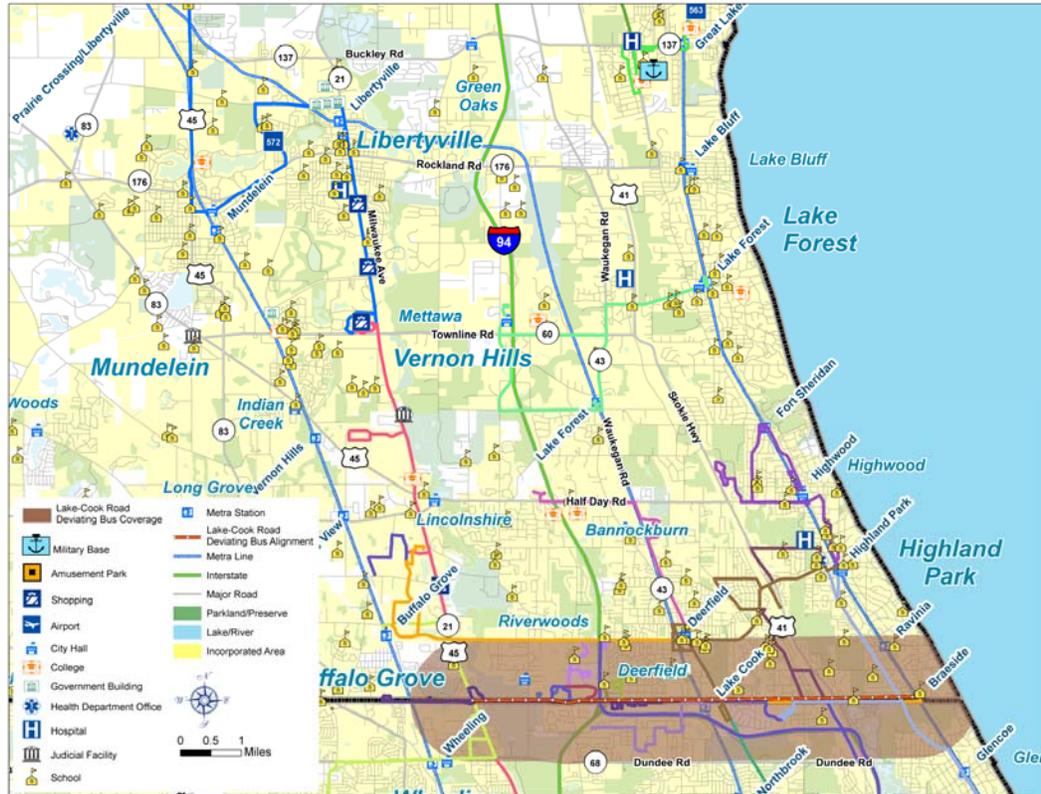
The proposed Lake-Cook Road deviating bus service would act as a point deviation service between Milwaukee Avenue on the west and the Braeside Metra station on the east. Operating in a deviation service zone between Deerfield Road and Dundee Road shown in **Figure 9.15**, the route would provide on-demand midday transit service in southern Lake County and northern Cook County, one of the largest employment centers in the Chicago region.

Notable destinations within the service area include two Metra stations (Braeside on the UP-N line and Lake-Cook on the MD-N Line) along with dozens of corporate headquarters and large employers.

This study’s **Technical Report 3**, “*Analysis of Land Use, Socioeconomic and Travel Patterns*,” found that the North Central Lake-Cook market district has almost 86,000 jobs and is the largest “net importer” of jobs compared to other Lake County market districts. This district, which will be served by the proposed bus route is projected to continue to grow as a major employment site. The Lake-Cook Road corridor currently has transit service in the morning and evening peak travel periods. Transit service is primarily in the form of Shuttle Bug services, which bring passengers from Metra stations to office buildings in the corridor. Providing midday transit service in the corridor would allow more flexibility for workers who use transit in peak hours but occasionally need to get to or from their offices during the middle of the day (either to make a local trip or

to access the Metra station). The service also would accommodate visitors and prospective employees to the many offices along the Lake-Cook corridor, as well as residents living within the deviation zone.

Figure 9.15 Map of Proposed Lake Cook Road Deviating Bus



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.

A summary of operating characteristics of the proposed Lake-Cook Road deviating bus service is shown in **Table 9.13**.

Table 9.13 Operating Characteristics of Lake-Cook Road Deviating Bus

Characteristic	Value
Span of Service	9:00 a.m. to 4:00 p.m.
Frequency of Service	Hourly
Peak Vehicles Required	2
Vehicle Type	15-passenger bus; Wheelchair-accessible
Vehicle Hours of Service	14 hours/day
Likely Operating/Maintenance Base	Private contractor

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 Bug service with four to five companies, but the service was discontinued.

## 9.6 SUMMARY OF FLEXIBLE SERVICE RIDERSHIP AND COST CHARACTERISTICS

Ridership and cost estimates were developed for each option. The following section describes these estimates for each type of service.

### Call-n-Ride 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 density, percentage of the population age 65 or older, the number of connecting bus routes, and the zone size. The analysis used data from CMAP, the U.S. Census, and Pace. This forecasting tool is used by Pace and was presented at a recent TRB conference, and is intended for use only as a planning tool to aid in the design of potential CnR service areas. (Note that the regression model was *not* designed to analyze the effect of the fixed deviation outside of the service zone such as to the Lindenhurst Medical Center. While this deviation provides access to a major attraction and travel generator, increasing potential ridership, this deviation takes extra time that can't be used to serve other trips – which could have a negative impact on productivity.) Operating costs were estimated using the contractor operating cost for demand responsive services.

Table 9.14 shows a comparison of each CnR service in this section.

Table 9.14 Summary of Proposed Call-n-Ride Service Areas

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

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

The four proposed CnR service areas all have the potential to be successful CnRs within the Pace system. With sizes ranging from 5.6 to 10.0 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 among these four, and also are 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.

When implementing these services, improved customer information on CnR service and eligibility policies is desirable, since it will help the public understand this service and policies better.

### Deviating Bus Services

Deviating bus service would be new to the Pace service area. No model is available to estimate the ridership of the proposed services. Ridership for deviating bus service was based on the range of typical productivities observed for deviating bus services around the country.

Operating costs were estimated assuming operation by the demand responsive services contractor except in the case of Green Bay Road where Pace direct operation is shown as the high end of the range.

Table 9.15 shows a comparison of each deviating bus service in this section.

**Table 9.15 Summary of Proposed Deviating Bus Services**

Deviating Bus	Peak Vehicles	Annual Ridership <sup>a</sup>	Annual Operating Cost	Subsidy per Rider
Green Bay Road	1	8,160 to 14,300	\$122,400 to \$173,400 <sup>b</sup>	\$7.64 to \$20.31
Townline Road	2	25,500 to 44,600	\$382,500	\$7.64 to \$14.06
Lake-Cook Road	2	14,000 to 25,500	\$214,200	\$7.46 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 analysis.

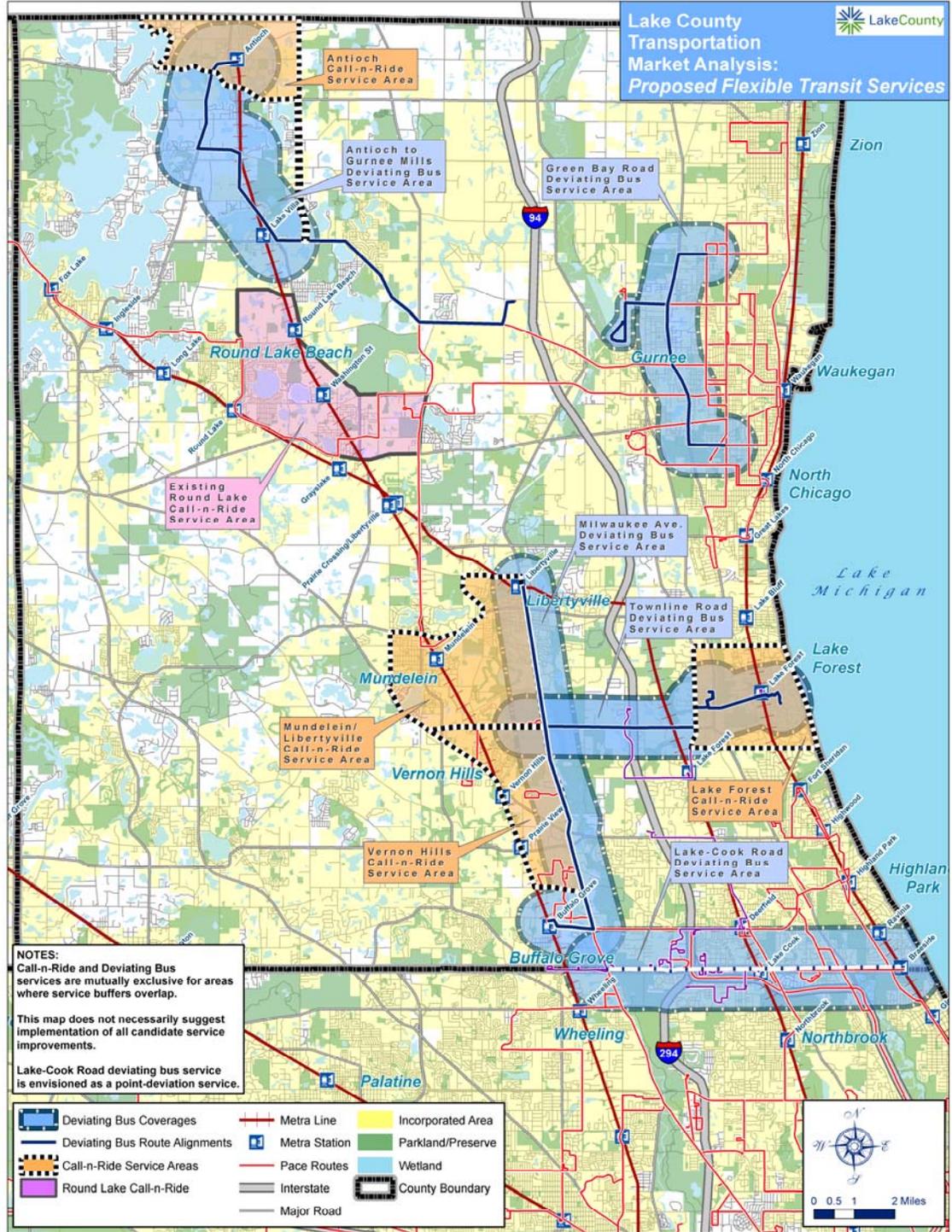
<sup>a</sup>Based on productivity range of 4-7 passengers per revenue hour of service.

<sup>b</sup>Range reflects Pace operation at the high end and private contractor operation at the low end.

Since the ridership 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.

Figure 9.16 displays a consolidated map of the proposed flexible transit services in Lake County. It is noted that Call-n-Ride and Deviating Bus services are mutually exclusive for a given geographic area, when service buffers overlap. The map does not necessarily suggest implementation of all candidate service improvements.

Figure 9.16 Proposed Flexible Transit Services in Lake County



Source: Cambridge Systematics

## 9.7 DIAL-A-RIDE/PARATRANSIT POLICY COORDINATION

Paratransit service is the general term used to describe demand-responsive services that offer door-to-door, curb-to-curb, or point-to-point trips on a flexible routing in response to the rider's demand. Pace operates three types of Paratransit service in Lake County; ADA Paratransit, Dial-a-Ride (DAR), and Call-n-Ride (CnR). This study has found that coordination of certain operational elements among the various DAR programs in Lake County has the potential to improve the efficiency and effectiveness of service.

The current DAR programs present a disjointed and confusing impression to Lake County residents, especially in areas where programs overlap. Discussions with operating staff and focus group participants indicate that coordination among providers is a key component to improving demand response operations. The Lake County Coordinated Transportation Services Committee (LCCTSC) currently is focused on coordination of 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, who will need to understand why coordination is important.

The elements most in need of coordination include administrative policies, fare policy, and service area boundaries. Each of these elements is discussed in more detail below. These coordination proposals are focused on the DAR programs, but may have an indirect impact on ADA Paratransit services and this will be noted.

### **Administrative Policies**

Each local governmental agency tailors their DAR program to the needs of their 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 for those communities that enjoy overlapping services. It is recommended that the LCCTSC take the lead in the coordination effort to review current operational policies of all the DAR programs with the goal of standardizing certain rules. Also, since Pace Suburban Bus Service operates and supports majority of the existing dial-a-ride services in the County, it is recommended that Pace provides guidance to LCCTSC in this coordination effort by offering transportation and service operation expertise to create service efficiencies.

### *Rationale*

Discussions with operating staff at First Transit – Grayslake and with the focus group participants suggest that potential riders of DAR services are often

confused by the differing rules and policies of DAR programs. This confusion hinders the mobility of potential riders because they cannot take advantage of programs that they don't understand. As the average age of the population rises, it is likely that there will be more requests for demand response services. Coordination among the DAR programs can ease the confusion experienced by riders. A well understood, easy to use and accessible program would increase transit use.

### *Operating Characteristics*

This coordination effort involves the participation of all DAR program sponsors, the LCCTSC, Pace, and Lake County. The effort should concentrate on reviewing cancellation policies, service hours, reservation types, and eligibility requirements. Consideration should be given to:

- Cancellation policies that are as stringent as the ADA Paratransit program to decrease the number of no-shows and late cancellations, which will improve efficiency of the scheduling process.
- Coordination of service hours to the extent possible given individual program budget constraints. At a minimum, a core set of days and hours should be established that are common among all programs.
- Applicability of standing or subscription reservations which will assist in the scheduling process.
- A core set of eligibility requirements that are common among all programs.
- A common telephone number for all users and a centralized call center that would coordinate all paratransit/dial-a-ride trip reservations and create efficiencies in service operations countywide.

### *Conclusion*

The service provided to DAR riders can be improved through a general coordination effort by all DAR programs, where LCCTSC can help initiate and facilitate the discussion and Pace Suburban Bus can help by providing 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 range from Free to \$4. Fare levels are inconsistent among programs and most are lower than the ADA fare of \$3. This proposal recommends coordinating fares among the DAR providers such that the DAR fare is equal to the ADA Paratransit fare.

Low DAR fares impact the transportation system in two ways:

- Individuals who could utilize the fixed route system may use DAR services because the DAR fare is lower than the fixed route fare. The fare for DAR service should encourage the use of fixed routes for those riders who could use the fixed route service for some trips or for part of a trip. Due to the relatively high cost of providing demand response service, use of the fixed route system should be encouraged whenever possible. This can be accomplished by eliminating the current price advantage that DAR service has over fixed route service.
- ADA-eligible riders seek trips on DAR services because DAR fares are lower than ADA fares. Dispatchers at First Transit-Grayslake routinely search for the lowest fare when customers call for a reservation. This is much appreciated by ADA-eligible riders, but it reduces the amount of service available to those individuals who require demand response service but are not ADA-eligible. The DAR programs were initiated to meet the needs of residents living in the service area, and all residents should have an equal chance of receiving service. By making the fares between the DAR and ADA services equal, individuals in need of a DAR trip, who are not ADA-eligible, will have a better chance of reserving a trip.

### *Rationale*

DAR and ADA Paratransit service are costly to provide and therefore riders who are capable of using available fixed route services should be encouraged to do so. This can be accomplished by ensuring that fixed routes have lower fares than DAR or ADA Paratransit, and that DAR fares are not lower than ADA Paratransit fares. This will preserve opportunities for those who are not physically capable of taking a fixed route bus and must rely on the paratransit system. Coordinating fares as well as other elements of demand response service in the county will reduce confusion among users.

### *Operating Characteristics*

It is proposed that Lake County DAR and ADA Paratransit sponsors agree to a hierarchy of fares that encourages use of fixed route by setting higher fares for DAR service that match the fare levels on ADA Paratransit.

### *Conclusion*

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 demand response service. It is therefore reasonable to enact a higher fare on demand response 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 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 demand response 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. This proposal recommends that the DAR program sponsors agree upon a system of transfer points and communication protocols that would enable the various DAR programs to form a network, allowing patrons the ability to travel across the county from one DAR to another.

#### *Rationale*

A DAR program should have a defined service area boundary so that the managing agency can control service quality and operating costs. However, the travel needs of residents may require crossing these boundaries. Although there may be informal arrangements in place to allow transfers to occur in some situations, the riders are generally unaware of these informal arrangements and this hampers their ability to plan trips. A formal process that allows riders to cross program boundaries would improve access for many riders.

#### *Operating Characteristics*

Implementing a system to allow transfers between DAR programs requires a large coordination effort. DAR programs will need to agree on a logical set of transfer locations, and will need to institute a communication protocol to ensure that transfers are well timed. At least initially, it is envisioned that trips will be made only between adjoining boundaries. This is to reduce the burden on dispatchers. Riders will call the DAR program in their origin location and request a trip with a destination in an adjoining DAR service area. The DAR program in the origin location will make arrangements with the DAR program in the destination location for a suitable transfer, and will arrange the return trip, if needed.

#### *Conclusion*

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 response services in the county will be improved, which may eventually increase ridership.

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

## 9.8 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. No specific timeframe is proposed. Ultimately, implementation phasing will depend on funding realities and further consultations with stakeholders. The potential phasing provided here is preliminary, offering a menu for future service improvement programs that will serve as a basis for continued discussion and refinement.

### Methodology

The following factors were considered in developing preliminary recommendations for implementation phasing:

- General priority of the need, including any available input from community stakeholders;
- Whether the improvement would require an increase in the operating budget or potentially generate a savings;
- Whether outside funding grants will be required;
- Need for further coordination and consultation with stakeholders; and
- Whether the service concept is new or currently a mode operated by Pace (deviating bus likely will take longer to implement than CnR).

### Implementation Phasing Recommendations

The proposed phasing is shown in **Table 9.16**.

**Table 9.16 Preliminary Phasing Plan**

Proposal	Recommendation	Explanation	Implementation Phase
Route 564/568 Modification	Recommended	Shorten Route 564.	1
DAR Policy Coordination	Recommended	Current services are hindered by inconsistent policies and lack of understanding. Better use of existing resources presents an opportunity. Begin work with stakeholders.	1
Metra Coordination	Recommended	Better coordination between Metra and Pace on delays and wayfinding at transfer stations. Investigate parking solutions at stations over capacity.	1
New Mundelein/Libertyville CnR and/or New Vernon Hills CnR or Milwaukee Avenue Deviating Bus	Recommended	These communities already are a focus of Pace and has a strong focal point. Deviating Bus is a new service mode and will take time to plan. CnR may be able to be implemented faster. If CnR, phase 1; if deviating bus, phase 2.	1 or 2
New Job Access Express Route	Advance Planning	Job access is a high priority need. Work with employers and seek JARC grant.	2
Convert Existing Route 573/portion of 562 to Green Bay Road Deviating Bus	Recommended	The current fixed route has very low productivity. Deviating Bus is a new service mode and will take time to plan.	2
New Lake Forest CNR or Townline Road Deviating Bus Route	Recommended	Lake Forest studied and proposed new service options. Further coordination with community is needed. Deviating Bus is a new service mode and will take time to plan. CNR may be able to be implemented faster.	2
New Antioch CNR or Antioch Deviating Bus Route	Recommended	Access to the medical center is a high priority for the community. Deviating Bus is a new service mode and will take time to plan. CNR may be able to be implemented faster.	2 or 3
Provide Fixed-Route Service to Lindenhurst Medical Center	Recommended	Implemented in conjunction of Antioch CnR.	2 or 3
Create an Hourly Pulse Point at CLC	Recommended	Appears feasible to create an hourly pulse for all routes with increased levels of service.	2 or 3
Shift Route 565 and 570 Terminus to CLC	Recommended	Part of plan for hourly pulse point at CLC.	2 or 3
New Lake – Cook Road Deviating Bus	Recommended	Midday service is a lower priority. Deviating Bus is a new service mode and will take time to plan.	3
Increased Metra NCS service	Recommended	Increase service in both directions on NCS line as feasible.	3
Route 569 Modification	Not Recommended	Minimal benefit and potential negative impacts on a major travel generator.	–
Waukegan Pulse Point Relocation	Not Recommended	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.	–

# **APPENDICES**



# A. Resident Survey Instrument



Lake County is conducting a comprehensive study to better understand the daily travel of people in the County. Please take a few minutes to answer some questions about your typical daily travel and your preferences. Your response to this survey will help identify the need and opportunities for enhancements in the transportation system in Lake County. Your answers are very important and will be kept strictly confidential.

If you have any questions, please contact Valbona Kokoshi of Lake County Division of Transportation at 847 377 7538 or send an email to [vkokoshi@lakecountyil.gov](mailto:vkokoshi@lakecountyil.gov).

We appreciate your support. For more information about Lake County, visit [www.lakecountyil.gov](http://www.lakecountyil.gov).

Thank you.

1. Please provide the nearest intersection to your residence and zip code.

Nearest Intersection: \_\_\_\_\_ & \_\_\_\_\_

Zip Code \_\_\_\_\_

2. Please consider a trip that you routinely make few times a week. Examples for such trips may include trip to work, school, routine shopping or other purposes for which you would typically need a motorized vehicle.

Do you make this kind of routine trip?

Yes → Go to Question 6     No

3. Is there anybody else in your household, who makes routine trips from home to any particular destination?

Yes                                     No → Go to Question 5

4. Can you have the other member of your household making routine trips fill out this survey?

Yes → Go to Question 6     No

5. Unfortunately, your household does not qualify for our study. However, please feel free to use the space below to provide specific recommendations for transit service operations and improvements in your area that could be beneficial to you. Transit services include Pace bus, Metra rail, Dial a Ride, Call and Ride, ADA paratransit services and vanpool programs. Thank you for your time.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. What is your schedule for this routine trip?

Leave Home        \_\_ : \_\_     AM     PM

Leave Destination    \_\_ : \_\_     AM     PM

7. What is the primary purpose of your routine trip starting from home?

Work                             School                             Routine Shopping  
 Medical                         Social                             Recreational                     Other (please specify) \_\_\_\_\_

**8. What is the destination of your routine trip?**

Place: \_\_\_\_\_  
 Nearest Intersection: \_\_\_\_\_ & \_\_\_\_\_  
 City/Town \_\_\_\_\_  
 Zip Code \_\_\_\_\_

**9. How did you get to your final destination today?**

- Drive Alone       Carpool (Driver)       Carpool (Passenger)  
 Vanpool (Driver)       Vanpool (Passenger)       Get dropped off  
 Walk/Ride a bike       Ride Transit (Bus and/or rail)       Other (please specify) \_\_\_\_\_

**10. Do you have an automobile available for your trip?**

- Yes → **Go to Question 12**       No

**11. If you had a vehicle available for your routine trip, would you change the way you travel now?**

- No       Yes, I would use transit/carsharing less frequently.  
 Yes, I would stop using transit/carsharing.       Not certain.

**12. How much time does it take you to travel to your final destination?**

- Less than 10 minutes       15 to 19 minutes       20 to 29 minutes  
 30 to 44 minutes       45 to 60 minutes       More than 1 hour

**13. How often do you use transit to travel to/from your final destination?**

- Never       I used to take transit, but stopped.       Few times a year  
 Once in a month       Once a week       Few times a week → **Go to Question 18**

**14. How familiar are you using transit (Pace, Metra, CTA) from your home to your FINAL destination?**

- Very Familiar       Somewhat familiar       Not at all familiar       Not sure/don't know

**15. Is transit available to get you from your home to your FINAL destination?**

- Only Metra is available       Only Pace Bus is available       Both are available  
 None is available       Not sure/ Don't know

**16. Please rank the THREE MOST IMPORTANT reasons why you don't use transit regularly. Please use "1" for the most important factor, "2" for the second, and "3" for the third one.**

Transit service is not available.	<input type="text"/>
I do not know how to use transit.	<input type="text"/>
Transit stops/stations are not close enough to my home	<input type="text"/>
Transit stops/stations are not close enough to my destination.	<input type="text"/>
Schedules are not convenient.	<input type="text"/>
Transit takes too long to get to/from my destination.	<input type="text"/>
I need to transfer to travel to my destination and transfers are not convenient.	<input type="text"/>
No midday transit service is available.	<input type="text"/>
I need a car during the day.	<input type="text"/>
I make multiple stops on the way to/from my destination.	<input type="text"/>
My employer does not provide any transit benefits.	<input type="text"/>
I can find free or discounted parking at my destination.	<input type="text"/>

17. If transit improved, I would...

- Ride transit regularly.                       Ride transit occasionally.  
 Give it a try.                                       Never ride transit.

} **Please Go to Question 25**

18. When traveling by transit, how do you start your trip from home?

- Drive to my Metra station and ride Metra first  
 Walk/Bike to my Metra station and ride Metra first  
 Get dropped off at my Metra station and ride Metra first  
 Walk/Bike to my Pace stop and ride Pace first  
 Get dropped off at my Pace stop and ride Pace first  
 Drive to CTA/Rail station and ride CTA/Rail first  
 Get dropped at my CTA/Rail Station and ride CTA/Rail first.

} **Please Go to Question 20**  
 } **Please Go to Question 21**

19. Which Metra Stations do you usually use?

Board at \_\_\_\_\_ Station and Get Off at \_\_\_\_\_ Station → **Go to Question 22**

20. Which Pace Route do you use?

Route Number: \_\_\_\_\_

Board near the Intersection of \_\_\_\_\_ & \_\_\_\_\_

Get off near the Intersection of \_\_\_\_\_ & \_\_\_\_\_ → **Go to Question 22**

21. Which CTA Rail line do you use?

- Blue     Purple     Red     Yellow     Brown     Green     Orange     Pink

Board at CTA's \_\_\_\_\_ Station

Get off at CTA's \_\_\_\_\_ Station

22. Do you use additional buses or trains to travel to your final destination?

No

Yes → **Please provide details on all the trains/bus routes did you use and where you board and get-off each train/bus at the bottom of PAGE 5 and continue to Question 23 below.**

23. Please evaluate your transit ride on the attributes listed below.

	Very Good	Good	Neutral	Poor	Very Poor	N/A
Availability of service.	<input type="checkbox"/>					
Ease of getting to stops/stations.	<input type="checkbox"/>					
Quality of amenities (shelters, stops/stations etc.)	<input type="checkbox"/>					
Frequency of service	<input type="checkbox"/>					
Total travel time	<input type="checkbox"/>					
Ease of transfers	<input type="checkbox"/>					
Reliability (on-time performance)	<input type="checkbox"/>					
Comfort during the ride.	<input type="checkbox"/>					
Ease of getting from stops/stations at your final destination.	<input type="checkbox"/>					

24. Based on your experience in riding transit, how do you feel recommending transit to friends and family?

- Definitely would recommend.                       Likely to recommend.  
 Unlikely to recommend.                               Definitely would not recommend.

**25.** Please feel free to use the space below to provide specific recommendations for transit service operations and improvements in your area that could be beneficial to you. Consider Pace and Metra services as well as Dial a Ride, Call and Ride, ADA paratransit service and vanpool programs.

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**26.** How familiar are you with other transit services in your area?

	Very Familiar	Somewhat Familiar	Not at all Familiar	Not Applicable
Pace Shuttle Buses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pace Call and Ride	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pace ADA Paratransit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pace Vanpool	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dial a Ride	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Shuttles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**27.** Please consider your day-to-day travel both for work and other purposes and rate the statements below.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The fastest way to get to work/school is driving.	<input type="checkbox"/>				
If it would save time, I would change my form of travel.	<input type="checkbox"/>				
More than saving time, I prefer to be productive when traveling.	<input type="checkbox"/>				
I often need to change my daily travel plans at a moment's notice.	<input type="checkbox"/>				
I often make a lot of stops along the way to work/school.	<input type="checkbox"/>				
Privacy is important to me when I travel.	<input type="checkbox"/>				
I'm willing to walk a few minutes to get to and from transit.	<input type="checkbox"/>				
I don't mind transferring between buses and trains.	<input type="checkbox"/>				
It is important to be able to control heat and air conditioning when I travel.	<input type="checkbox"/>				
As long as I am comfortable, I can tolerate delays.	<input type="checkbox"/>				
Riding transit is more reliable than driving during bad weather.	<input type="checkbox"/>				
Predictable travel time is more important than a faster trip.	<input type="checkbox"/>				
Riding transit is less stressful than driving on congested highways.	<input type="checkbox"/>				
I'm the kind of person who rides transit.	<input type="checkbox"/>				
My family and friends typically use public transportation.	<input type="checkbox"/>				
Regardless of cost, I choose the fastest way to travel.	<input type="checkbox"/>				
Improving transit infrastructure is as good a use of tax dollars as improving roads.	<input type="checkbox"/>				
Increasing fares is necessary to avoid any cuts in transit service.	<input type="checkbox"/>				

28. Are you:

- Male  
 Female

29. What is your age?

- Under 18    18 – 24    25 – 29    30 – 34    35 – 39  
 40 – 44    45 – 49    50 – 54    55 – 59    60 – 64    65 or Over

30. How many people are there in your household? \_\_\_\_\_

31. How many licensed drivers are there in your household? \_\_\_\_\_

32. How many motor vehicles does your household own? \_\_\_\_\_

33. What is the total income of your household?

- Under \$10,000    \$10,000 - \$19,999    \$20,000 - \$29,999    \$30,000 - \$39,999  
 \$40,000 - \$49,999    \$50,000 - \$59,999    \$60,000 - \$69,999    \$70,000 - \$79,999  
 \$80,000 - \$89,999    \$90,000 - \$99,999    \$100,000 or more

34. Please provide your contact information, if you prefer to participate in further studies.

Name: \_\_\_\_\_  
Email: \_\_\_\_\_  
Phone (Optional): \_\_\_\_\_  
Mail Address (Optional): \_\_\_\_\_

**THANK YOU**

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**Please fill out this section if answered "YES" to Question 22.**

Please provide details about the rest of your trip. Please include mode, route number, boarding and alighting locations below. (Example: Pace Bus, 572, board at Washington St. and Green Bay Road, and get off at Almond Road and W. Washington St.)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

## **B. Pace Rider Survey Instruments**

Pace and Lake County are conducting a comprehensive study to better understand the daily travel of people in the County. Please take a few minutes to answer some questions about your trip today.

Your response to this survey will help identify the need and opportunities for enhancements in the transportation system in Lake County. Your answers are very important and will be kept strictly confidential. If you have any questions, please contact Lake County Division of Transportation at 847-377-7538 or send an email to [vkoshi@lakecountyil.gov](mailto:vkoshi@lakecountyil.gov).

Thank you.

¿Habra español? Este formulario de la encuesta está disponible en español. Por favor, pregunte el encuestador.

## ABOUT YOUR TRIP TODAY

- Where did you COME FROM before starting this ONE-WAY trip?**  
 Home                       School (K-12)                       Restaurant  
 Place of Work                       Medical/dental                       Recreation  
 College/University                       Store/Shopping                       Other
- Where was that located?** (Please provide the nearest Street Intersection)  
 Place Name: \_\_\_\_\_  
 Street 1: \_\_\_\_\_  
 Street 2: \_\_\_\_\_  
 City/Town: \_\_\_\_\_ Zip: \_\_\_\_\_
- When did you START this ONE-WAY trip?** \_\_\_\_ : \_\_\_\_  AM  PM
- What is your FINAL DESTINATION for this ONE-WAY trip?**  
 Place of Work                       School (K-12)                       Restaurant  
 Home                       Medical/dental                       Recreation  
 College/University                       Store/Shopping                       Other
- Where is that located?** (Please provide the nearest Street Intersection)  
 Place Name: \_\_\_\_\_  
 Street 1: \_\_\_\_\_  
 Street 2: \_\_\_\_\_  
 City/Town: \_\_\_\_\_ Zip: \_\_\_\_\_
- Did you transfer TO THIS BUS from another bus or train?** (If transferred from another Pace bus, please provide the nearest street intersection where you boarded this bus.)  
 No  
 From Pace bus # \_\_\_\_ at \_\_\_\_\_ & \_\_\_\_\_  
 From Metra at \_\_\_\_\_ station.
- Will you transfer AFTER THIS BUS to complete this ONE-WAY trip?** (If you will transfer to another Pace bus, please provide the nearest street intersection where you will get off from this bus.)  
 No  
 To Pace bus # \_\_\_\_ at \_\_\_\_\_ & \_\_\_\_\_  
 To Metra at \_\_\_\_\_ station.
- How MANY TIMES a week do you make this same ONE-WAY trip?**  
 Less than once a week                       3-4 trips a week  
 1-2 trips a week                       5 or more trips a week
- How LONG have you used Pace?**  
 Less than 6 months                       3 years to 5 years  
 6 months to 2 years                       More than 5 years
- Was there a VEHICLE AVAILABLE in your household for you to make this ONE-WAY trip?**  
 Yes                       No

## YOUR TRANSIT EXPERIENCE

- Please evaluate THIS BUS TRIP on the attributes listed below. Please check one box in each row.**

	Very Good	Good	Neutral	Poor	Very Poor	NA
Availability of weekday service	<input type="checkbox"/>					
Frequency of weekday service	<input type="checkbox"/>					
Ease of getting to stops	<input type="checkbox"/>					
Quality of shelters and stops	<input type="checkbox"/>					
Total travel time	<input type="checkbox"/>					
Ease of transfers	<input type="checkbox"/>					
On-time performance	<input type="checkbox"/>					
Comfort during the ride	<input type="checkbox"/>					
Ease of getting from stops at your final destination	<input type="checkbox"/>					

**Please now consider this service during the WEEKEND.**

Availability of weekend service	<input type="checkbox"/>					
Frequency of weekend service	<input type="checkbox"/>					
- If you use the current transfer location near Washington and Sheridan in Waukegan, how would you rate the comfort and amenities at this location?**  
 Very Good                       Neutral                       Very Poor  
 Good                       Poor                       Not Applicable
- Do you find that you must go substantially out of your way to transfer between buses at the current transfer location near Washington and Sheridan in Waukegan?**  
 Yes                       No                       Not Applicable
- Are there places you want to access by Pace but can't because service is not there? (Check all that apply. Please provide specific locations and more details in the comments section.)**  
 No                       Yes, to work                       Yes, to school  
 Yes, to shopping                       Yes, to the hospital                       Yes, Other
- Based on your experience in riding Pace, how do you feel recommending transit to friends and family?**  
 Definitely would recommend.                       Unlikely to recommend.  
 Likely to recommend.                       Definitely would not recommend.

## ABOUT YOURSELF

- Are you?**                       Male                       Female
- What is your AGE?** \_\_\_\_\_
- Including YOU, how many people live in your household?** \_\_\_\_\_
- How many CARS, VANS, OR TRUCKS are available in your household?**  
 None                       Two  
 One                       Three or more
- What is the TOTAL INCOME (before taxes) of your household?**  
 Under \$9,999                       \$25,000 - \$49,999                       \$75,000 - \$99,999  
 \$10,000 - \$24,999                       \$50,000 - \$74,999                       \$100,000 and more

Please use the space below to provide specific recommendations for transit service operations and improvements in your area that could be beneficial to you. Transit services include Pace bus, Metra rail, Dial a Ride, Call and Ride, ADA paratransit services and vanpool programs.

**COMMENTS:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

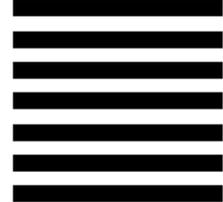
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E - 000001

Pace y el Condado de Lake County están realizando un estudio comprensivo para entender mejor los viajes diarios de los residentes del Condado. Por favor tome unos minutos de su tiempo para responder algunas preguntas sobre su viaje de hoy.

Su participación en este estudio asistirá a identificar la ayuda necesaria y las oportunidades para mejorar el sistema de tránsito del Condado de Lake County. Sus respuestas son muy importantes y se mantendrán estrictamente confidenciales. Si tiene alguna pregunta, por favor ponerse en contacto con Lake County Division of Transportation llamando al 847-377-7538 o enviando un email a [vkokoshi@lakecountyil.gov](mailto:vkokoshi@lakecountyil.gov).

Gracias.

## SOBRE SU VIAJE DE HOY

### 1. ¿Cuál fue su punto de salida antes de comenzar este viaje DE IDA?

- |                                      |  |                                      |
|--------------------------------------|--|--------------------------------------|
| <input type="checkbox"/> Hogar       | <input type="checkbox"/> Escuela (K-12)  | <input type="checkbox"/> Restaurante |
| <input type="checkbox"/> Trabajo     | <input type="checkbox"/> Doctor/dentista | <input type="checkbox"/> Recreación  |
| <input type="checkbox"/> Universidad | <input type="checkbox"/> Tienda/Compras  | <input type="checkbox"/> Otro        |

### 2. ¿En dónde se encuentra su punto de partida? (Por favor indique la intersección de calles más cercana del lugar)

Nombre del Lugar: \_\_\_\_\_

Calle 1: \_\_\_\_\_

Calle 2: \_\_\_\_\_

Ciudad/Estado: \_\_\_\_\_ Zip: \_\_\_\_\_

### 3. ¿A qué hora comenzó este viaje DE IDA? \_\_\_\_ : \_\_\_\_ AM PM

### 4. ¿Cuál es su DESTINO FINAL en este viaje DE IDA?

- |                                      |  |                                      |
|--------------------------------------|--|--------------------------------------|
| <input type="checkbox"/> Trabajo     | <input type="checkbox"/> Escuela (K-12)  | <input type="checkbox"/> Restaurante |
| <input type="checkbox"/> Hogar       | <input type="checkbox"/> Doctor/dentista | <input type="checkbox"/> Recreación  |
| <input type="checkbox"/> Universidad | <input type="checkbox"/> Tienda/Compras  | <input type="checkbox"/> Otro        |

### 5. ¿En dónde se encuentra su destino final? (Por favor indique la Intersección de calles más cercana del lugar.)

Nombre del Lugar: \_\_\_\_\_

Calle 1: \_\_\_\_\_

Calle 2: \_\_\_\_\_

Ciudad/Estado: \_\_\_\_\_ Zip: \_\_\_\_\_

### 6. ¿Tomó otro autobús o tren para transferirse a ESTE AUTOBÚS? (Si se transfirió de otro autobús de Pace a este, por favor indique la intersección de calles más cercana de dónde tomó ese autobús.)

- No
- El autobús de Pace # \_\_\_\_ entre \_\_\_\_\_ y \_\_\_\_\_
- La estación de Metra \_\_\_\_\_.

### 7. Tomará otro autobús después de este para completar su viaje DE IDA? (Si tomará otro autobús de Pace, por favor indique la intersección de calles más cercana de dónde tomará el autobús.)

- No
- El autobús de Pace # \_\_\_\_ entre \_\_\_\_\_ y \_\_\_\_\_
- La estación de Metra \_\_\_\_\_.

### 8. ¿CUÁNTAS VECES a la semana hace usted este mismo viaje DE IDA?

- |  |  |
|--|--|
| <input type="checkbox"/> Menos de una vez por semana | <input type="checkbox"/> 3-4 viajes por semana     |
| <input type="checkbox"/> 1-2 viajes por semana       | <input type="checkbox"/> 4 o más viajes por semana |

### 9. ¿Desde HACE CUÁNTO TIEMPO usa usted Pace?

- |  |  |
|--|--|
| <input type="checkbox"/> Menos de 6 meses    | <input type="checkbox"/> De 3 a 5 años |
| <input type="checkbox"/> De 6 meses a 2 años | <input type="checkbox"/> Más de 5 años |

### 10. Hay algún vehículo en su hogar con el que usted pudiera hacer este viaje DE IDA?

- Si  No

## SU EXPERIENCIA DE TRANSITO

### 11. Por favor evalúe este viaje de autobús en cada una de las siguientes categorías. Por favor marque las siguientes líneas.

	Muy Bien	Bien	Neutro	Pobre	Muy Pobre	No Aplica
Disponibilidad de servicio durante la semana	<input type="checkbox"/>					
Frecuencia de servicios durante la semana	<input type="checkbox"/>					
Facilidad de llegada a las paradas	<input type="checkbox"/>					
Calidad de paradas techadas y no techadas	<input type="checkbox"/>					
Tiempo total de viaje	<input type="checkbox"/>					
Facilidad de transferencias	<input type="checkbox"/>					
Llegadas y Salidas a tiempo	<input type="checkbox"/>					
Comodidad durante el viaje	<input type="checkbox"/>					
Comodidad de viaje desde la parada hasta su destino final	<input type="checkbox"/>					

### Por favor, ahora considere nuestro servicio durante los FINES DE SEMANA

Disponibilidad de servicios durante los fines de semana	<input type="checkbox"/>					
Frecuencia de servicios durante los fines de semana	<input type="checkbox"/>					

### 12. Si usted utiliza una de las ubicaciones de transferencia cerca de Washington y Sheridan en Waukegan, cómo clasificaría las comodidades y los servicios de la ubicación?

- |                                   |                                 |                                    |
|-----------------------------------|---------------------------------|------------------------------------|
| <input type="checkbox"/> Muy Bien | <input type="checkbox"/> Neutro | <input type="checkbox"/> Muy Pobre |
| <input type="checkbox"/> Bien     | <input type="checkbox"/> Pobre  | <input type="checkbox"/> No Aplica |

### 13. Siente usted que tiene que desviarse significativamente en camino a una transferencia de autobús en la actual ubicación de transferencia cerca de Washington y Sheridan en Waukegan?

- Si  No  No Aplica

### 14. ¿Hay lugares a los cuales usted quisiera tener acceso a través de Pace, pero no puede por falta de servicios? (Marque todas las opciones que apliquen. Por favor, indique ubicaciones específicas y más detalles en la sección de comentarios).

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> No               | <input type="checkbox"/> Si, para el trabajo  | <input type="checkbox"/> Si, para la escuela |
| <input type="checkbox"/> Si, para comprar | <input type="checkbox"/> Si, para el hospital | <input type="checkbox"/> Si, otro            |

### 15. Basado en su experiencia abordo de Pace, siente usted que el servicio de tránsito es recomendable a familiares y amistades?

- |  |   |
|--|---|
| <input type="checkbox"/> Definitivamente lo recomendaría | <input type="checkbox"/> Probablemente no lo recomendaría   |
| <input type="checkbox"/> Probablemente lo recomendaría   | <input type="checkbox"/> Definitivamente no lo recomendaría |

## SOBRE USTED

### 16. ¿A cuál SEXO pertenece? Masculino Femenino

### 17. ¿Cuál es su EDAD? \_\_\_\_\_

### 18. Incluyéndose a USTED, ¿cuántas personas viven en su hogar? \_\_\_\_\_

### 19. ¿Cuántos CARROS, CAMIONETAS, O CAMIONES hay en su hogar?

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| <input type="checkbox"/> Ninguno | <input type="checkbox"/> Dos        |
| <input type="checkbox"/> Uno     | <input type="checkbox"/> Tres o más |

### 20. ¿Cual es el INGRESO TOTAL (antes de impuestos) de su hogar?

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Menos de \$9,999    | <input type="checkbox"/> \$25,000 - \$49,999 | <input type="checkbox"/> \$75,000 - \$99,999 |
| <input type="checkbox"/> \$10,000 - \$24,999 | <input type="checkbox"/> \$50,000 - \$74,999 | <input type="checkbox"/> \$100,000 o más     |

Por favor, utilice el siguiente espacio para detallar recomendaciones específicas para los operativos del servicio de tránsito y mejoras en su área que serían de beneficio para usted. Los servicios de tránsito incluyen autobuses de Pace, Metra rail, Dial a Ride, Call and Ride, ADA paratransit services y programa de vanpool.

**COMENTARIOS:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

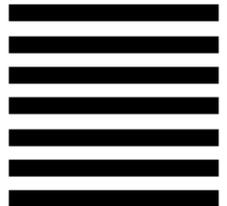


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## **C. Final Project Presentation**

# Lake County Transportation Market Analysis

## Final Report Presentation

*presented to*

**Lake County Division of Transportation  
and Pace**

*presented by*

**Cambridge Systematics, Inc.  
with MKC Associates**

August 9, 2012



Transportation leadership you can trust.



## Outline

- Objectives of the Study
- Approach
- Transportation Service Analysis
- Data Analysis and Travel Markets
- Data Collection
- Developing Service Concepts
  - » Evaluation of Existing Services
  - » Proposed Improvements
  - » Evaluation and Service Recommendations
- Concluding Remarks



# Project Objectives and Approach



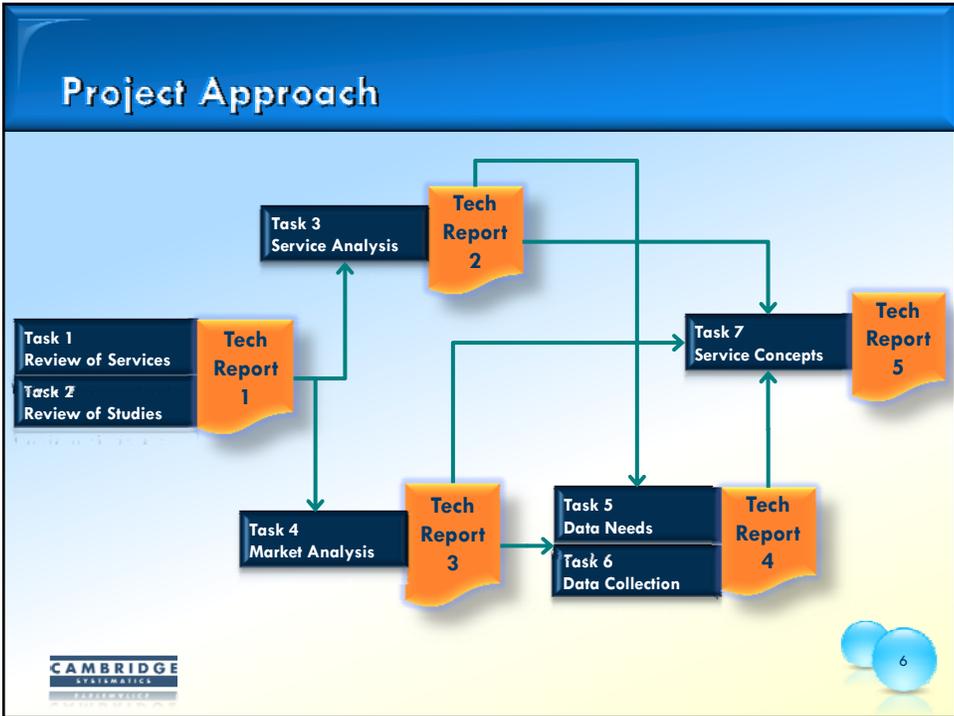
## Project Objectives

- Detailed evaluation of the travel market in Lake County
- Analysis of the service profile of existing fixed route and demand-responsive services
- Development of transit service concepts that meet the transportation needs of Lake County residents



## Project Approach

- A data-driven approach to planning and marketing
  - » Geography and directionality
  - » The size of each travel market
- How is transit viewed?
  - » Individuals as decision makers
  - » Role of attitudes and beliefs
  - » Market segment and profiles
- Transit Supply and Demand
  - » Available data
  - » New data
  - » Challenges and opportunities
- Service Concepts
  - » Generate alternatives
  - » Evaluation
- Service Recommendations



## Project Team

- **Market Research Team**

- » Cemal Ayvalik
- » Anurag Komanduri
- » Kevin Ebright-McKeehan
- » Kimon Proussaloglou

- **Team Partners**

- » MKC Associates
- » CmQue, Inc.

- **Service Planning Team**

- » Larry Englisher
- » David Baumgartner



## Transportation Service Analysis



## Overall Service Methodology

- **Analysis of Existing Services**
  - » All Modes
- **Design and Evaluation of Service Improvements**
  - » Service Inventory and Coverage
  - » Span and Frequency
  - » Eligibility and Rider Profile
  - » Route-level Ridership and Productivity
  - » Boardings at Bus Stops
  - » Loads by Route Segment
  - » Fares and Policy Coordination
  - » Operations Staff Interviews
  - » Identified Deficiencies

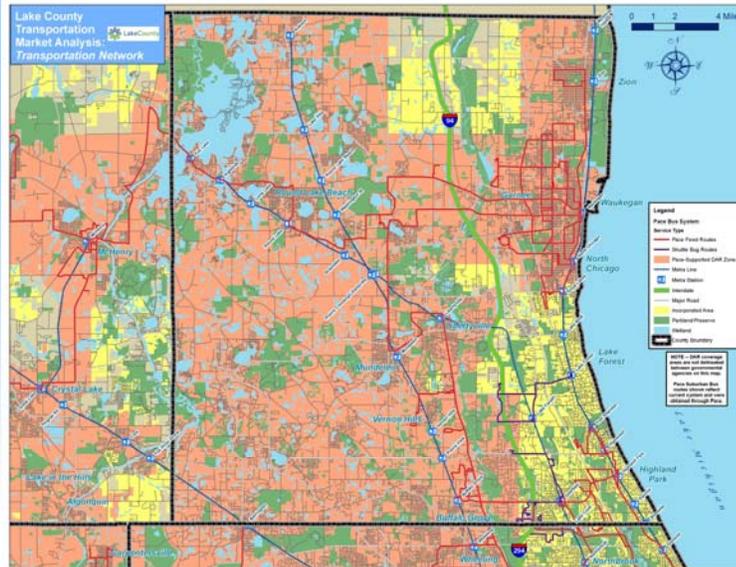


## Service Analysis

- **Service Overview**
  - » Modes
  - » Coverage
- **Metra Commuter Rail**
- **Fixed Route Bus and Shuttle Buses**
  - » Ridership and Productivity
  - » Boardings and Loads
- **DAR, CnR and ADA Services**
  - » Rider Profile and Eligibility
  - » Operations
- **Vanpools**
- **Customer Information**



## Transportation in Lake County



## Metra Commuter Rail

- 3 commuter lines with 32 stations in the county
- NCS has lower frequency and fewer Pace bus connections
- Shuttle Bugs offer last mile connections for reverse commuters

Service in Lake County						
Line	No. of Stations	Weekday Boardings (2006)	Parking Spaces (2008)	Parking Usage	Connecting Pace Bus Routes	AM Inbound Trains
MD-N	10	7,209	3,916	83%	13	16
UP-N	13	5,369	2,702	79%	15	16
NCS	9	2,272	4,298	45%	4	8



## Productivity of Fixed Routes Weekday 2011 First Quarter Data

- **Fixed route productivity (riders per revenue hour) ranged from 2 to 46**
  - » Pace service standard is 25
- **Recovery ratio (fares vs. operating cost) varies from 11% to 49%**
  - » Pace service standard is 18%
- **Most productive fixed routes were 571, 566, 562, 568, and 569**
- **Shuttle Bug productivity ranges from 13 to 75**
- **Least productive were 573, 234, 570, 471 (service has since changed)**
- **Shuttle Bug recovery ratio from 20% to 98%**




## Pace Fixed Routes Nodes of Activity

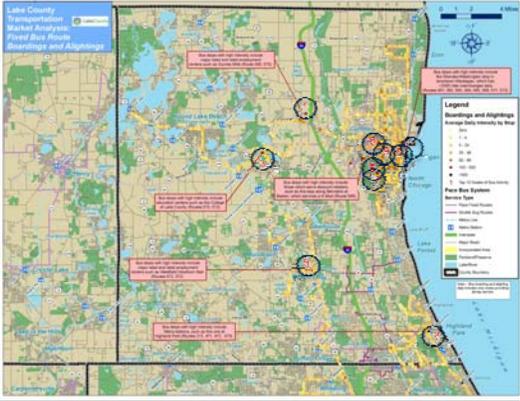
**Top 10 Nodes of Bus Activity in Lake County**

Rank	Stop Location	Total Average Daily Boardings and Alightings
1	Sheridan/Washington, Waukegan	2,513
2	Highland Park Metra Station	666
3	College of Lake County, Grayslake	444
4	Gurnee Mills Mall	389
5	Westfield Shoppingtown Hawthorn Mall	311
6	Dugdale/Whispering Oaks, Waukegan	261
7	Dugdale/Woodland Village, Waukegan	235
8	Waukegan High School	215
9	Washington/Jackson, Waukegan	168
10	Washington/Victory, Waukegan	164

- **Transfer Points**
- **Schools**
- **Shopping**



Source: Pace Suburban Bus, Cambridge Systematics analysis. Data is daily average during March and April 2011.





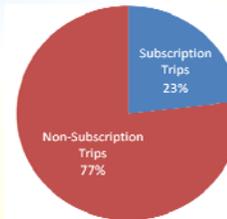
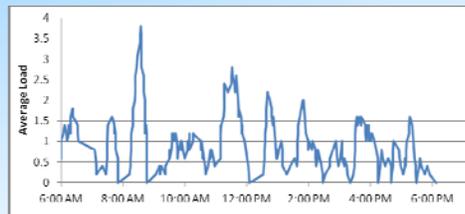
## ADA Paratransit

- **Stable Ridership**
  - » 53,000-56,000/year
- **Only 12% of trips leave county**
- **Service Area Map:**
- **4 Municipalities make up 47% of trips**
  - » Waukegan
  - » Zion
  - » Highland Park
  - » Gurnee

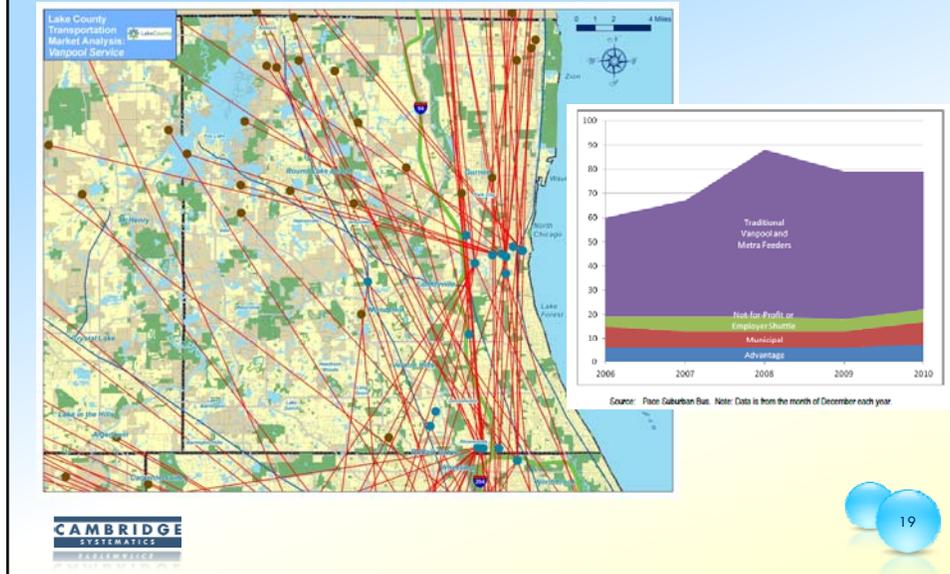


## Round Lake Area Call-n-Ride

- **2010 to 2011: Significant ridership growth**
- **Load by time-of-day:**
  - » Correspond to CLC Transfer
  - » Trips occurring throughout day
- **23% of trips are subscription**
- **Cash most common payment**



## Vanpools



## Interviews with Transit Service Operators

- Getting Pace services onto Google Transit would allow customers to more easily find information on when, where, and how to use transit services in Lake County.
- Improved signage at transfer locations between Metra, CTA, and Pace would benefit each agency by making wayfinding easier for customers unfamiliar with these transfer points.
- More information from Metra on train delays would enable Pace to improve day-to-day operations on Pace fixed routes and Shuttle Buses.
- Improved customer information on DAR and Call-n-Ride is desirable, since it is believed the public does not understand DAR or Call-n-Ride service structures and policies.

This slide features a light blue header, a dark blue middle section with the title, and a light yellow footer. The title 'Data Analysis and Travel Markets' is centered in the dark blue section. The footer contains the Cambridge Systematics logo on the left and a blue sphere with the number 21 on the right.

## Data Analysis and Travel Markets

**CAMBRIDGE SYSTEMATICS**

21

This slide features a dark blue header with the title, a light blue middle section with a bulleted list, and a light yellow footer. The title 'Overview' is centered in the dark blue header. The list items are arranged in two columns. The footer contains the Cambridge Systematics logo on the left and a blue sphere with the number 22 on the right.

## Overview

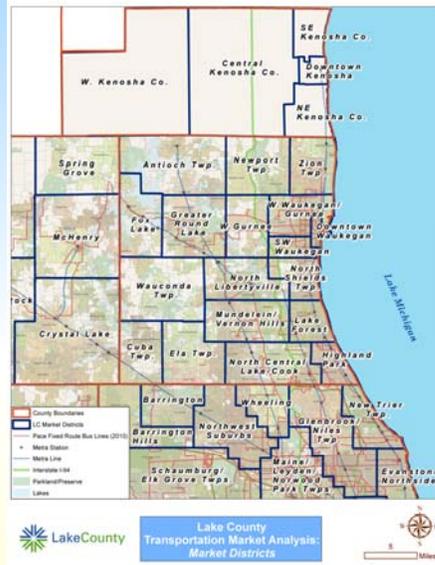
- **Districts as a New Geography**
- **ACS 2005-2009 Socioeconomic Data**
- **CMAP Land Use Estimates and Forecasts**
- **CMAP Travel Demand Model Trip Tables**
  - » **District Level**
  - » **TAZ level**
- **Dun-Bradstreet Data**
- **CTPP – 2000 Journey to Work**
- **2006 Metra Rider Survey**
- **2007 Pace Customer Satisfaction Survey**
- **2009 RTA Rider Non-Rider Survey**

**CAMBRIDGE SYSTEMATICS**

22

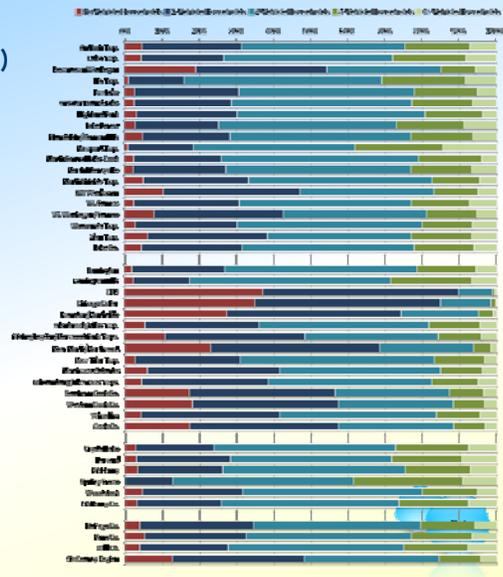
## Districts

- A set of 45 analysis districts was created
- Nested in CMAP TAZ system
- A higher level of detail within Lake County and areas nearby



## ACS Data

- 5-year ACS Data (2005 – 2009)
- Custom summaries at the district level for
  - » Household,
  - » Person, and
  - » Commute characteristics



## ACS Data Analysis Findings

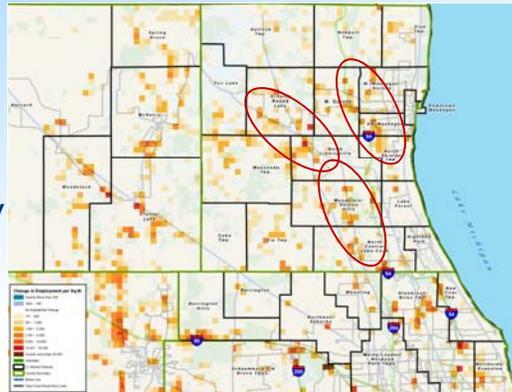
- **Northeastern shoreline of Lake County has a greater need for transit service**
- **Residents in these districts are likely to use transit for multiple purposes**
- **Northwestern portion had the longest commutes**
- **Two different types of transit markets**
  - » **Transit service that links areas with high unemployment to key employment centers in Lake County**
  - » **Need for flexible services**



## CMAQ Land Use

- **CMAQ Estimates and Forecasts**
  - » **Population**
  - » **Employment**
  - » **Workers**
  - » **Worker – Employment Parity**
- **Growth patterns**
  - » **Population**
  - » **Employment**

Forecasted Change in Employment



## CMAP Land Use Data – Key Findings

- Commute to the City of Chicago will continue to be a strong market
- North Central Lake-Cook and Mundelein/Vernon Hills provide a critical mass of employees
- Growth in Cook County and strong employment in these two districts will support reverse commuting
- The profile of Waukegan residents underscores the value of current transit service and the potential for future service enhancements
- The population growth projected in Greater Round Lake District and the level of economic activity in the Central Corridor showed potential for transit services



## CMAP Trip Tables

- CMAP travel demand model tables (All trips, Work Trips)
  - » County
  - » District
  - » TAZ
- Comparisons with
  - » ACS based CTPP
  - » Census 2000 JTW
  - » Dun-Bradstreet

From \ To	Cook	DuPage	Lake	McHenry	Kane	Will	Kenosha WI	Grand Total
Cook	2,119,245	140,225	63,555	5,155	19,220	36,555	450	2,384,455
DuPage	144,130	281,125	7,405	1,120	18,325	12,785	60	694,960
Lake	83,595	7,125	238,430	8,030	1,840	460	3,860	343,340
McHenry	26,220	6,045	19,145	80,975	10,720	340	405	153,860
Kane	45,105	43,260	3,505	8,060	128,110	3,570	0	231,910
Will	97,720	57,435	1,185	320	5,235	151,265	45	313,205
Kenosha	3,405	325	17,430	1,220	85	80	41,895	64,220
Grand Total	2,529,429	535,540	350,655	104,890	183,815	205,055	46,555	3,955,930

Source: 2006-2008 ACS Based CTPP Worker Flows - Census Bureau

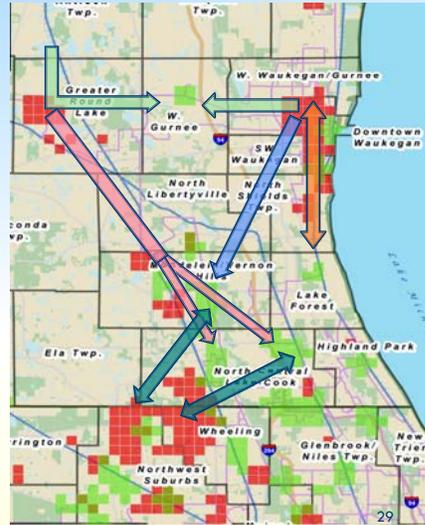
From \ To	Cook	DuPage	Lake	McHenry	Kane	Will	Kenosha WI	Grand Total
Cook	2,545,157	199,335	91,189	4,705	18,231	37,699	1,051	2,897,373
DuPage	209,868	348,150	1,648	275	32,921	17,278	27	638,175
Lake	98,879	1,286	309,963	17,722	1,397	2	29,289	458,538
McHenry	40,011	923	48,131	83,893	27,079	0	4,071	204,078
Kane	71,758	102,016	4,417	18,451	121,726	7,202	1	325,571
Will	137,733	113,531	0	0	13,070	172,902	0	436,901
Kenosha, WI	3,107	0	23,770	3,575	2	0	30,366	68,765
Grand Total	3,136,528	763,049	479,118	128,341	214,374	234,683	73,008	4,029,701

Source: 2010 CMAP Travel Demand Model Trip Tables



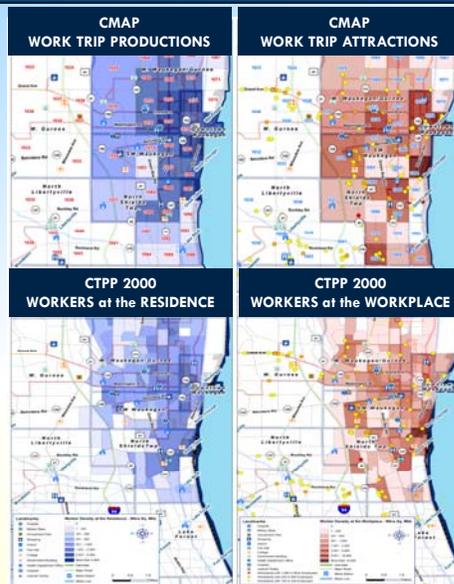
## Identification of Broad Travel Markets

- Integration of socioeconomic, land use, and travel data
- 5 Broad Travel Markets
  - » Intra Waukegan Districts,
  - » Waukegan Districts to Central Corridor
  - » Greater Round Lake to Central Corridor
  - » Intra Central Corridor, and
  - » Greater Round Lake - West Gurnee – W. Waukegan/Gurnee



## CMAP Trip Patterns (TAZ Level)

- Focused on Work trips
  - » CTPP 2000
  - » Dun – Bradstreet
- Key trip productions and attractions
- Prominent flows within each market



## Travel Analysis – Key Findings

- A focus on Waukegan Routes
- Lower travel density in the northwest indicated the need to examine more flexible transit solutions
- Potential link between Waukegan and the Central Corridor
- Trip interchanges between zones near the Lake-Cook Road corridor called for
  - » a closer look at trips within the Milwaukee Avenue Corridor, and
  - » supplementing Shuttle Bug services serving specific destinations with a fixed-route service along the Lake-Cook Road



## New Data Collection



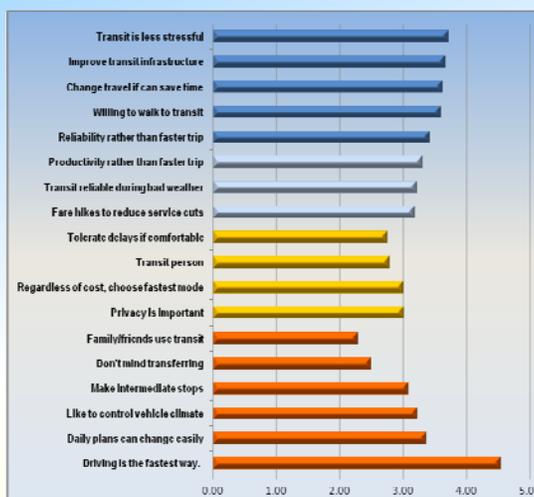
## Needs for New Data

- Resident Travel Survey
  - » Greater Round Lake, Antioch and Waukegan districts
  - » Availability of transit services
  - » Attitudes towards daily travel
- Employee Survey
  - » Key employment sites
  - » Residential locations
  - » Commute characteristics
- Pace Rider Survey
  - » Waukegan Pace bus routes
  - » Origins and destinations
  - » Transit trip characteristics
- Focus groups
  - » Stakeholder opinions
  - » Call-n-Ride (C-n-R) services
  - » Flexible bus services



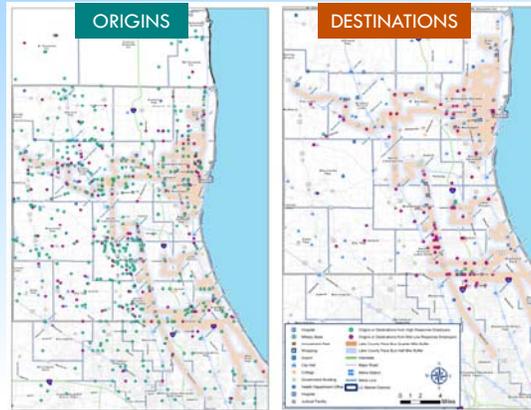
## Resident Survey

- Online Survey
- Outreach by Lake County Staff
- About 30 calendar days
- Nearly 1700 responses
- Origins and Destinations
- Barriers and Attitudes



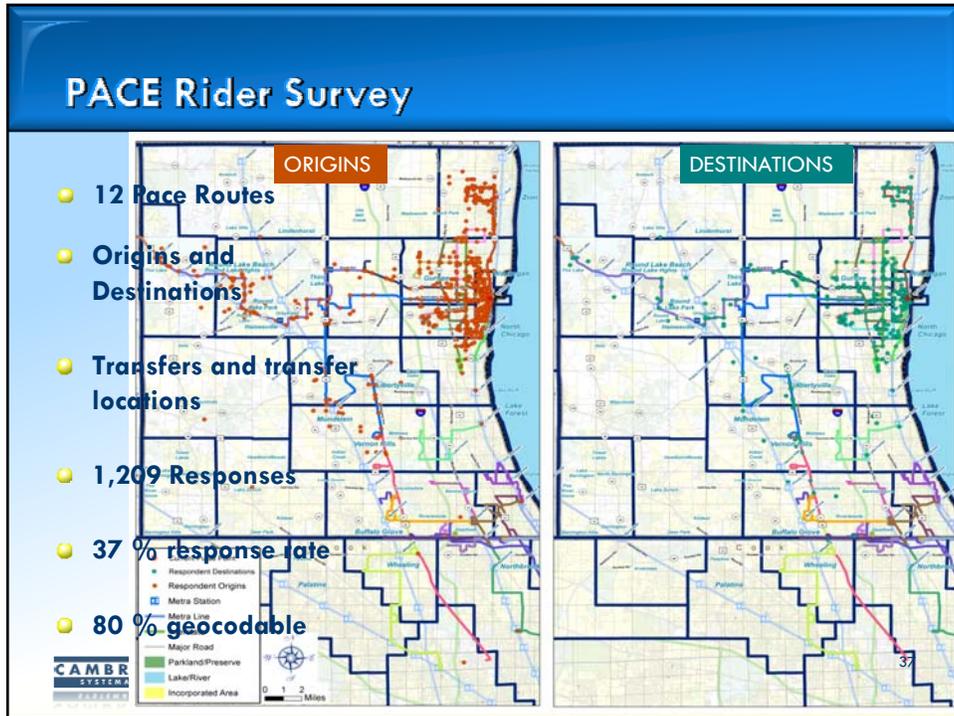
## Employee Survey

- Online Survey
- Outreach by Lake County Staff
- About 36 calendar days
- Near 1,100 responses
- Origins and Destinations
- Barriers



## Resident and Employee Survey Key Findings

- Residents pointed to the unavailability of transit as the key problem
  - » Sparsely distributed origins
  - » Low density development
  - » Reliance on auto for other activities during the day
- Support for transit friendly policies and willingness to use transit
- Workers in Lake County face the same issues of transit unavailability
  - » Spread-out origins
  - » Longer travel times
  - » Inconvenient schedules



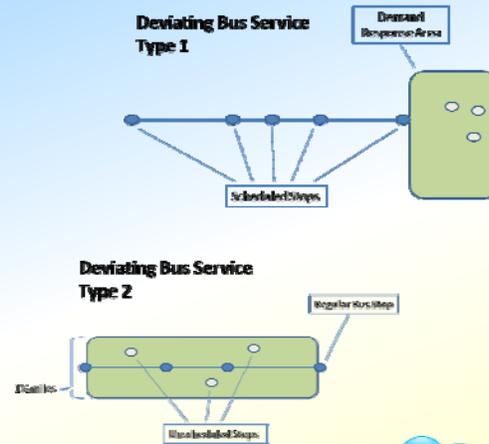
## Pace Rider Survey Key Findings

- The existing transit market is highly captive
  - » Majority of riders (70 percent) did not have an auto available.
- The existing service design requires a high degree of transferring between Pace routes

- In addition to a large share of loyal riders, there is a sizeable market of students who are new to Pace
- Current riders were satisfied. However, they demanded:
  - » More frequent service during weekends
  - » Improved reliability
  - » Quality of amenities

## Focus Groups

- Purpose was to obtain stakeholders' perspectives and feedback on innovative service ideas
- Nine stakeholders from the Mundelein/Vernon Hills/Libertyville community
- Six stakeholders from the Antioch/Lake Villa/Lindenhurst community
- Stakeholders receptive to flexible service options



## Focus Groups – Key Findings

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● <b>Antioch/Lake Villa Lindenhurst Community:</b> <ul style="list-style-type: none"> <li>» Requires transportation for medical appointments</li> <li>» Transportation options for senior citizens and young teens are lacking</li> <li>» Low-income populations, new to the area, need transportation</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>● <b>Mundelein/Vernon Hills/Libertyville Community:</b> <ul style="list-style-type: none"> <li>» Access to desired destinations is a major concern</li> <li>» The ability to travel across dial-a-ride program boundaries is needed, and better coordination between the various programs may alleviate this problem</li> <li>» There are many attractions within the area that should be served by transit</li> </ul> </li> </ul> |
|--|---|

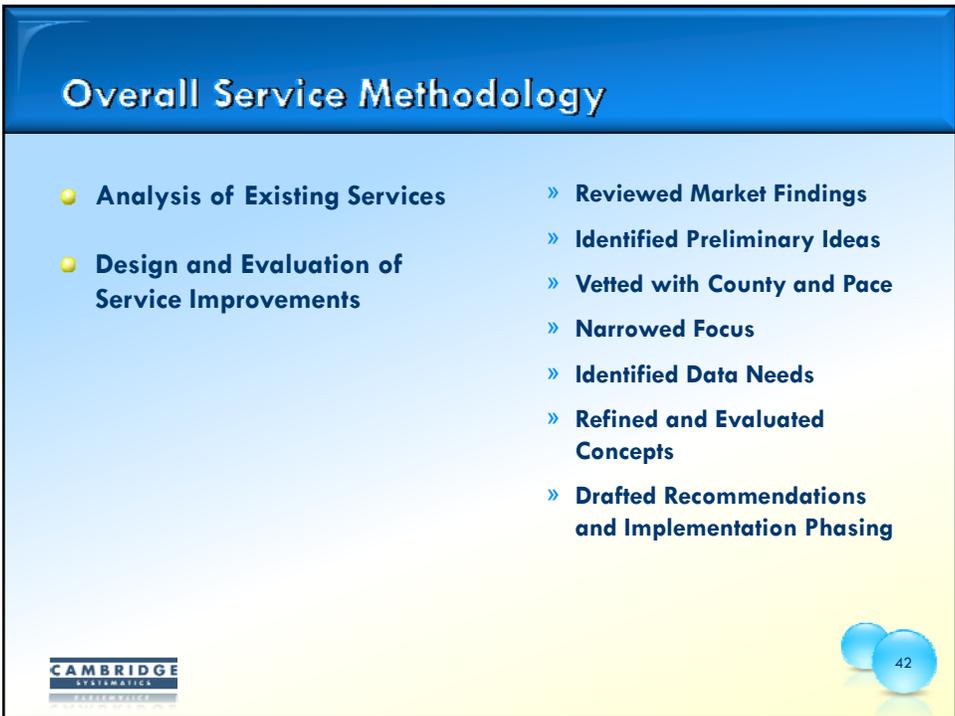


Development and Evaluation of Service Concepts

CAMBRIDGE SYSTEMATICS EXPERTISE

41

This slide features a light blue header, a dark blue title bar with the text "Development and Evaluation of Service Concepts", and a light yellow footer. The footer contains the Cambridge Systematics logo on the left and a graphic of two blue spheres with the number 41 on the right.



Overall Service Methodology

- Analysis of Existing Services
  - » Reviewed Market Findings
  - » Identified Preliminary Ideas
  - » Vetted with County and Pace
  - » Narrowed Focus
  - » Identified Data Needs
  - » Refined and Evaluated Concepts
  - » Drafted Recommendations and Implementation Phasing
- Design and Evaluation of Service Improvements

CAMBRIDGE SYSTEMATICS EXPERTISE

42

This slide features a dark blue header with the text "Overall Service Methodology". The main content area is light blue and contains a bulleted list of methodology steps. The footer is light yellow and includes the Cambridge Systematics logo on the left and a graphic of two blue spheres with the number 42 on the right.

## Development and Evaluation of Conceptual Service Improvements

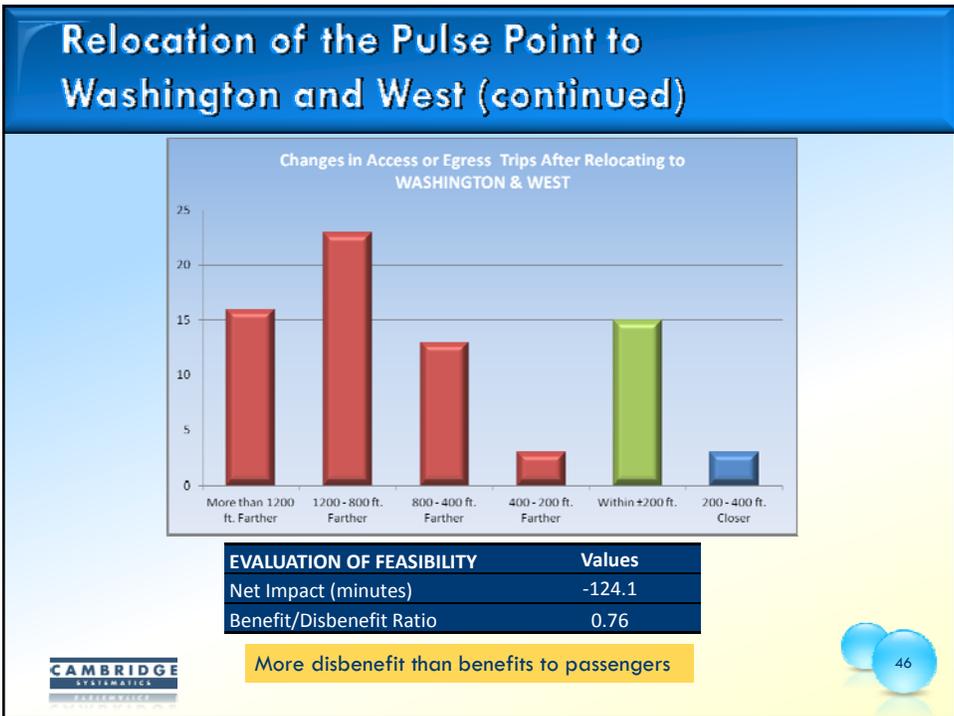
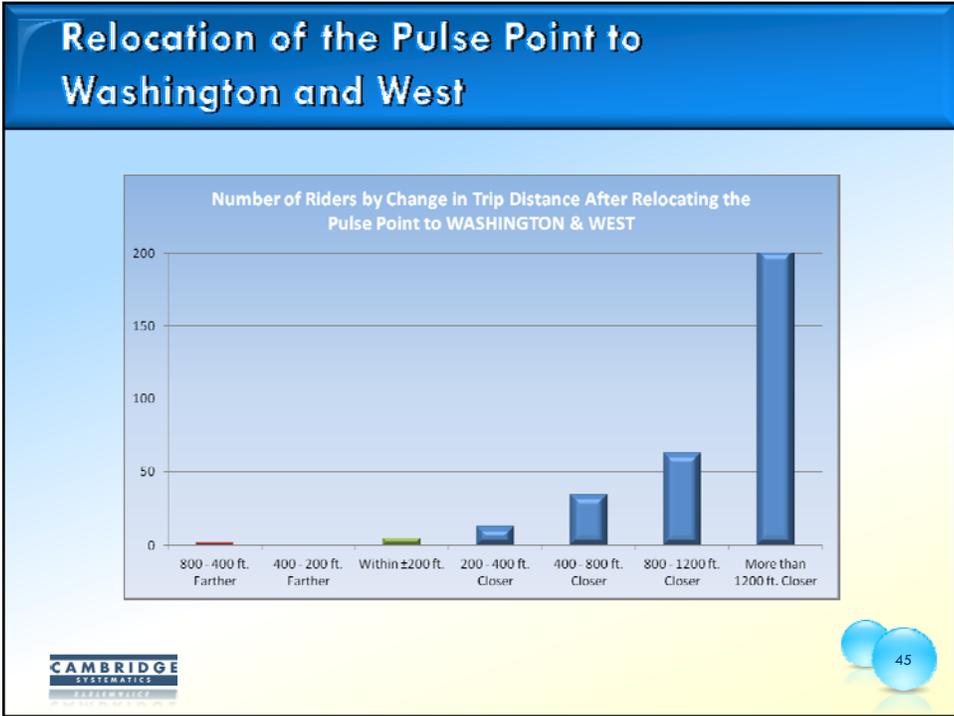
- Pulse Point Relocation
- Fixed Route Modifications
- New Express Route
- New Call-n-Ride Services
- New Deviating Bus Service
- DAR/Paratransit Policy Coordination
- Implementation Phasing



## Pulse Point Relocation

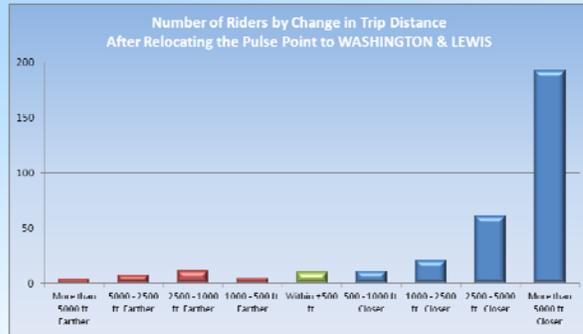
- Existing Pulse Point Deficiencies
  - » Not operationally central
  - » Uncomfortable location with few amenities
  - » Involved some circuitous routing
  - » Inconvenient connection to Metra
  - » Pace finds it difficult to adhere to the schedule during high traffic periods
- Options
  - » Move to Washington & West
  - » Move to Washington & Lewis
  - » No change or improvements at existing site (not evaluated)
- Methodology
  - » Use survey data to examine impacts of relocation on travel time and walk time for those transferring or destined to downtown Waukegan
  - » High level analysis





## Relocation of Pulse Point to Washington and Lewis

- Existing transfer trips are shorter
- Introduces many new transfers
- Transfers and associated wait times are onerous



EVALUATION OF FEASIBILITY	Values
Net Benefit (minutes)	-1,200
Benefit/Disbenefit Ratio	0.63

More disbenefit than benefits to passengers



## Fixed Route Modifications

- College of Lake County Transfer Point
- Routes 564 & 568 Service to Fountain Square
- Fixed Route Connections to Lindenhurst Medical Center
- Route 569 Lewis
- Other candidate rationalization improvements and span extension being planned already by Pace

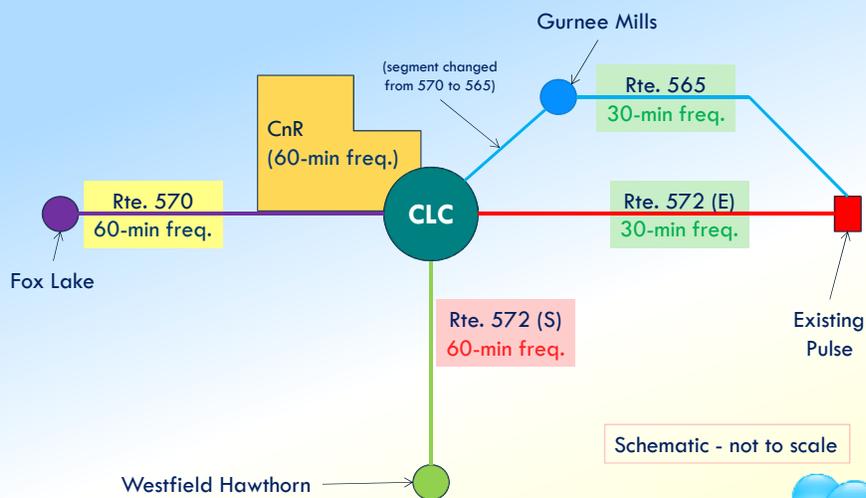


## College of Lake County Transfer Point

- **Convert Part of Route 570 to Route 565**
  - » Would require more resources and inconvenience passengers
  - » Route 565 operates at different headway than Route 570
  - » Would be worthwhile if it enables a minor pulse point at CLC
  
- **Create an Hourly “Pulse” at CLC**
  - » Appears feasible to create an hourly pulse point with increased resources and half hour service on Route 565
  - » There are trade-offs between increasing frequency for most riders and introducing transfers for others



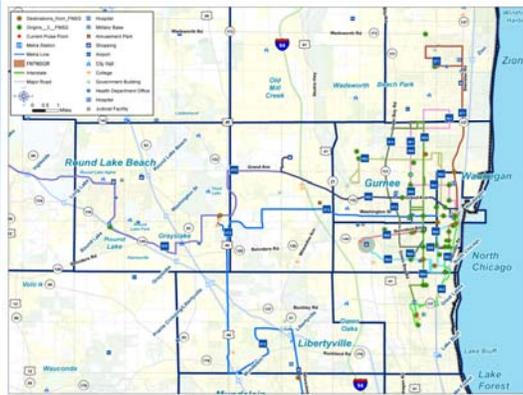
## CLC Pulse Point Schematic



## Routes 564 & 568 Service to Fountain Square

- Two routes may not be needed
- Compared use of each route
- Recommend shortening Route 564; leaving only Route 568 to serve Fountain Square
- Reprogram Route 564 resources

Origins and Destinations of Trips Beginning or Ending at Fountain Square (Routes 564/568)



## Fixed Route Connections to Lindenhurst Medical Center

- Considered in conjunction with Antioch Call-n-Ride
- Extension of either Route 570 vs. 565 vs. 572
- Further discussion with stakeholders needed to determine best approach

## Route 569 Lewis

- **Shorten Route/Increase Frequency**
  - » Survey identified users
  - » Potential negative impacts on a major travel generator
  - » Minimal benefit on Route 569
  - » Not recommended

Origins and Destinations for Trips to/from VA Medical Center on Routes 563 and 569



53

## New Express Route for Job Access

- **Would link low income residents of Waukegan with retail and jobs in south Central Corridor**
- **Express portion on I-94**
- **Candidate for JARC grant**
- **Needs further planning with stakeholders**

Item	Value
Span of Service	7:00am to 9:30pm
Frequency of Service	4 trips in each direction per day
Peak Vehicles Required	1
Vehicle Type	40-foot bus, wheelchair-accessible
Vehicle Hours of Service	12 hrs/day
Likely Operating/Maintenance Base	Pace



## New Demand Responsive Services

- Call-n-Ride vs. Deviating Bus
- Developed concepts using each type of service for several areas
- Held focus groups to contrast ideas and obtain input



## Deviating Bus Characteristics

- » Hybrid of demand responsive and fixed route services
- » Two types - *route* and *point* deviation
- » Deviations either to any point in the deviation zone or to predefined on-demand stops.
- » If to any point within  $\frac{3}{4}$ - mile of a route can meet the ADA requirements for complementary service
- » Nearly 40 percent of transit agencies operate some form of flexible service; number is rising
- » Typical densities for suburban deviating bus services: 1,000 - 1,800 people per square mile
- » Typical trip purposes include non-emergency medical, shopping, and social trips
- » Typical riders include youth, the elderly, persons with disabilities, and low-income persons
- » Contract operators may keep costs low, and may offer existing paratransit reservation services



## Mundelein/Libertyville Call-n-Ride

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	12.5 hrs/day
Likely Operating/Maintenance Base	Private contractor



The map shows the service area for Mundelein/Libertyville Call-n-Ride, highlighted in a brown shaded region. It covers parts of Mundelein, Libertyville, and Vernon Hills. Major roads like I-54, I-90, and various local highways are visible. The map includes a legend for various landmarks and features.




## Vernon Hills Call-n-Ride

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	12.5 hrs/day
Likely Operating/Maintenance Base	Private contractor



The map shows the service area for Vernon Hills Call-n-Ride, highlighted in a brown shaded region. It covers parts of Vernon Hills, Mundelein, and Libertyville. Major roads like I-54, I-90, and various local highways are visible. The map includes a legend for various landmarks and features.




## Milwaukee Avenue Deviating Bus

Item	Value
Span of Service	6:00am to 6:30pm
Frequency of Service	Hourly
Peak Vehicles Required	3
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	37.5 hrs/day
Likely Operating/Maintenance Base	Private contractor



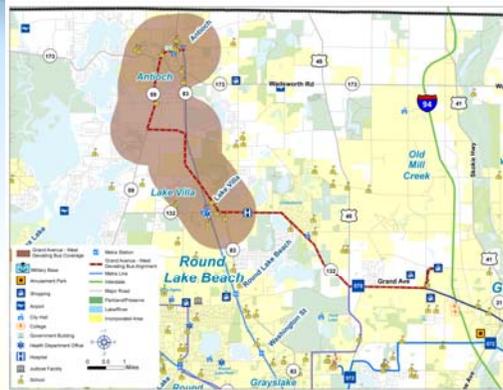
## Antioch Call-n-Ride

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	12.5 hrs/day
Likely Operating/Maintenance Base	Private contractor



## Antioch to Gurnee Mills Deviating Bus

Item	Value
Span of Service	6:00am to 6:30pm
Frequency of Service	Hourly
Peak Vehicles Required	3
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	37.5 hrs/day
Likely Operating/Maintenance Base	Private contractor



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## Lake Forest Call-n-Ride

Item	Value
Span of Service	6:00 a.m.-6:30 p.m., weekday-only
Frequency of Service	Hourly connections with fixed routes
Peak Vehicles Required	1
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	12.5 hrs/day
Likely Operating/Maintenance Base	Private contractor

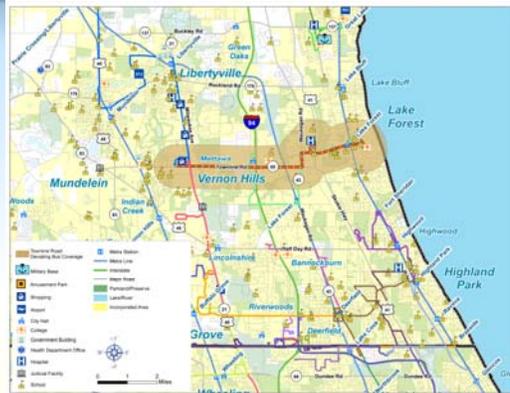


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## Townline Road Deviating Bus

Item	Value
Span of Service	6:00am to 6:30pm
Frequency of Service	Hourly
Peak Vehicles Required	2
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	25 hrs/day
Likely Operating/Maintenance Base	Private contractor



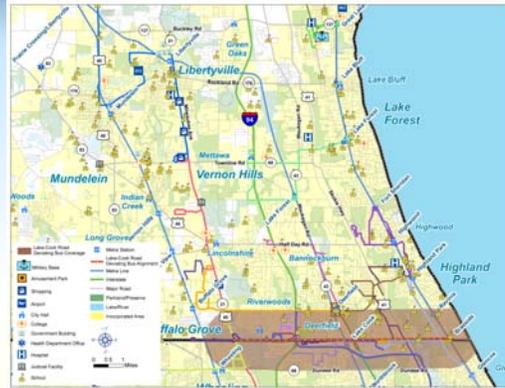
## Green Bay Road Deviating Bus

Item	Value
Span of Service	6:00am-10:00am; 2:30pm-6:30pm
Frequency of Service	80-minute headways
Peak Vehicles Required	1
Vehicle Type	Existing vehicle or a 15-passenger, wheelchair-accessible bus
Vehicle Hours of Service	8 hours/day
Likely Operating/Maintenance Base	Pace North Division or Private Contractor



## Lake-Cook Road Deviating Bus

Item	Value
Span of Service	9:00am to 4:00pm
Frequency of Service	Hourly
Peak Vehicles Required	2
Vehicle Type	15-passenger bus, wheelchair-accessible
Vehicle Hours of Service	14 hrs/day
Likely Operating/Maintenance Base	Private contractor



## New Call-n-Ride Services

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



## New Deviating Bus Service

- **Ridership Based on Typical Productivity of 4-7 pass./rev-hr.**

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	14,000 to 25,500	\$214,200	\$7.46 to \$14.36
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



## DAR/Paratransit Policy Coordination

- **Rationale**
  - » Current services are hindered by inconsistent policies and lack of understanding
  - » Better use of existing resources presents an opportunity
- **Types of Coordination**
  - » Administrative policies
  - » Fare structure
  - » Service area boundaries
- **Recommendation:**
  - » Begin working with stakeholders



## Implementation Phasing

### ● Factors

- » General priority of the need, including any available input from community stakeholders
- » Whether the improvement would require an increase in the operating budget or potentially generate a savings
- » Whether outside funding grants will be required
- » Need for further coordination and consultation with stakeholders
- » Whether the service concept is new or currently a mode operated by Pace (deviating bus likely will take longer to implement than CnR)



## Implementation Phasing Recommendations

### ● Phase 1

- » Route 564/568 Modification
- » DAR Policy Coordination
  - These save resources

### ● Phase 1 or 2

- » New Mundelein/Libertyville CnR and/or New Vernon Hills CnR (1) or Milwaukee Avenue Deviating Bus (2)
  - These communities are already a focus of Pace and have a strong focal point

### ● Phase 2

- » New Job Access Express Route
  - Job access is a high priority need.
  - Work with employers and seek JARC grant
- » Convert Existing Route 573/portion of 562 to Green Bay Road Deviating Bus
  - Route 573 has very low loads.
- » New Lake Forest CNR or Townline Road Deviating Bus Route
  - Lake Forest studied and proposed new service options
  - Further coordination with community is needed



## Implementation Phasing Recommendations (continued)

### ● Phase 2 or 3

- » New Antioch CNR or Antioch Deviating Bus Route
- » Provide Fixed-Route Service to Lindenhurst Medical Center
  - Access to the medical center is a high priority for the community
- » Shift Route 565 and 570 Terminus to CLC
- » Create an Hourly Pulse Point at CLC

### ● Phase 3

- » New Lake-Cook Road Deviating Bus
  - Midday service is a lower priority

### ● Not Recommended

- » Route 569 Modification
- » Waukegan Pulse Point Relocation

## Concluding Remarks

## Conclusions

- A thorough review of existing public transit services
- Development of customized data products (transit, demographics, estimates, forecasts)
- Identification of key travel flows within Lake County
- Service improvement ideas
- Collection of new market survey data
- Data-driven evaluation of service improvements
- A set of recommendations to guide project development, refinement, and prioritization
- A repository of travel demand and supply information for Lake County

