

Paper Title: *Don't Miss the Bus – The Emerging Concept of Locally Based Transit Options*

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Abstract

Locally based transit service is a customized small scale, needs based approach to transit that addresses a community's specific transit needs and goals. This paper outlines the Regional Transportation Authority's (RTA) efforts in engaging communities to investigate and plan for this type of service, examines why this type of innovative service is emerging as a possible viable option in today's transit climate, discusses the various ways this type of service can be implemented, and presents the City of St. Charles Transit Circulator Plan as a case study.

The RTA, through its Community Planning Program, funds planning studies that analyze the market and feasibility for locally based transit services. A total of six studies have been funded by the RTA during the past four years. The St. Charles Transit Circulator Plan, its planning process and the prospects for implementation are discussed.

General public, shared ride services are seen as a way to provide more cost effective service to low density, small scale service areas where demand for traditional high frequency transit service is low. These services are emerging in the suburbs as an effective way to address the last mile problem while increasing access and mobility to targeted populations, such as the elderly and disabled.

Potential options include the creation of community circulators in the form of fixed route and/or route deviation service. Services are typically designed to benefit residents, employees, and possibly tourists/shoppers. Smaller scale shuttle buses and vans are utilized creating an aesthetically pleasing experience. Implementation of service can be accomplished through a variety of options. Pace, the Suburban Bus Division of the RTA, offers a variety of local community service options and partners with communities to provide such service. Additionally, Pace currently operates two Call-n-Ride services.

Introduction

As a way to address modern day travel patterns and lifestyles, emerging concepts in public transportation are taking a unique look, feel and approach that drastically differs from the traditional, grid based, 40-foot bus fixed route service that has been the historic standard. These approaches to meet the changes in the market, demographics, land use patterns and travel patterns can result in custom tailored locally based transit service for particular low density areas. Since this form of public transit looks and operates in a totally new paradigm, those not aware of this concept can very well “miss the bus”.

This paper outlines the Regional Transportation Authority’s (RTA) efforts in engaging communities to investigate and plan for this type of service, examines why this type of innovative service is emerging as a possible viable option in today’s transit climate, discusses the various ways this type of service can be implemented, and presents the City of St. Charles Transit Circulator Plan as a case study. The plan was funded by the RTA through the Community Planning Program and completed by the consultant team of Land Vision, Inc., Transystems Corporation, and DLK Civic Design, Inc. in June 2010.

The RTA’s Role in Local Transit Improvement Plans

The RTA’s Community Planning and Subregional Planning Programs offer funding and planning assistance that can benefit both local communities and the regional transportation system. These programs support a variety of planning efforts, including feasibility studies for locally based service. The RTA’s planning goals for these projects include increasing transit usage, improving the efficiency and effectiveness of the region’s current transit system, providing better mobility for seniors and people with disabilities, and improving job access. The following points are used as a guide to preparing these feasibility studies for locally based transit service:

1. Provide a forum in which communities can be educated about and investigate possible local transit service improvements and opportunities.
2. Assist local communities in determining preferred parameters for transit service, thus allowing potential providers to focus on service implementation.
3. Provide an objective, systematic planning process for the communities, enabling them to produce quality plans, prepare for recommended transit service and pursue implementation.
4. Identify community driven priorities, and prepare a plan in which residents, businesses, employers and/or employees will benefit from and take ownership of the implementation.
5. Develop and foster partnerships and relationships among the appropriate transit agencies, community officials, regional agencies, and residents that will streamline the implementation process.
6. Determine next steps that can be addressed through an implementation strategy.

In addition to the City of St. Charles Transit Circulator Plan, the RTA has completed transit service improvement studies for The City of Lake Forest and the Village of Mount Prospect. Studies for the Village of Schaumburg, Village of South Elgin and Village of Hanover Park are currently underway. More information on RTA funded Local Transit Improvement Plans is available at <http://rtachicago.com/community-planning/eligible-projects.html#local>.

For more information on specific projects and final reports, please visit the following:

- The City of St. Charles Project: <http://www.rtams.org/rtams/planningStudy.jsp?id=290>
- The City of Lake Forest Project: <http://www.rtams.org/rtams/planningStudy.jsp?id=225>
- The Village of Mount Prospect Project:
<http://www.rtams.org/rtams/planningStudy.jsp?id=222>
- The Village of Schaumburg Project:
<http://www.rtams.org/rtams/planningStudy.jsp?id=294>
- The Village of South Elgin Project:
<http://www.rtams.org/rtams/planningStudy.jsp?id=433>
- The Village of Hanover Park Project:
<http://www.rtams.org/rtams/planningStudy.jsp?id=435>

Locally Based Transit – A Viable Option

Locally based transit service is a needs-based, general public, shared ride service that can provide more cost effective service to low density, small scale service areas where transit demand exists, but ridership is too low for traditional fixed route service to be effective. Several characteristics of locally based service make it a viable option in such environments.

Locally based transit service effectively addresses the ramifications of modern day travel and land-use patterns that often result in dispersed trip origins and destinations. As such, this service works well in suburban areas where these types of patterns are prevalent. This solution allows transit to move beyond the grid based fixed route model of a centralized city system and accommodate the travel and land use patterns typical of suburban land uses. Accordingly, this origin-destination focused service is a viable answer to the “last mile problem”, which is the first or final portion of a transit trip that often is not served by traditional transit service, as locally based transit typically serves the last mile.

Service is typically designed to benefit residents, employees, and possibly tourists/shoppers. Typical short distance destinations include local shopping trips, connections to other transit services, and connections to activity nodes. Shuttle busses and vans are utilized creating an aesthetically pleasing experience for both passengers and the general public. Since the service can be curb to curb, a small vehicle is better suited to be used in residential neighborhoods. It is suggested that a 10-12 passenger wheelchair accessible vehicle be used. Such vehicles typically cost between \$50,000 - \$70,000 and have a useful life of five to seven years. Branding and marketing on the vehicle is recommended to establish the service’s identity.

Under the Americans with Disabilities Act (ADA), complementary paratransit service is required for all public fixed-route transit systems in the United States. Demand-response transit systems do not have to provide separate paratransit, although they do have to ensure that passengers who use wheelchairs receive service equivalent to that provided to other passengers.¹ A key advantage of most locally based service is that ADA complementary service is no longer

¹ Koffman, D. (2004). *TCRP Synthesis 53: Operational Experiences with Flexible Transit Services*. Washington, DC: Transportation Research Board of the National Academies. p.13.

required, resulting in lower costs while accommodating the mobility needs of elderly and disabled riders.

Locally Based Transit- Implementation Options

Locally based transit implementation options consist of two elements: service type and service operations. A few service types are typically used and are determined based on a community's unique characteristics. Fixed route circulator service travels in a predetermined (fixed) route or loop and follows a fixed schedule. It is most effective when the service area includes well defined origins and destinations, such as centralized residential, transit and employment areas.

Demand response service is a reservations based, curb to curb service that picks up riders and drops them off anywhere within the designated service area. Through this capability, the Call-n-Ride option addresses the last mile problem that often eludes fixed route buses. This option is discussed in detail below. This type of service works well in service areas that have a low population density and dispersed residential, employment and transportation centers.

Route deviation, also referred to as a flexible circulator, is a service that is set on an established fixed route and timetable, but may travel off the route to pick up and drop off riders, then returns back to the pre-established route, adhering to its set schedule. Vehicles can typically deviate, or go off the route, by as much as ½ mile to a ¾ mile, which is the distance/service area that ADA complimentary paratransit service must operate from traditional fixed routes. Route deviation allows for more places to be served than a fixed route circulator, but keeps the traditional fixed route and fixed travel times. Limitations of this service include instances of denying some route deviation requests in order to stay on schedule. A surcharge can be imposed whenever there is a deviation off the established route.

Population density also plays a role in determining appropriate service type. The *Transit Capacity and Quality of Service Manual* provides guidelines for the type of recommended service based on population density. Three households per acre is the minimum acceptable to support fixed route transit service.² Populations with lower densities may be able to support either flexible route, demand response, or a combination of both service types. These lower density areas have fewer residents and the residents are usually dispersed over the geographic area. Locally based service is designed to provide transit service that works in these lower density areas, making it a viable option over fixed route transit service. A residential density of three households per acre is comparable to single family home neighborhoods in inner-ring, grid-based suburbs such as Oak Park and Evanston.

In addition to the service type, a variety of service operations exist to best accommodate a community's needs. Through an in-house operation, a community is totally responsible for the management and operation of the service. The community purchases all equipment and hires all staff. This service option appeals to communities that want to take a "hands on approach" to their local transit service. The Village of Niles currently operates this type of service.

² Land Vision, Inc., Transystems Corporation, and DLK Civic Design, Inc. (2010). *City of St. Charles Transit Circulator Plan*. Chicago, IL. Northeastern Illinois Regional Transportation Authority and the City of St. Charles. p. 26.

Contracting with a private transit operator is a “turn-key” option for a community. Through this arrangement, service, equipment and operators are contracted out to a private company, and the private company is responsible for the management and operations of the service.

A community can also partner with Pace using one of Pace’s local Community Vehicle Programs. Through this arrangement, Pace provides the vehicles for the service along with maintenance. The community is responsible for supplying the driver and setting the hours of operation and service parameters. Several municipalities, such as the City of Berwyn, Village of Fox Lake, the Town of Cicero, and the City of County Club Hills, and townships such as Addison and Avon utilize this option. This service option is best suited for communities that have limited, small scale transit service.

The establishment of a Pace designated Call-n-Ride or Dial-a-Ride allows for Pace to operate the service. Pace runs two Call-n-Ride services and numerous Dial-a-Ride services.

Through the Call-n-Ride Program, Pace operates and administers all aspects of the service, and assigns a route number to the service. Pace currently operates two Call-n-Ride services, Route 510 West Joliet Call-n-Ride, which was implemented in November 2008 and Route 590 Round Lake Area Call-n-Ride, which was implemented in December 2009.

Pace designated Call-n-Rides are demand response services open to the general public. A main function of the service is to connect with or transfer to other transit routes. The service is designed to compliment, not compete, with existing fixed route services in the area. No registration or eligibility requirements exist. To participate in the service, passengers call the driver directly to arrange the trip. Riders are able to schedule trips within a designated window, and plan trips conveniently within their schedule. Reservations may be taken up to one hour in advance for same day service, and may schedule trips up to 24 hours in advance.

When making a reservation, the passengers provide their name, date of travel, pick up location, drop off location, and desired arrival time. The driver then provides an expected pick-up time. It is suggested that passengers be ready at least 10 minutes ahead of the expected pick-up time. Drivers may not wait for passengers if they are not ready when the vehicle arrives. This policy allows for the driver to stay on schedule and make sure the service remains reliable for other passengers.

Trip reservations are made on a first come, first served basis. Since this is a shared ride service, several passengers going to a variety of destinations may be in the vehicle at the same time. Such a service can typically transport 6 to 8 passengers per hour. Passengers with a recurring trip (same days and times) may be able to schedule a subscription trip. These trips are arranged at the same time and day for an extended and routine period of time. This allows for routine users to ride the service without calling each day.

Call-n-Ride and Dial-a-Ride are demand response concepts that are quite similar in nature and purpose. Pace operates both types of service through designated programs. There are a few detailed differences between Call-n-Ride and Dial-a-Ride, such as the size of the service area. Call-n-Ride service has a relatively small service area, typically less than eight square miles.

Dial-a-Ride service areas can be much larger. The trip reservation process differs between the two services. Call-n-ride utilizes the relatively new concept of having riders directly call the vehicle driver. The driver then arranges for the trip. The call can be made up to an hour in advance. Dial-a-Ride reservations are arranged through a dispatcher, and must be made at least 24 hours in advance. Eligibility requirements can differ between the programs. Call-n-Ride services are open to everyone and have no eligibility requirements. Dial-a-Ride may impose eligibility requirements.

In “*Forecasting Call-n-Ride Productivity in Low-Density Areas*”, an analysis of Call-n-Rides is performed. The paper states “at just over \$51 per vehicle service hour, it is significantly cheaper to operate the Call-n-Ride than its fixed route services, which cost \$80 per service hour.”³

“Table 1 compares the Joliet Call-n-Ride service to Pace Bus fixed-route and limited access ADA (Americans with Disability Act) – required demand response transit. This shows that the Call-n-Ride falls between these two more traditional forms of transit service, costing less and performing more effectively in terms of riders per revenue mile than ADA required demand response transit service, and costing more per passenger trip and costing more per passenger trip and carrying fewer riders than fixed route services.”⁴

Table 1: Comparison of Pace Bus Service⁵

Performance Measure	Pace ADA Paratransit	West Joliet Call-n-Ride	Pace Bus Fixed Routes
Productivity (pax/hour)	1.54	3.02	23.66
Operating Cost per Revenue Hour (\$/hr)	\$51.38	\$51.11	\$84.41
Operating Cost per Passenger Trip (\$/pax)	\$33.39	\$16.90	\$6.91
Operating Cost per Revenue Mile (\$/mi)	\$3.50	\$4.81	\$4.98
Farebox Recovery Ration	7.0%	7.8%	28.5%
Subsidy per Passenger Trip (\$/pax)	\$31.05	\$15.59	\$5.29
Coverage (population)	---	22,200	6,700
No-Show Rate	6.65%	0.88%	--

Note: “- -” means performance measure is not applicable for the given service

*Average population uniquely served (i.e. not served by another Pace route) within ¼ mile of each Pace route.⁶

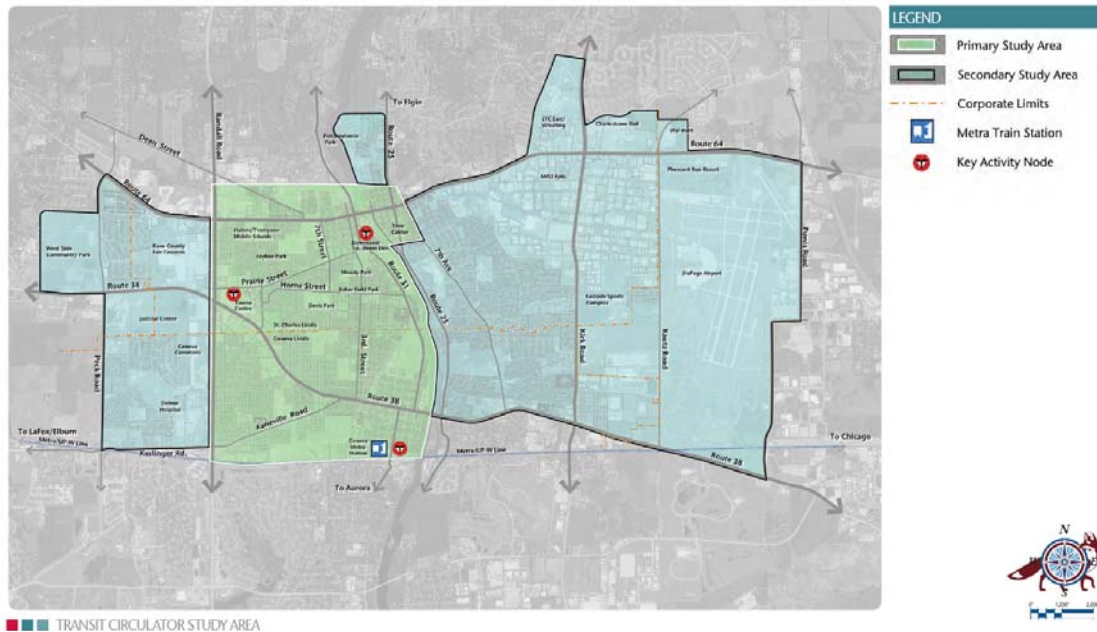
³ Baumgartner, D. and J. Schofer. *Forecasting Call-N-Ride Productivity on Low-Density Areas*. p. 3.

⁴ Ibid., p. 4.

⁵ Ibid., p. 4.

City of St. Charles Circulator Study- Background Information

Figure 1: City of St. Charles Circulator Study Area⁷



The City of St. Charles is a well developed, mature and historic community located along the banks of the Fox River in Kane County. The city has three Pace fixed routes: 529 Randall Road, 801 Elgin Geneva, and 802 Aurora- St. Charles. The Ride in Kane Program provides expanded transportation services for senior, disabled and low income individuals in Kane County. Downtown St. Charles is approximately 2.5 miles from the Geneva Metra Station. See Figure 1 for a map depicting the study area.

The St. Charles Circulator Study was included in the RTA's 2009 Community Planning Program. Planning partners that participated in the Steering Committee included staff from the City of St. Charles, the First Street Development, St. Charles Towne Centre Development, RTA, Pace, and Metra.

The goal of the St. Charles Circulator Study was to develop a transit circulator plan to encourage, promote, and complement public transportation and mobility options within the community for residents, employees and visitors. The guiding principles of the study included:

1. Enhanced accessibility, efficiency, and safety of transit throughout the study area.
2. Identification of transit service alternatives that allow for expansion and phasing of the transit system over time.
3. Reducing operating costs while maintaining the affordability for transit riders.
4. Establishing communication, marketing and implementation options to ensure the success of the transit system.

⁶ Ibid., p. 4.

⁷ Land Vision, Inc., Transystems Corporation, and DLK Civic Design, Inc. p. 4.

The study included the following elements:

1. **Data collection and analysis of existing conditions** in order to garner an understanding of the various characteristics within the community and to gather the necessary information used as “inputs” in determining the most appropriate type of transit service. Methods to obtain this data included a combination of decennial 2000 Census block group statistics, windshield surveys of existing land uses, zoning classifications, and interviews with key businesses and employers. Peer community/case study reviews were also completed.
2. **Density analysis** to determine the propensity of key transit indicators such as household density, employment density, and elderly and youth population. These key indicators were evaluated to predict the success of transit service.
3. **Market feasibility** to determine the demand for service and identify appropriate routes, service areas and potential riders.
4. **Needs assessment** to identify latent opportunities and potential service improvements.
5. **Public participation** to present study details and gather public input regarding preferred service and service characteristics. Through this process, the public was given the opportunity to contribute to the plan. Open houses, on-line surveys, paper surveys and a project webpage were utilized.
6. **Development of recommendations** and concept plans to clearly define the agreed upon findings and recommendations. These elements document the results of the study.
7. **Implementation strategies** to provide communities with step by step guidelines and instructions on how to undertake the process of making the plan a reality.

City of St. Charles Circulator Study- Initial Findings and Recommendations

An initial focus of the study was to designate primary and secondary districts and identify activity nodes and destinations. The primary district is approximately five square miles, and encompasses the central part of the city. The secondary district is approximately 11.6 square miles and encompasses the remaining higher action activity areas.

The major activity nodes are the Geneva Metra station, the proposed St. Charles Towne Centre Development, First Street Development/Downtown St. Charles, and significant local parks and recreation centers. The secondary transit market includes the DuPage airport, additional shopping destinations, a regional resort and spa, a higher density apartment complex, regional park, county fair grounds, Geneva Commons shopping area, Kane County Judicial Center, and the local hospital.

The household density analysis revealed that a majority of the study area had 1-3 dwelling units per acre, which is too low to support fixed route circulator service. This would indicate that a demand response service would work best to address the population density. The employment density analysis identified employment density to be centered along IL Route 64, IL Route 38, Randall Road, and at the DuPage Airport, and should be served as part of the service. There were no substantial employment generators that would call for select shuttle service. The senior population analysis found that the senior population was concentrated in the primary study

district. Twelve senior living/retirement centers are located in or immediately abutting the study area, creating a demand for transit service. This was a promising finding, as it demonstrated that there would be a need for a service.

As stated above, a survey was utilized to garner preferences and priorities for the potential service. Respondents indicated that the Geneva Metra Station was the most requested transit destination. It would be important that the service go to the Geneva Metra station. Respondents to the survey also indicated that the desired service hours be between 5 am and 7 pm. When asked to comment on the cost to ride the service, respondents were receptive to paying \$1-\$2 for service; however, 12% stated that they are unwilling to pay any amount to ride the service. Survey respondents identified the ability to know arrival time, frequency of service, safety of service, and scheduled coordination with Metra as the most important features.

Based on the evaluation of the transit supportive physical and socio-economic conditions of the primary and secondary study areas, the data findings listed above, and the corresponding financial and operational requirements, it was determined that limited demand exists to support immediate implementation of an area wide fixed route transit circulator. Two types of service were recommended to be implemented: a special events circulator and a demand response Call-n-Ride service, with the Call-n-Ride preferably operated as part of Pace's designated Call-n-Ride Program. These alternatives are not intended to be the long term solution, but can be viewed as an introductory system that can build awareness of and increase ridership within the service area.

Special Event Circulator

A special events circulator is suggested to be utilized during various special events such as Pride of the Fox RiverFest, July 4th Celebration, and Scarecrow Festival. This fixed route, fixed schedule, privately operated service will introduce residents and visitors to the idea of a transit circulator while connecting transit stations (particularly the Geneva Metra Station), parking lots and shopping destinations to the special event location. This service will "introduce" circulator service in the area, and build potential ridership. By familiarizing users with special event service, it is conceived that when the Call-n-Ride service is implemented, there will be a greater demand since users will already be comfortable with using transit service. As ridership grows for the special event circulator, it is suggested that service can be expanded to both the holiday shopping season and during the summertime months, when tourist activities increase. The service frequency would be every 15 minutes. The estimated daily cost for this 12 hour, two vehicle service is \$1,000- \$5,000. The initial "start-up" phases of the service will be at the higher cost end. Once the service has been established and ridership increases, the service could be offered more frequently. This will lower costs as private operators typically charge higher rates for infrequent service.

For this special event type of service, it is recommended that a 21 to 24 seat vehicle be used. It is suggested that no fares be charged to encourage residents to try the service. The primary goal of this circulator is to reduce congestion during special events by encouraging people to park in outlying areas or use transit, and then be bussed to the event location. The secondary goal is to get patrons comfortable with a circulator service.

Table 2: Estimated Costs for the St. Charles Call-n-Ride

	Estimated Daily Cost	Estimated Annual Cost
Weekday	\$650-\$845	\$165,750- \$215,475
Saturday	\$500-\$650	\$26,000-\$250,000
Total		\$190,000-\$250,000

It is recommended that the service be funded from fares; local partnerships with the St. Charles Park District, Chamber of Commerce, First Street Development, Pheasant Run Resort, City of Geneva, and others. A fare of \$1.75 is recommended, which is the same as the Pace fare.

Pace uses a formula for estimating ridership for any proposed Call-n-Ride. The indicators used are:

1. Zone Size
2. Population Density
3. Employment density
4. Number of connecting buses
5. Percentage of the population over age 65

The formula for Call-n-Ride productivity can be estimated using the following equation:
 $4.74 + 0.669 * (\text{Employment Density}) - 0.737 * (\text{Population Density}) - 0.118 * (\text{Zone Size}) + 0.111 * (\text{Bus Lines}) + 0.147 * (\text{Seniors})$

Where: Zone Size is measured in square miles, Population Density is in units of thousands of people per square mile, Employment Density is measured by thousands of workers per square mile, Bus Lines is the number of fixed-route transit lines passing through or along the border of the zone, and Seniors is the percentage of the population in the zone over age 65.⁹

This equation identifies the key variables that contribute to the success of a Call-n-Ride. It states that higher population densities result in lower productivity, while higher employment density leads to higher productivity. The smaller the zones, the higher the productivity. Productivity increases with the number of connecting bus routes in the area. The percentage of the population over age 65 contributes to the productivity because this population group is more transit dependent.¹⁰

According to this equation, the City of St. Charles productivity model yields a value of 5.3 passengers per hour. This result is in the top 33% of the productivity of the cases used to estimate the model, therefore the “promise for Call-n-Ride in this setting is good.”¹¹

Monthly ridership is estimated to be 1,745. Comparatively, April 2011 ridership for the Route 510 West Joliet Call-n-Ride was 711¹² and April 2011 ridership for Route 590 Round Lake Area Call-n-Ride was 764.¹³

⁹ Baumgartner, D. and J. Schofer. p. 10.

¹⁰ Ibid, pp. 10-11.

¹¹ Ibid., p. 12.

Implementation next steps

Currently, the City is working on implementation of the study recommendations, including the establishment of a transit circulator task force. Additionally, the City has been working with Pace to investigate the feasibility of a Pace designated Call-n-Ride service, and continues to pursue funding opportunities.

Conclusion

Locally based transit service is an emerging tool that can be used to provide improved transit service at the local level by addressing many of the concerns that limit the success of traditional transit service in today's suburban settings. Through the Community Planning and Subregional Planning Programs, the RTA provides communities with assistance to pursue the feasibility of such options, with the eventual aim of full service implementation.

¹²Conversation and e-mail from
Pace Suburban Bus Service
550 W. Algonquin Road
Arlington Heights, IL 60005

¹³ Ibid.