# Personal Rapid Transit: Developing a New Mode of Public Transportation

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The development of the Regional Transportation Authority's (RTA's) Personal Rapid Transit (PRT) Project since the project was announced in April 1990 is chronicled and the decision-making process that led to its initial formulation is explored. PRT's possible application in Northeastern Illinois, the growth in Chicago's suburbs, and the changes in Chicago's commuting patterns that have triggered RTA's examination of a new transit technology are described. In 1950, Chicago's suburbs had about 20 of every 100 jobs in the Northeastern Illinois region. Today, they account for almost 60 percent of the jobs, and their share is growing. RTA's PRT Project is a response to these fundamental changes to the Northeastern Illinois suburban landscape. The key elements of the PRT Project to date include (a) a multiphased approach with decision points at the end of each phase; (b) competitive system designs to foster competition; (c) drawing new technology out of the private sector by identifying new markets and giving generous public exposure; and (d) hedging risk by sharing in the ownership of new intellectual property and by developing partnerships with private, and other public, entities. The PRT site selection process has identified four communities that measure best against a list of attributes possessed by an ideal PRT community. All four have thus far met RTA's requirements for complementing the existing regional transit system and for generating local support.

"Chicago's booming suburbs are hurtling down a road of riches that dead ends in gridlock" (*1*). So stated a February 1990 series of *Chicago Tribune* articles on traffic congestion in Chicago's suburbs. Two months later Gayle M. Franzen, chairman of the Northeastern Illinois Regional Transportation Authority (RTA), announced RTA's Personal Rapid Transit (PRT) Project as a possible first step in the evolution of a new mode of public transportation for suburbia. "We have reached a crossroads in the public transportation industry," Franzen said on the day the project was announced. "Suburban growth patterns have outstripped our capability to serve new markets with only traditional forms of transit" (*2*).

This paper chronicles the development of RTA's PRT Project since that announcement, explores the decision-making process that led to its initial formulation, describes PRT's possible application in Northeastern Illinois, and describes the growth in Chicago's suburbs and the changes in Chicago's commuting patterns that have triggered RTA's examination of a new transit technology.

## GRIDLOCK IN SUBURBIA

Transportation has always been the lever on economic development and prosperity, and the development of Chicago's suburbs during the past four decades are a case in point. In 1950, Chicago's suburbs had about 20 of every 100 jobs in the Northeastern Illinois region. Today, they account for almost 60 percent of the jobs, and the Northeastern Illinois Planning Commission predicts that their share will rise to 65 percent by the year 2010. More than half of all Chicago area workers currently commute from suburb to suburb, whereas fewer than 15 percent make the traditional commute from suburbs to city, according to the Chicago Area Transportation Study. And in the morning, outbound traffic on two of Chicago's busiest radial expressways—the Kennedy and the Eisenhower—are often higher than inbound volumes.

This change in travel patterns is having a clear impact on the form of the suburban landscape. Schaumburg, Illinois, for example, once a remote farm town 29 mi northwest of Chicago's Loop, has become a community with 8 million ft$^2$ of office space, just 2 million ft$^2$ less than downtown Milwaukee, Wisconsin. The Sears, Roebuck and Co.'s recent decision to move its merchandise group headquarters, and more than 5,000 Sears employees, from the Sears Tower in downtown Chicago to a 786-acre site in Hoffman Estates, Illinois—a Chicago suburb even farther away from Chicago's downtown—illustrates this migration of businesses to the suburbs and the concomitant change in regional travel patterns.

In short, the rising number of Chicagoans and residents of the inner suburbs driving to jobs in the outer suburbs is leading a shift in economic development in the six-county metropolitan region, but it is also bringing with it increased suburban congestion. Consequently, the mobility, prosperity, and quality of life of the suburbs—precisely those attributes that attracted first residents, retailers, and now businesses to suburban locales—are ironically being threatened, jeopardizing the economic future of the entire region. RTA's PRT Project is a response to these fundamental changes to the suburban landscape and is part of a larger, more comprehensive technology development and capital program whose aim is to address these vexing problems.

## RTA'S TECHNOLOGY PROGRAM

The Regional Transportation Authority was established in 1974 on approval of a referendum in the six-county Northeastern Illinois region. RTA is a special unit of local government, a body politic, political subdivision, and municipal corporation of the state of Illinois. Initially, RTA provided financial assistance to the then-existing public transportation carriers.

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RTA also entered into purchase-of-service agreements with private railroad companies and private and public bus companies. As a number of carriers discontinued service, RTA temporarily became engaged in direct operations.

In 1983, the RTA Act was amended to make substantial changes in the organization and funding of RTA and its operations. All operating responsibilities were placed in three "Service Boards": the Chicago Transit Authority (CTA) and two RTA operating divisions—Metra (the commuter rail division) and Pace (the suburban bus division)—each having its own independent board of directors. RTA was given increased power and responsibility to supervise the budgets and financial condition of the CTA, Metra, and Pace. RTA's responsibilities for fiscal and policy oversight of public transportation services in the region were also increased.

The 1983 Regional Transportation Authority Act also gave RTA the responsibility to conduct the region's research and development. In particular, the act calls for RTA to study public transportation problems and developments; encourage experimentation in developing new public transportation technology, financing methods, and management procedures; and conduct, in cooperation with other public and private agencies, studies and demonstration and development projects to test and develop methods for improving public transportation, for reducing its cost to users, or for increasing its public use (*3*).

In the past year, RTA has formalized its research and development effort by forming a capital program and technology division. This division, headed by Marc A. Hillier, directs the PRT effort and tries to identify and develop other new technologies that promise increasing efficiency and effectiveness of the region's public transportation services.

## RTA'S PRT PROJECT

RTA's PRT Project is being conducted in three phases. They are as follows:

### Phase I: System Design

Develop a system design that would meet the RTA definition of PRT and RTA's goals for personal transit for the public. The intended outcome of this phase is a system design of such quality and promise that RTA can confidently proceed with Phase II. The system design must be safe and reliable and must provide evidence that in subsequent phases it can be developed, economically constructed and maintained, and deployed as a successful transit demonstration project.

### Phase II: Development and Test

Develop hardware, including prototype guideway sections and vehicles, and all operational control and communication software for testing at a test site. Testing would begin with individual component testing and would proceed to the extent necessary to determine the desirability of proceeding to Phase III. It is anticipated that this phase would conclude with an extensive indoor and outdoor test of a completely integrated PRT system.

### Phase III: Demonstration Site Deployment

Construct and operate during Phase III a 2- to 4-mi demonstration PRT system in a suburban Chicago community.

The system design work started in March 1991 and was scheduled for completion in March 1992. The Phase I work is being done by two competing system designers: Intamin AG (Wollerau, Switzerland) and Stone & Webster Engineering Corporation (Boston, Massachusetts). Each contract is for $1.5 million. At the completion of Phase I, if RTA is satisfied with the progress of the system designs, comfortable with the financial arrangements for future phases, and convinced that PRT will increase the public's use of public transportation and have a positive impact on the region's productivity and mobility, RTA would select one of the two system designs for further development. A technical support team—Custom Engineering, Inc. (CEI)—was hired to aid in the technical evaluation of these competing system designs and was instrumental in the creation of the project's form and content. This team is led by Carlos deMoraes, CEI president.

Of the original 22 communities expressing interest in the project, four suburban Chicago communities have demonstrated that they offer the most potential for a successful PRT deployment and are currently competing to host the initial demonstration system. Ridership demand estimations were scheduled for completion in February 1992 to gauge the ridership potential at each of these proposed sites. The goals of the PRT Project are manifold:

1. To conceptualize a new mode of public transport, one that combines right-of-way, technology, and type-of-service in nontraditional, creative, and unique ways;
2. To develop this new mode and successfully demonstrate its applicability to markets in the Northeastern Illinois region;
3. To show that this new mode is safe, reliable, and efficient, and is an effective complement to existing transit modes; and
4. To provide strong evidence that this new mode may be deployed with a minimum of disruption to the community. Disruption is minimized by civil works that may be constructed relatively quickly and inexpensively, by environmental impacts during operation that are acceptable to the community, and by guideways that are aesthetically unobtrusive and easy to maintain.

For the purpose of this demonstration project, RTA has defined PRT as follows:

- Fully automated
- Two- to five-passenger vehicles, all seated;
- One-way guideways;
- All stations off line and free standing;
- Minimum mainline headway of 5 sec at demonstration system start-up;
- Capability to meet needs of a large network;
- Wait time for vehicle 3 min or less;

- Goods movement capability;
- Service that is accessible to disabled and mobility-impaired passengers; and
- System availability goal at least 99.7 percent within 6 months of start of demonstration service.

## DEVELOPING A NEW MODE OF PUBLIC TRANSPORTATION

Having the statutory obligation to do research and development is one thing; developing a mode of public transportation that according to the RTA definition of PRT does not yet exist is quite another. Lacking the staff expertise and wherewithal to examine this technology on its own, and faced with approximately one-third of the region's $16 billion transit infrastructure in desperate need of repair, RTA had to structure a PRT research and development program that extracted new technology from the private sector, identified viable markets (if any) for a mode of transportation that does not yet exist, minimized the risk associated with public funding, and minimized the diversion of capital dollars from a badly needed, and highly visible, capital program.

### Minimizing Risk

There is some risk involved in any research and development effort. No research and development project is assured of success. And public sector officials are particularly prone to charges of unnecessarily risking public dollars on projects that promise highly visible, yet uncertain, payoffs to society. RTA has therefore tried to structure the PRT program so that the financial risk associated with this project—a risk that is often magnified in the public sector because of the competition for scarce public dollars, particularly in this case—is limited.

Structuring the PRT research and development effort was indeed easier given the general support of Chairman Franzen and the RTA board. The Board has been willing to start a program of innovation that is atypical of a public agency. Indicative of this attitude is Chairman Franzen's remarks (*2*) on the day the PRT Project was announced:

> I think that too often public agents refuse to recognize innovation based simply upon institutional biases. There is a hesitancy to pursue technologies such as PRT only because it has never been done before. We at RTA think differently. If a technology is viable, then we feel it is our obligation to experiment to see if it can indeed provide answers to our problems. We must look beyond the restraints of our industry and explore. It is more than our statutory obligation, it is our public responsibility.

Because of the dispersed travel demands characteristic of Chicago suburban development and travel and the dramatic improvements during the last decade in solid-state controller technology and microprocessor controls, PRT seemed, at first blush, to be more applicable to suburban travel and more feasible than what staff originally expected. The PRT technology was so new and exciting that the immediate temptation was to run quickly to its development and implementation. Because staff members had also visited with Morgantown PRT officials and learned the difficulties Morgantown PRT experienced in their quick 22-month development effort they had to temper their excitement with the need to proceed responsibly and with caution to ensure that the public was well served.

This requirement led to the project being broken into phases. Each phase is structured with a decision point at its conclusion: Is it prudent to commit more public funds for PRT development and proceed with the next phase, or are the results to date too discouraging, and projects costs too excessive, to merit further public funding? The project therefore has built-in mechanisms that limit the exposure of public funds and allow for public scrutiny and an explicit examination of the benefits and costs of proceeding.

Risk was further mitigated when contracts with the system designers were negotiated. Each contract includes language that gives RTA the possibility of jointly owning all intellectual property (patent, copyright, trade secret, trademark, or other intellectual property rights) developed as part of this contract or as part of future phase work. Moreover, as a precedent to proceeding with any future phase work, the selected system designer may be required to agree on an arrangement by which RTA would earn a royalty on fees earned by the system designer for the design and development of any other PRT system.

This unique financing arrangement follows from RTA's statutory obligation to also develop new financing methods and follows from the venture capital mode of financing private enterprises. A venture capitalist expects to be rewarded for the risk involved in fronting the money to finance an unproven, and perhaps risky, new venture. Similarly, RTA structured the PRT agreements so it could possibly recoup its initial investment and potentially receive a revenue stream for many years to come, one that could be used to examine other promising public transportation technologies or for badly needed capital improvements. A key difference, however, is that RTA in this case assumed additional risk other than simply a financial one. Whereas a venture capitalist may also lend some managerial expertise to the initial start-up effort for a product or service aimed at a particular market segment—a segment that is often fairly well defined—RTA was also responsible for identifying and cultivating travel markets that neither RTA nor the system designers even were sure existed. In effect, RTA's call for community participation, and the creation of evaluation guidelines that described an ideal PRT community, created a marketplace of potential PRT sites ready for the system designer's service that heretofore had not existed.

### Extracting New Technology from Private Sector

Based on conversations with numerous corporate entities that may have an interest in developing PRT, RTA thought that the PRT Project would have to be structured in a way that would attract firms with the human and financial resources to carry this project beyond its initial stages. The project also had to be attractively enough packaged so that the private sector would be willing to risk some of their own capital if that was necessary to complete the initial phase.

There were concerns expressed over the cost associated with developing a PRT system, and there was uncertainty

about the existence of a transit market for this product. After all, if markets did exist, why hadn't the private sector already developed, and marketed, a PRT system as they had successfully done with other automated systems? Quite honestly, it was unclear how much the system design work would cost to complete, or how many, if any, responsive proposals would be submitted in response to the initial request for PRT proposals. It was clear that this research and development project would require an innovative structure to attract firms with appropriate capabilities and adequate resources.

A key decision was made early to structure the project so that there would be competitive system designs. Opening the first phase to two different firms developing independent system designs served three primary purposes: (a) it allowed RTA to see a range of system design choices and select the one design that was most appropriate for the Northeastern Illinois region; (b) it created an element of direct competition that RTA hoped would result in system designers being more responsive to RTA's needs and desires for Phase I as well as for Phase II; and (c) it would open the door for more firms to initially participate, to gain a measure of notoriety, move down the PRT learning curve, and be poised to enter the PRT marketplace even if not selected for a second phase.

Conducting a parallel search and competition among Chicago's suburban communities to host the initial PRT demonstration was another key element of the project structure. RTA had believed that developing competing PRT system designs was not enough. A process to identify viable markets had to be developed to entice private participation and to ensure that there was a user for the technology developed. The very act of communities competing for the initial demonstration, and acknowledging a need for PRT, meant that the system designers would not have to undertake a lengthy, and perhaps expensive, market identification effort on their own and that they could still approach competing communities with ready-made PRT plans if not selected for Phase II work. The competitive nature of the process would mean that communities would be most apt to submit site proposals that met RTA guidelines for personal transit for the public. Hence, the RTA created a parallel competitive PRT site selection process that is described in further detail in the next section.

One final element of the project used to entice private participation was to set aside a large portion of the Phase I work plan for public presentations and communication. The Phase I work scope includes two-dimensional and three-dimensional computer simulations; scale models of PRT stations, vehicles, and guideways; and four community presentations that allow system designers to illustrate how their system would look, demonstrate how it could be used, and in general show off their system designs. The process gives generous public exposure to each system design and gives the system designers excellent opportunities to build working relationships with community representatives.

### Public/Public and Public/Private Partnerships

The seed money for PRT development has thus far been solely provided by RTA. But the process has been structured so the cost of future phases, if any, will be shared by other public or private entities, or both. Given that RTA's current priority is rebuilding the region's transit infrastructure, the success of the PRT research and development effort will ultimately depend on finding other sources of financing and in-kind support to bear the major burden of additional program costs.

As part of the Phase I work scope, system designers are required to describe their exact contributions, including those of any private partners, for their planned Phase II work program. The overall cost, financing arrangements, and schedule for Phase II must also be presented. RTA's present goal for a second phase is to develop as much private financing as possible. If not enough is found to cover the total development and testing costs for Phase II, RTA will seek partnerships with other public agencies or private entities to co-sponsor this work.

For Phase III, RTA has said that any community selected for a demonstration system should acquire and provide all right-of-way necessary for PRT deployment. Furthermore, RTA has stated that an ideal demonstration site would offer the potential for a partnership among RTA, local governments, and developers with the objective of exploring creative financing arrangements, integrating PRT designs with existing or proposed development, mitigating construction and operating constraints, marketing a strong, positive image of the system, and supporting and promoting PRT ridership.

A unique partnership between RTA and other transit agencies has also been forged to review the operational aspects of the two system designs. Personnel from B.C. Transit, Detroit Transportation Corporation, and Bay Area Rapid Transit have served on a PRT Advisory Group to review and comment on the system design from the start of the project. These individuals have considerable experience with day-to-day operation of automated transit systems, and their critiques focus on practical operational issues that normally get overlooked at this stage of the design process. Two other members of the advisory group have special expertise to advise the RTA on disability design and ridership estimations. The following are the individuals who have served in this group: Clyde Hayes, Operations Director, British Columbia Rapid Transit Co., Ltd.; William McDowell, formerly Executive Director, Detroit Transportation Corporation; James King Jr., Manager, Reliability Engineering, Bay Area Rapid Transit District; Alan Hewson, Manager, Special Services, Chicago Transit Authority; and David Boyce, Director, Urban Transportation Center, University of Illinois at Chicago.

RTA has also formed a group of service board representatives. Members of the CTA, Metra, and Pace were directly involved with the system designer selection process and continue to be important sources of advice and information during site evaluation and selection activities. Their input regarding new transit initiatives that may potentially complement, or complete with, PRT service and their knowledge of changing suburban development and travel patterns are an increasingly important part of the process.

## PRT SITE SELECTION AND POSSIBLE PRT APPLICATIONS

### Site Selection Process

RTA began the site selection process with a call for interest to all 265 Northeastern Illinois suburban communities. Of those, 22 communities expressed initial interest in the PRT

Project subject to reviewing a draft of request for PRT site proposals (RFP) that was forwarded to these communities immediately thereafter. An informational meeting was held with the 22 communities, and their comments were incorporated into the RFP. Six suburban Chicago communities—Addison, Deerfield, Lisle, Naperville, Rosemont, and Schaumburg—eventually submitted formal PRT Site Proposals. After an evaluation of the written materials, and after community presentations and site visits, RTA decided that Deerfield, Lisle, Rosemont, and Schaumburg should remain as candidate deployment sites and participate in the next stage of site selection activities.

The PRT site selection process was governed by three guiding principles that were used as evaluation criteria (*4*):

1. *Ridership potential.* PRT ideally will be located where a sufficient number and variety of work and nonwork destinations exist to generate stable riderships throughout the day without extreme single-point loading. The site should complement the regional transportation system by tying in with other transit service and with parking and highways, as appropriate. A site within a major multiuse complex in which PRT would serve as an internal distribution and circulation system in preference to the automobile would be attractive.

Chairman Franzen articulated early on that it was essential for PRT to connect to CTA, Metra, or Pace service to aid in serving a longer regional trip. Because any initial system would be no larger than perhaps 2 to 4 mi, it was important that PRT go beyond serving a simple internal circulation function and serve regional trips where PRT, in concert with bus or rail service, would be preferable to the automobile.

2. *Constructibility.* The site must have the requisite space to construct the system and should offer a setting which elevated guideways and fully accessible stations can be integrated within existing and future development without conflicting with community open space, historic preservation, or environmental protection objectives. The site should present realistic construction challenges without major cost risks (e.g., utility relocation, code restrictions, and architectural or physical barriers). The site must provide for the necessary PRT maintenance facility. The potential for cost-effective expansion beyond the boundaries of the initial demonstration system will also be an important consideration.

Because RTA had little idea what PRT would cost to construct, the RFP asked each community to show a 2-, 4-, and 6-mi PRT system on its proposed site plan. In response, some communities proposed up to 11-mi systems with expansions beyond the conceptual site plan to show possible PRT extensions.

3. *Local commitment.* The successful demonstration of PRT will best be achieved in partnership with local private and public interests committed to its success. PRT must be integrated into existing or planned development and marketed as an attractive alternative to the automobile. Creative approaches on how to structure this partnership will receive high priority in the evaluation of competing sites.

Chairman Franzen has also said that the NIMBY (not in my back yard) syndrome would guide the site selection process. RTA would not put PRT where it was not wanted, and the RFP clearly stated that an ideal PRT community would have broad and vigorous support of local community groups and the general populace.

Rather than ask the communities to simply state the merits and superior qualities of their proposed sites, the RFP asked each community to compare their conceptual plans to an ideal site. The creation of an ideal site set a standard for site evaluation and clearly expressed to the communities which site attributes RTA felt were most important to achieving a successful demonstration system deployment.

The communities were also told that the submittal of a site proposal was only the first part of a longer process. RTA recognized that the attractiveness of some proposed sites may depend on specified, yet uncertain, future development, and some sites may propose plans and commitments that have not yet had time for local community review and support. The objective at this point of the process was to simply narrow the group of interested communities to those sites that measured favorably against the stated evaluation criteria and possessed the characteristics necessary to define a Phase I "composite site." Selected communities would be subject to a final and more rigorous evaluation when, and if, RTA decided to proceed with Phase II.

To digress for a moment, the composite site is a hypothetical site consisting of the most limiting features (e.g., maximum span between columns, minimum turning radius, etc.) constraining the PRT design at the locations proposed by each community. The composite site plan and models are being used to evaluate the capabilities and robustness of each of the competing system designs.

## Possible PRT Community Sites

The proposed expanded PRT site plans for Deerfield, Lisle, Rosemont, and Schaumburg are shown in Figures 1–4, respectively. The following are the PRT community representatives: Kent S. Street, Assistant to the Manager, Village of Deerfield; Mary Lou Kalsted, Assistant Village Manager, Village of Lisle; Terrance McCabe, Village Attorney, Village of Rosemont; and Thomas J. Dabareiner, Transportation Planner, Village of Schaumburg.

All the sites complement CTA, Metra, or Pace service and all have core routes that have the potential to serve a longer regional trip. A summary of each proposed site plan follows.

### *Deerfield PRT Site*

Deerfield proposes a core PRT system of approximately 2.75 mi long with four stations in this primary loop. The system would directly connect with a proposed Metra Milwaukee station at Lake-Cook Road and would service office and commercial centers in the surrounding area. These destinations include Matas-Corporate 500, Deerbrook Shopping Center, Lake-Cook Plaza, and Underwriters' Laboratories. The PRT maintenance and administration building would be located adjacent to the parcel proposed for the joint Metra-PRT station construction.

Deerfield proposes two major expansions to the initial demonstration system—one to the west and one to the east. The western expansion consists of a PRT loop that accesses major employment centers on and adjacent to Lake-Cook Road and the Tollway Spur in Deerfield and Northbrook. This expansion, approximately 5.7 mi in length, would use Tollway right-

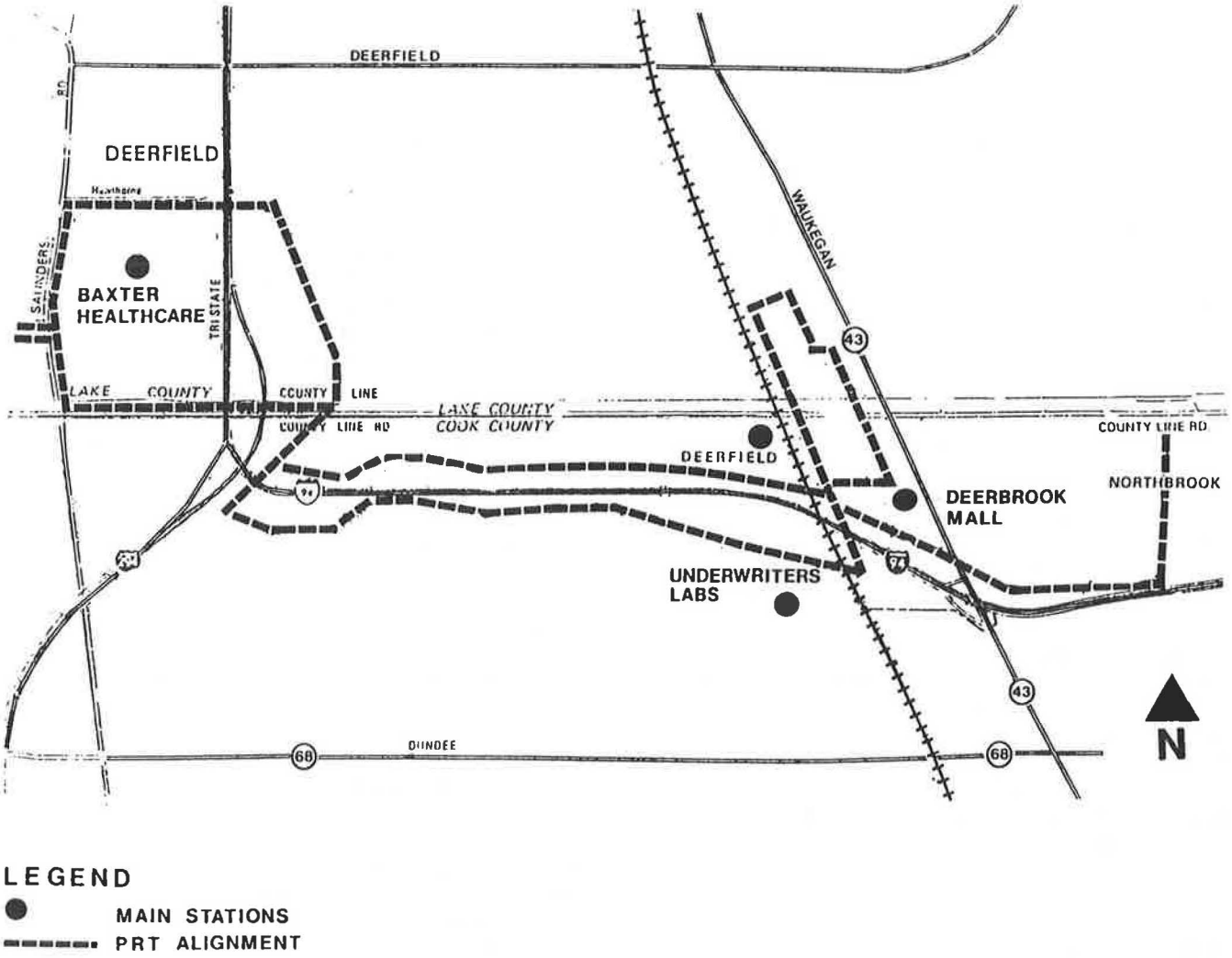



**FIGURE 1 Proposed site plan for Deerfield.**

of-way to service employment centers along both sides of the Tollway Spur, including the Sky Harbor industrial complex to the south, and the Lake Cook Office Center, Teradyne complex, and Arbor Lake Development to the north. This same expansion would also serve the Hyatt-Deerfield, Walgreen Company property, Baxter Healthcare, and Homart/Dean Witter development further north and west.

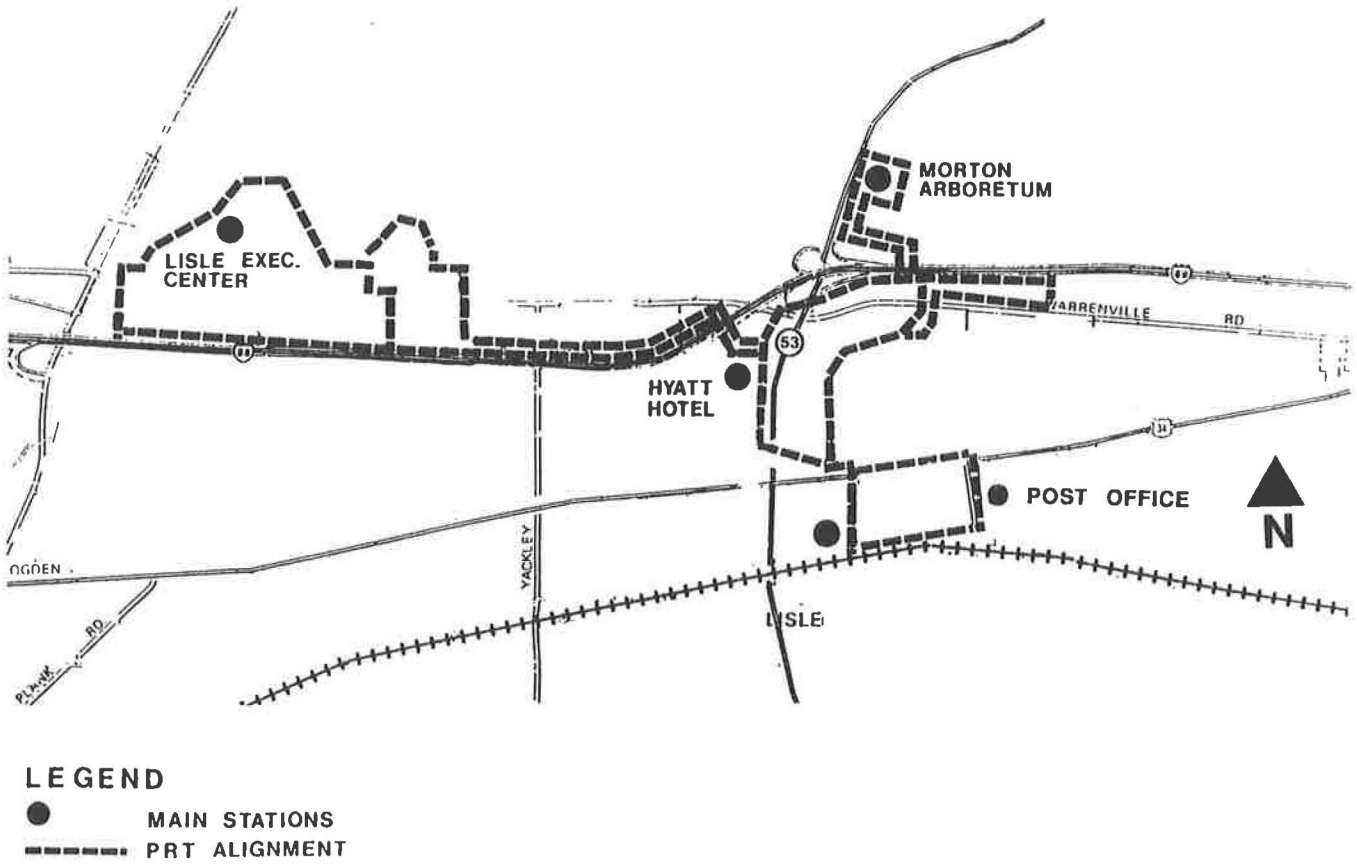
An expansion to the east would provide access to Northbrook Court, which is located approximately 1 mi from the proposed Lake-Cook Metra station. This major retail shopping center would be accessed along the northern edge of the Tollway Spur right-of-way. The distance of this PRT loop is approximately 2.6 mi.

### *Lisle PRT Site*

Lisle proposes a core route approximately 2.5 mi in length, extending north from the Metra Burlington Northern train station. It serves downtown Lisle, portions of three office/research developments, the Hyatt-Lisle hotel, and a full-service automobile dealership complex. The project site is generally bounded by the Metra BN line to the south, the East-West Tollway to the north, Route 53 to the west, and the Corporetum property to the east. Major traffic generators include the Arboretum Lakes development, the Corporetum office campus development, the Hyatt-Lisle, and the Lisle Auto Plaza car dealerships. The initial demonstration system could accommodate 7 to 10 stations.

Lisle has also identified three primary expansions and seven other potential extensions to the initial system. The first primary extension extends the demonstration system farther west to serve office development along Warrenville Road and extends north across the East-West Tollway to serve the Morton Arboretum. Major office tenants located within this service area are R. R. Donnelley Company and ABS/Combustion Engineering. The length of this extension is 1.9 mi.

The second primary extension crosses the East-West Tollway and serves primarily office and multifamily developments to the west along Warrenville Road. This route serves the Arboretum Villages Apartments, the Westwood of Lisle development, the General Accident Insurance Company building, and the Corporate Lakes development, whose tenants include Pansophic, Van Den Bergh Foods, and AT&T. This




**LEGEND**

● MAIN STATIONS

▬▬▬ PRT ALIGNMENT

**FIGURE 2 Proposed site plan for Lisle.**

extension is 2.9 mi long and potentially serves four to seven stations.

Among the other possible system extensions, Lisle has proposed extending the system into Naperville along the Warrenville Road/I-88 corridor and into a light industrial area south of the East-West Tollway that includes a Federal Express distribution center.

*Rosemont PRT Site*

Rosemont proposes a core PRT system of approximately 2.2 mi, extending to the north and south of the Northwest Tollway and I-190 O'Hare extension along River Road. It is composed of a one-way, figure-8 system that links a concentration of uses in the heart of the village, the Rosemont O'Hare Expo Center, and the Pace/CTA station stop and parking lot at River Road. Hotels located in the initial PRT service area are the Hotel Sofitel, the Hyatt Regency O'Hare, Marriot Suites, Westin Hotel, and Radisson Suites Hotel. The site plan includes elevated and grade-level walkways to link PRT stations with surrounding buildings and to link buildings together. All seven PRT stations proposed for this initial site are standardized, three-level, free-standing structures.

Rosemont proposes three alternative expansions of approximately 2 mi each. The first alternative, known as the West Expansion, consists of a 1.75-mi round-trip loop extending into O'Hare Airport. PRT would connect with the O'Hare Peoplemover system. The Peoplemover system is presently under construction and will link remote parking with the new International Terminal and all domestic terminals.

The second and third alternatives are known as the North Expansion. The first phase of the North Expansion consists of a 2.04-mi round-trip loop extending to Higgins and Devon to the northwest of the initial system. The second phase of this expansion consists of a 2.65-mi round-trip loop extending north to the Rosemont Horizon.

The first phase of the North Expansion would serve primarily Des Plaines and Rosemont office developments along Devon Avenue and Higgins Road. Some of these developments include the O'Hare Office Center, a Xerox office/warehouse facility, the Orchard Point Office Center, and the Executive Estates condominiums. The second phase of the North Expansion would serve development primarily around the Rosemont Horizon. Using right-of-way along the Wisconsin Central Railroad and along Higgins Road, this expansion would serve Des Plaines single-family residents, the Rosemont Horizon, O'Hare Corporate Towers, O'Hare International Office Center, and various hotels.

*Schaumburg PRT Site*

Schaumburg proposes a 2.15-mi PRT demonstration system serving a development centered around the 2.3 million ft$^2$ Woodfield Shopping Center. The system serves the west (Nordstrom and Lord and Taylor) and the South (Sears) side of Woodfield. To the north and west of Woodfield, the pro-

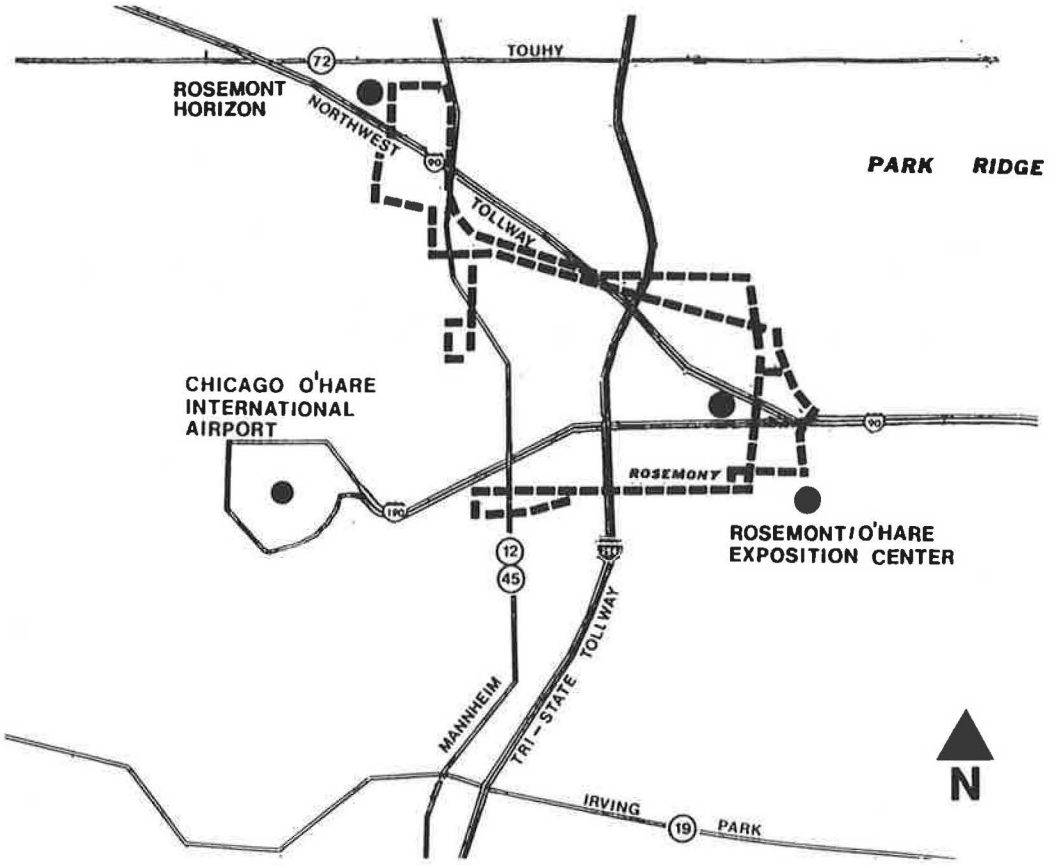



**FIGURE 3 Proposed site plan for Rosemont.**

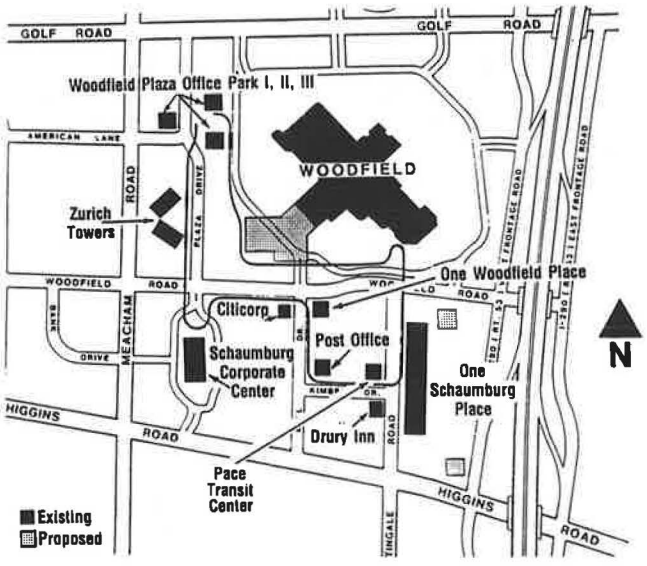



**FIGURE 4 Proposed site plan for Schaumburg.**

posed system passes the Woodfield Lake Plaza office triangle, Zurich Towers, and Schaumburg Corporate Center. From here, the route turns east linking two more office towers with a proposed Pace Transit Center and a new retail center called One Schaumburg Place. There are eight stations proposed for this initial system.

Schaumburg proposes two expansions, each about 2 mi in length. One expansion travels south along Martingale Road; the other expansion travels through Unocal property to the north. The Martingale PRT extension begins at the Pace Transit Center located at the demonstration route's southeastern terminus. Traveling south on Martingale Road, the route passes three hotels, several restaurants, and 2 million ft$^2$ of office space. Several hundred residents also live within a short walking distance of this expanded route.

The Unocal property expansion would circulate through 235 acres of mostly undeveloped land owned by Unocal Corporation. This undeveloped land offers the opportunity to integrate PRT stations directly into the design and construction of new office complexes. A Hyatt hotel and 0.5 million ft$^2$ of office space presently exist on this property, and

Schaumburg has approved 3.6 million ft² of additional office development plus retail for this area.

Schaumburg also proposes a future PRT network that would link Schaumburg with Hoffman Estates and Elk Grove Village. The network would serve the nation's largest industrial park in Elk Grove Village and the new Ameritech and Sears headquarters development in Hoffman Estates. Both Hoffman Estates and Elk Grove Village have endorsed Schaumburg's proposal as the logical first leg of the network.

### PRT Applications in Northeastern Illinois

Collectively, the community site plans address one of four possible types of applications:

1. *City-to-suburb commute.* Suburban travel demands tend to be too dispersed to handle them efficiently with normal bus service. Pace presently meets some trains at some Metra stations to take Metra passengers to their final suburban destinations, but usually this service is limited. PRT is proposed to connect directly with Metra train service in two of the four site plans. Metra would serve the longer "reverse" portion of a journey in the morning, and PRT would finish the trip. PRT could offer a distinct advantage over Pace service by providing all-day, on-demand, direct service to a variety of suburban locations. Additional Metra service would make this city-to-suburb service even more attractive. Two sites include light industrial development that currently attracts workers living in Chicago.
2. *Suburb-to-suburb commute.* All the proposing communities propose deploying PRT to serve this type of trip. Every proposed site has at least five Pace routes that would connect with PRT and usually begin in some other suburban community. Similar to the reverse commute, PRT would serve the final leg of a longer regional trip. But in this case, Pace instead of Metra would serve as the primary carrier. As an example, a husband and wife could take a bus to a Metra station. One spouse travels downtown to work, and the other takes PRT to a suburban work location. Alternatively, the same couple might drive their car to a Metra parking lot and complete their respective journeys. The husband might return early from work using PRT, travel home to complete household chores, and return to the train station later that evening to pick up his wife.
3. *Intrasite circulation.* All the proposing communities also propose using PRT to circulate and distribute passengers within their own community as well. Typical journeys include work to lunch and back; work to health club and back; work to shopping either during the lunch hour or after work; train station to automobile dealership; hotel to office and back; remote parking facility to Metra station; remote parking facility to regional arboretum; hotel to convention center; or workplace to workplace for business meetings. The communities believe PRT may serve the kinds of trips that currently are taken by private automobile, rental car, or hotel limousine or are not taken at all because of congestion or the logistics of automobile travel.
4. *Goods movement.* At least one site has a post office and Federal Express distribution center close to the proposed site alignment. With a special station designed for these and other similar facilities, PRT could be used to distribute and collect letters, packages, and other business parcels to and from surrounding office developments. PRT would not be subject to the same surface congestion as other truck delivery services and could open up new markets for message and catering services that typically offer over-the-road delivery services during the off-peak hours.

Ultimately, serving these kinds of trips are only a means to a larger goal—increasing trip choice, increasing regional mobility, spurring new, more efficient development, and increasing the region's prosperity and productivity.

## CONCLUSIONS

Innovative technologies sometimes require innovative methods for their development and implementation. With a clear-cut need for improved transit technologies to handle the growing and increasingly dispersed suburban travel demands, and in the absence of major private investment and well-defined markets, PRT research and development required such an approach. This paper has summarized the RTA decisions and institutional process that have shaped RTA's PRT Project.

Conducting research and development, and developing a new mode of public transportation, is a risky enterprise. There are no guaranteed payoffs. And by no means is it clear whether RTA will move beyond the initial PRT system design phase. There are technical, institutional, and financial hurdles still to be overcome before any further phases can begin. But the process of designing a research and development effort that attempts to extract a new technology from the private sector while minimizing the public exposure may be worth the risk. After all, RTA thinks that if it does not try, what is at risk is the economic future of Northeastern Illinois.

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