

J. Edward Anderson, Ph.D., P. E.
5164 Rainier Pass NE
Fridley, MN 55421-1338

Mayor Ron Tran and Members of the City Council
City of Milpitas
Milpitas, California 95035

Dear Mayor Tran and Members of the City Council:

Rob Means has invited me to be a member of the Board of Directors of the organization, LoopWorks, that he is setting up to manage the construction and operation of a PRT system according to plans I have developed. A review of the history seems appropriate: In 1953, two transportation engineers (Donn Fichter, working in Chicago and Ed Haltom, working in Dallas) were considering the need for rail systems that were elevated to get away from the traffic of the city. Both, in different ways, saw the need to reduce the cost of the guideway. Instead of the large vehicles of conventional rail systems they proposed using the smallest practical size vehicles fully automated to eliminate the need for drivers. These 2 factors, low cost guideway and automated driving, could drive the cost of a well-designed guideway down by 20:1. However, using such small vehicles and obtaining adequate capacity, the stops could not be online as they are in a conventional rail system but offline as they are on a freeway.

These two ideas: very small automated vehicles and offline stopping define PRT.

In the late 1950s and early 1960 several other inventors came up with the same ideas, one or more of which caught the attention of a Milwaukee Congressman who drafted a paragraph that appeared in the 1964 Act of Congress that established the Urban Mass Transit Administration (UMTA). This paragraph ordered studies be done of the new ideas. In 1967 UMTA, then in HUD, awarded 17 studies at \$500,000 (\$3.8M adjusted for inflation) each to a major corporation or research institute. The results were published in a report *Tomorrow's Transportation: New Systems for the Urban Future* that caught the attention of many companies in the United States and abroad. One of these companies was The Aerospace Corporation in El Segundo, California. One of its Vice Presidents, Dr. Jack Irving, picked up on the idea quickly and in 1968 formed a group of outstanding systems engineers to investigate.

There are many ways to design a PRT system, almost all of which we found to be lacking in one way or another. In 1970, while at the University of Minnesota, I was asked to coordinate a group we called the "Task Force on New Concepts in Urban Transportation." We had exam-

ined every PRT concept then available and concluded that Dr. Irving's system¹ was by far the most promising. There were three ideas that made it so:

1. Use vehicles small enough so that they are occupied either by one person or a very small group traveling together by choice. In studies we did around 1980 for Indianapolis, women's groups immediately saw that larger vehicles, in systems called "Group Rapid Transit," which could be occupied by strangers, would not be acceptable.
Ridership with the smallest vehicles would be much higher.
2. Use a vertical chassis to permit the design of the smallest, least expensive guideway. Aerospace was the only company that did this, likely because it requires a bit more sophistication in structural design than other PRT developers possessed.
3. Use a propulsion system not dependent on friction at the running surface. In 1968 when Dr. Irving began his PRT work, linear induction motors (LIMs) were not well developed, so he invented a pulsed D.C. motor, but it required magnets in the guideway.

By 1980, early problems with LIMs had been solved, so that is what we use – thus avoiding expensive magnets in the guideway. All other PRT systems use rotary motors that depend on friction at the running surface, and result in headways of 6 seconds or longer. That gap is too long to be useful to San Jose. Thus, in Aerospace Corporation studies of Automated Transportation Network (ATN) systems (a new name for PRT) for San Jose in 2010-2012 the conclusion was reached to reject all the then operational PRT system because they all used rotary motors.

The Aerospace Corporation, having finished their two-year study for San Jose, held a workshop on ATN systems on June 28, 2013. I found that I was the only person that represented a specific PRT system invited, and to my surprise they gave me the award shown on the next page.

I have compiled my work on PRT in a 1500-page book in three volumes. The first volume can be found on www.advancedtransit.org/Library/Books. The other two volumes will be made available once the project is initiated. More of my papers and a book *Transit Systems Theory* can be found at that URL. My job will be to act as an adviser for the project.

¹ Irving, J. H., Bernstein, H., Olson, C. L., and Buyan, J. *Fundamentals of Personal Rapid Transit*, Lexington Books, D. C. Heath and Company, Lexington, MA, 1978.



I look forward to working with the City of Milpitas.

forward to

Sincerely yours,

Handwritten signature of J. Edward Anderson in blue ink.