

History of the Advanced Transit Association (ATRA) Year by Year

by J. Edward Anderson, first ATRA President.

1995 – The Twentieth Year.

The ATRA annual Board of Directors meeting was held on January 27, 1995, in the Café Paradiso in Washington, D. C. Twenty-three ATRA members and 6 others attended. Hon. Dr. Byron L. Johnson was reelected President and Dr. Jerry Kieffer was elected Chairman.

“Steve Gluck, Director of Strategic Systems at the Raytheon Equipment Division, briefed the meeting on his company’s progress on the development of a PRT prototype. He stated that the concept design was complete and the detailed design process was in progress. The operational prototype was to be ready by the 4th quarter of 1996 and the demonstration in Rosemont, Illinois, in 1999. Looking beyond the requirements of the RTA project to the future marketability of Raytheon’s PRT design, he stressed that his company foresees design evolution to cut both capital and O&M costs through size reduction and less costly methods of easing the problems of snow and ice accumulation on the guideway. He hoped that system capacity could be increased by reducing the current planned 2.5 second headway to one second. He said that in time PRT can be operated without a subsidy.”

Dr. Kieffer commented that “one of ATRA’s long term objectives was to encourage broader awareness among policymakers, the media, and the public, of the strategic need for low cost, high-service modes of intra-urban transit. An ATRA technical committee reported in 1989 that PRT had great promise of meeting this need and was technically feasible. However, while this report was widely circulated with good effect, ATRA recognized the need for readily understandable graphic and media displays that could illustrate what PRT would look like and how it would work in a variety of applications.”

A one-hour TV program was produced with cost support from Raytheon Company and ATRA, and technical development from Aurora Higher Education Media Center in Denver, Colorado.

A brief but active discussion developed on ways ATRA could encourage more interest in promotion of lower cost, higher service transit options for meeting the mobility needs of badly underserved parts of the world’s metropolitan areas. Specifically, the attendees discussed a strategy of promoting this objective through participation in, or co-working with, other transportation-related professional and other organizations. A number of suggestions were made as to organizations and their leaders. The Chairman said that the officers would follow-up on the suggestions and keep the Association advised on progress.

On August 16, 1995, Chairman Jarold Kieffer wrote a memorandum to the ATRA Executive Committee on the ATRA project: Minimum Essential Requirement for PRT. He said that ATRA could follow up on its 1988-89 PRT assessment report and perform a further service:

- By helping policymakers understand and focus upon the key unmet transportation needs in the world's urban/suburban areas – lack of service-effective non-road-bound transit that can be low enough in cost to permit, over time, its deployment in medium/lower density, traffic congested areas that have no prospect of being served by high-cost conventional modes of transit;
- By helping identify the minimum essential requirements for PRT specifications, taking into account very low cost (capital and O&M), mechanical and all-weather reliability, safety, effective service capacity, and beneficial environmental impacts; and
- By promoting wider understanding of ATRA's findings among policymakers and transportation and land-use consultants and planners, and to encourage the interest of investment capital.

Dr. Kieffer stressed that “beyond the value of helping to shape critical thinking on the PRT specifications, the project would have the value of illustrating to its members and others ATRA's continued leadership in pressing for service-effective, very low-cost modes of urban/suburban transit. Other than Byron's TV project last year, we haven't had a clear ATRA leadership project for several years.

The reason was that, with the high hopes we all had two years ago about the Raytheon/RTA contract to test a Taxi-2000-type PRT system, many ATRA members assumed that the specs would evolve pretty closely in line with Taxi 2000's patents, etc., and that many of the cost, headway/capacity, service reliability, etc. issues we all argued about for years finally would get resolved. After a successful test program, we assumed further that an effective demonstration would follow and inspire development of a thriving market. I for one assumed that, in such a scenario, ATRA's role would shift to informing policy makers, consultants, etc., that PRT was now a proven option they could seriously consider for implementation in their communities. Eventually ATRA could dissolve. Most of us never imagined that Raytheon (with a firm contract and its deadlines, funds available, and a concept that won over the RTA) would add over an extra year to its development schedule (at high cost) and wind up abandoning Taxi 2000's patents and cost indications, and devise a rather different much heavier and costlier system, probably with much less market attractiveness. So, ATRA's work must go on, and we need a solid leadership project to fly from our masthead and to rally member interest and attract new members. The 1988-89 report certainly had that outcome, and we actually had a net revenue gain from report sales and new memberships.”

The 4th International PRT Conference

ATRA's officers are considering the strong possibility that ATRA will join with the University of Minnesota's Intelligent Transportation Systems Institute in sponsoring the 4th International

PRT Conference in September 1996. The ATRA Report on Minimum Essential Requirements for PRT systems would be one of the key papers given attention at the Conference.

My work on PRT during 1995.

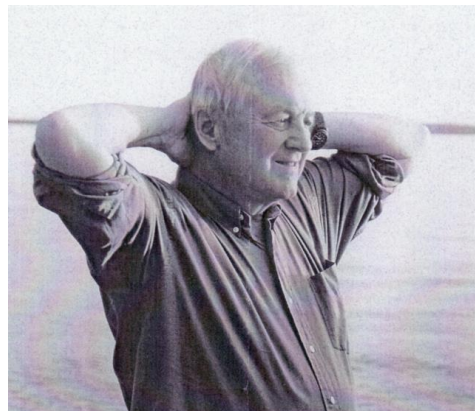
In early January, I wrote a letter to Steve Gluck expressing my concerns about the heavy vehicle and guideway. He inquired of several Raytheon people including Dick Daly of the market acceptability of the current PRT 2000 design. As I mentioned, none of these people had any of the kind of experience needed to answer Steve's question, but that did not stop them from responding. Daly responded and in a cover letter to me said "I feel quite certain that you will disagree with my comments but they are my thoughtful response to his question." Dick commented that he was "not overly concerned with the size of the guideway" but was concerned with the open trough, which would require that the guideway be heated. He further commented: "The PRT 2000 system, as now envisioned, continues to incorporate *the* essential technical and marketing features that Taxi 2000 brought to Raytheon and that are vital for commercial success." What essential features were retained, I wondered. I saw none!

When I commented to Dick that his statements were not the view of the Taxi 2000 Corporation, he retorted that they were because he was CEO. I was shocked. When Dick came on board as President, I was Chairman and CEO. What happened? During the fall of 1994 Dick had worked with his lawyer Nick Stone on reestablishing Taxi 2000 Corporation as a Massachusetts corporation. They placed in the by-laws the statement that the President was the CEO. In the great rush of activity that fall I had missed that. So, he was the CEO! I will describe a little later how we handled that. Dick's letter to Steve Gluck, to which I responded, was delivered on January 17th and he sent it to me on January 20th. This occurred while I was in discussion with Gene Stockton about a second-generation design. As I have mentioned, Gene was a vice president and senior Equipment Division Manager. A couple years before, he had led a detailed review of the Taxi 2000 design and came out as a strong supporter. He did not buy Dick's views. The views Dick had expressed were likely motivated by his desire to get PRT planning contracts with Raytheon.

I was back in Boston January 30-February 1 in discussions with Gene Stockton and other engineers. I was out there again on February 8-10, during which time I stayed at the home of Dick Radnor, who had worked with me on PRT control since 1987. He was appalled at the direction PRT 2000 was going and totally supportive of Gene Stockton's plan to work with me on a next-generation PRT system. I was back again at Raytheon on March 1-3 to work on various aspects of the new PRT design, and this time stayed at the home of Harvard Professor Chuck Harris. One product of my consulting work for Raytheon was a 42-page memo dated March 24th entitled "Is a Vertical Suspension System Needed?" I showed that under obtainable conditions, it was not, which reduced the cost of the vehicle. On April 20th, I submitted a 19-page memo entitled "Attainment of Necessary Safe Minimum Headway in PRT Systems," in which I did my first detailed failure-modes-and-effects analysis and derived attainable design requirements for safe, short-headway operation. For Raytheon, however, I learned that all of this was of no use since they had so overspent their budget on the big system that they had no funds to develop a new design. This

work was, however, of much value to me in later years even though at this time I could no longer market my system independent of Raytheon.

Before going to Boston University in 1986 I had been a regular attendee at Citizens League breakfasts, which were held at the University Club in St. Paul. We heard outstanding talks by various Twin Cities personalities. The third time I attended was on March 14th. The attendees sat at about a half dozen round tables, each accommodating about eight people. This time, the person who sat directly across from me looked familiar and apparently I to him. I mentioned my name and he his. He was Shef Lang, i.e., A. Scheffer Lang, who I had met about 25 years previously when he was Professor of Transportation at M. I. T. It is amazing how one retains an image of a face. I show a picture of him here. During the early 1960s he and a colleague, Richard Soberman, had written a book entitled *Urban Rail Transit: Its Economics and Technology*. They had concluded that conventional rail transit was no match for the automobile and, while not being very specific, hinted at the need for a new mode. Pretty much based on this book, the Transit Development Committee of the Twin Cities Metropolitan Transit Commission had decided to include Shef in a visit to inspect several new automated transit systems, and they invited me along at their expense. Most of Shef's career had been in railroad economics, and he had served a term as Federal Railway Administration in the Johnson Administration, so he was well acquainted with many of the top transportation people in the country and he was one of them. As we talked after the Citizens League breakfast, we agreed to meet for lunch that same day. The more we talked the more we saw in each other the same vision.



At about this time Dick Daly informed me that, the corporate by-laws established by the Commonwealth of Massachusetts require that a stockholder meeting be held every year to elect directors. Such a meeting for the Taxi 2000 Corporation would have to be held in May. I discussed this requirement with Shef and with our company lawyer Dick Hackett of Gray Plant Mooty. Shef agreed to serve as a Taxi 2000 director and Hackett explained exactly how we should proceed. Soon after, Dick Daly announced a stockholder meeting on May 22nd and ask for proxies. This being the case, it was logical for me to ask stockholders to give me their proxies. I called stockholders, explained the situation, and asked enough of them if they would give me their proxy until I was assured that I had more than 65% of the votes – University policy prevented them from voting. I needed to propose a slate of five directors. We needed three more. Bert Press, whom I have mentioned had been providing me with legal advice, agreed to serve. So did Ed Rydell, who was among the first group of potential investors we had talked to way back in 1983. We needed a fifth. So, I asked Mike Loeffl, a Vice President of Davy McKee, who had become a great friend. He agreed.

On April 4th, I mailed out our request for the proxy based on this slate of directors, and the proxies began coming in. By early May, Shep Arkin, who was then a director with Dick Daly, called me to ask what was happening – proxies were not being returned. At that point I had enough

votes to tell him why. The stockholders' meeting was held at the corporate office in Lynnfield, Massachusetts. Not wanting to appear by myself, I asked my good friends Chuck Harris and George Anagnostopoulos to join me. Three of us attended the meeting at 1 pm on Monday, May 22nd. You can imagine the expression on Dick Daly's face when I presented all the proxies. I had the votes and a new Board of Directors. We held the first meeting of our Directors on May 30th and sometime later Shef was elected Chairman of the Board. At this first meeting I was elected President & CEO. Taxi 2000 Corporation had a substantial portion of the funds we received from Raytheon in its Boston bank account. I now had these funds transferred to a bank in the Twin Cities where they were available to us in our efforts to promote the further development of the kind of PRT we had envisioned. While we were obliged to involve Raytheon because we had given them exclusive rights to the patents, we reasoned that if we got a sale, there would be no problem giving them their due.

Because of the events, the Swedes had been thinking about a new design that looked very promising to me and may have used carbon-fiber composite guideways. Also, my good friend Ray MacDonald has been working on a new PRT design in Korea with a modest-sized Korean firm. He sent me their brochure and invited me to Korea to give lectures on PRT from July 8 through 16th.

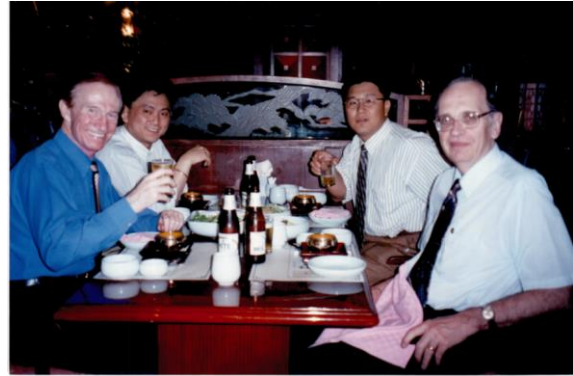
The Raytheon Equipment Division managers had sold their corporate management on the idea that PRT would in a decade be a multi-billion-dollar business, and they were under a great deal of pressure to deliver a product they could sell. Seattle-Tacoma Airport people told Raytheon that they should return to the Taxi 2000 design or forget the State of Washington.

During the winter of 1995 I was invited to give a two-week course on PRT at Chalmers University in Gothenburg, Sweden, from June 6-16, 1995. Cindy and I left Minneapolis on May 31st, just a day after the first formal meeting of our new Board of Directors. We arrived in Gothenburg on Thursday, June 1st. My hosts were Dr. Ingmar Andréasson and Hakan Janson, who was the Ministry staff person who had sponsored my visit to Linköping in January 1994 and also the 1995 course.

One week after we got home, I was on an airplane headed for Seoul, South Korea. I spent nine days there as a guest of Kim In Key, president of Woo Bo Engineering. Ray MacDonald was there too. Here the three of us sit at a nice dinner. Ray had arranged a series of meetings in which I gave lectures almost every day, and discussed PRT planning and technology with the staff of Woo Bo. Kim's son



Nam Ho Kim was with us the whole time. In this second picture, Nam Ho sits at the right next to me, and one of his colleagues sits on the left next to Ray.



Back home, on the week of July 25-30 we had the pleasure of the company of Fran and Jerry Kieffer and took them sailing. While the Kieffer's were with us, our Board of Directors and close friends met at Ed Rydell's home and there I took this picture. From left to right we see Shef Lang, Ed Rydell, George Anagnostopoulos, Chuck Harris, Tony Strauss, Jerry Kieffer and Bert Press.

On August 14th, I flew to Boston to close the Lynnfield Taxi 2000 office. Chuck Harris and George A accompanied me to take possession of all the Taxi 2000 documents, which I then had shipped to my home in Fridley. The next day I drove to Raytheon in Marlborough to meet with Steve Gluck. At that time, Taxi 2000 Corporation had a contract with Raytheon for \$1.8 million in engineering, but Raytheon had under the contract the right to cancel it at their discretion. We did not see much of it.



Roy Moore had resigned from the company Sky Highways, Inc. that he and Liz Sroufe had formed to market Taxi 2000. He then formed a group he called The Jefferson Group to introduce my kind of PRT into the Seattle Area. He invited me, George A, and several others to an organizational meeting on August 18th. Since I was out west, I decided to stop on the way back at the Idaho National Engineering Laboratory in Idaho Falls. My reason was that one of their engineers, John Dearian, had invented a people mover he called Cybertran, and there was growing publicity about it. He proposed to use 20-passenger vehicles, and proposed to have stations on by-pass rails just like PRT. I did not think of it as competition, but was interested in every new transit development program. He showed me a test model of his system. I asked him how his switch worked, but all he did was mumble. That was typical of many inventors of new transit system ideas – they left the switch to later. The switch is, however, primary to the design. Dearian initiated his design in 1981, the same year I initiated my design, so we were in a way comrades.

On August 29th, I had lunch with Gordon Amundson, who was a program coordinator in the Department of Conferences at the University of Minnesota. He had run our three PRT conferences in 1971, 1973, and 1975 and was now interested in sponsoring a new PRT conference with me as chairman. Shef Lang was at that time Chairman of the Executive Committee of the University of Minnesota's Transportation Studies Center, so it was easy to get the Center's sponsorship. The Center had an Institute for Intelligent Transportation Systems, directed by Dennis Foderberg, who was more than happy to offer his institute as the conference's main sponsoring organization.

He agreed to front the pre-conference expenses so we were on our way. I sent out letters of invitation to join our Conference Committee and before long had 39 confirmed members from not only the USA, but from Sweden, The Netherlands, Spain, United Kingdom, South Korea, Finland, France and China. We formed a Steering Committee that consisted of Amundson, Foderberg, me, Ingmar Andréasson, George A, Chuck Harris, Jerry Kieffer, and Bob McLane, President of CPRT and an associate when I worked at Honeywell. We met often by phone and fax, and occasionally the U.S. members came to Minneapolis for all-day meetings. The first such meeting was held on Friday, September 22, 1995. We set the date of the conference as November 18-29, 1996, and mailed to everyone we thought would be interested a Call for Papers.

On the 21st of September, I got a phone call from Martin Lawson from Bristol University in England. He had called me previously to tell me that he had received a grant of one million pounds from the British Government to work on automated transit, and that he had decided to invest it in PRT. At the time of that first call he said that he anticipated that he would purchase the system coming out of the Chicago studies. But on this call, he told me that he did not like the Raytheon system, so his university design group decided to start from scratch with a new design. It was not, however, completely from scratch because he had access to the reports of the PRT design work done at the Royal Aircraft Establishment in the late 1960s, and was influenced by that work in the design he was developing. He said that his project was going very well and that he had funding for 8 to 10 people. The main reason he called was to tell me that he accepted my invitation to be a member of our conference committee for the 1996 PRT Conference. Lawson's work led later to the PRT system he called ULTra.

Sometime in September 1995, my HUD friend Andy Euston, whom I first met at a conference on Sustainability issues at Harvard in 1987, called to invite me to a two-day workshop on Sustainable Cities on October 21-22. He was the lead person on this topic in the U. S. Department of Housing and Urban Development. The workshop was held at Slippery Rock University at Slippery Rock, Pennsylvania, which is about 40 miles north of the Pittsburg International Airport. Andy invited me to give a 10-minute presentation on PRT. One of the attendees at the workshop was a planner, David Shaw, from Cincinnati. He was most interested and took home some of the material I brought as handouts including a video. One of the people he showed this material to was Dr. William Charles Roth, a marine biologist. Doc Roth, as he was called, was following a debate going on in Cincinnati about new means of transportation, and was so excited about the potential of Taxi 2000 that he dropped what he was doing and devoted the next three years of his life to developing his own presentation and educating as many people as he could in the Greater Cincinnati Area, which includes cities on the Kentucky side of the Ohio River.

During that time, an influential developer, Bill Butler, had challenged a plan offered by the Ohio Kentucky Indiana Regional Council of Governments (OKI) to build a conventional surface-level rail system called "light rail." He was quoted in the local papers as saying emphatically that it would not be possible to reduce congestion by means of a surface-level rail system – it would be necessary to elevate. A Northern Kentucky organization called Forward Quest, through Butler's influence, formed a committee they called the Advanced Elevated Rail Committee (AERC) that began gathering information on possible elevated rail systems of all known kinds.

Also during October 1995, the Chicago RTA distributed its *PRT Update*, the first page of which is shown here. It was displayed with a lot of fanfare, but knowing that the vehicle weighed over 5000 lb and knowing the size of the guideway Raytheon had designed, it made me sick to my stomach. I doubted very much that it would find much if any market.

One of the critically negative aspects of our experience with the Chicago RTA was that Gayle Franzen resigned as Chairman at about the same time that Walter Stowell resigned as General Manager of the Raytheon Equipment Division. My two strongest supporters were gone, and I believe that if they had stayed on the Raytheon project may have succeeded.

On Friday November 3rd, George A, Chuck Harris, and Jerry Kieffer arrived for an all-day planning meeting for the 1996 PRT Conference. My time during those months was taken up with meetings of the Taxi 2000 Board of Directors; calls from Roy Moore, Ray MacDonald and other engineers and planners; meetings of Citizens for PRT; etc.

PRT Vehicle, Station Unveiled in Rosemont; "Impressive," "Spiffy," "A Dream Come True" Say Guests and Media

With more than 100 guests in attendance including RTA Chairman Thomas J. McCracken, Jr. and Executive Director Laura A. Jibben, the RTA's Personal Rapid Transit (PRT) project took a "giant leap" forward to implementation when the PRT vehicle and prototype station were unveiled August 29 in Rosemont, Illinois. With the swipe of a card in a reader greeting the "user" with a warm "welcome to PRT," McCracken not only opened the door to the PRT vehicle but to the first new transportation technology in more than 50 years. Joining McCracken and Jibben at the ceremonies were C. Dale Reis, senior vice president and deputy general manager of Raytheon Electronic Systems; Gayle M. Franzen, current chairman of the DuPage County Board and former chairman of the RTA, who first initiated the agency's involvement in PRT; and Don Stephens, mayor of Rosemont, where construction of the world's first PRT system is planned.

Guests also included RTA Board members, area mayors and officials, representatives from local business groups and a variety of interested spectators. All had the opportunity to walk into a PRT station exhibit approximately 30 feet by 40 feet featuring a full-size



Welcome to PRT, the first new transportation technology in more than 50 years.

vehicle and station platform, ticketing equipment, and a computer-enhanced backdrop of Rosemont illustrating how the PRT system will look in operation. They were also able to sit in a PRT cabin.

The unveiling of the four-passenger PRT vehicle and station mark two important milestones in the development of PRT, which was launched by the RTA in 1990. PRT is being developed as a joint venture by the RTA and Raytheon to meet transportation requirements in a variety of applications. The RTA has committed \$18 million to the project. In return for

its investment, the agency will receive a percentage of profits from the sale of the PRT system anywhere in the world for a period of 25 years.

PRT offers non-stop, origin-to-destination, on-demand transit service utilizing light, unobtrusive guideways. Because it's an elevated, electric-powered conveyance, PRT does not contribute to ground-level congestion or to air pollution. And, by reducing the number of cars on the road, it can help reduce gridlock. According to data gathered by Raytheon, PRT can cost three times less, on

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