

handicapped, and the young. In the guided tour of Arcadia during the conference in 1973 in Rochester, on the DRT bus I was on, we were listening to the open mike of a report from another bus that was delivering a 7-year-old school kid to her home. The bus driver said to the dispatcher, "Susie's mother is not home. What do I do with Susie?" The dispatcher replied, "Keep Susie, and I'll try to find her mother." Four minutes later he came back on, "Mother's home. Take Susie home." That is trivial—and terribly important.

#### *General Discussion*

**JOE KATZ:** Toronto seems to be held up as an example of a failure. The thing that happened is that the minister of transport changed, and the new minister did not realize the kind of experiments that had been set up. Another experiment had been set up close to Toronto and penetrated half the market.

I do not think we are yet in the adolescent stage. We are still in a baby stage, and I think we should keep our sights much higher. About 1960 I suggested one of the first Dial-A-Ride experiments in Washington as part of the transit system there and it took about 10 years for it to start. We should consider all the experiments now as a means of amassing experience and not be so quick to judge them.

**KARL GUENTHER:** I apologize to anybody who took affront about Toronto. The point I was trying to make is that there was a grand plan that was not going to be carried out as it was originally conceived. The reasons (and I have done considerable work on this) are much more complex than a simple change in ministers. They have to do with ridership, productivity, costs, and all sorts of social and labor implications as well as the change of ministry. The point is to learn what was done so that perhaps the same things can be corrected the next time. Toronto and Ontario are still the hub of what is going on in DRT.

**AARON ISAACS:** Does anybody have cost information on voice radio versus digital communications? In one of the conference sessions, someone said that digital communications were cheaper.

**DANIEL ROOS:** I made that comment based on a limited test that was carried out by Karl Guenther at the Ford Motor Company and with Motorola in Batavia, observations on the operation of the Rochester system, and also some speculations and projections of what the impact of digital communication might be, given the availability of a computer system.

I recall in the Batavia experiment that there was an indication of a productivity improvement of 10 or 11 percent. An economic analysis indicated that either 13 or 14 vehicles would be the point at which it was more economical to go to digital communications as opposed to voice communications. That does not take into account any of the indirect benefits of digital communications, such as fewer errors and safer operation. The Rochester system is a difficult one to evaluate from that perspective simply because digital communications were used from the start. In Batavia, we started with voice and switched to digital. We have not really had the opportunity to analyze the difference. The indications are certainly that, if a computer is introduced, the economics would improve even more markedly because the computer would directly transmit the message to the vehicle and thereby eliminate to a large extent, but not totally, the need for human intervention.

I believe that figure of about 13 or 14 is reasonably accurate. But several things should be borne in mind. What type of digital communication system is it? That is, is it just a printer or an alphanumeric delay device, which is more expensive? In addition, the price of electronic technology is dropping markedly. You can now buy

desk calculators for \$35 or \$40. The same is true of computers and communication equipment. So we have a situation that will get better because, although labor costs are increasing, technology costs are decreasing. Another critical point is channel availability. To get channels allocated by the FCC is difficult.

**STANLEY HIRSCH:** There is one DRT system that has been successful: That is our taxi system in Hicksville. Our average fare is \$2.15 per person, which includes trips that exceed 30 miles and the costs of capital equipment, amortization, and appreciation. I challenge any DRT system in any municipality to match those costs.

**DANIEL ROOS:** Batavia, New York, is one DRT system that has lower costs. Several Canadian systems also do. However, people got hung up with the whole question of what the costs are and what the benefits are, and I think that has gotten us into a lot of trouble. This is not to say that one should not be conscious of economics. The best illustration is the Interstate Highway program in which decisions were made solely on a cost-benefit basis for many years. A number of people now regret that those decisions were made strictly on a dollar cost-benefit analysis.

The cost of DRT service is important and so is the fare. But that is not the whole story. One has to define the system. We must be concerned about the integration of the DRT component into a larger total system and what the impacts are on that larger system. We must be concerned with social benefit. The community has to be aware of what the dollar and cents implications are, and it also has to make value judgments as to how important it is to provide service to various groups.

In September, the Rochester vehicle fleet size was increased. The cost per trip went up but now, as ridership is increasing, the cost per trip is decreasing. The average cost was \$3.30 but is going down by an average of 25 or 30 cents a month.

**STANLEY HIRSCH:** But the Rochester system only serves a small area. We serve an area of 30 miles.

**DANIEL ROOS:** DRT in Rochester is not a regional transit system. It is one component of the regional transit service. That is the point I tried to get across. If one wants to choose an isolated portion of a total system and set certain ground rules, one can reach certain conclusions. One can also set different ground rules and define systems in different ways and get entirely different conclusions.

**RONALD COUSINEAU:** As a representative of General Motors, I was confronted by a lot of people throughout the conference. So I would like to present a manufacturer's question and a challenge.

UMTA is involved with specifications for Transbus, the state-of-the-art car for light-rail systems, and has let contracts for magnetically levitated vehicles and air-suspension buses. UMTA has not talked about, has not awarded contracts, or even discussed specifications for DRT vehicles. The manufacturers had a representation of a DRT vehicle on display at the conference, and many people told me that the vehicle was not representative of their wants and needs. Therefore, here is the challenge from the manufacturers: Can you get organized to confront the manufacturers with what your wants and needs are?

The American Public Transit Association data indicate that the transit coach fleet size is about 50,000. I have done some limited research in the DRT area, and I estimate the small bus fleet to be about 1,000. The question is, What is the fleet size going to be in 1980, and what is it going to be in 1985?

**KARL GUENTHER:** I used to work for one of the big three vehicle manufacturers, and I am damned sick and tired of that question. I have heard it for 5 or 6 years. I used to get asked that question by our corporate production planning people. I used to get asked that question by our field sales people. Now, as a buyer of equipment, I found that it is necessary to find somebody who will be responsive to what you want and work with you on development of a vehicle. Our responses from the major suppliers

have been poor. But fortunately, a few people have been responsive, and some of the vehicles are giving a lower repair frequency and a lower cost per hour of operation than GM transit coaches.

I think that there is no way that either the aggregate of DRT operators or UMTA is going to be able to bring giant General Motors and giant Ford Motors into the small bus business. I am glad that there are people who are willing to take a base production and convert it into something we need. I do not think it is either the government's responsibility or the American Public Transit Association's responsibility or my responsibility as an operator to help the big 3 define a market size.

**DAVID RYNERSON:** How does one handle a large transit modal split of 30 to 50 percent? How will higher modal splits lead to more efficient, higher productivity operations?

**JERRY WARD:** We are initiating some research to understand this better. As we increase the fixed-route system (higher ridership, density), productivity goes up for both fixed- and flexible-route systems. You can plan systems more efficiently because the flexible-route system allows you to monitor designations so you can put in the fixed route a much surer demand for those elements. You probably should be able to improve a load factor, but we really do not know.

We also do not know whether we can induce those kinds of modal splits. You can only go so far on paper in predicting behavior. From then on, you have to do it and see what happens and how people react.

**SALLY COOPER:** We have high-density areas in Philadelphia where there is also low mobility. In those high-density areas we have concentrations of existing transit but, because of inability to get to that transit or fear of getting there, the situation is similar to that in suburban areas where there is no transit. Is there a federal policy to encourage demand-responsive service in high-density areas as in low-density suburban areas?

**JERRY WARD:** The best estimate we have now is that the demand-responsive systems may make more sense at higher density than we previously thought. I think it would make sense to have flexible-route elements serving high-density areas. In fact, I suspect that the downtown circulation system will end up being a combination of flexible-route elements and fixed-route elements. If we can succeed in keeping the total number of vehicles down so that traffic can flow, we can provide good service from the nonshared taxi ride to whatever one wants to buy.

I think our policy is to encourage doing what appears to make sense and tailoring the system to solve particular problems. We do not really have a policy of encouraging one approach over another.

**ROBERT McMANUS:** After the 1966 and 1967 riots and civil commotion in the cities, there was an urgent concern on the part of the administration at that time to address transportation in inner-city neighborhoods as a way to alleviate conditions. In fact, the managers of transit resources at that time were considering using the entire resource—the mass transportation resource, the capital grants resource, the planning program, the demonstration program—to address that question, not on a theoretical research-oriented basis but on an action basis.

As things quieted down, we seem to have narrowed our sights too much with respect to special user groups to the point that we seem to be talking almost entirely about the aged and handicapped. In our policy discussions now, we are changing that thinking and are eager to get some demonstrations going.

With respect to meaningful transportation service in the inner-city neighborhoods, the HUD Model Cities program attempted to get at that situation in an operational sense. The Model Cities program and other community development programs have now been merged into a block grant delivery system, and the cities themselves must now sort out how they want to use that resource. They may choose to use it for transportation ser-

vice focused on the needs of the inner-city neighborhood.

I frankly think we have gone to sleep on that issue and that at this time is a dangerous thing to do because of unemployment and the economy. But it is not so much a technical research-oriented issue as much as an action issue that can be addressed by using available physical resources and what we currently know about demand-responsive system modes.

DANIEL ROOS: Caracas, Venezuela, has high densities and extensively uses jitney transportation. Jitneys carry 40 percent of all people who use public transportation in the Caracas area. Paratransit services can play a role in the high-density areas, but we have to be realistic and mix them with conventional system services.

I think it is healthy that we are showing concern and raising questions about DRT systems. One of the biggest problems we have had in public transportation and specifically in new systems is a lack of credibility. People have been promised many things, and many of those promises have been false. In developing demand-responsive systems, we must be honest with ourselves and honest with the public.

This conference for the first time brought together taxicab people and transit people, and that was a positive forward step. My concern is that we do not get so hung up with the question of who operates these services that we lose sight of the services that we should operate. The linkage between taxicabs and traditional public transportation can be extended even further: as car pooling operations, van pooling, taxicab in its pure form, subscription bus, and DRT and then fixed route. There is quite a continuum. One could imagine some public agency tying together all of these various concepts, starting out with the car pooling program and, when the car became full, moving the people into a van. When the van became full, the people would be moved into a subscription bus operation and so on. The point is that for the first time I think we are starting to see certain commonalities among a number of ideas, concepts, and service methods that in the past we viewed separately and operated under totally different corporations.