Synopsis of Pre-Conference Papers

Joseph R. Stowers

This section offers a synopsis of the five overview papers that were prepared for and provided to the participants before the Woods Hole conference. In addition, authors of the papers had an opportunity to comment further on their themes and positions. Such comments are highlighted here, and the edited texts of their papers are included for further reference.

The authors and their topics are as follows: Effects of Energy Supply and Telecommunications on Urban Mass Transit’s Future, Sarah J. LaBelle and Martin J. Bernard III, Argonne National Laboratory; Land Use Trends and Transit Operations, Donald E. Priest, University of Virginia and Prienac Corporation, and Joseph L. Walsh-Russo, New Jersey Department of Transportation; Changes in the Economic Base of Urban Areas Implications for Urban Public Transportation, Richard V. Knight, University of Akron; Financing Public Transportation, Ronald F. Kirby, Urban Institute; and Does This Bus Go to the Future? Some Thoughts on the Future of Urban Public Transit, Joseph L. Schofer, Northwestern University.

The list of points made by the authors includes finance, paratransit, private-sector involvement, private-sector management practices, metropolitan development patterns, and energy.

First, all recognize that finance is tight at all levels of government. Users will have to pay a larger share of the total cost of public transportation. Kirby and Schofer agree on several particular points regarding finance. They agree on the basic pricing strategy that we should take and base their arguments on the objective of achieving economic efficiency. The papers do not focus on how these objectives can be achieved in practice—an area that merits more attention.

Economic efficiency suggests that peak-period fares should be higher and that fares should be lower in the off-peak for the elderly and the handicapped and for students. In general, whenever elasticities are low, fares should be high; when elasticities are high, fares should be low.

Fares should be distance-based so as to relate more closely to cost. Priest and Walsh-Russo disagree with this, however, because they are looking at it more from the standpoint of the ease of use of the system. They suggest one flat areawide fare, particularly in the context of coordinated suburban systems, with free, timed transfers that would more effectively serve current and emerging patterns of demand.

Several authors argue that revenue should be obtained directly from nonusers who benefit from transit service, i.e., all types of nearby commercial, industrial, institutional, and other intensive land uses. Research in this area is needed to determine how much they benefit and which land uses in the vicinity of transit systems benefit more, so that we can have a basis for fair and equitable determinations of their share of transit costs.

User-side subsidies are more efficient for achievement of welfare objectives in transit. Kirby puts it this way: "Don't charge less than people are willing to pay unless the objective is income transfer." Schofer says that he sees a decline in the welfare role that transit should play.

Turning to paratransit, again Kirby and Schofer join in arguing that various forms of less conventional public transportation should be supported as substitutes for portions of existing conventional services. All high-occupancy modes should be candidates for subsidy, says Kirby. Any provider should be able to participate. Do not give all the public assistance funds to one operator. Service should be diversified, states Schofer. Transit agencies should become brokers. They should contract for service and become information disseminators and coordinators. The private-sector role should be increased, Schofer argues, by trying to encourage entrepreneurs to test the market. Whenever they benefit, the private sector should be encouraged to participate in providing service and paying for their share of the benefits, Kirby argues.

Priest and Walsh-Russo maintain that private developers should be brought into joint development far more than has been done. Kirby points out that one way to do that is to involve them in potential joint development and value-capture projects very early in the planning process before routes and station locations are fixed.

More public and private cooperation is occurring now of necessity, and much more of this cooperation is needed, everybody seems to agree. How this can most effectively be achieved needs to be discussed.

Strategic planning seems to be a theme that runs through almost all papers. Strategic planning, Knight argues, should be used by cities to create their own visions of what the future of each city is going to be, and transit should have a major role in that process. Transit operators should participate in the strategic planning process that city leadership should conduct. Some kind of representative groups to pursue strategic planning that presumably should involve more than just city government and transit operators needs formation.

Turning to the topic of emerging metropolitan development patterns, several important points of potential consensus exist. Downtowns will continue to grow, Priest and Walsh-Russo argue, in cities that serve as headquarters and regional capitals. Knight argues that central business districts (CBDs) can attract development from economic sectors that are growing nationally and internationally, if they are prepared to attract that economic development. If they are not, they may not get it. LaBelle and Bernard tie the impacts of telecommunications to joint development patterns and thus indirectly to mass transit demand.

The rate of urbanization has leveled off nationally, several people point out. Smaller statistical metropolitan study areas (SMSAs) are growing, particularly in the South and the West, but generally speaking urbanization is going to remain relatively constant in terms of percentage of the total popula-
tion. What population growth does occur in urban areas will continue to be primarily in suburban areas. Suburban centers should be provided with more careful planning of service; much more emphasis should be placed on developing transit systems that focus on growing major suburban centers. Mixed-use developments are occurring in suburbs as a result of natural economic forces, but they require more planning to realize their potential and they require greater transit service. Priest and Walsh-Russo argue that many suburban centers have densities similar to those for CBDs but far less transit service, and that is a criticism of the transit industry in not recognizing these trends and opportunities and not providing the service designed to serve the pattern of travel demand that has evolved around these centers.

There are some possible areas for debate on metropolitan development patterns. Priest and Walsh-Russo argue that densities will increase slightly, and this is backed up by some careful analysis of what is happening in the marketplace in each of the major categories of land development. However, there is a need for continuing among the other authors, and probably among many in the field, that the opposite is true. The more commonly held view is that densities are decreasing and that the population is moving to the less dense parts of metropolitan areas and to the less dense parts of the country. A better understanding of what is really happening is needed to take advantage of these trends and maximize the role of transit in emerging development.

Some opposing views exist in terms of the role of technology, particularly information systems and telecommunications, in shaping land use and travel demand. Priest, Walsh-Russo, and Schofer say that information systems and telecommunications will affect transit trends to a significant, although not great, extent.

LaBelle and Bernard put together a careful analysis of telecommunications and travel, and they conclude that there is going to be very little effect. LaBelle and Bernard make an important point that should be stressed: When you look back over history, it is clear that innovations in telecommunications have tended to create increasing awareness of opportunities for business, opportunities for recreation, and so on, and they have tended to encourage longer-distance travel, and different kinds of travel. This is not a point recognized in the four other papers.

There is a significant difference in the views that the authors have of the role that transit operators should play in the future. Walsh-Russo, Priest, and Knight urge a very aggressive role for transit operators. They should be involved in development planning, zoning, and the regulation of land use and densities. Transit should play an active role in the city-building process, Knight argues, because it is a key element in the structure of urban development, and should be more so. In contrast, Schofer says more about the transit operators' role in providing service than about their involvement in land development and the planning of cities, but still suggests a role that seems to be more of a passive one, coordinative for transit operators in the future.

Energy does not appear to be a problem, according to LaBelle and Bernard. They point out that regulations to reserve fuel for transit during a shortage have disappeared and that no contingency planning is being done. Because automobile fuel economy is increasing rapidly, the energy advantage of transit has been steadily diminishing.

Several unique points that do not overlap among the authors should be highlighted for discussion. First, Bernard and LaBelle conclude from their analysis of transit and energy that the picture right now is far less encouraging than it was back in the 1970s. Their analysis is a fresh update on the energy picture, with considerable useful new analyses of trends, policy, and future prospects. It is an original piece of work.

There is a very pessimistic outlook on energy prices: LaBelle and Bernard project a range of increases from twofold to fourfold in real petroleum prices by the year 2000. On the other hand, they are very optimistic about electric energy. They project only about a 40 percent real increase to 1995, compared with a 240 percent real increase in petroleum prices to the year 2000, under presumably comparable assumptions. This appears to imply very little competition between the two types of energy.

LaBelle and Bernard present what can be characterized as a rather pessimistic comparison of the energy efficiency of transit and other modes, particularly for the long-term future. Automobile fuel efficiency is improving because of regulations, downsizing, and the effects of past gasoline price increases, and transit has not been doing very well in terms of changes in technology that yield increases in energy efficiency. They project that the year 2000 automobiles will be more energy efficient than transit. However, this analysis ignores some differences in the patterns of travel in the various modes that would have some significant effects on the comparisons. There is greater circuitry, for example, in carpooling and vanpooling. Also, energy consumed in the mode of access to each of the modes compared should be considered in any comprehensive evaluation. Finally, and perhaps most importantly, a comprehensive comparison should not ignore the differences among the locations where the travel takes place for the various modes. Their analysis is based on a comparison of modes across the country under average conditions without looking at specific corridors where mode choices might be made.

An analysis performed by System Design Concepts in Washington, D.C., takes into account all these factors, and the bus turns out to be more energy efficient than it has been shown by most other analyses. Most access to the bus is not by single-person automobile, as is the case with carpools. Circuitry for bus travel is less than for most other multiple-occupancy modes. Moreover, far more congestion exists in average bus travel conditions (where choices among modes actually exist) than in average automobile, carpool, and vanpool conditions. Average automobile travel occurs under far less congested conditions where energy efficiency is greater but where little choice of mode exists or will exist in the future.

These criticisms, however, are not intended to challenge the conclusion of LaBelle and Bernard regarding the basic trends in the relative energy efficiency of bus transit versus automobiles and pooling modes. If these factors were properly taken into account, bus transit would appear more favorable in these comparisons, but the trend would still certainly be toward a less favorable comparison for buses.

In terms of energy supply, LaBelle and Bernard appear to be fairly optimistic, projecting roughly constant petroleum energy availability to the year 2000, which makes one wonder about the consistency of this projection with the high price projected for petroleum. Some increase in price might be expected...
with constant supply, but recent experience indicates that long-term demand elasticity is fairly high; this leads one to expect that only rather modest price increases would be necessary to hold demand constant.

LaBelle and Bernard note that diesel prices will probably be driven up by increasing consumption of trucks and other competitors, perhaps to as high a level as $2.75 per gallon.

There are not many options for transit in the energy area. LaBelle and Bernard point to some benefits from using smaller buses. They note that regulations have all expired, including requirements for reservation of fuel during shortfalls for transit. They suggest that transit consider stockpiling fuel, and point out one very positive point—the strategic petroleum reserve is now up to a level of 275 million gal, which is enough to get the nation through either of the past two shortfalls.

The paper by Priest and Walsh-Russo is a survey and forecast of trends in land development. They note that infrastructure of all kinds is deteriorating, and government in public and private sectors. In response to these and other trends, government is trying to shift the cost of infrastructure to the private sector.

All these factors tend to encourage development to occur where the service capacity already exists. It is particularly noteworthy that development tends to concentrate in intensive mixed-use developments that are inherently transit-oriented and offer considerable potential that has not been fully exploited as transit service centers.

Suburban shopping malls have dominated commercial activity in suburban areas and are expanding. Very often they are intensifying and developing into mixed-use developments. Office development is strong nationally, and about half of it is occurring in the suburbs, mostly in multipurpose centers. They also note that private financing of internal transit systems within those larger multipurpose developments is occurring in some suburban areas.

Multicentered metropolitan areas are developing (Houston is cited as the clearest example of the pattern that is emerging) with several major, well-defined multipurpose nodes, each of which is similar in density and mix of activity to a downtown of a medium-sized metropolitan area. This multicentered development pattern can be well served by transit. As noted before, the transit industry has not taken advantage of these trends, and has not really understood them, seeing them more as threats in the past. Transit service is still mostly radially oriented. Priest and Walsh-Russo point out and discuss some of the polycentric transit systems that are being developed in Phoenix and Portland, Portland, and other local revenues. At the federal level a similar program has been urged by DOT and has been favorably considered by a committee on Capital Hill. To a significant extent these efforts are based on local jurisdiction. Kirby also notes that automobile user taxes are easier to justify than most of the other forms of earmarked nontransportation taxes.

Kirby questions the wisdom of going to capital-grant-only funding in a period of tight finance because of the incentive this is going to create to overcapitalize transit systems. Kirby notes that dedicated taxes are being used for transit on an increasing scale around the country. The most common of these are sales taxes and property taxes. The problem has been that these sources are growing too slowly to match transit needs. The dedication of taxes in some metropolitan areas has tended to create disputes among local governments as to the amount of service provided vis-a-vis the tax generated from each local jurisdiction. Kirby also notes that automobile user taxes are easier to justify than most of the other forms of earmarked nontransportation taxes.

Kirby discusses recent examples of restructuring of state and federal programs. He points to New York's system of allocating money on the basis of passenger and vehicle miles of travel as a good example of creating incentives because funding is tied to performance. Minnesota is also creating performance incentives based on performance in transit, and other local revenues. At the federal level a similar program has been urged by DOT and has been favorably considered by a committee on Capital Hill. To a significant extent these efforts are based on local jurisdiction. Kirby also notes that automobile user taxes are easier to justify than most of the other forms of earmarked nontransportation taxes.

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no scale economy. I would also point out that smallness beyond a certain level has no scale economy. Splitting up transit service into units of just a few buses can also result in diseconomy. If the system is too small, you start to increase the unit cost of transit.

Schofer argues that greater emphasis should be placed on cost-effectiveness management controls. He cites an example of using statistics such as cost per passenger, rather than cost per vehicle mile, as indicators of cost effectiveness in transit. Despite the dramatic decline in the role of the private sector in providing major transit services, Schofer points out that the private sector has done relatively well in a number of specialized areas including taxis, the charter business, school bus business, elderly and handicapped services, vanpools, and carpool assistance. He argues that we should seek controlled competition between the public and the private sectors.

Schofer also believes that industry needs to be tough on labor on issues affecting the long-term efficiency of transit, even allowing strikes if necessary in order to tie benefits and wages to productivity.

Finally, he argues in favor of shifting federal programs toward block grants, to encourage proper incentives for improved performance at the local level.

Comments by Authors

Sarah J. LaBelle

Regarding the points made about the energy crisis: All the talk we hear at Argonne while constantly reviewing energy crisis forecasts indicates that the price will go up. The question is how much. The price will go up just on the basis that the supply is getting harder and harder to extract. It is very hard to make crisis forecasts when the price does what it will do, go up and down over the short term. If your forecast is for price increases and is announced the day that the prices went down, then your forecast is not believed. It is obviously not a credible forecast because the price has just fallen. So, to a certain extent we have to watch our time frame and see beyond the monthly and seasonal changes in oil price. Ours was clearly a long-term forecast with a long-term overall rise. We feel that a transit operator would be wise to seriously expect and prepare for those increases in price, and to expect the restructuring of prices where diesel is no longer something that is a small-volume, low-priced fuel. That change is major for a transit operator.

We used the example of Houston in the paper because their consultants have been talking with us on these price forecasts; please note that in some cases they used even higher forecasts than ours.

Regarding energy efficiency: Our efficiency numbers are realistic overall because we were looking at entire systems and the actual usage of vehicles. Our simulations on energy efficiency come from urban travel demand models. For transit buses we used route simulation work sponsored by NCTRP at Booz-Allen and Hamilton. That group has done very specific energy simulations of bus routes. We used their results to compare with our work on automobile energy efficiency. Both calculations were for vehicles in use, including speed changes, automobile size-specific differences in fuel economy, actual trip mileage, and whatever route circuitry there is in carpooling. We did rely on actual travel data from three cities to come up with these averages. The travel data included automobile access to transit, and differentiated work travel from non-work.

The per-passenger-mile averages in the paper were derived from trip-specific energy use and distance data.

Because of the strong basis of actual travel patterns for the energy use forecasts, I tried to make the point strongly that we forecast a big change in automobile fuel efficiency relative to that of transit. Full transit vehicles are incredibly energy efficient. You cannot beat them, but you cannot run them full all the time. (This is why the issue of transit vehicle size was raised.) This change does not argue against transit forever as a mode in cities, but it does change the picture considerably from 10 years ago. Cars have changed a lot, and transit buses have not. The other way to view this situation is that there is an opportunity for improving transit vehicles. Let me stress that much of the change in the energy-efficiency picture is conditioned on the fact that we see no change in transit vehicles by 2000 based on a fairly extensive survey of vehicles and technology.

Martin J. Bernard III

I think the transit operator has to understand the potential future problems of middle distillates. The potential pressure on middle-distillate prices worldwide will be high because of trucks, inegration pumps, and stand-by electrical power generators in the Third World countries, if for no other reason. If there is going to be another energy shortage in the next couple of decades, I feel the middle distillates are the portions of the barrel that are going to be hit the hardest. That is a fuel on which transit operators are totally dependent.

Another point about telecommunications, we do say telecommunications could be important to transit, but compared with the other probable changes in ur-