Two Ways of Thinking About Productivity and Ridesharing

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Ridesharing organizations, like other tax-financed agencies, are under pressure to produce results and produce them at a reasonable cost. The question this paper addresses is, What knowledge, gleaned from research, could help ridesharing organizations increase their productivity? Before addressing this question, we need to pose a more basic one: Do ridesharing organizations have a productivity "problem"—and, if so, why?

PRODUCTIVITY AND RIDESHARING

The managers of ridesharing programs say they do have a productivity problem and they characterize it in terms of low closure rates. A closure rate is the number of persons placed in carpools or vanpools relative to the number requesting assistance and the still larger number offered assistance. So there is a perceived productivity problem, and it is reflected in the fact that the number of carpools and vanpools actually formed is disappointingly low compared with the number of requests for assistance and the number of tripmakers offered assistance. Program evaluation data support this perception.

Why do ridesharing organizations have a productivity problem? My answer is a controversial one. I believe the pressure to produce results has hurt productivity. Ridesharing organizations might be more productive if they were under less pressure to show results.

This proposition is more reasonable than it sounds if we distinguish between short-run and long-run results. The typical ridesharing organization—for reasons of funding—is under pressure to produce short-term results. It does not usually have the luxury of laying the groundwork for long-term results even if those results would be larger and the effort eventually more productive.

Let me distinguish between (a) the current practice of managing for short-term results and (b) what I think would be involved in managing for long-run results and higher productivity.

Managing for Short-Term Results

The quarterly and annual reports of ridesharing organizations typically report

1. The number of vans placed on the road,
2. The number of carpool applications in the agency's match files, and
3. The number of companies and institutions requesting and receiving matching services.

Those that use surveys to audit their results also report estimates of gasoline saved, pollution averted, and travel expenses avoided.

The performance and productivity of ridesharing organizations are judged by numbers such as these; thus, program managers are motivated to increase the volume of transactions in which the agency is involved: for example, employer contacts, placement requests, and names in the match file. One strategy is to increase output (carpool and vanpool placement) by increasing input (requests for placement). This is usually accomplished by increasing the pace of employer contact and streamlining the procedure for disseminating, collecting, and coding requests for carpool-matching assistance. A second strategy is to increase output by improving service. This usually means reducing the time lag between a request for matching assistance and the provision of that assistance, usually a computer listing. Some agencies also think about the quality of service in terms of the proximity of carpool trip ends, and they have tried to improve the quality of their matchlists by closer geographic fitting. Still others emphasize computer file updating to improve the quality of the matchlist in terms of its timeliness.

Thus, many ridesharing organizations are trying to improve their quarterly and year-end results by increasing the volume and velocity of their operations. In turn, most organizations focus on improved computer operations as their strategy for increasing throughput.

The quick-in and quick-out efficiency that can be achieved in servicing either individuals or organizations is both extraordinary and seductive. And, given the pressure for short-run results, quick-in and quick-out efficiency becomes a matter of organizational pride and a central organizational goal.

Unfortunately, there is little evidence that such efficiency increases the rate of closure, although it can increase the number of pools formed. Increasing throughput masks the productivity problems of ridesharing organizations; it does not solve them. How then can closure rates be improved? The answer may lie in less volume and slower velocity.

Developing a Long-Run Commitment

The managers of most ridesharing agencies agree that employer-based campaigns are their most effective operations. They also agree that the most effective results can be obtained when employers commit to a sustained placement program rather than a one-shot matching effort. But in dealing with employers, most ridesharing organizations operate in the mode...
This organizational model of ridesharing has been embraced by the San Francisco Bay Area Metropolitan Transportation Commission (MTC). Working through local commerce and industry associations, MTC is persuading employers to appoint in-house transportation coordinators. MTC then trains the coordinators to manage and market a comprehensive "commute-alternative" program. To date, almost 75 transportation coordinators have been appointed and trained. These coordinators are now using RIDES's computer placement and vanpool leasing services as functional elements of broader traffic and parking management plans. The quick-turnaround capability of RIDES is an asset in this regard.*

As time-consuming and painstaking as it is, I suspect the constituency-development model of ridesharing is a better formula for productivity than the volume and velocity model. But given the current state of research, I can only say that I suspect that is the case. In my judgment, the most important research that can be undertaken in ridesharing would involve a systematic, multiyear assessment of the accumulated returns produced by the two organizational approaches.

Such research could and probably should be conducted in the context of a demonstration project that documents costs and benefits of a ridesharing campaign organized as a "pure case" of the constituency-development model. Short of that, it would be appropriate to document and analyze the results of employer-based programs already under way; many of those programs are poorly documented because the Urban Mass Transportation Administration (UMTA) Service and Methods Program has neglected research that is not coupled with UMTA-funded demonstration projects. The critical questions to be answered are, How much corporate commitment can be generated, at what cost, and with what results in terms of accumulated, multiyear reduction in travel expenses, vehicular traffic, fuel consumption, and pollutant emissions?

A closely related research question is, What agencies or actors are best equipped to generate employer involvement and commitment? I suspect the answer is city governments rather than regional planning agencies or area-wide ridesharing organizations because city governments can build traffic mitigation into their permit and zoning review processes. I think this is another hypothesis worth testing through research and demonstration projects.

Finally, there is a crucial area of research that is needed to stimulate corporate involvement in ridesharing and broader traffic mitigation efforts. Little is known about the impact of ridesharing on the productivity of the workplace, the job satisfaction of employees, or the quality of working life. Evaluations of ridesharing have focused on objectives salient to the U.S. Environmental Protection Agency, the U.S. Department of Energy, and the U.S. Department of Transportation. Impacts on these dimensions are not particularly salient to workplace management and are therefore not very useful in generating employer commitment. The impacts that are salient include those on the costs of operating a program; potential liability exposure; quantity of the labor force that a company can recruit and retain; absenteeism, turnover, tardiness, and workday erosion; ability of the organization to maintain production in the face of external contingencies such as a petroleum shortage or a transit strike; work that can be obtained from employees, including both paid and unpaid work; the loyalty of customer service; employee loyalty and job satisfaction; parking space requirements expressed as initial and recurrent costs; disposable income of employees expressed as after-tax salary equivalents; quality of
customer service; and quality of corporate relations with government agencies and neighboring residents.

These impacts are researchable, although they are not within the ambit of conventional transportation expertise. Nevertheless, they deserve the highest research priority and funding from transportation agency budgets. At the strategic level, such research is necessary to generate committed corporate involvement in ridesharing. But, at a more fundamental level, such research is necessary to understand the complex ways in which transportation is valuable to society—how it influences the quality of working life and the methods, quality, and profitability of production. In a very basic sense, such research is needed in order to measure the productivity of ridesharing and of other transportation investment and development strategies.

PRODUCTIVITY AND THE TRANSPORTATION SYSTEM

In the first part of this paper, I explored the productivity of organizations formed to promote ridesharing. This part of the paper takes on a more difficult task: exploring the contribution that ridesharing can make to the productivity of the transportation system. The difficulty arises from the problem of giving meaningful definition to the concept of transportation system productivity.

Most efforts to measure and then trend the productivity of the transportation system have emphasized facility-oriented measures, such as vehicle or person throughput per hour. Such ratios are frequently used in engineering analysis. Predictably, throughput increases as traffic volume approaches facility capacity. As volume exceeds a facility's service rate, queues form and congestion builds; throughput stabilizes at the service rate but delay increases.

The traditional engineering response has been to expand system capacity by adding lanes or building a parallel facility. More recently, efforts have been made to increase throughput by encouraging the use of high-occupancy vehicles—carpools, vanpools, and buses. This has been accomplished by reserving freeway lanes for the exclusive use of high-occupancy vehicles or by treating buses and carpools preferentially at metered freeway ramps. The time advantage offered by preferential treatment provides a mild incentive for ridesharing.

Person throughput is a partial measure of transportation system productivity, because it deals with only one element of the transport system, freeways, and only one dimension of system efficiency, the service rate. As a result, it can be a misleading measure of system merit. Our intent is to search for a broader, and, it is hoped, more meaningful, definition of productivity. The approach will be unabashedly philosophical rather than technical.

We begin by asking a basic question: What is the product delivered by the transportation system? Throughput is one of its products, the specialized product of higher-order facilities. But the transportation system as a whole is hierarchically specialized to deliver a variety of products.

Hutchinson (3) offers a useful hierarchical classification scheme that distinguishes the service functions of expressways, arterials, collector streets, and local neighborhood streets:

1. Class 1: Expressways—provide for the movement of high volume and relatively fast movements to and from major activity concentrations that depend on region-wide traffic movement. Traffic movement on these facilities are grade separated without direct land access and movements between different road facilities are achieved by interchanges;

2. Class 2: Arterials—provide for the movement of trips between freeways and collectors with some direct access to land is provided; intersections between arterials, and with collectors, are usually at grade and signalized;

3. Class 3: Collectors—provide for the movement of trips between arterials and locals and provide some direct access to land; and

4. Class 4: Locals—provide for the distribution of traffic within activity areas where the emphasis is on the integration of the road with the land and where the speed of movement is deemphasized.

Hutchinson's classification, like many employed in transport engineering, emphasizes traffic service. I prefer an ecological approach, using the word as sociologists do. The transportation system performs multiple ecological functions.

1. Freeways and expressways increase the reach of travel and quarantine large volumes of through movement. They deliver two products: reach and quarantine.

2. Arterial streets serve a more complicated function. They provide access to commerce and industry; they provide for the circulation of vehicles, pedestrians, and perhaps bicyclists; they provide passage for vehicles with destinations elsewhere; they provide storage for the vehicles of employees and customers; and they provide a commons for conversation, window-shopping, congregation, bag lunches, and the like. Thus, arterial streets may deliver as many as five products: access, circulation, passage, storage, and congregation.

3. Neighborhood streets provide access to homes. They are also a commons that is used for play, neighboring, and strolling. They deliver two primary products: access and commonspace.

When we think about the productivity of the transportation system, we should ask how productively it serves all of these functions, not just traffic service. No simple metric or family of metrics can measure productivity, but it can be defined in the collaborative processes of community planning. This is not merely a recognition of fundamental value conflicts in the use of the roadspace environment.

Many transportation issues in recent years have their roots in conflict over the use of the roadspace environment, in the "dumping" of express traffic on arterial streets, and in the invasion of lower-order systems by traffic operating according to the rules of higher-order systems (e.g., speedign, taking shortcuts, and littering). It is in this context that maximizing throughput can be a misleading rule for productivity gain. It may increase the productivity of higher-order systems but may overload and thereby reduce the productivity of lower-order systems that perform their functions more complicated, diverse, and fragile.

Massive resources have been mobilized to build freeways and to solve the problems of reach and quarantine. The more complicated problems of the arterial and neighborhood street environment have, by comparison, suffered comparative neglect. If there is a productivity problem in the transportation system, it may not be throughput but an imbalance of effort. Parenthetically, it is appropriate to note that the imbalance would be compounded under the Reagan budget that proposes to eliminate Federal-Aid Urban System.

I think it is fair to say that ridesharing organizations have not had a significant impact on
M. Effective demand for ridesharing is unproductive. Ridesharing can enhance both the reach and quarantine functions of the freeway system. The lower cost of ridesharing increases the reach of the system effectively open to its users. And reduction in on-freeway congestion can help perfect the quarantine function of higher-order facilities.

I suspect ridesharing's most important contribution to transportation system productivity is not and cannot be at the scale of the freeway system but rather at the scale of the commercial district and the major employment center (where targeted effort can produce concentrated results). Ridesharing can play a significant role in managing two problems mentioned earlier: use conflicts in the environment of commercial-industrial districts and the dumping of express traffic on arterial streets. In fact, preferential treatment of high-occupancy vehicles on freeways should be evaluated not only in terms of throughput, but also in terms of its spillover value for community-service roadspace. (By the same token, some ramp-metering schemes should be viewed skeptically because of traffic diversion and the consequent violation of the quarantine principle.)

How might ridesharing offer a strategy for dampening use conflict in the environment of commercial districts and employment centers? It can free parking space now required for the storage of commuter vehicles. It can reduce the spillover of parking and traffic management value of ridesharing with an activity-center focus. That is here that a targeted and concentrated contribution to system productivity might be achieved.

As in the first section of this paper, I have used the phrase "I suspect" to hedge an assertion. Research is needed to confirm or reject the proposition. There is little research that documents the parking and traffic management value of ridesharing in the environment of arterial streets and activity centers. This is further evidence of imbalanced effort and the neglect of research, planning, and investment with an activity-center focus. That neglect should be corrected in the research and demonstration agenda recommended by this conference.

REFERENCES


Ridesharing services have grown from relative obscurity and neglect in the early 1970s to become the subject of national publicity and promotion in the 1980s. Over the last decade, the pressures of increasing fuel prices, occasional fuel shortages, and tighter funding for conventional transit services have greatly increased the demand for, and policy interest in, carpools, vanpools, and subscription services. The highly publicized success of certain ridesharing projects such as the Tennessee Valley Authority's (TVA's) carpool and vanpool programs, the M and Golden Gate vanpool programs, and the COM-BUS subscription bus program has encouraged a number of other large firms, private bus companies, transportation authorities, and communities to initiate ridesharing programs. The promotion and information dissemination activities of the U.S. Department of Transportation (DOT) and several state departments of transportation have also contributed greatly to the increasing interest in ridesharing options.

Evaluations of ridesharing programs have focused primarily on measuring short-run mode shifts from the single-occupant or low-occupant automobile modes to higher-occupancy carpool, vanpool, and subscription bus services. The benefits of ridesharing programs have been quantified in terms of reductions in overall vehicle miles of travel (VMT) and in out-of-pocket cost savings to users of the ridesharing services. Reductions in VMT have often been transformed into gasoline savings and air-quality improvements. Savings in parking space requirements have also been credited to ridesharing programs in some cases.

The estimation of the benefits derived from ridesharing programs must be undertaken with considerable care because of a number of technical considerations that complicate the measurement process. The most important of these considerations are as follows:

1. The impacts of ridesharing programs must be measured against a well-defined base case. In some evaluations, benefits and costs have been computed...