Session Summary

The workshop participants concluded that there is a need to improve the productivity of the planning process. Three keys to this are

1. Providing quick responses to decision makers,
2. Providing technical assistance to implementors, and
3. Identifying the most effective solutions.

These three areas are closely identified with establishing better credibility for planners.

The image of local planners is considered to be poor. Often, the local planner does not understand the decision-making process. Effective communication between local elected officials and planners is essential and, in general, is lacking in most areas. The workshop participants felt that planners should help the elected officials to identify the difficult issues and also the solutions (or at least the alternatives) in order to facilitate the decision-making process.

The mix of long-range versus short-range planning in a small urban area is quite often defined by federal and state regulations. Most of this, however, deals with administrative requirements. The comprehensive planning process provides an opportunity to develop a perspective of the future in order to facilitate the short-range planning decisions being made in the present. There is inherent flexibility and creativity available within the current planning process because the regulatory requirements deal primarily with administrative matters.

Long-range planning in many small urban areas has traditionally been highway oriented, but a significant change could be fostered by the effects of economic and energy-related issues, which could cause a major shift toward transit. Obviously, short-range planning is the major thrust in smaller areas; therefore, smaller communities may be more responsive to changes brought about by economic, environmental, and energy issues.

Techniques

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The scope of this session workshop included an examination of all aspects of public transportation planning, implementation, and operation in small urban areas. Specifically, three issues were addressed:

1. Identification of the categories of techniques that are useful in the planning, implementation, and operation of public transit in small urban areas;
2. Assessment of the available techniques in the three areas and of the availability of these techniques; and
3. Assessment of the marginal improvements that may be needed to improve these existing techniques.

Transit Service Standards, Routing, and Scheduling

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The governments of Eugene, Springfield, and Lane County, Oregon, recently adopted a multimodal transportation plan that has forecasts to the year 2000. Serving this area is the Lane Transit District. The board of this district recently developed short-range objectives for fixed-route service designed to interface with the year 2000 plan. These objectives include a goal of a ratio of fare-box revenue to operating cost of 25 percent by 1982. Lane Transit District offers three types of service: urban fixed route, nonurban fixed route, and urban dial-a-bus. The service standards considered most important to the development program include coverage, travel time, availability, and accessibility. Route and schedule adjustments originate from public and employee suggestions, which are considered as part of a periodic route-and-schedule review. Surveys and passenger-opinion data are collected regarding any proposed changes. Schedule changes are made three times a year, route changes are made annually. Routes and schedules are adjusted as necessary to achieve long- and short-range goals. The transportation plan for the Eugene-Springfield area calls for implementation of a bus rapid transit system supported by local buses. A key element of the plan is the construction of 10 major and 10 minor transit stations throughout the metropolitan area.

The Lane Transit District in Oregon operates a fleet of 61 transit coaches and six dial-a-bus vehicles in a ser-

Table 1. Productivity by time period: October 11, 14, and 15, 1978.

Time Period	Productivity (rides/vehicle-h)		
	Urban Routes	Nonurban Routes	Total Routes
Morning peak (6:00-9:00 a.m.)			
Weekday	27.61	10.20	24.88
Saturday	7.17	2.85	6.49
Midday			
Weekday (9:00 a.m. -2:00 p.m.)	26.19	12.05	24.64
Saturday (9:00 a.m. -7:00 p.m.)	22.99	9.40	21.27
Weekday afternoon peak (2:00-6:30 p.m.)	35.01	10.00	30.96
Evening			
Weekday (6:30 p.m. -12:00 m.)	10.72	6.55	10.59
Saturday (7:00 p.m. -12:00 m.)	9.00	4.83	8.72
Sunday	19.81		19.81

Table 2. Productivity by day: May 1978.

Service	Avg Total Rides	Total Vehicle (platform plus turn-in) Time (h)	Total Productivity (rides/vehicle-h)[a]
Fixed Route			
Monday-Friday	15 493	733.2	21.1
Saturday	9 825	694.5	14.1
Sunday and holiday	1 461	83.3	17.5
Dial-a-bus[b]			
Monday-Friday	105	48.0	2.2
Saturday	51	24.0	2.1
Sunday and holiday	0	0	

[a]Including transfers.
[b]One-half of dial-a-bus riders are wheelchair-bound and most are elderly or handicapped (or both).

vice area that has a population of 210 000. This service area includes the Eugene-Springfield metropolitan area, the second largest in the state, and central and eastern Lane County, which contains rural and small urban areas and has a population of 30 000.

STATUS OF PLANNING

The general-purpose governments of Eugene, Springfield, and Lane County recently adopted a metropolitan-area transportation plan that is multimodal and includes forecasts to the year 2000. The plan includes year 2000 goals for transit modal split for the various jurisdictions that vary from 5 percent in Springfield to 15 percent in Eugene. The areawide average would be about 13 percent. Currently, the transit modal split is about 2.4 percent. With a forecasted areawide increase in population of 60 percent, a massive increase in transit ridership will be necessary to achieve this goal.

The Lane Transit District Board is in the process of adopting short-range quantitative objectives for fixed-route service. Indicators that have been selected for these objectives include total ridership, vehicle productivity, the ratio of the fare-box revenue to the operating cost (expressed as a percentage), and cost per person trip.

The board has indicated that it will adopt as a goal a ratio of fare-box revenue to operating cost of 25 percent, to be achieved by 1982. Goals will be selected for the other indicators that are consistent with this goal but reflect a strategy to be chosen by the board during the annual updating of the transit development program.

Strategies that could be chosen to achieve the 25 percent objective include increasing fares, reducing low-productivity services, and actions to increase ridership.

All of these strategies have the potential for counterproductive results. For instance, actions to increase ridership often increase costs. Estimates of net effect should include both positive and negative impacts. Deliberation on any of these strategies also requires consideration of the adopted service standards by which the system is designed.

DESCRIPTION OF SYSTEM

Lane Transit District offers three basic types of service: urban fixed route, nonurban fixed route, and urban dial-a-bus. These can be characterized as follows:

Urban Fixed Route

The urban fixed-route service has a flat fare. The base is $0.35; discounts are available to the elderly, children, and young people; an unlimited monthly pass and discounted tokens can be obtained. The routes are primarily radial from the central business district, except that they are pinched together at other major activity centers; extensive use is made of end-of-line loops; there are overlapping routes that have staggered schedules on major lines; in most developed areas, access is within 0.4 km (0.25 mile). Schedules allow standard clock headways of 30 min in the daytime, 60 min in the evening, 15 and 30 min, respectively, on lines that have overlapping routes; schedules pulse every 15 min from the layover point in the central business district.

Nonurban Fixed Route

The nonurban fixed-route service has a zonal fare system of $0.15-increments at approximately 11-km (7-mile) intervals; discount rates are the same as those of the urban system. The routes connect major satellite communities to the metropolitan area and serve points between; branching is used to provide additional off-peak coverage. The schedules vary depending on route length and reverse-commute timing.

Urban Dial-a-Bus

The urban dial-a-bus service has a flat fare of $0.70; discounted tokens are available, and the service of attendants is free. All handicapped persons are eligible to use the service (identification is through a physician, social service agency, or volunteer program) as are all persons more than 62 years old. All vehicles are lift equipped, and 49 percent of the riders are in wheelchairs. The coverage is in the many-to-few mode on weekdays (home to 30 selected destinations) and the many-to-many mode on Saturdays; priority is given to subscription passengers.

Although the different types of service are actually integrated at many levels, they are often separated for analysis purposes. Allocation of cost and ridership data involves some arbitrary assumptions, but this approach is necessary to satisfy policy-level information requirements. Some statistics that have been generated to answer questions about urban versus nonurban fixed-route services and fixed-route versus dial-a-bus services are given in Tables 1 and 2.

SERVICE STANDARDS

The transit development program adopted includes the following service standards:

1. Coverage—access distance to the nearest bus stop: The distance from home or business in the urbanized area to the nearest bus stop should not exceed 0.4 km; spacing between bus stops should be approximately two blocks or 230 m (750 ft). Closer bus stops and shorter access distances (or both) should be considered for downtown areas and developments having a high density

of elderly people. Longer distances may be unavoidable due to street layout or other geographic constraints. Coverage in the nonurbanized areas is provided by routes serving the urbanized areas, satellite communities, and points between. (A computerized land-use parcel-file plot is updated annually for the metropolitan area and used to evaluate coverage.)

2. Travel time—total time for the passenger from origin to destination (e.g., home to work), including time spent walking to a bus stop, waiting for a bus, riding, and transferring: This time should not exceed twice the automobile travel time for the same trip. One major factor in travel time is schedule frequency. The following standards have been set for routes connecting downtowns to other areas:

Type of Area	Schedule Frequency
Major activity center (school or retail services)	15 min
Residential	30 min
Industrial	Corresponding to shift
Nonurbanized	Proportional to trip length

3. Availability—provision of transit service to the passenger when and where it is advertised to be: In the area of schedule reliability, on-time performance (bus not ahead of schedule nor more than 4 min late) should be achieved 98 percent of the time. In the area of fixed-route capacity, peak loads should not exceed seated capacity for more than 10 min and should never exceed 133 percent of seated capacity. In the area of dial-a-bus capacity, service should always be available to passengers making reservations 24 h in advance.

4. Accessibility—provision of transit service to passengers who have mobility limitations. For dial-a-bus service, the vehicle should be accessible to all passengers who can meet it at the curb near their origin or destination, with or without an attendant. For fixed-route service, standards should be developed in consultation with handicapped members of the local community.

ROUTE AND SCHEDULE ADJUSTMENT

Route and schedule adjustments originate with the suggestion process. The department of planning and development serves as the clearinghouse for all suggestions relating to routes and schedules. The suggestion sources and average monthly rates per source for FY 1977/78 are listed below:

1. Telephone—8/month,
2. Letter—5/month,
3. Bus drivers—10/month,
4. Board of directors,
5. Public hearing statements at board meetings,
6. Transit district staff,
7. Transit district citizens advisory committee, and
8. Employees advisory committee.

Every suggestion receives two types of response. First, an acknowledgment that, if possible, gives an initial indication of the feasibility and timing for implementation of the suggestion is sent to the person who made it. Second, the suggestion is noted for future consideration in a periodic route or schedule review.

Suggestions written by employees, if of general interest, are published in the monthly employees' newsletter together with the response and an editorial note about subsequent developments, if any. All employee suggestions and responses are reviewed and discussed at the monthly employee advisory committee meetings.

The evaluation of some suggestions requires special surveys. Passenger-load and schedule-performance information is collected at major bus stops and on board the buses. An on-board record is also used to satisfy the operating-data reporting requirements of Section 15 of the Urban Mass Transportation Act of 1964.

Passenger-opinion data are collected regarding proposed changes that may adversely affect current passengers. This procedure is useful in reconciling conflicting demands of different groups. It also alerts the passengers to proposed changes far more effectively than any other advertising technique that Lane Transit has tried.

Disadvantages of this passenger-opinion survey method include sporadic gaps in response because of driver resistance and problems in filling out forms on moving buses, especially at night. It is planned to provide an optional mail-back feature in future surveys of this type. Other disadvantages are that passengers misinterpret proposed changes and are often upset at the very thought of change.

Schedule changes can be made three times a year, coincident with the reprinting of timetables. The timetables are prepared by computerized typesetting so as to minimize proofreading and paste-up errors. Unless headway changes are envisioned, the review of schedule changes is limited to the staff and the employees advisory committee.

Route changes can be made once a year, coincident with the reprinting of the color-coded system map. Proposed route and headway changes are advertised widely, and the board of directors is supplied with a list of suggestions that have been reviewed and an explanation (often expressed in terms of the service standards) of the staff recommendations.

Quantitative objectives are planned for the entire system but have not been applied to individual routes. However, measurement of route performance is reported.

Route and schedule adjustments are accepted as ongoing processes that are necessary to achieve both long- and short-range goals. The procedures described here have been developed to make the processes as responsive as possible to public and employee input, while taking into account service design standards and the needs of current riders.

FUTURE PLANS

The Eugene-Springfield Area Transportation Plan calls for implementation of a bus rapid transit system supported by local buses. The plan defines bus rapid transit as follows:

> bus rapid transit is the provision of a rapid transit service utilizing conventional or high capacity super-buses (80 seats, as opposed to 50 for standard buses) operating in limited-stop express service, often in priority rights-of-way. The mode of operation might be:
>
> A. Line haul vehicles operating between stations to which passengers arrive by feeder bus, park and ride, bicycle or walking.
> B. Line haul vehicles operating through stations to provide both the collection/distribution portion and the line haul portion of the trip.
>
> Urban areas throughout the country currently utilize a wide spectrum of bus priority techniques for bus rapid transit. Of these priority treatments, only exclusive bus lanes on existing arterial streets and traffic signal preemptions by buses have applicability in Eugene-Springfield in the foreseeable future.

A key element of the plan is the construction of 10 major and 10 minor transit stations at activity centers throughout the metropolitan area. The plan defines these stations as follows:

Minor transit stations typically include signed bus stop zones, passenger waiting shelters, route and schedule information signing, lighting, bicycle parking and locking facilities, and accessibility for the physically limited.

Major transit stations typically include all of the facilities of a minor station, plus restrooms and pay phones. Other improvements vary by site, but many include park and ride lots and bus turnarounds to accommodate converging routes.

Three of the major stations will include park-and-ride lots. All of the stations will increase the options available for routing and scheduling by providing layover points and passenger amenities. The stations will constitute nodes in a node-link network, serving as points of interconnection among local, express, and crosstown routes.

Initial discussion of Rynerson's paper centered on the soon-to-be-adopted standard of covering 25 percent of the operating cost from the fare-box. The question was raised whether this standard is too low. Currently, Lane Transit is covering slightly less than 20 percent of operating cost from the fare-box. It was, however, pointed out that, for systems up to this size in the Pacific Northwest, coverage is generally about 20 percent. There was also concern expressed that this objective of cost coverage from the fare-box is biased in that a system that carries a large number of discount passengers (such as elderly and handicapped persons) would be unduly penalized. A better objective measure of efficiency versus productivity might be cost per passenger trip.

The discussion then moved to the topic of how to use the scheduling-run-cutting process to save operating cost. A common problem in smaller transit systems is that the policy-making board typically does not realize the interrelationships between scheduling and the budget process. There is a need to inform these boards that scheduling can be used as an analytical tool that evaluates various service options and associated costs. A question was raised as to whether there is a rule-of-thumb on the relationship between reducing vehicle hours of operation and attendant operating-cost savings. The consensus was that, rather than rules of thumb, what is required are guidelines on the process of scheduling and run-cutting for small to medium-sized transit systems. Transit boards should also understand that schedule cutting is not a quick process and should understand what is and what is not possible in making service changes or cutting new schedules.

The discussion next addressed the problem of providing service to new developments. It is the responsibility of the transit service planner to communicate with local land-use planners and general-purpose governments and to sensitize them as to how new housing developments may be planned so as to be served by transit. Many new subdivisions are purposely designed to limit through traffic but, in turn, this limits transit vehicle accessibility. Therefore, it is incumbent on transit planners to insert themselves into the development planning process.

Forecasting Transit Ridership in Smaller Communities

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As the attention being given to transit planning for smaller communities increases, more accurate ridership forecasts are being required. In smaller areas, basic data for these forecasts remain scarce, but a number of successful techniques have been designed to overcome this lack of original data. Among the techniques developed for use by small cities and rural areas in Florida is a first-cut, sketch-planning estimate that roughly forecasts the annual numbers of riders, vehicles, and equipment kilometers. This technique can also be used to estimate capital costs and yearly operating costs. If, on the basis of the initial forecasts, a community decides to pursue a transit plan, additional ridership forecasts will be necessary. Particularly for fixed-route systems, the latent-demand and direct-demand forecasting techniques can be very useful. These two techniques and the results of the initial survey can provide a cost-effective basis that local officials can use in deciding on the most appropriate transit plan for their area.

Forecasting transit ridership in smaller urban areas and rural communities has become more analytical in recent years because of the increased attention (social, political, and financial) being placed on the need to provide transit services to the people in these areas. As recently as five years ago, a systemwide forecast was the most to be expected of a transit planning effort for a smaller community. Now, more fine-grained projections are being required; however, the basic data with which to forecast remain as scarce as the financial resources available for the development of small-area transit plans. This situation has fostered the development and use of ridership forecasting tools based on little original data, yet still capable of providing satisfactory results and some reliability.

Experience with these forecasting techniques has led to the recognition that there is more than one level of patronage forecasting for smaller areas. Therefore, in a recent effort to assist the Florida Department of Transportation, a two-step process for ridership forecasting for small urban and rural communities was developed. This process can be used for four types of transit systems—demand-responsive, planned-demand, point-deviation, and fixed-route, fixed-schedule options; however, this discussion will center on the techniques applicable to the latter two, which are more commonly deployed in smaller communities. The entire analytical process for all four types of systems is described in the Florida Transit Planning Manual (1).

FIRST-CUT ESTIMATES OF SYSTEMWIDE RIDERSHIP AND COSTS

Many smaller communities, particularly rural ones and those having fewer than 50 000 people, do not have the capability to develop or operate a transit system. Often, they have neither the demand, the community backing, nor the financial resources to support transit. Therefore, it is unwise to authorize a transit planning effort to proceed to a relatively detailed level of forecasting of either transit ridership or cost if a first-cut, sketch-planning estimate can produce enough reliable information so that an early decision can be made as to whether to pursue transit seriously. To provide data at this early phase, the Florida Transit Planning Manual offers a first-cut analysis tool to forecast approximately, but realistically, the annual number of riders, the number of vehicles that will be needed, and the number of kilometers that will be traveled by the equipment annually. It also provides estimates of capital costs to launch a program over a five-year implementation period and