

offered a parking discount as an incentive to do so. For example, in the fourth commuting condition in the table, which comes closest to the actual current situation, if as few as one in five of those initially driving alone joined carpools, the cost to the employer would decrease.

Furthermore, if such an offer did draw some current transit riders into carpools for work trips, this would not necessarily be an undesirable result. Most analyses of the deteriorating financial situation of public transit operations have concluded that among the most important causes is the peaking of transit demand during morning and evening commuting hours (15,16). In addition, because carpool travel entails a level of fuel consumption per passenger mile that is among the lowest of all travel modes, diverting some transit commuters to carpools might well reduce energy consumption as well as operating losses incurred by public transit authorities (17,18). The "administrative control" problems of such a scheme are now at least as severe with employee parking-permit schemes. The problem of "phantom" carpools evidently was nowhere more severe than in DOT's own parking garage when no such carpool discount scheme was in effect.

The objection to carpool discounts on equity grounds now applies even more strongly to employer parking-subsidy plans that do not offer carpool discounts, since carpoolers receive a smaller subsidy than those who drive alone. Although the proposal would not correct the inequity between automobile commuters and those who use transit,

bicycle, or walk, it would at least correct the inequity between the different classes of automobile users, carpoolers, and those who drive alone. Finally, all of the ridesharing promotion activities Morin applauds are not only subject to exactly the same objections that he raises to the carpool discount proposal but are also likely to prove no more effective in encouraging carpooling while consuming considerably more of employers' time and resources.

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Publication of this paper sponsored by Committee on Parking and Terminals.

Abridgment

Maintenance of Park-and-Ride Facilities in New Jersey

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An overview of the maintenance and cost experiences of park-and-ride facilities now owned by the New Jersey Department of Transportation is presented. A brief description is given of how the department became involved in the operation of park-and-ride facilities—initially subsidizing the maintenance of privately owned facilities and eventually constructing its own rail park-and-ride facility at MetroPark Station on the present Northeast Corridor Line. Department-maintained and municipally maintained park-and-ride facilities are compared in terms of costs and effectiveness. The state of New Jersey is in the process of finalizing the acquisition of more than 130 rail stations with associated parking, and the New Jersey Department of Transportation is developing a plan to effectively deal with the maintenance and service needs of these facilities. The proposed policy, which calls for local operation and management of state-owned rail stations and park-and-ride facilities, is outlined.

The New Jersey Department of Transportation (DOT), like most state DOTs, evolved from a typical highway department. The New Jersey DOT became involved in public transportation with the creation in 1966 of the Commuter Operating Agency (COA). This has led to the expanding state program of financial support of privately owned rail and bus companies. Until the beginning of the 1970s, park-and-ride facilities in the state were constructed and operated by the private transit companies. The COA supported the maintenance of these facilities, no matter how minimally, through the financial assistance program. However, there was no major direct involvement by staff of the state DOT or COA.

After a few demonstration projects, the department, using federal highway funding, initiated its first regional rail park-and-ride project: construction of the first phase of the MetroPark facility.

PRESENT PRACTICE

Currently, the state of New Jersey is the owner of five rail park-and-ride facilities. Of these five facilities, four (Princeton Junction, Little Silver, Middletown, and Waldwick) are locally operated and maintained through lease agreements between the state and the local municipality. The MetroPark Station park-and-ride lot is maintained by the state DOT.

In 1971, the New Jersey DOT constructed the initial parking lot at the MetroPark Station on what is now known as the Northeast Corridor Line. The original lot had a capacity of 818 parking spaces. On-site parking was expanded in 1974 to 1334 spaces. Because of congestion problems, department maintenance crews undertook minor expansion and restriping of the lot in the summer of 1979 to accommodate compact cars and provide an additional 178 spaces, for a total of 1512 spaces. All parking at MetroPark is currently on a paved lot directly in front of the station. Parking is free, and the lot is filled beyond capacity every day.

With its excellent vehicle access via the Garden

State Parkway and NJ-27, MetroPark is one of the most heavily used facilities in the state, and parking demand is increasing each year. It is the only park-and-ride facility in New Jersey that is both owned and operated by the state. The Construction and Maintenance Unit of the state DOT maintains the lot by using highway maintenance crews. Since no additional personnel or resources were made available when this responsibility was assigned, and MetroPark must compete with the state highway network for the attention of the understaffed maintenance force, the unit is unable to maintain the MetroPark facility to a satisfactory level. For example, in the winter months, snow removal and salting on roads take priority over snow removal at MetroPark.

The major problem at MetroPark is the lack of patrolling to make sure that all cars are legally parked. Despite the availability of more than 1500 delineated spaces, there are approximately 200 illegally parked cars daily, which results in considerable congestion. Cars are parked in every conceivable spot, and the overflow extends down the adjacent roads. Spaces specifically designated for handicapped drivers are taken by anyone. Even with the recent improvements to the lot, maneuvering in the facility is difficult. The state lacks the manpower to properly patrol the lot and has been unsuccessful in securing a maintenance and policing agreement with the local municipality, Woodbridge Township.

Recently, the New Jersey State Police have provided assistance to enforce parking regulations. The state DOT is currently working with Middlesex County to effect local operation of the facility. Patrolling and enforcement of parking regulations are key items that a local entity could provide and thereby eliminate congestion and other related parking problems. Because of the congested situation, cleaning and sweeping of the lot during the day are practically impossible.

Since highway maintenance is the first objective of maintenance crews assigned to the area, the Construction and Maintenance Unit maintains the facility on an as-needed basis. This amounts to directing attention to the facility only after a backlog of maintenance needs has built up.

In 1973, the New Jersey DOT constructed a 430-space rail park-and-ride facility at Princeton Junction on the Northeast Corridor Line in West Windsor Township. In a lease agreement between the state, West Windsor Township, and the West Windsor Parking Authority, the Parking Authority agreed to lease the newly constructed parking facility and to be responsible for the complete maintenance, control, and jurisdiction of the lot, including paying for electricity, toll collection facilities, associated sidewalks, and operation of the facility. The lease specifies that the facility is to be a nonprofit operation and parking fees are to be established to cover operating and maintenance expenses and provide a 10 percent contingency reserve for major repair work. Under local jurisdiction, the facility is closely maintained and supervised. The West Windsor Parking Authority is continually complimented for the lot's neatness, pleasantness, and efficiency. Parking fees are collected by the sale of monthly tickets, and the present parking fee is \$5.50/month. Since many permit holders do not use the lot on a day-to-day basis, the West Windsor Parking Authority oversells permits to ensure full use.

At Little Silver Station in the borough of Little Silver on the North Jersey Coast Line, the New Jersey DOT constructed a 385-space park-and-ride lot in 1972. The township operates and maintains the

facility under a lease agreement with the state. The lot is a well-kept and attractive facility. Parking fees are \$0.50/day at 53 metered spaces, \$18.00 for six-month permits, and \$30.00 for one-year permits.

At Middletown Station in Middletown Township on the North Jersey Coast Line, the New Jersey DOT constructed a 1210-space park-and-ride facility in 1974. In 1973, the state and Middletown entered into a lease agreement in which the township agreed to assume maintenance and operational responsibility for the facility. This large park-and-ride facility is in excellent condition and is well maintained by the township. Parking is by permit at \$35/year.

In 1978, the department initiated the construction of a 155-space park-and-ride lot at Waldwick Station in the borough of Waldwick on the Consolidated Rail Corporation (Conrail) main line and subsequently leased the lot to the borough for their operation and maintenance. Parking permits are sold at \$2.50/week, \$10.00/month, and \$100.00/year. This lot became operational in the spring of 1979, and operational cost figures are not yet available for comparison with the costs of other facilities.

Capacity and use data for the four facilities for which data were available are summarized below:

<u>Facility</u>	<u>Total No. of Spaces</u>	<u>Approximate Use (%)</u>
MetroPark	1512	100
Princeton Junction	430	>100
Middletown	1210	85
Little Silver	385	75

Table 1 gives 1978 maintenance costs for the four state-owned rail park-and-ride facilities for which cost data were available. MetroPark cost figures were obtained from the Construction and Maintenance Unit of the state DOT; costs for the three leased facilities were obtained from 1978 financial reports that the municipalities are required to submit to the state under the terms of the lease agreements.

From the data for total annual cost and annual cost per 100 spaces, it appears that the state maintains the MetroPark facility the most economically. However, the state devotes minimal attention to MetroPark because of manpower shortages. Therefore, although it is true that maintenance costs are low, the corresponding level of maintenance in terms of quality and frequency is also low. As previously stated, MetroPark competes with the New Jersey highway network for maintenance by an understaffed highway maintenance crew, and as a result the department's crews cannot provide the day-to-day maintenance required.

If one compares MetroPark with a facility of similar size, such as Middletown, one can see that costs for the Middletown facility are much higher across the board. The Middletown facility is maintained to a higher standard and includes frequent power sweeping and complete landscaping functions, such as mowing, trimming, fertilizing, and plant replacement. Currently, there is no enforcement of parking regulations at MetroPark. Annual security costs associated with the other facilities range from \$412 to \$1530/100 spaces. It is obvious, therefore, that a major cost element is missing from the cost per 100 spaces for MetroPark. In almost all categories, the annual maintenance cost per 100 spaces for various items is considerably lower at MetroPark than at the other facilities. This results from the lower level of maintenance quality and frequency at MetroPark.

The municipally leased facilities are maintained

Table 1. Maintenance costs in 1978 for four New Jersey park-and-ride facilities.

Category	Maintenance Item	Annual Cost (\$)							
		MetroPark		Princeton Junction		Middletown		Little Silver	
		Total	Per 100 Spaces	Total	Per 100 Spaces	Total	Per 100 Spaces	Total	Per 100 Spaces
1	Snow removal and ice control	1660	124	10 995	2557	4 640	384	924	240
2	Sweeping and removal of litter	1800	135	180	42	4 931	408	152	39
3	Grass, shrub, and weed control	750	56	2 526	587	11 543	954	1 046	272
4	Security	0	0	3 026	704	4 990	412	5 889	1530
5	Lighting	4700	352	2 199	511	17 658	1459	1 841	478
6	Miscellaneous (drainage, restriping, signs, etc.)	120	9	459	107	1 941	160	1 784	463
Total		9030	676	19 385	4508	45 703	3777	11 636	3022

more frequently, and many maintenance needs are handled through service contracts. For example, Princeton Junction is maintained by a parking authority that has no maintenance force. The West Windsor Parking Authority has maintenance service contracts for all of the categories shown except lighting. Costs are higher with service contracts, but the frequency and quality of maintenance are also higher.

Middletown and Little Silver maintain their facilities through a combination of municipal forces and maintenance service contracts. Items such as snow removal, sweeping, litter removal, and mowing are handled by the municipal maintenance forces and therefore reflect a lower cost. Items such as drainage cleaning, restriping, and lighting may require maintenance contracts.

As Table 1 clearly shows, great variations in cost per 100 spaces exist between the various park-and-ride facilities. These costs vary for a number of reasons, such as size, design features, condition, and the priority each municipality places on a particular maintenance need as part of its maintenance policy. For example, Middletown keeps its facility clear of litter and dirt through the frequent use of power equipment for sweeping and litter removal. As a result, its annual cost for this activity--\$408/100 spaces--far exceeds that of any other facility. The frequency of maintenance and the use of power equipment vary with each municipality for categories 1, 2, and 3 in Table 1. As a result, the costs vary widely. Security costs vary according to the number of police on patrol, the number of vehicles used, and the number of hours the facility is patrolled. For example, Middletown uses only one policeman (and one vehicle) 2 h each day to enforce parking ordinances, and this low security effort is reflected in the low annual cost of \$412/100 spaces. Annual lighting costs (including electricity, bulb replacement, and minor electrical repairs) vary from \$352/100 spaces for the adequately lit facility at MetroPark to \$1459/100 spaces for the extensively lit facility at Middletown (Middletown is lighted by ninety-six 400-W mercury vapor lights).

Although administrative costs are not specifically reflected in Table 1, approximate annual administrative costs for Princeton Junction, Middletown, and Little Silver in 1978 were, respectively, \$12 689, \$2745, and \$848. This would indicate that administrative costs amount to approximately 40, 6, and 7 percent, respectively, of the total annual operating and maintenance expenses for these three facilities. Administrative costs at Princeton Junction are very high because the facility is maintained by a fully staffed parking

authority and it is the only facility the authority currently operates. As the authority assumes responsibility for additional facilities, the administrative costs assigned to Princeton Junction should be reduced. Since municipalities, on the other hand, use existing staff on a time-sharing basis, the administrative cost of maintaining their facilities is low. If one disregards the high administrative cost at Princeton Junction as not being representative, approximately 10 percent of the total annual operating and maintenance expenses for a municipally controlled park-and-ride facility can reasonably be assumed to consist of administrative expenses.

Table 1 illustrates that keeping park-and-ride facilities in excellent condition requires a yearly maintenance expenditure ranging from approximately \$3000 to \$4500/100 spaces. As pointed out previously, the specific costs depend on design features and the degree of maintenance and security provided at the facility. MetroPark's annual cost of \$676/100 spaces falls decisively short of this range, and the lack of adequate maintenance and operational control results in an unattractive and disorderly facility. The MetroPark figure, therefore, should not be used as a realistic comparative cost figure. Experience indicates that a cost of \$3000-\$4500/100 spaces for maintenance and security is a reasonable figure to use for estimating purposes.

FUTURE PROGRAM AND POLICY

On September 15, 1978, the state of New Jersey exercised its option to take title to most of the rail properties in the state used in commuter rail service, which were conveyed to Conrail on April 1, 1976, under the terms of the Regional Rail Reorganization Act of 1973, as amended. Consequently, the state is in the process of acquiring 130 station parcels, including associated parking facilities. As a consequence of these acquisitions, the New Jersey DOT is developing a policy on the operation and management of station facilities. The objectives of the draft policy are to (a) encourage local pride, (b) improve the standard of maintenance and security, (c) minimize state and local costs, and (d) retain limited control to ensure full access to the commuter rail system.

Although the draft policy limits discussion to rail station facilities, it is the department's intention to apply the same policy concepts to the management of bus and rail park-and-ride facilities. This policy is an outgrowth of the arrangements currently in existence at the rail park-and-ride facilities described in this paper.

The policy has been developed to effect the transfer of facility operating, maintenance, and security responsibility from the state, by way of a nominal fee for lease, to municipalities within a relatively short period of time. In general, this leasing policy gives the municipality the right to use and administer the buildings and parking facilities in the manner it deems most appropriate so long as adequate, clean, and safe commuter facilities,

including parking, are maintained.

Only through local supervision of and daily attention to maintenance and service needs can New Jersey's many park-and-ride facilities be maintained in a safe, attractive, and orderly condition to better serve the needs of the state's public transit users.

Publication of this paper sponsored by Committee on Roadside Maintenance.