DUAL-MODE STATION CONFIGURATIONS

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The functional features and the advantages and disadvantages of several dual-mode station configurations, developed for the Urban Mass Transportation Administration, are evaluated. Each uses the Otis palletized-bus dual-mode vehicle.

Trade study summaries address the trade-off of throughput performance and functional features against relative capital cost, land requirements, and implementation risks. The most likely station types for a dual-mode system in a typical urban area are considered.

In the central business district, where land is scarce and expensive, a full-service station incorporating lateral docks for berthing and elevators for the mode interchange function is proposed. This concept provides high throughput, efficient operations, excellent integration with CBD buildings, and minimal land and building requirements. Variations are proposed for other stations in the system. These include a ramp type of interchange in corridors in which land may be more readily available, a passive mode interchange at the corridor extremes where requirements for throughput and passenger transfer at the station may be low, and simple siding stops in areas where mode interchange is not required. For any urban installation, an optimum station configuration can be selected from the alternatives to fulfill specific station site requirements.

Four station types are recommended in a typical system. The simple siding stop would be useful where vehicle mode changes are not required but where small dual-mode vehicle operation is desired. The passive station design eliminates the need for station mechanization and provides redundant loading paths. The two-level station with rotating elevators is the most compact and cost effective. The three-level ramp, mode-interchange station provides high availability but is more expensive and requires more land. When specific station requirements and restrictions are known, the appropriate station can be selected for each site.

SIMULATION, DESIGN, AND IMPACT OF DUAL-MODE ACCESS FACILITIES

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An approach is described to the functional design and analysis of a typical access facility of a dual-mode system concept being researched at General Motors Research Laboratories. The procedure uses a discrete-event simulation model to analyze the performance capability of the facility during the peak demand period and to establish the design values of the critical elements of the access facility. After several design iterations and analyses, a typical access module was adopted. The most critical element was found to be the preinspection queuing area. The analysis revealed that the queuing area would require a storage capacity for 38 vehicles, given a maximum waiting time of 6 min and the requirement that all vehicles be stored off the feeder arterial street.

The entrance module would have three vehicular inspection and automation bays, measure 29.6 × 310.9 m (97 × 1020 ft), require 9308 m^2 (2.3 acres) of land, and have a processing capacity of 360 vehicles/hour. The performance and design characteristics of the entrance module would then be fed into a land requirement model, along with peak-hour loadings, to estimate land consumption effects of the access facilities on the affected communities in a case study area.