

EFFECT OF REGULATIONS ON BUS MAINTENANCE FACILITY DESIGN

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SUMMARY

This reports on a survey of transit properties to identify the effects of recently enacted legislation and implemented regulations on the design of vehicle maintenance facilities. Also identified are some recent practices that have been incorporated into design of maintenance facilities including modifications to adapt to new technology vehicles.

Recent regulations that affect facility design are those relating to (1) The Americans with Disabilities Act (ADA), (2) The Clean Air Act Amendments of 1990 (CAAA), (3) The Clean Water Act and (4) underground fuel storage tanks. Information was obtained from 16 transit agencies on practices used in the design of recently completed bus maintenance facilities. Ways in which these regulations have affected the design of new bus garages are identified.

ADA regulations to improve handicap accessibility impacts a bus maintenance facility size and functional layout in the following ways: restrooms are larger, handicap parking stalls take more space, elevators may be required, ramps are required for small elevation changes, walkways are wider, and doors may be wider. Special features are required including special signage, drinking fountains, telephones and door hardware. These modifications and special features add to the cost of a new or remodeled maintenance facility.

The Clean Air Act Amendments of 1990 impacts many design features. The biggest impact is on maintenance shop modifications required to accommodate safety requirements for new technology buses using alternative fuels. These include fuel handling, improved ventilation, hazardous vapor venting, explosion proof fixtures, special sensing devices and

other automatic controls to provide early warning of trouble. The specific requirements depend on the type of alternative fuel used. It is estimated that the cost to retrofit a shop to accommodate new technology buses using alternative fuels is \$25.00 per square foot. Other impacts due to the CAAA include providing more attention to air quality throughout the maintenance facility. Features such as special exhaust systems in the fuel area and repair areas are common. Pits are being designed with exhausts and make up air systems. New equipment items include antifreeze recycling, freon recovery and paint spray booths.

There are many facility design features affected by the Clean Water Act. They include a water recycling feature for the automatic bus wash system. The recycling is limited to about 80 percent of the water and can add \$25,000 or more to the cost of a washer. Clean Water Act also affects site drainage requirements. Control facilities are needed to treat site drainage before it drains into the surface water or storm system. The shop floor drainage system also is controlled with most agencies having a drainage system that includes industrial waste treatment such as an oil/water separator which can cost \$250,000 for a 10-acre site.

All agencies surveyed store diesel fuel in underground storage tanks. Tank sizes vary from 4,000 to 20,000 gallons. Many tanks are double walled with spill prevention features, leak detectors and inventory monitoring systems.

The complete report is published in Transit Cooperative Research Program (TCRP) Synthesis 7, "Regulatory Impacts on Design and Retrofit of Bus Maintenance Facilities," Transportation Research Board, Washington, D.C., 1994.