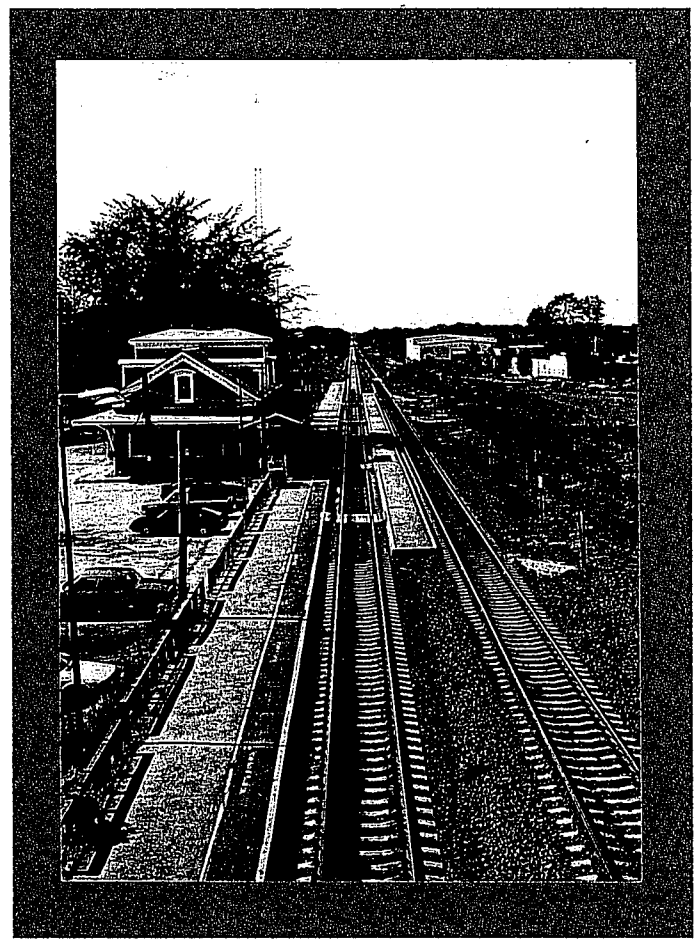
RHODE ISLAND DEPARTMENT OF TRANSPORTATION
RAIL CORRIDOR FEASIBILITY STUDY



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Executive Summary

Introduction

The purpose of the study was to determine the potential for the use of existing railroad rights-of-way for public transportation facilities and services using light rail, commuter rail, or busway technologies. Existing rights-of-way may offer a convenient place in which to locate facilities for enhanced public transportation services.

The study was not intended to develop a system plan for public transportation, as railroad rights-of-way are not the only places where enhanced public transportation services might be appropriate. Developing a public transportation system is a multistep process. This study is the first step, intended solely to determine whether such an enhanced system would be appropriate in a specified set of locations.

The Rhode Island Department of Transportation analyzed twenty rail corridors in the state and selected nine with the best potential for public transportation. Those nine rail corridors were addressed in this study:

Amtrak Shore Line—Connecticut line to Massachusetts line
Bristol Secondary Track—Bristol to Providence
East Providence Secondary Track—East Providence to Cumberland

Harbor Junction Industrial Track—Southern Providence
Newport Secondary Track—Newport to Tiverton
P&W Main Line—Central Falls to Woonsocket
Pontiac Secondary Track—Warwick to Cranston
Quonset Point Industrial Track—North Kingstown
Washington Secondary Track—Coventry to Providence

Where necessary, connections beyond each rail corridor were included to allow direct service to major activity centers.

History of Rail Service in Rhode Island

The first task in the study was a review of Rhode Island's rail history. The most important aspect of that history for this study is the effect that the railroads had upon the development of the land within the state. Although the recent past has brought many new forces to bear upon the patterns of urbanization and suburbanization, the power of the railroads in shaping Rhode Island's development is still clear.

Transportation System Characteristics

Presently existing transportation characteristics were defined through data-collection efforts that focused on the characteristics that would have the greatest effect upon the feasibility of services in the study corridors. Data on the roadway network, ridesharing programs, public transportation services, intercity rail passenger services, rail freight services, and specialized services within the study corridors were used to identify the conditions that could affect the feasibility of public transportation services.

Conditions in the Study Corridors

Present conditions in the study corridors are important because they would affect the costs of developing public transportation facilities there. Those conditions were identified through field inspections in each of the nine corridors, supplemented by interviews with people who had specific information about the corridors. The purpose of the field inspections was to create a comprehensive, current, directly observed assessment of the conditions that would affect the types of construction that would be necessary. Maps of the corridors were created by adding the locations of existing tracks, wayside facilities, and structures onto U.S. Geological Survey maps.

Conditions in the study corridors were found to vary widely, from railroad facilities in excellent condition that exceed the Federal Railroad Administration standard for 110 mph service, to worn and misaligned track that would require major reconstruction, to a corridor in which the rails have been removed and a bikeway constructed.

Selection of Corridors for Detailed Study

To assure that the resources available for this study would be most effectively used, the nine initially identified corridors were screened to select the ones that demonstrate the greatest potential for feasibility. The information developed to support the selection included two basic factors related to feasibility—ridership and characteristics of the right-of-way. Ridership is the most important factor in determining the feasibility of any public transportation system, as it is a measure of the benefits that the system would produce. Characteristics of the right-of-way are also important because they would affect the cost of establishing a public transportation project.

The Amtrak Shore Line, the Bristol Secondary Track, the East Providence Secondary Track, the Newport Secondary Track, the P&W Main Line, and the Washington Secondary Track were selected to be studied in more detail. A variation on the Newport Secondary that would connect to the Bristol Secondary was also included in the study. The Harbor Junction Industrial Track, the Pontiac Secondary Track, and the Quonset Point-Davisville Industrial Track were not studied in more detail but could still be considered for transit system improvements in future planning efforts.

Alternatives

Alternative improvements were defined in each corridor using three fixed-guideway public transportation technologies. *Light rail transit* is a metropolitan railway system with vehicles similar to streetcars but which is separated from other traffic as much as possible. *Commuter rail* is a longer-distance passenger railroad using trackage that is a part of the general railroad network. *Busways* are roads that are used exclusively by buses. Not all technologies would be appropriate in all corridors.

Station Locations

Each of the corridors selected for study was examined to identify potential locations for public transportation stations and stops. Station locations are important for estimating ridership, determining the accessibility of a public transportation line from the surrounding area, and examining the environmental impacts of station development. Criteria used for the selection of station locations included amount of development in the vicinity, compatibility of a station with surrounding development, and accessibility from the roadway network.

Ridership

Estimates of ridership in 2010 on each line were developed based upon projected future geographic distribution of population and employment in Rhode Island, projected trip patterns both within Rhode Island and to Boston, and the usage characteristics of public transportation systems in other urban areas. A single ridership estimate was made for each corridor regardless of the type of public transportation line that could be built there. A range of daily ridership was

estimated for each corridor reflecting variations in the portion of total trips that could be attracted to public transportation.

In general, the ridership projections are highest for those areas that are projected to have the highest amount of development and where there is a natural attraction between the area in the corridor and a downtown, either Providence or Boston.

Environmental Issues

Environmental conditions in the corridors were reviewed to identify any that might preclude the development of public transportation. None was found, but noise impacts could require mitigation. Further detailed analysis would be needed on some issues, including impacts upon historic sites and traffic impacts, and permits would be required in coastal areas.

Institutional Issues

Organizational issues would require resolution before undertaking a project, including the definition of responsibilities for construction, finance, and operations. Project planning would need to follow federal guidelines if federal funds are to be sought for construction.

Capital and Operating Costs

Probable capital costs were estimated for the initial construction of facilities and acquisition of vehicles. Estimates were also developed for the annual operating cost, including maintenance. The costs were based upon cost information from the Rhode Island Public Transit Authority and other public transportation agencies, especially the Massachusetts Bay Transportation Authority.

Evaluation of Alternatives

The feasibility of public transportation improvements in the corridors was assessed based upon costs, ridership, and environmental effects. The characteristics of the alternatives in each corridor are shown below.

Summary Characteristics of the Alternatives

Alternative	Route Miles	Capital Cost, Millions	Annual Operating Cost, Millions	Total Annualized Cost, Millions	Daily Ridership
Amtrak Shore Line Commuter Rail to Westerly	43.0	$48.75	$13.60	$17.90	3,300-5,000
Amtrak Shore Line Commuter Rail to Kingston	27.2	41.72	9.41	12.83	3,200-4,800
Bristol Secondary Busway	16.2	71.17	4.30	9.81	
Bristol Secondary LRT	16.2	109.52	5.10	13.67	2,900-4,300
Bristol Secondary Commuter Rail	15.5	72.72	7.97	13.92	
East Providence Secondary Busway	9.2	66.71	3.75	9.23	4,200-6,300
East Providence Secondary LRT	9.2	88.78	3.47	10.42	
Newport Secondary Commuter Rail to Fall River	21.2	64.70	6.50	11.52	500-800
Newport-Bristol Combination Busway	30.5	95.96	5.58	13.00	3,200-4,800
Newport-Bristol Combination LRT	30.5	228.65	7.80	25.38	
P&W Main Line Commuter Rail	16.5	63.25	8.46	13.71	2,200-3,300
Washington Secondary Busway	14.3	45.09	3.69	7.24	3,300-4,900
Washington Secondary LRT	14.3	98.35	4.24	11.98	

Several evaluation measures were developed for the alternatives, including capital cost per mile, annual operating cost per mile, annual operating cost per passenger, and total annualized cost per passenger that included both capital and operating cost. They are shown below:

Evaluation Measures for the Alternatives

Alternative	Capital Cost per Mile, Millions	Annual Operating Cost per Mile	Annual Operating Cost per Daily Rider*	Total Annualized Cost per Daily Rider*
Amtrak Shore Line Commuter Rail to Westerly	$1.13	$316,000	$3,300	$4,300
Amtrak Shore Line Commuter Rail to Kingston	1.53	346,000	2,400	3,200
Bristol Secondary Busway	4.39	266,000	1,200	2,700
Bristol Secondary LRT	6.76	315,000	1,400	3,800
Bristol Secondary Commuter Rail	4.69	514,000	2,200	3,900
East Providence Secondary Busway	7.25	408,000	700	1,800
East Providence Secondary LRT	9.65	377,000	700	2,000
Newport Secondary Commuter Rail to Fall River	3.05	306,000	10,000	18,000
Newport-Bristol Combination Busway	3.15	183,000	1,400	3,300
Newport-Bristol Combination LRT	7.50	256,000	2,000	6,300
P&W Main Line Commuter Rail	3.83	513,000	3,100	5,000
Washington Secondary Busway	3.15	258,000	900	1,800
Washington Secondary LRT	6.88	297,000	1,000	2,900

* At midpoint of range of ridership estimate

Conclusions

- Development patterns in the study corridors do not exhibit the scale of concentrations that are typically recommended to support a light rail system. Community plans, zoning ordinances, and development incentives would need to be revised to encourage higher-density development.

- Railroad rights-of-way can allow inexpensive construction of fixed-guideway public transportation facilities.

- Railroad rights-of-way are not in all cases the best location for fixed-guideway lines. Where they follow bodies of water, the ridership potential can be limited and there may be greater environmental sensitivity.

- Design and operating standards can have a significant effect upon cost-effectiveness. Lower standards than the ones used in this study could reduce costs, but could reduce ridership.

- The ability to develop a financial plan for a fixed-guideway project is a critical issue.

- The Amtrak Shore Line provides the easiest opportunity to develop a fixed-guideway line in Rhode Island. Commuter rail fits the characteristics of the corridor well.

- The East Providence Secondary has the highest ridership of the corridors studied; it also has the highest capital cost per mile. It shows the best potential for fixed-guideway development after the Amtrak Shore Line.

- The Washington Secondary is one of the better-performing corridors in the analysis because it runs through a developed area. Performance measures are better for a busway, but light rail would have better environmental characteristics.

- The Bristol Secondary would be a challenging location for fixed-guideway development because of moderate ridership. The facility would require creative design to accommodate the existing bikeway. A busway shows the best cost-per-rider performance.

- The P&W Main Line would have relatively low ridership, which would reduce performance measures. Any further analysis should consider opportunities for cost reduction.

- The Newport-Bristol Combination would reflect the characteristics of the two corridors that it comprises. Total cost per daily rider would be higher for the combination corridor than for the Bristol Secondary alone. The LRT alternative would have a high capital cost because of the new bridge over Mount Hope Bay. The combination of this high cost and the low ridership on the Newport Secondary portion of the corridor would create a high total cost per rider.

- The Newport Secondary has the lowest capital cost of the corridors studied other than the Amtrak Shore Line. But ridership would be low, and cost per rider would be highest of the corridors analyzed. Increased development levels and strategies to reduce costs would be necessary for fixed-guideway development.

Recommendations

- Development of commuter rail service on the Amtrak Shore Line should proceed incrementally.

- Because of the large capital investments that would be necessary, a decision must be made whether further fixed-guideway public transportation should occur, based upon Rhode Island's transportation, development, and fiscal goals.

- If fixed-guideway development is to occur, the next decision will concern project funding. If federal funds are deemed to be necessary, federal planning procedures will need to be followed. This would begin with the development of a system plan, selection of a priority corridor, and analysis of alternative public transportation improvements in that corridor.