WARWICK INTERMODAL STATION
AT T.F. GREEN AIRPORT
WARWICK, RHODE ISLAND

ENVIRONMENTAL ASSESSMENT

May, 1999

RHODE ISLAND
DEPARTMENT
OF TRANSPORTATION

FEDERAL
HIGHWAY
ADMINISTRATION

Warwick Intermodal Station
at
T.F. Green Airport
Warwick, Rhode Island

Environmental Assessment

Submitted Pursuant to 42 U.S.C. 4332 (2) (c)
By the
U.S. Department of Transportation
Federal Highway Administration
And the
Rhode Island Department of Transportation

5-24-99
Date of Approval

Melisa L. Ridenour
Division Administrator
Federal Highway Administration, Rhode Island Division

5/21/99
Date of Approval

William "Chuck" Alves
Chief/Intermodal Planning
Rhode Island Department of Transportation

This Environmental Assessment (EA) evaluates various alternatives for a new Amtrak and Commuter Rail Station in Warwick with a people mover connection between the station and the T.F. Green Airport Terminal. In accordance with the applicable Federal-aid highway procedures, the EA has been prepared to evaluate the potential social, economic, and environmental impacts of the preferred alternative.

The following persons may be contacted for additional information concerning this document:

Mr. Ralph J. Rizzo, Transportation Planner
Federal Highway Administration
380 Westminster Mall
Providence, RI 02903
(401) 528-4548

Mr. Stephen A. Devine, Project Manager
Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02904
(401) 222-4203

TABLE OF CONTENTS

EXECUTIVE SUMMARY ES-1

SECTION 1.0 PURPOSE AND NEED 1

1.1 Introduction 1
1.2 Project Background 1
1.3 Statement of Purpose and Need 4
1.3.1 Transportation 4
1.3.2 Economic Development 5
1.3.3 Environmental 5

SECTION 2.0 ALTERNATIVE ANALYSIS 8

2.1 Introduction 8
2.2 No Build Alternative 8
2.3 Development and Evaluation of Build Alternatives 9
2.3.1 Amtrak/Commuter Rail Station Sites 9
2.3.2 People Mover Routes and Systems 11
2.4 Preferred Alternative 19
2.4.1 Amtrak/Commuter Rail Intermodal Station 20
2.4.2 People Mover Connection to T.F. Green 24
2.4.3 Shuttle Service Between Providence and Warwick 24

SECTION 3.0 POTENTIAL IMPACT CATEGORIES 28

3.1 Land Use Impacts 28
3.2 Park and Recreation Area Impacts 28
3.3 Farmland Impacts 29
3.4 Social Impacts/Environmental Justice 29
3.5 Relocation Impacts 31
3.6 Economic Impacts 32
3.7 Joint Development 32
3.8 Pedestrian and Bicycle Movement 33
3.9 Air Quality Impacts 33
3.10 Noise Impacts 36
3.11 Traffic 37
3.12 Ridership 41
3.13 Water Quality Impacts 42
3.14 Permits 43
3.15 Wetland Impacts 43
3.16 Water Body Modification and Wildlife Impacts 47
3.17 Floodplain 47
3.18 Wild and Scenic Rivers 47
3.19 Coastal Zone Impacts 49

3.20 Threatened Species 49
3.21 Historic and Archaeological Preservation 49
3.22 Hazardous Waste Sites 53
3.23 Visual Impacts 55
3.24 Energy 55
3.25 Construction Impacts 55
3.26 Access Impacts 58

SECTION 4.0 COMMENTS AND COORDINATION 59

4.1 Introduction 59
4.2 Public Workshops 59
4.3 Agency Coordination 59

SECTION 5.0 DISTRIBUTION LIST 62

SECTION 6.0 APPENDICES

6.1 Noise Analysis
6.2 Hazardous Materials Investigation
6.3 Historical and Archaeological Reports
6.4 Natural Systems
6.5 Traffic
6.6 Ridership
6.7 Relocation Impacts

LIST OF FIGURES

Figure 1-1 USGS Locus Map 2
Figure 1-2 Photo of Study Area 3
Figure 1-3 Warwick Station Redevelopment District 7
Figure 2-1 Station Site Alternatives 13
Figure 2-2 Site Plan of Intermodal Station 21
Figure 2-3 Cross Sectional View of Proposed Intermodal Station 22
Figure 2-4 Elevation of Proposed Intermodal Station 23
Figure 2-5 Site Plan of People Mover 26
Figure 3-1 Schools and Park Areas 30
Figure 3-2 Drainage Basins - Watersheds 44
Figure 3-3 Designated Sole Source Aquifers 45
Figure 3-4 Wetland Classification 46
Figure 3-5 FEMA Floodplain Classification 48
Figure 3-6 Historic Sites 51
Figure 3-7 Hazardous Sites 54

LIST OF TABLES

Table 2-1 Summary of Potential Station Locations 11
Table 2-2 Summary of Characteristics of Alternative People Mover Routes 12
Table 3-1 Annual Emissions Reduction for 2000 and 2020 34
Table 3-2 Level of Service Criteria for Intersections 38
Table 3-3 Warwick Station Daily Ridership Demand - Trips 41-42

LIST OF PHOTOS

Photos 1 and 2 - Moving Sidewalk at Logan Airport 17
Photos 3 and 4 - Horizontal Elevator at Wellington Station 18
Photos 5 and 6 - Moving Sidewalk at Logan Airport 26
Photos 7 and 8 - Wellington Horizontal Elevator Lobby Area 27

EXECUTIVE SUMMARY

Introduction

As authorized under the 1998 Federal Transportation Equity Act for the 21st Century (TEA 21), the Rhode Island Department of Transportation (RIDOT) proposes to construct an Amtrak and commuter rail station in the Hillsgrove area of the City of Warwick along the Northeast Rail Corridor (NEC), and provide an automated people mover connection between the train station and T.F. Green Airport (the Airport). The project area is shown in Figure ES-1.

To adequately serve the new train station, RIDOT proposes an electrified rail shuttle to be considered in the future that would provide frequent service between the Providence metropolitan area and the Airport. Such a shuttle train would operate along the NEC. The train station and people mover project has independent utility and is not dependent on the shuttle service. The shuttle train is not evaluated in this Environmental Assessment (EA) and may be the subject of future environmental documentation.

This section summarizes the EA for the proposed Warwick Intermodal Train Station Project. These improvements are necessary to alleviate projected traffic congestion along the roadways in the Airport area that will result from substantial current and future growth in passenger use at the Airport. In addition, the improvements will support and enhance the proposed redevelopment within a 22-acre Intermodal Zone between the NEC and the Airport, as proposed and recently enacted by the City of Warwick.

The EA for the Warwick Intermodal Train Station Project has been prepared pursuant to rules and regulations of the National Environmental Policy Act of 1969 (as amended) 40 CFR Parts, 1500-1508, and the Federal Highway Administration's (FHWA) Environmental Impact and Related Procedures (23 CFR 771). In particular, the EA has been prepared in compliance with FHWA Technical Advisory 6640.8A (1987), and is submitted pursuant to 42 USC 4332 (2) (c) by the U.S. Department of Transportation, FHWA and RIDOT.

The EA identifies the potential environmental impacts associated with the preferred alternative. The No Build alternative is addressed as a viable option and as a basis of comparison to the preferred alternative. The EA process has provided opportunities for public input into the assessment of environmental consequences of the project.

Purpose and Need

The NEC is located approximately 1,570 feet west of the new terminal at the Airport. It is the closest Amtrak rail line to a major airport terminal in the country. As upgrades continued to be made to the NEC by Amtrak, major investments have been taking place at the Airport, the State's principal air transport facility. The Airport is operated by the Rhode Island Airport Corporation (RIAC). Since 1991, more than $210 million has been invested to construct a new two-story terminal building, access roads, parking facilities and related improvements. The new facilities at the Airport have been in operation since 1996 and have proved to be remarkably successful. With new facilities in place, the RIAC was able to attract Southwest Airlines to the Airport and passenger volumes increased sharply. In 1996, the airport served 2.5 million passengers while just a year later (1997), that number increased to 4.1 million. RIAC projects passenger numbers to continue to grow and reach 6 million passengers by the Year 2000. This projection is independent from the effects of the train station and people mover project.

With improvements on the NEC nearly complete, and the successful Airport nearby, State and local transportation officials have sought to create an intermodal gateway connecting the two transportation facilities. The 1998 TEA 21 authorized $25 million for a new Warwick Amtrak/Commuter Rail Station with an elevated people mover to connect the new station to the Airport terminal building.

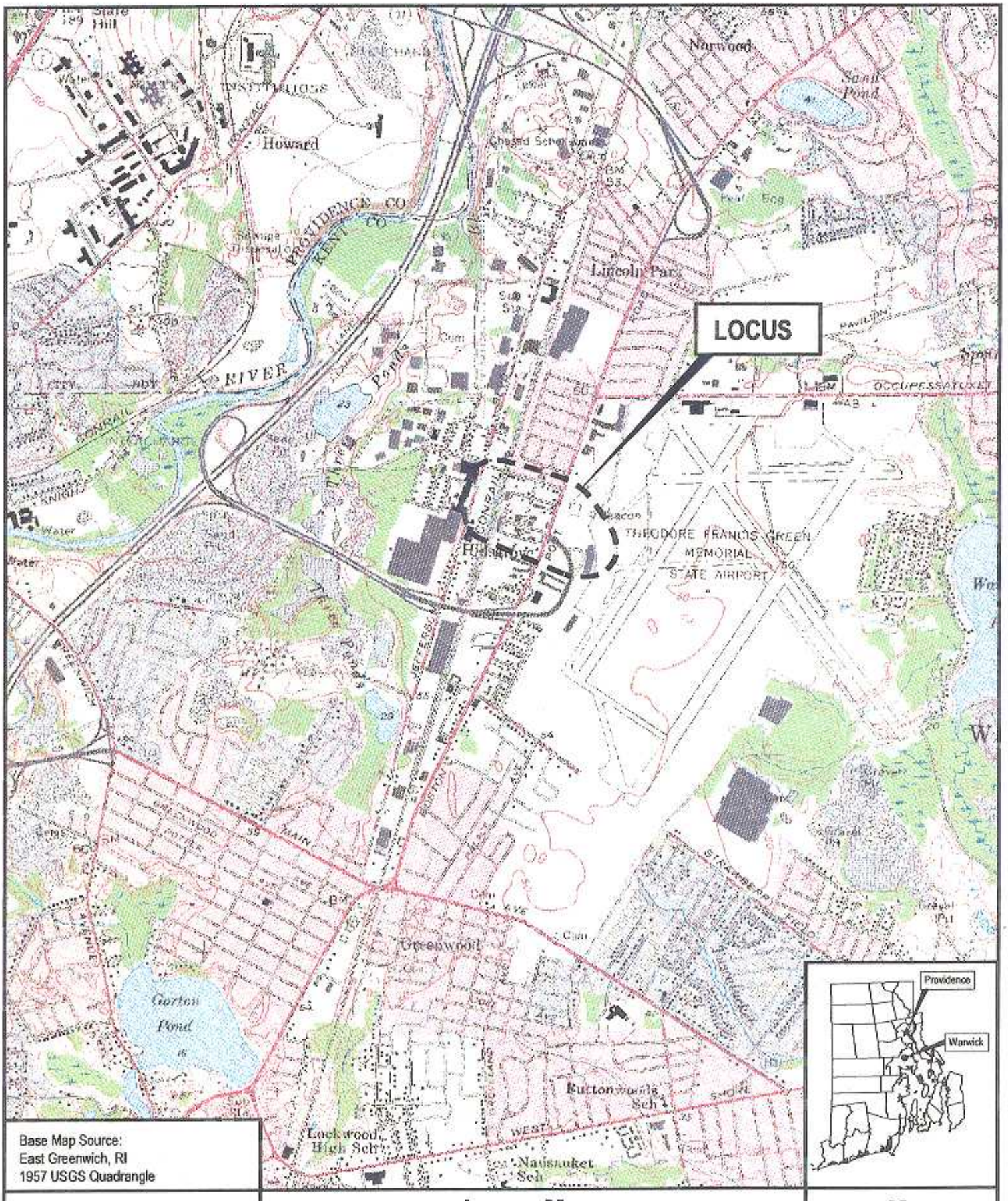
The following is a summary of the project's purpose and need:

➢ Transportation

The proposed project has two primary transportation purposes:

- To relieve peak hour traffic congestion in the I-95 corridor in the Providence metropolitan area by diverting drivers of single occupant vehicles to use the rail station and people mover to access the Airport. The proposed people mover element of the project is intended to make the new train station an intermodal facility. Any modal shift will serve to preserve available roadway capacity on Post Road (U.S. Route 1) and local roadways.

- To provide an additional mode of travel for area residents to access jobs in Providence and Boston. Projections for daily use of the commuter rail station show that some 400-500 commuters would use the proposed station.



Base Map Source:
East Greenwich, RI
1957 USGS Quadrangle

Rhode Island Department
of Transportation
Federal Highway Administration

Locus Map
Warwick Intermodal Station
at T.F.Green Airport
Warwick, Rhode Island

Scale: 1"=2,000'

N

Figure ES-1

➢ Economic Development

The proposed project will support and enhance the City of Warwick's redevelopment efforts as described in the City's Warwick Station Redevelopment District Plan enacted December 14, 1998. The train station and people mover would provide intermodal access opportunities to the surrounding 22-acre Intermodal Zone. The proposed project would enhance economic development opportunities within the Intermodal Zone, in addition to the adjacent 48-acre Gateway Zone.

➢ Environmental

The proposed project will improve air quality by reducing automobile traffic volumes along I-95 and the roadways adjacent to the Airport. Any diversion of trips from automobile to rail will assist in improving existing air quality conditions, which has been classified by the U.S. Environmental Protection Agency (EPA) as a serious non-attainment area for ozone.

The proposed project will provide for the cleanup and removal of documented hazardous material and groundwater contamination from the land parcels proposed for the train station, thereby improving and enhancing the environmental quality in the area.

Alternatives Considered

The proposed project consists of the following two major components:

- Amtrak/commuter rail station on the NEC
- Automated people mover connection to the Airport

A future electrified rail shuttle between Providence and Warwick has been proposed by RIDOT. The proposed train station and people mover project has independent utility from the shuttle service.

The public scoping process developed by RIDOT and FHWA for this project provided input as to the selection of practicable and feasible alternatives for the two major components.

The following are the alternatives considered for this project:

No Build Alternative
The No Build Alternative assumes the following independent transportation improvements will be implemented. Note that a significant volume of train traffic will pass through the proposed Warwick station area because of these improvements, even without the train station and people mover project.

- Continuance of existing ground transportation system adjacent to the Airport, in addition to future Amtrak high-speed train service on the NEC

- Implementation of RIDOT's Freight Rail Improvement Project (FRIP) on the NEC. The FRIP would provide a third railroad track approximately 23 miles long between Quonset Davisville Port and Commerce Park in North Kingstown and Central Falls in Pawtucket. The third track would be for use by freight trains, thereby not using the same tracks as the Amtrak passenger trains.

- South County Commuter Rail Service between Providence and Westerly on the NEC

- Year 2018 proposed transportation improvements as currently planned by RIDOT

Build Alternative

The Build Alternative includes a train station and a people mover system in Warwick near the Airport. The following briefly discusses alternatives for both project components.

Train Station Sites Considered

Jefferson Boulevard North	This is the area north of the Jefferson Boulevard and Coronado Road intersection. The approximately 3-acre site includes several small businesses. This site was dropped from study due to the lack of a reasonably direct connection to the Airport terminal for a people mover, the impacts upon active businesses and its proximity to a church and school.
Leviton Parking Lot	This approximately 3.5-acre site has suitable access from Jefferson Boulevard and a parking area with approximately 300 spaces. The site is situated so that a people mover connection would be easily aligned with the Airport terminal. This privately owned lot currently provides parking for employees of Leviton, one of Warwick's major industrial employers. The parking area is not currently fully used. Relocation of some parking spaces to other areas within the Leviton property would be required.
Leviton/Baylis Chemical Site	The Baylis Chemical site is approximately 1.2 acres in size. The Baylis Chemical property was formerly used to process hazardous wastes. The site is contaminated and requires expensive clean up. Although the

Baylis site by itself is not large enough to accommodate required parking for the station, the property can be used for access to the station and the people mover. The Bayliss site is located east of and across the railroad tracks from the Leviton site. When the two sites are combined in the project plans, the Leviton site provides a large parking lot for the station. The Leviton parking lot site combined with the Baylis site ranked high as a candidate station site in the alternatives evaluation. The site meets both objectives of keeping the station and parking west of the railroad tracks to facilitate highway access and of keeping the people mover connection east of the tracks to facilitate airport access.

Leviton/Budget Rental Site

This site is occupied by Budget truck rental and maintenance facilities. This property combined with the Leviton site was considered to maximize train station parking facilities, and provide for a long-term Amtrak parking lot, distinct from the commuter rail lot.

Hillsgrove South Area

This site is located north of the Airport Connector Road and east of the railroad tracks. This site was dropped from further study because it is too far south of the Airport terminal to make a good connection for a people mover. The area consists of single family residential homes. Access to this area would be via Post Road, which is already heavily traveled, and a less desirable access point than Jefferson Boulevard, which carries a lower volume of traffic.

Connector Road Area

This area is south of the Connector Road and east of the railroad tracks. This site was dropped from further study because it is substantially south of the Airport terminal, making a people mover connection quite difficult. The site is occupied by several businesses and access to the site would be from Post Road, an already congested roadway.

Table ES-1 summarizes the basic characteristics of each of the train station sites considered.

Table ES-1 Summary of Potential Station Locations

Potential Site	Characteristics			
	Intermodal Connection	Highway Access	Community Impacts	Development Interface
Jefferson Blvd. North	Indirect	Jefferson Blvd.	Business Relocation Required	Less Feasible
Leviton Parking Lot	Direct	Jefferson Blvd.	No Building on Lot	Less Feasible
Leviton/Budget	Direct	Jefferson Blvd.	Business Relocation Required	Feasible
Leviton/Baylis	Direct	Jefferson Blvd. & Post Road	Clean-up of Baylis Required	Feasible
Hillsgrove South	Indirect	Post Road	Business and Residential Relocation Required	Less Feasible
Connector Road	Indirect	Post Road	Business Relocation Required	Less Feasible

People Mover Systems

Several types of people mover systems were studied for potential application to this project, including:

- Personal Rapid Transit (PRT)
- Monorail
- Moving Sidewalk
- Horizontal Elevator
- Airport Bus Shuttle

After analysis of each system, including costs and system characteristics, the PRT, monorail and airport bus shuttles were dropped from further consideration. These systems did not meet the multiple and seamless access needs of the project as fully developed. The moving sidewalk and horizontal elevator were selected for the preferred people mover route. These systems best met the access needs of the railroad station and the airport as well as the future proposed economic development between Post Road and the railroad tracks.

People Mover Routes

The following is a description of the proposed alternative routes of the people mover that were considered in this study:

Coronado Road — The people mover uses the Coronado Road right-of-way between the train station and Post Road, and approaches the airport terminal on the north side of the airport loop roads.

Fresno Road — The people mover uses the Fresno Road right-of-way between the train station and Post Road, and approaches the airport terminal through the short-term parking lot to either the center or south end of the terminal building.

Montebello Street — The people mover uses Glenham Avenue to the south, and Montebello Street right-of-way between the train station and Post Road, and approaches the Airport terminal along the south loop road and Airport Connector Road.

Table ES-2 Summary of Characteristics of Alternative People Mover Routes

People Mover Route	Route Length (feet)	Direct Intermodal Connection	Supports Redevelopment District	Visual Impacts	Construction Issues
Coronado Road	1,720	No	No	Yes	Major grade differentials
Fresno Road	1,570	Yes	Yes	Yes	Uses existing roadway
Montebello Street	2,200	No	No	Yes	Substantially higher structure

Preferred Alternative

The project's preferred alternative is to construct an Amtrak/commuter rail station on the west side of the NEC on the Leviton Parking Lot and Budget Rental sites, with a connection at the Baylis Chemical site to a people mover system along Fresno Road to the Airport terminal. The people mover system consists of two components:

(1) an elevated moving sidewalk above Fresno Road between the train station and Imera Street; and
(2) an elevated horizontal elevator between Imera Street, through the RIAC short-term parking lot, and the Airport terminal building or upper roadway.

The preferred alternative is shown on Figure ES-2.

The design of the people mover connection between the train station and the Airport terminal will be detailed in the next phase of the project. A final decision on the technology and equipment to be employed has not yet been made. Preliminary analysis conducted for this EA indicates that a feasible and cost-effective configuration would consist of a combination of a moving sidewalk and a horizontal elevator, connecting the intermodal station concourse at its second level and the Airport terminal. The 300-foot moving sidewalk would be inside a weatherproof structure, similar to the new elevated and enclosed moving sidewalks connecting the West Garage with two terminals at Boston's Logan International Airport (Logan).

The easterly end of the moving sidewalk would interface with the second component of the people mover, a horizontal elevator, at a lobby that would also be accessible to planned adjacent development. The horizontal elevator will travel on an elevated structure a distance of approximately 1,200 feet and connect to a glass-enclosed area adjacent to the second level roadway immediately in front of the airport terminal. The preferred alternative design needs to be flexible so the people mover will terminate either in front of the terminal or at its south end, at the upper roadway or connect to the building. This analysis does not preclude consideration of an enclosed people mover during the design phase.

The technology for this type of people mover is proprietary and the specifics of what the system will look like will be refined during the design phase of the project. Generally, however, the system may work and look like the 800-foot-long horizontal elevator known as the "Wellington Shuttle". This operating system located in Medford, Massachusetts connects a 1,500-car parking garage to the Wellington Station of the Massachusetts Bay Transportation Authority (MBTA) that serves heavy rail rapid transit (Orange Line).

The proposed electrified shuttle service between Providence Station and the proposed Warwick Station would provide an alternate intermodal access in the future for the thousands of travelers arriving at the Airport with destinations in the downtown area of Providence. It is anticipated that the shuttle would operate during peak periods at approximately 30-minute intervals. The exact operating schedule has not yet been determined. The shuttle would be serviced by a platform next to a fourth railroad track east of the mainline tracks.

The preferred alternative was selected because it best meets the purposes and need for the project, as described below:

Transportation: The station location and the people mover will be substantially visible and easily accessible so as to divert modal shifts from single-person automobile to transit, thereby helping to reduce highway congestion in the immediate area. The easy connection for rail-air travelers over busy U.S. Route 1 (Post Road) should be a major incentive to drivers to switch modes. Further, the project will increase use of new rail service by commuters, especially those not necessarily destined for air travel.

Economic Development: The new railroad station and people mover will be a major catalyst to attract economic real estate development of this underdeveloped area and make full use of the excellent multi-modal transportation facilities nearby. Further, the project supports implementation of the City of Warwick recently enacted Redevelopment District Master Plan.

Environmental: The project will divert automobile drivers to transit for Airport-related and some commuter trips, thereby having a positive effect on reducing vehicle emissions in the area. In addition, the project will cause the clean up of a site containing hazardous materials and groundwater contamination.

FEDERAL HIGHWAY ADMINISTRATION	Site Plan of People Mover	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure ES-2

Environmental Impacts Assessed

The EA assesses the social and environmental effects of the Preferred Alternative, both qualitatively and quantitatively. Both beneficial and adverse impacts are discussed and, where necessary, mitigation measures are identified. A summary of the major findings is presented below:

TABLE ES-3 SUMMARY OF ENVIRONMENTAL IMPACTS OF PREFERRED ALTERNATIVE

ENVIRONMENTAL CATEGORY	COMMENTS	IMPACT
Land Use	· Consistent with City-enacted land use plan as part of Redevelopment District · Existing uses: light industrial, misc. commercial and residential	Beneficial Impact
Park and Recreation Areas	· No public parks or recreational facilities within the project area	No Impact
Farmland	· Soils are not suited for agriculture	No Impact
Social/Environmental Justice	· Increased employment opportunities · Supports City's development plan · Consistent with Environmental Justice objectives	Beneficial Impact
Relocation	· Relocation of one business (Budget). No relocation of housing units	No Significant Impact
Economic	· Supports City's development plan · Greater employment opportunities · Increased tax revenue due to adjacent development	Beneficial Impact
Joint Development	· Supports development at new intermodal station · Allows concentrated development along people mover alignment	Beneficial Impact
Pedestrian and Bicycle Movement	· Provides for safe pedestrian access between station and airport and alongside roadways · Provides bicycle storage	Beneficial Impact
Air Quality	. Reduction in Vehicle Miles Traveled . Reduction in regional emissions	Beneficial Impact

TABLE ES-3 SUMMARY OF ENVIRONMENTAL IMPACTS OF PREFERRED ALTERNATIVE (Continued)		
ENVIRONMENTAL CATEGORY	**COMMENTS**	**IMPACTS**
Noise	· Build Alternative reduces noise from all train sources within project area · Overall decrease in maximum noise levels	No Significant Impact
Traffic	· Two unsignalized intersections to be signalized · Two signalized intersections to be upgraded	No Significant Impact after Mitigation
Ridership	· Project will result in reduction of vehicle miles traveled · Project will aid in modal shift from car to train	Beneficial Impact
Water Quality	· No surface water resources located within the project area · Not within designated sole source acquirer	No Significant Impact
Permits	· Requires RIPDES Permit and State Water Quality Certification	Permits Required
Wetland	· No wetlands within the project area	No Impact
Water Body Modification and Wildlife	· No wetland or water resources within project area · No wildlife corridors or significant wildlife habitat	No Impact
Floodplain	· No impact to the 100-year or 500-year flood zones	No Impact
Wild and Scenic Rivers	· No designated rivers within the project area	No Impact
Coastal Zone	· Not located within a coastal zone	No Impact
Historic and Archaeological Preservation	· Eligibility studies completed	No Adverse Effect
Hazardous Waste Sites	· Baylis site to be remediated	Beneficial Impact
Visual	· Project intended to complement the surrounding area	Beneficial Impact
Energy	· Design will use latest energy saving features	No Significant Impact

TABLE ES-3 SUMMARY OF ENVIRONMENTAL IMPACTS OF PREFERRED ALTERNATIVE (Continued)		
ENVIRONMENTAL CATEGORY	**COMMENTS**	**IMPACTS**
Construction	· No residential areas affected · Traffic impacts will be coordinated with the City and RIAC	No Significant Impact
Access	· Will provide elevators and all necessary ADA components	Beneficial Impact

Public and Agency Participation

The EA was developed through a collaborative process involving the public, State and Federal agencies and the City of Warwick. During the scoping phase, two public meetings were held on August 3 and 27, 1998, both at the Radisson Hotel in Warwick.

During scoping, the public and agencies provided comments on the alternatives being developed. All comments were responded to in writing by RIDOT. Public meetings were supplemented by telephone contact, correspondence and on-site meetings with agencies, area business owners and residents.

In addition, an agency scoping meeting was held on August 27, 1998 at the RIDOT Traffic Operations Center Conference Room. Each State and Federal agency represented was asked to provide comments and input at the meeting.

The following agencies are Cooperating Agencies for the EA:

Federal
Federal Railroad Administration (FRA)
Federal Transit Administration (FTA)
Federal Aviation Administration (FAA)
Environmental Protection Agency (EPA)

State
Department of Environmental Management (DEM)
Rhode Island Airport Corporation (RIAC)
Rhode Island Public Transit Authority (RIPTA)
Historical Preservation and Heritage Commission (HPHC)

The following agencies, designated as Coordinating Agencies for this project, have been provided with all project information and updates as necessary:

- Rhode Island Economic Development Corporation (RIEDC)
- Amtrak
- Massachusetts Bay Transportation Authority (MBTA)
- City of Warwick
- Narragansett Indian Tribe

A third public informational meeting was held on October 20, 1998 at the Radisson Hotel, Warwick. The purpose of the meeting was to present the selected alternatives for analysis in the EA, the EA scope of work, and basic conceptual design components.

A fourth public meeting was held January 7, 1999 at the Radisson Hotel, Warwick, to present the Preliminary EA and its findings.

SECTION 1.0 PURPOSE AND NEED

1.1 Introduction

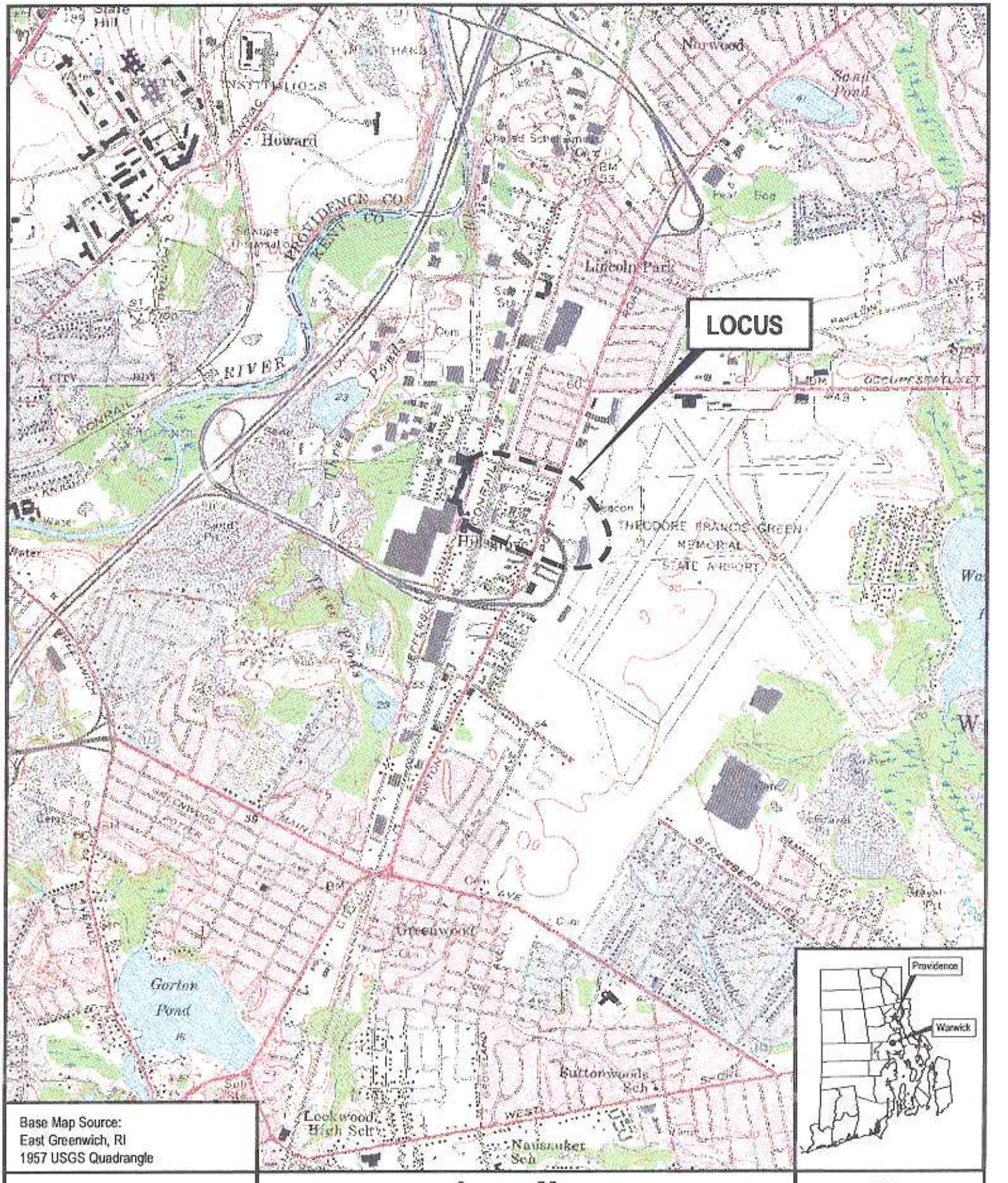
The Rhode Island Department of Transportation (RIDOT) proposes to construct a new Amtrak and commuter rail station in Warwick on the upgraded Northeast Rail Corridor (NEC) and provide a people mover connection between the train station and the rapidly expanding T.F. Green Airport (the Airport). In addition to the new rail station and people mover in Warwick, State transportation officials are proposing the institution of an electrified rail shuttle that would provide frequent service between Providence and Warwick. The shuttle train would operate within the NEC right-of-way. The shuttle would provide a connection between the Airport and downtown Providence. The shuttle is not part of this project but the new rail station and people mover will be designed so as not to preclude such a shuttle at a later date.

These proposed improvements will be accomplished under the 1998 Federal Transportation Equity Act for the 21st Century (TEA 21). In accordance with the applicable Federal-aid highway procedures, RIDOT has prepared this Environmental Assessment (EA) to address the potential social, economic and environmental impacts of the preferred alternative. The project location is shown on Figure 1-1, and the study area for the proposed improvements is shown in the aerial photo on Figure 1-2. The Alternatives Analysis is presented in Section 2.0. The preferred alternative is described in Section 2.4.

1.2 Project Background

The NEC is the nation's busiest rail corridor and serves 11 million passengers annually. The corridor links the major cities of Boston, Providence, New York, Baltimore and Washington. This 457-mile rail line is publicly owned and operated by Amtrak. In 1971, Congress created Amtrak to help maintain the viability of rail service in the Northeast, the most densely developed section of the country. To ease the burdens on both highways and airports in the NEC, Congress has appropriated $3 billion since the late 1970's to upgrade and electrify this railroad corridor, so that trains could travel at higher speeds and provide more service. The investment in rail improvements is nearly complete. By late 1999, intercity rail passenger service will connect Boston and Providence with 30-minute trip times and will connect Providence and New York with 2.5-hour trip times.

The NEC will allow for several types of rail-service including the newest Amtrak high-speed (150-mph) service connecting the major cities as well as the current 100-mph service that now provides the intercity service. In addition to Amtrak rail service, the NEC will handle freight and Massachusetts Bay Transportation Authority (MBTA) commuter rail service. The MBTA currently provides commuter rail service to Providence. In May 1998, an agreement was reached between the State of Rhode Island and the Commonwealth of Massachusetts to provide additional trains to Providence and extend service to Warwick once a train station is constructed.



Base Map Source:
East Greenwich, RI
1957 USGS Quadrangle

Rhode Island Department
of Transportation
Federal Highway Administration

Locus Map
Warwick Intermodal Station
at T.F.Green Airport
Warwick, Rhode Island

Scale: 1"=2,000'

N

Figure 1.1

FEDERAL HIGHWAY ADMINISTRATION	Study Area - Warwick Intermodal Station at T.F.Green Airport	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 1-2

The NEC is only 1,570 feet west of the new terminal at the Airport. It is the closest Amtrak rail line to a major airport terminal in the country. During this recent period of investment in the NEC by Amtrak, major investments were taking place at the Airport, the State's principal airport. The Airport is operated by the Rhode Island Airport Corporation (RIAC). Since 1991, more than $210 million has been invested to construct a new two-story terminal building, access roads, parking facilities and related improvements. The new facilities at the Airport have been in operation since 1996 and have proved to be remarkably successful. With new facilities in place, the RIAC was able to attract Southwest Airlines to the Airport and passenger volumes increased sharply. In 1996, the airport served 2.5 million passengers while just a year later (1997), that number increased to 4.1 million. RIAC projects passenger numbers to continue to grow and reach 6 million passengers by the Year 2000.

With the nearly completed improvements on the NEC, and the successful Airport nearby, State and local transportation officials have sought to create an intermodal gateway connecting the two transportation facilities. The 1998 TEA 21 included a $25 million authorization for a new Warwick Amtrak/Commuter Rail Station with an elevated people mover to connect the new station to the Airport terminal.

1.3 Statement of Purpose and Need

The purpose and need of the Warwick Intermodal Station project encompasses three areas: transportation, economic development, and environmental, as described below.

1.3.1 Transportation

The proposed project has two primary transportation purposes. The first purpose is to relieve peak hour traffic congestion on the I-95 corridor in the Providence Metropolitan Area by diverting drivers of single occupant vehicles to use the rail station and people mover to access the Airport. As identified in the 1997 Rhode Island Congestion Management Plan, congestion is now and will continue to be a problem along the I-95 corridor within the Providence Metropolitan Area, the Airport Connector Road and Post Road. Any number of diverted trips would help reduce congestion on these important roadways. The proposed intermodal station project is consistent with the Action Plan as outlined in the State's Congestion Management Plan. The Airport has experienced significant growth in recent years and appears poised for continued growth. In the near future, RIAC expects the Airport to accommodate 6 million passengers annually. The proposed people mover element of the project is intended to make the new train station an intermodal facility. Any modal shift will serve to preserve available roadway capacity on Post Road and other local roadways.

The second transportation purpose of the proposed new Amtrak and commuter rail station in Warwick is to provide an important additional mode of travel for area residents to access jobs in Providence and Boston. Projections for daily use of the commuter rail station show that some 400-500 commuters would use the proposed station. Many of these trips are likely to be diverted

trips from single occupant vehicles. The projected shift in mode will preserve roadway capacity and contribute to improved air quality.

Those commuters who use the new Warwick Station to reach jobs in Providence and Boston would be commuting in the normal manner of outlying residents traveling to concentrations of jobs in the central cities. The trips that use the train to access the airport would very likely be considered reverse commuters. Most commuter rail lines carry few, if any, reverse commuters. The proposed project has the potential to be a highly efficient line carrying people in both directions throughout the day as opposed to carrying people in only one direction during the AM and PM peak commuter periods.

1.3.2 Economic Development

Another purpose of the proposed transportation project is to support the City's redevelopment plan. Situated in the center of the City of Warwick's 70-acre proposed redevelopment district, the intermodal train station and people mover would provide intermodal access opportunities which would enhance economic development potential in this district.

The City of Warwick enacted the Warwick Station Redevelopment District Master Plan on December 14, 1998. The plan calls for a Warwick Station Redevelopment Agency to maximize the economic benefits of having the Airport in the center of Warwick. Within the city's proposed 70 acre redevelopment district, shown on Figure 1-3, an area of approximately 22 acres between the Airport and the NEC has been designated as an Intermodal Zone. It is expected that redevelopment in this zone would consist of airport related development such as hotels with meeting facilities and commercial activities geared to travelers. By concentrating such development so close to the Airport and using a people mover concept, local traffic would be reduced. In contrast, the current scattered and strip development pattern of Airport related hotels and commercial uses spread along Post Road encourages vehicle use.

People mover projects are relatively new in this country but even from the limited experience, it is clear that they provide added value to the total development as well as efficient transportation. The wide array of completed people mover projects show that people movers are not just utilitarian transportation conveniences but add to the overall quality of the development. The new monorail people mover at Newark International Airport (NJ) and the new elevated and enclosed moving sidewalks between the West Parking Garage and two terminals at Logan International Airport in Boston are examples of people mover projects that attract and support private economic development.

1.3.3 Environmental

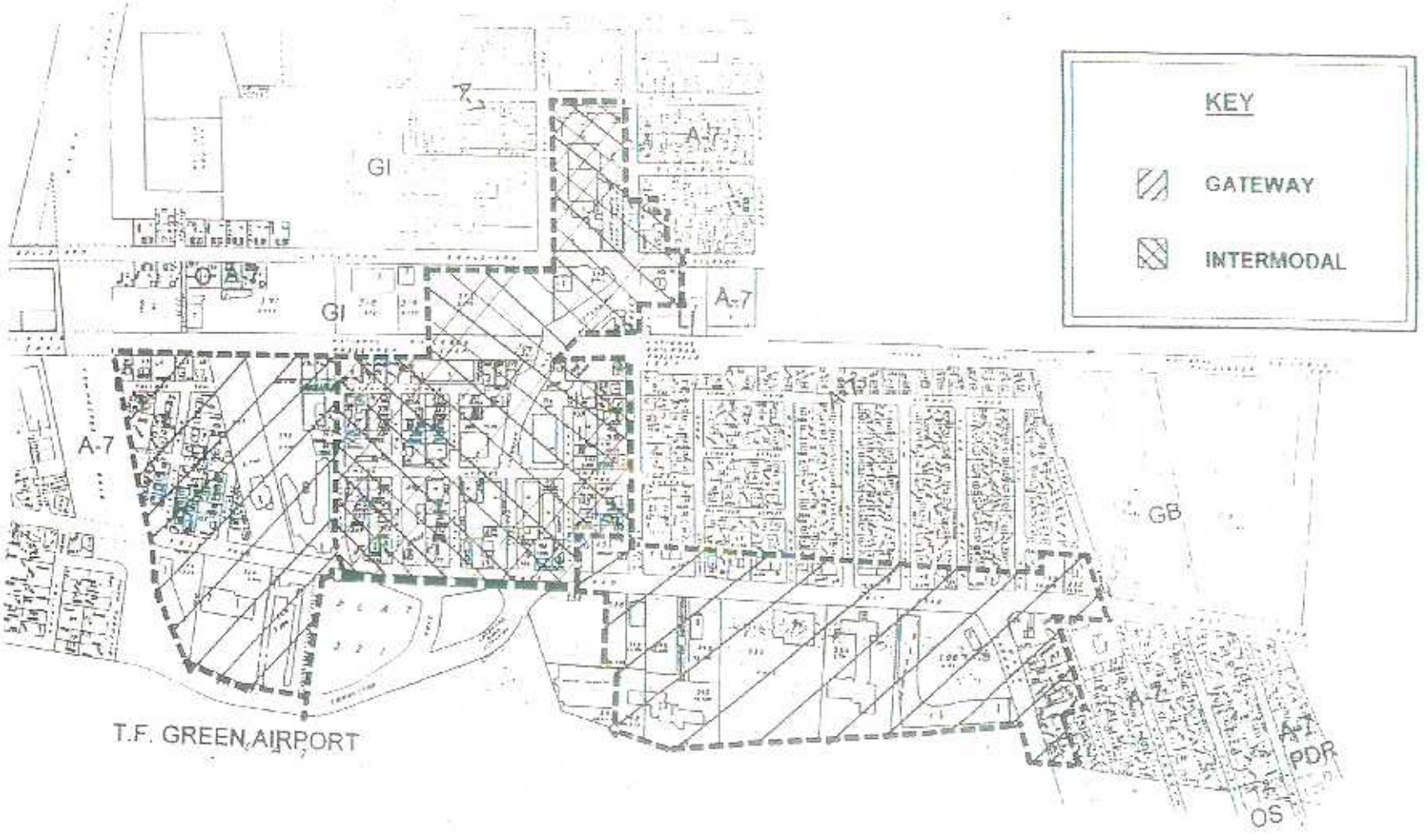
The proposed project has the environmental purpose of reducing traffic congestion impacts in Warwick, by providing an opportunity for modal shift from automobile to rail for trips going to and from the Airport. The entire State of Rhode Island has been classified by the U.S. EPA as a

serious nonattainment area for ozone. Any reduction in traffic congestion will help improve existing air quality conditions.

The intermodal zone envisions two hotels and airport related commercial uses, such as shops and restaurants, located immediately adjacent to the proposed people mover. It is expected that this concentrated development pattern will allow many walking trips and promote use of the people mover. These people mover trips and walking trips would reduce auto trips made necessary by the current strip development pattern along Post Road.

The visual quality of the intermodal facility is an important objective to encourage user acceptance as well as promote the City's redevelopment objectives. The proposed construction of these transportation facilities in Warwick would be sensitive to and enhance the visual quality of the City's planned redevelopment district and the new Airport Terminal building.

An additional environmental objective involves the clean up of the T.H. Baylis property, a site contaminated with documented hazardous material. The T.H. Baylis property is included in all site alternatives for the proposed Amtrak/Commuter Rail Station. The removal of hazardous wastes and groundwater contamination from this site will enhance environmental quality in the area.



City of Warwick
Department of Planning
July 1998

FEDERAL HIGHWAY ADMINISTRATION	Warwick Station Redevelopment District	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 1-3

SECTION 2.0 ALTERNATIVES ANALYSIS

2.1 Introduction

This section describes various Build Alternatives regarding the site of the railroad station and associated parking, people mover options and the No Build Alternative. A No Build Alternative is required in the Federal environmental review process to establish a baseline for comparison with the Build Alternatives. A range of Build Alternatives was evaluated for this study. The purpose was to identify a preferred alternative that met certain project criteria regarding connection with the Airport terminal, roadway and pedestrian access, community impact and interface with proposed development in the area.

For this project, the preferred alternative was developed for the location of the intermodal station and for the people mover. These two project elements are presented individually as they can be considered separate elements of a larger project. The preferred alternative for the location of the intermodal station was selected after evaluation of six sites. Table 2-1 provides a summary matrix of the results of this evaluation. The people mover preferred alternative was identified after a broad-based review of many types of people mover technologies, which were narrowed to four people mover options.

The No Build Alternative is discussed in this section with regard to each of the project elements.

2.2 No Build Alternative

The No Build Alternative provides a base case against which to compare the preferred alternative. It includes the transportation improvements listed below that are already underway or committed. These improvements will substantially increase the number of passenger and freight trains moving through the Warwick Station area, even without the preferred build alternative. These ongoing improvements include the following:

- Continued existing ground transportation system adjacent to the airport, in addition to future Amtrak high-speed rail service on the NEC. This includes planned improvements to Post Road, construction of two new major parking garages to serve Airport users and other improvements to Airport parking and roadway access facilities.

- Implementation of RIDOT's Freight Rail Improvement Project (FRIP) on the NEC. The FRIP would provide a "third track" in the NEC for use by freight trains in an approximately 23-mile-long corridor from Quonset Davisville Port and Commerce Park in North Kingstown to the "Boston Switch" in Central Falls, Pawtucket.

- South County Commuter Rail Service between Providence and Westerly on the NEC. This project would extend existing Commuter Rail service now terminating in Providence southerly to Westerly.

- Year 2018 proposed transportation improvements as currently planned by Amtrak. These improvements include both the introduction of "high speed" passenger train service with all new train sets in October 1999, and service upgrades to its existing "NortheastDirect" Service. Amtrak policy is to minimize stops on its high-speed service between New York City and Boston; the closest stop to Warwick is Providence Station. NortheastDirect trains could stop at Warwick. Currently, no passenger trains stop at Warwick.

From the above brief description of the improvements assumed in the No Build Alternative, it is clear that it does not support or encourage a modal shift to transit. Rather, the No Build Alternative facilitates vehicular use, not transit use, in the immediate area of the proposed Warwick Station. The above improvements assumed to be a part of the No Build Alternative represent a substantial upgrade in parking and roadway facilities in the area, but no new passenger rail service to the project area. Consequently, the No Build Alternative would not promote the objectives of an intermodal facility (i.e., airport-rail) envisioned with the preferred Build Alternative.

Under the No Build Alternative, a Warwick train station could be built later as a stand-alone project and function as a commuter rail and Amtrak facility. However, the lack of an intermodal connection to the Airport such as the people mover, would reduce or eliminate any modal shift from auto to train for Airport users. An interim people mover such as a shuttle bus or van may influence modal shift to transit. However, a roadway vehicle would not be as influential as a permanent people mover. Further, an interim shuttle bus or van would not provide the desired highly visible and seamless intermodal connection provided by the Preferred Alternative.

The No Build Alternative would have its own impacts, namely noise, vibration and air quality, but would avoid the impacts of the Preferred Alternative described in Section 3.0.

2.3 Development and Evaluation of Build Alternatives

This section discusses the various build alternatives for the Amtrak/commuter rail station and the people mover routes and systems.

2.3.1 Amtrak/Commuter Rail Station Sites

An evaluation of potential commuter rail station sites in Warwick began in 1997 as part of RIDOT's South County Commuter Rail Project. Six potential sites in Warwick were identified and are shown in Figure 2-1.

Jefferson North Area
Leviton Parking Lot
Leviton/Baylis Site
Leviton/Budget Site
Hillsgrove South Area
Connector Road Area

For the Warwick Intermodal Station EA these six sites were reevaluated in terms of how they would fit the needs for the combined Amtrak/commuter rail intermodal station and people mover connection to the Airport. The following is a description and brief analysis of each site:

Jefferson North is the area north of the Jefferson Boulevard and Coronado Road intersection. The site is about 3.0 acres in size and includes several small businesses. This site was dropped from study for the following reasons: its location does not provide for a reasonably direct connection to the Airport terminal for a people mover; it would displace active businesses; and it is too close to a church and school.

Leviton Parking Lot is approximately 3.5 acres in size, has suitable access from Jefferson Boulevard and a parking area with approximately 300 spaces. The site is situated so that a people mover connection would be easily aligned with the airport terminal. This privately owned lot provides parking for employees of Leviton, one of Warwick's major industrial employers. The parking area is not fully used. Relocation of some parking spaces to other areas within the Leviton property would be required.

Leviton/Baylis Property is comprised of the Leviton Parking Lot, described above, and the T.H. Baylis Chemical property. The Baylis property, which is approximately 1.2 acres in size, was formerly used to process hazardous wastes. The site is contaminated and would require expensive clean up. Although the Baylis site is not large enough to accommodate required parking for the station, the property is strategically located so that a portion of the site makes the Leviton parking lot site feasible. The Leviton parking lot site combined with the Baylis site ranked high in the analysis because it keeps the station west of the tracks for highway access purposes and keeps the people mover connection east of the tracks.

Leviton/Budget Property is comprised of the Leviton Parking Lot, described above, and the Budget Rental property, which is occupied by Budget truck rental and maintenance facilities. This property, combined with the Leviton site, was considered to maximize train station parking facilities, and provide for a long-term Amtrak parking lot, distinct from the short-term commuter rail lot.

Hillsgrove South area is a site east of the railroad tracks. This site was dropped from further study because it is too far south of the Airport terminal to make a good connection for a people mover. The area consists of single family residential homes. Access would be via Post Road, which is heavily traveled and less desirable than Jefferson Boulevard, which is less congested.

Connector Road area is south of the Connector Road and east of the railroad tracks. This site was dropped from further study because it is substantially south of the Airport terminal, making a people mover connection quite difficult. The site is occupied by several businesses and access to the site would be from congested Post Road.

The alternatives analysis identified the Leviton parking lot together with the Budget property as the best site for the station because it has the most direct connection to the Airport, the best roadway access and the least community impact. The train station properties are located on the west side of the NEC. In addition, the analysis identified the Baylis property as an integral part of the intermodal connection point, or interface, between the train station and the people mover. Consequently, these three properties combined are identified as the preferred location for the railroad station.

Table 2-1 represents a summary matrix of the above evaluation.

Table 2-1: Summary of Potential Station Locations

Potential Site	Criteria			
	Intermodal Connection	**Highway Access**	**Community Impacts**	**Development Interface**
Jefferson Blvd. North	Indirect	Jefferson Blvd.	Business Relocation Required	Less Feasible
Leviton Parking Lot	Direct	Jefferson Blvd.	No Building on Lot	Less Feasible
Leviton/Budget	Direct	Jefferson Blvd.	Business Relocation Required	Feasible
Leviton/Baylis	Direct	Jefferson Blvd. & Post Road	Clean up of Baylis Required	Feasible
Hillsgrove South	Indirect	Post Road	Business and Residential Relocation Required	Less Feasible
Connector Road	Indirect	Post Road	Business Relocation Required	Less Feasible

Note: See Figure 2-1 for location of station sites.

2.3.2 (a) People Mover Routes

Three people mover routes were considered: Coronado Road, Fresno Road and Montebello Road. They are described below.

Coronado Road: The people mover would use the Coronado Road right-of-way between the train station and Post Road, and would approach the airport terminal on the north side of the Airport loop roads.

Fresno Road: The people mover would use the Fresno Road right-of-way between the train station and Post Road, and would approach the Airport terminal through the short-term parking lot to either the center or south end of the Airport terminal building.

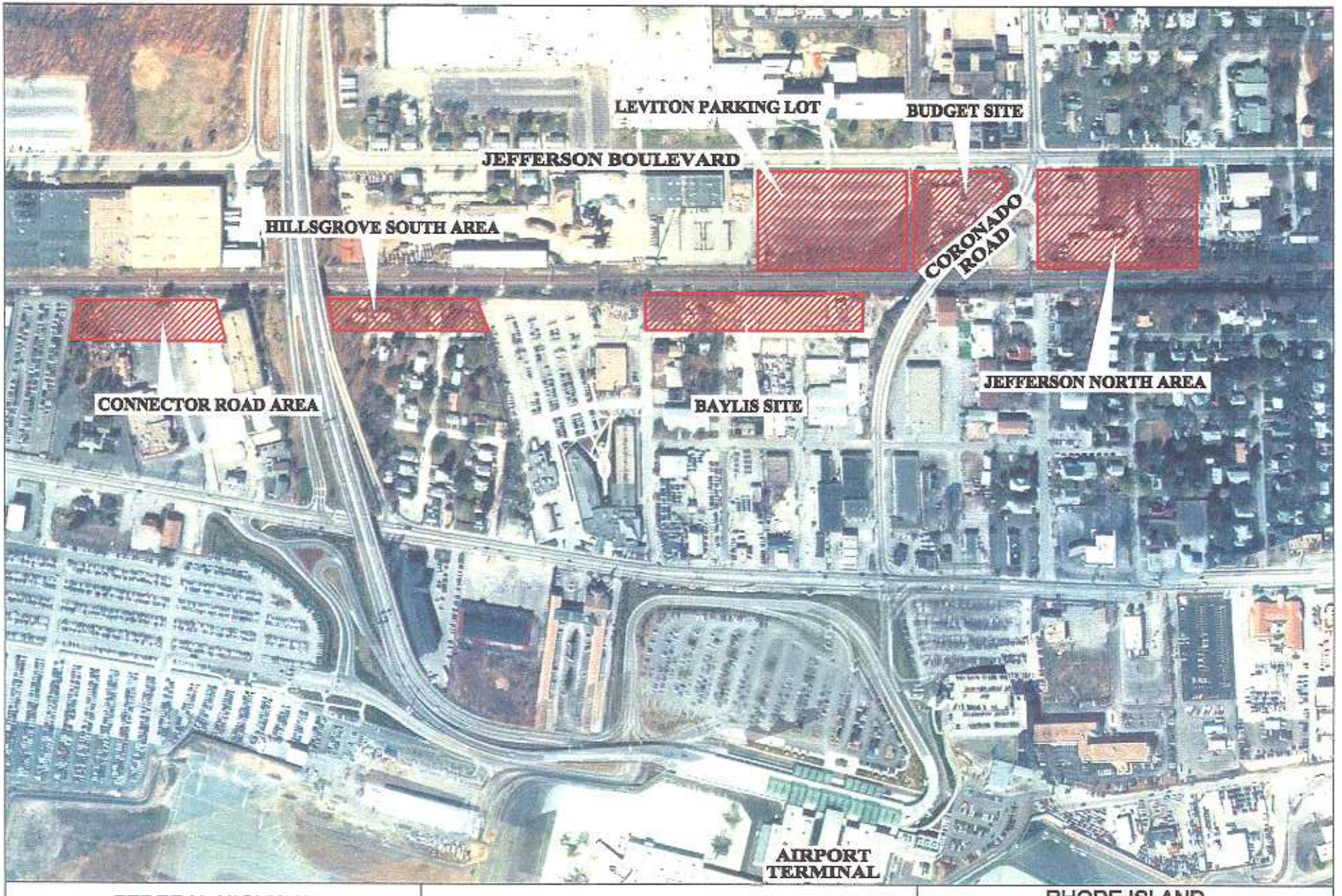
Montebello Street: The people mover would use the Glenham Avenue right-of-way to the south, and Montebello Street right-of-way between the train station and Post Road, and would approach the Airport terminal along the south loop road and Airport Connector Road.

Table 2-2 summarizes the major characteristics of these three routes.

Table 2-2 Summary of Characteristics of Alternative People Mover Routes

People Mover Route	Route Length (feet)	Direct Intermodal Connection	Supports Redevelopment District	Visual Impacts	Construction Issues
Coronado Road	1,720	No	No	Yes	Major grade differentials
Fresno Road	1,570	Yes	Yes	No	Uses existing roadway
Montebello Street	2,200	No	No	Yes	Substantially higher structure

From the above comparison, the Fresno Road route best meets the objectives of the project. It is the shortest route, provides for direct intermodal connections between rail and Airport, aligns appropriately with the site of planned future development between the train station and Post Road, has no adverse visual impacts and uses an existing public right-of-way. The other two alternative routes are longer and do not support a direct intermodal connection or future economic development as contemplated by the City of Warwick.



FEDERAL HIGHWAY ADMINISTRATION	Station Site Alternatives	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 2-1

2.3.2 (b) People Mover Systems

There are numerous functioning automated people mover systems in the U.S. and abroad. Generally, these automated people mover systems are divided into three classes based on capacity, size and configuration. These three classes include the following:

- Linehaul Transit Class
- Circulation/Distribution Transit Class
- Activity Center Transit Class

These three classes of automated people mover are described below:

1. Linehaul Transit Class - These systems serve high-density corridors with multiple on-line stations and may range in length from three to 25 miles. An example of this technology is the Vancouver, Canada "Skytrain" that opened for the 1986 EXPO. During the EXPO, the 114-vehicle system carried more than 200,000 passengers per day, between 15 stations, over the 13.3-mile alignment. The vehicles are powered by 600-volts DC and have steel wheels. Each car is powered by two linear induction motors and has steerable trucks. Today the Skytrain carries more than 23 million passengers annually. The current system uses a moving block signal/control system that permits it to run within 30 seconds of its intended schedule more than 95 percent of the time. The trains, which vary in length from two to six vehicles, carry about 25,000 passengers per hour in peak periods. The linehaul transit system is classified as an automated people mover. Such a system has been eliminated from consideration due to high construction cost. A linehaul transit system for this project would cost more than $100 million.

2. Circulation/Distribution Transit Class - This class of people mover generally includes systems that are set up in a loop configuration. Some of the systems are configured as a point-to-point operation, sometimes referred as a "pinched loop." Stations can be either on-line or can be situated off-line on bypass segments. Non-stopping vehicles can thus bypass a station at which another vehicle is stopped. The length of these systems range from one to five miles. An example of a circulation/distribution system is the Metromover system in Miami. It is a 1.9-mile loop with nine stations. The trains are powered by 600 volts DC transmitted by a third rail. The vehicles are 39 feet long and ride on two rubber tired axles on a concrete elevated guideway. The Metromover carries about 15,000 passengers per day, but was designed for about 40,000 passengers per day.

Another example of a circulation/distribution system is the Personal Rapid Transit (PRT). PRT is a transit system designed to function as a loop with multiple stations. Small vehicles, which seat four people, are sent by computer to a specific station on demand and run directly to the requested destination station. The PRT has been identified as a way to connect the airport with the train station and other nearby commercial activity centers. The RI Department of Administration/Statewide Planning Program conducted a feasibility study of the PRT technology

for possible use in downtown Providence, the Airport area, or the Route 2 commercial zone in Warwick. The Raytheon Company, developers of the PRT technology, prepared the study and a preliminary release of the study suggested the Airport area as a potentially feasible area for application of a PRT. The circulation/distribution class, like the linehaul class of automated people mover, is a larger and costlier system than is required for the Warwick Intermodal Station. The estimated cost for a very small PRT system of 3 miles has been estimated by Raytheon at over $100 million dollars. This people mover alternative has been dropped from further consideration.

3. Activity Center Transit Class - This class of automated people mover represent the smallest systems and are usually one mile or less in length and tend to be point to point rather than looped systems. The shuttle technologies considered under this system may or may not have intermediate stops. These systems are found in theme parks, casinos, commercial centers and airports. In general, fares are not charged but may be indirectly recovered through entrance fees, casino room charges and airline user's fees. The best local example of an activity center people mover is the Wellington shuttle located in Medford, Massachusetts. The system is 800 feet long and connects a 1,500-car parking garage to the Wellington MBTA Station (heavy rail rapid transit).

The requirements for the Warwick Intermodal Station fall within the smaller activity center transit class because the distance is less than a mile and requires a linear point to point system. Linehaul transit systems and Circulation/Distribution transit systems such as PRT are not practical to connect the train station to the Airport because of their close proximity.

People Mover Technologies within the Activity Center Class:

Based on estimates of the volumes of people to be accommodated and the distance between end terminals, two types of people mover technology appeared to merit detailed consideration, within the smaller activity center class. The two people mover technologies for the activity center system include the moving sidewalk and the horizontal elevator.

· Moving Sidewalk

The moving sidewalk (also termed horizontal escalator) is a technology that is used at many airport facilities. The moving sidewalk is similar to a passenger conveyor belt. Maximum length of a single conveyor is approximately 400 feet. Multiple conveyors are used to span longer distances with the passengers being required to step off and step on at each junction point. Operating speed is approximately 100 feet per minute or about 1.1 miles per hour. This coincides with walking speeds, thereby safely facilitating passengers stepping on and off the conveyor end points, often carrying luggage and attending to small children. The walkways can operate on inclines of up to 12 percent (approximately one foot rise or fall in eight feet). Depending on the width of the walkway, up to 7,000 passengers per hour can be accommodated. A recent example is the walkway installed at Logan Airport in Boston, shown on Photos 1 and 2.

The moving sidewalk is best suited for bridging relatively short distances, less than 400 feet. A maximum planning distance for walkways including moving sidewalks is 0.25 mile or 1,320 feet. With a distance of 1,570 feet, between the proposed Warwick Station and the Airport, the moving sidewalk is at the outer limits of its intended service area. This is a technology best suited to short distances and high volumes because of the limits on conveyor length and cost. In addition, the walkway system would require use of an enclosed, climate-controlled structure in its design.

Moving sidewalks look straightforward but are quite complex and very expensive. Actual costs from the recently completed moving sidewalk system at Logan Airport provide useful data for comparative purposes. The mechanical systems cost approximately $5,000 per linear foot. The enclosed heated and air conditioned structures required to support the moving sidewalk cost $12,000 a linear foot. Using $17,000 per foot for a 1,570 foot-long structure at Warwick would yield a cost of construction of nearly $27 million. Even a scaled back version of the Logan system would be in the range of $20 million.

· Horizontal Elevator

The horizontal elevator is an adaptation of conventional cable-operated elevator technology configured for horizontal instead of vertical operation. A cable propulsion system is used in conjunction with various vehicle support or cushioning systems. The cab or vehicle can be designed to hold 10-50 people, or even more, depending on specific applications.

The "Wellington Shuttle" in Medford, Massachusetts is an excellent example of a horizontal elevator, which is shown in Photos 3 and 4. It is a system of rubber-tired vehicles pulled by a cable on a grade-separated guideway. In the Wellington case, the steel guideway is made up of relatively short spans. Since the people mover at Wellington crosses the MBTA railroad yard, there were many opportunities to locate supporting piers at relatively close intervals. The total cost of the Wellington people mover project was $3 million or approximately $3,750 per linear foot.

A horizontal elevator, similar to the Wellington Shuttle, is best suited for bridging long distances.

The Wellington Shuttle approaches 15 mph at top speed and covers the 800-foot distance in 60 seconds. A smaller horizontal elevator between the intermodal station and Airport would travel the 1,570-foot distance in approximately 90 seconds. The Wellington Shuttle uses end-loading cabs. A system in Warwick would use either end loading or side loading cabs. The side loading cab would present greater flexibility if an intermediate stop were added later.

Photo of new skywalk at Logan Airport. A similar moving sidewalk, 300 feet in length, is proposed at the Intermodal Station.

Photo of lobby area at entrance to the new moving sidewalk at Logan Airport. A similar lobby would connect the proposed moving sidewalk and horizontal elevator and provide access for planned development.

Photo of the Wellington horizontal elevator. A similar design would make up the majority of the people mover connection to the Airport Terminal.

Photo of the Wellington horizontal elevator including cab and terminal. A similar horizontal elevator is proposed to run 1200 feet to link with the Airport Terminal.

An application at Warwick would involve a guideway structure with much longer spans to cross Post Road and minimize impacts to the Airport short-term parking lot. A projected cost for a horizontal elevator at Warwick would be in the range of $6,000-$7,000 per linear foot. These costs are projected to be higher than the Wellington Shuttle because of the longer spans required, and the greater length would require heavier components throughout the system. A total cost for a horizontal elevator in Warwick similar to the Wellington Shuttle would be in the range of $8 million.

4. Airport Shuttle

In addition to the people mover options discussed above, a well-known way to create an intermodal facility is to establish a shuttle bus or van system. Operating on a headway of perhaps 15 minutes, a shuttle van would serve the intermodal station but not provide the seamless intermodal connection that is planned.

An ideal intermodal connection would involve a seamless connection with little if any waiting to change modes. While the shuttle van falls short of this criterion, the mode is in use at virtually every airport in the country. Nearly all rental car companies employ shuttle vans to transfer customers between airport terminals and rental car office and vehicles.

The shuttle van or bus alternative would not enhance the City of Warwick's redevelopment plans within the 70-acre Warwick Station Redevelopment District. Moreover, the addition of shuttle vans to local roadways would add vehicular congestion to the upper and lower roadways of the Airport terminal. A shuttle service could, however, be used as an interim measure. It could provide the intermodal connection in the short-term, until precise development plans help determine the most effective location and types of the permanent intermodal people mover.

2.4 Preferred Alternative

The proposed Warwick Intermodal Station at T.F. Green Airport consists of two major components:

- Amtrak/Commuter Rail Station on NEC
- People Mover Connection to the Airport

The electrified rail shuttle between Providence and Warwick proposed by RIDOT has not been evaluated in this EA. If advanced by RIDOT in the future, it will be the subject of a separate environmental analysis and documentation.

Based on the evaluation of alternatives, the following is a description of the Preferred Alternative for this proposed action.

2.4.1 Amtrak/Commuter Rail Intermodal Station

The preferred site location for the station is the Leviton/Budget Truck Rental site, with vehicular access from Jefferson Boulevard, west of the railroad tracks. The preferred station is a two-level structure with a waiting room, public restrooms, ticketing, and baggage handling all on the second level. Figure 2-2 shows the proposed intermodal station located on a portion of the Leviton parking lot and over one of four railroad tracks. The balance of the Leviton parking lot is devoted to short-term parking for the station. The Budget Truck Rental maintenance site would be used as a parking lot that would serve long-term parking needs for Amtrak customers. The site plan also shows use of the Baylis property east of the NEC for the connection/transition area to the people mover system. A strip taking of D'Ambra Construction property may be required. This would be necessary either if the FRIP track is shifted west to accommodate the station platform or the site remediation of the Baylis property, proposed as part of the train station project, requires permanent system access to a groundwater sparging system on adjacent property.

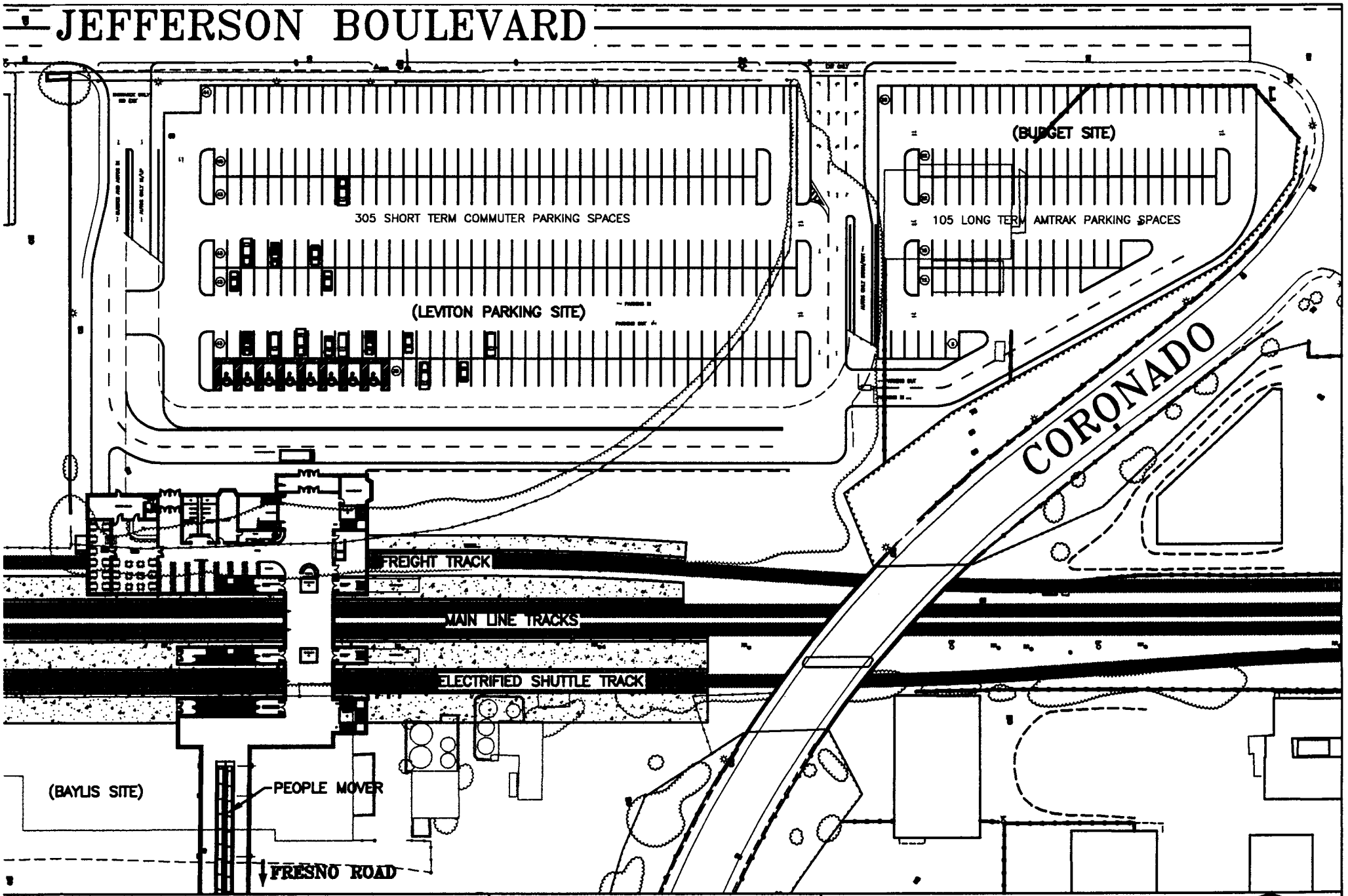
Four railroad tracks are shown on the site plan. These include two mainline tracks that are in the center of the railroad right-of-way, a proposed freight railroad track, and a railroad track proposed for the future electrified shuttle and commuter rail trains.

The two mainline tracks carry Amtrak trains and are shown between the outside tracks. To minimize construction disturbance to the mainline railroad tracks, only a portion of the passenger concourse is located above the mainline tracks. The majority of the station is located above the proposed freight track, which is being constructed as part of RIDOT's separate Freight Rail Improvement Project (FRIP). The freight track is closest to the proposed station building and would have a short (400-foot-long), one-sided platform.

A fourth track east of the elevated passenger concourse is shown with a 500-foot-long, one-sided platform. This track and platform will be used by either the future electrified shuttle trains traveling between this station and Providence Station or commuter trains directed to this fourth track to allow the faster Amtrak trains to pass on the mainline track.

All vehicular access to the station will be from the west side of the station. Passengers arriving at the station would use Jefferson Boulevard as the main entrance. A one-way access road would direct users to the front of the intermodal station. Figures 2-3 and 2-4 show a second-level entry ramp intended for automobiles, while buses, shuttles and other public transportation would use the lower level. The two-level entry ramps would provide easier access than only an at-grade entrance roadway.

A fee will be charged for parking at the Amtrak and Commuter Rail station lot. Although the fee has not been determined, it is likely that it will be a nominal charge. RIDOT and RIAC will be coordinating policy to ensure that T.F. Green potential parkers will not fill up the rail station lot to avoid higher fees at the airport, and that rail station patrons do not take potential airport parking spaces.

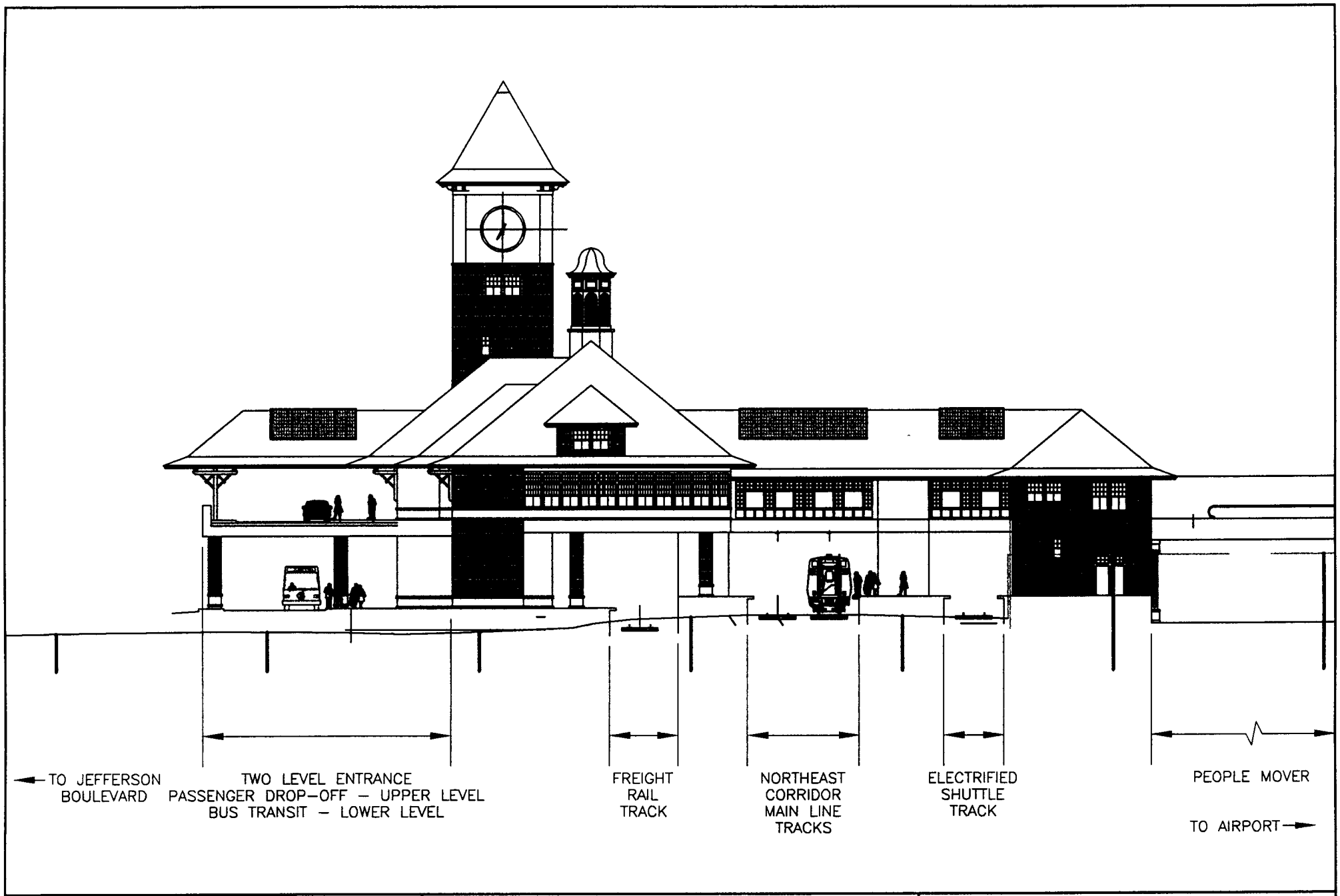


FEDERAL HIGHWAY ADMINISTRATION

Site Plan of Intermodal Station

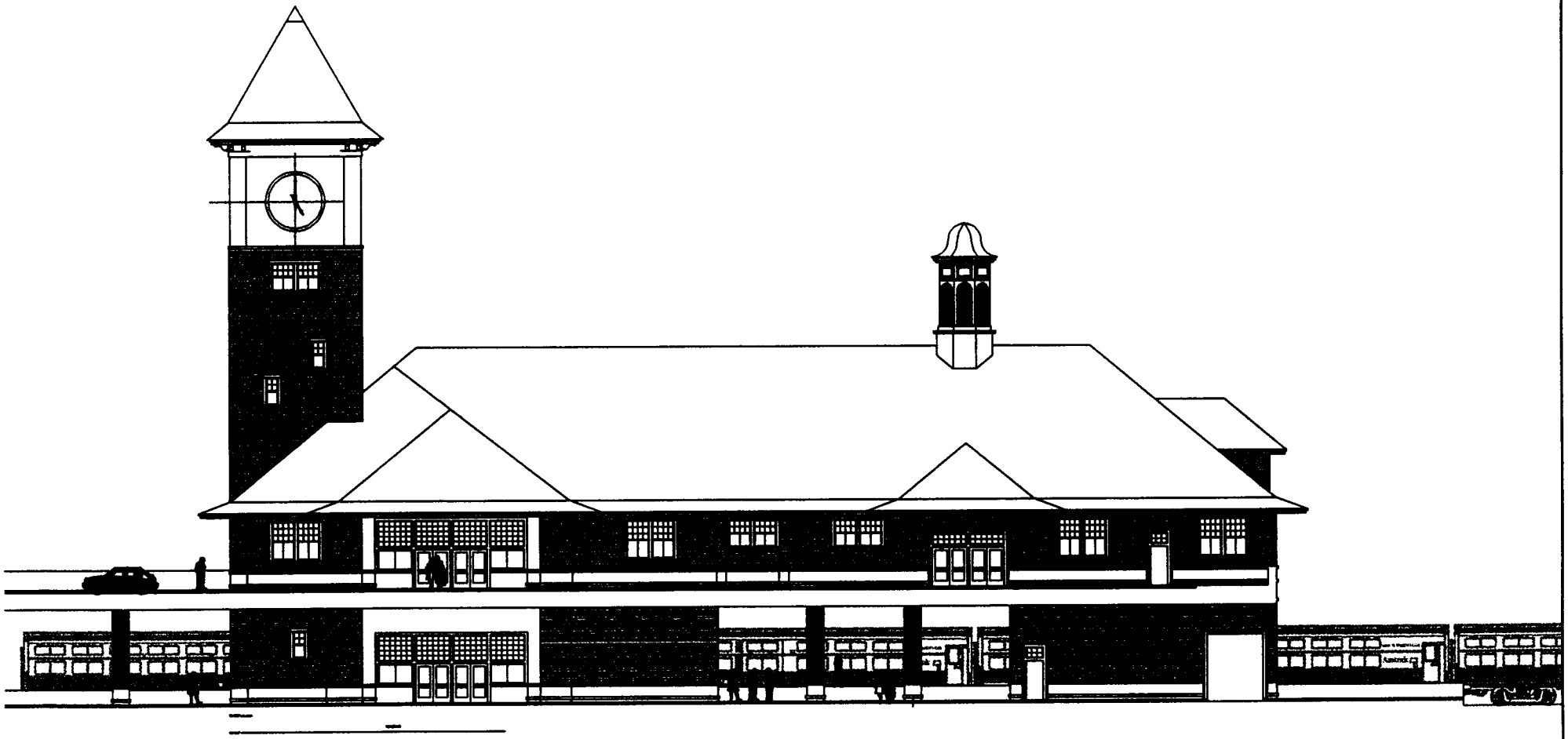
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 2-2



FEDERAL HIGHWAY ADMINISTRATION	Cross-Sectional View of Proposed Intermodal Station	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 2-3



FEDERAL HIGHWAY ADMINISTRATION	Elevation of Proposed Intermodal Station	RHODE ISLAND DEPARTMENT OF TRANSPORTATION Figure 2-4

2.4.2 People Mover Connection to T.F. Green Airport

The specifics of the people mover connection between the train station and the Airport terminal will be defined as the project advances into the design phase. Preliminary analysis indicates that the most feasible configuration would consist of a combination of a moving sidewalk and a horizontal elevator. The moving sidewalk would directly connect with the intermodal station concourse at its second level and continue eastward toward the airport for a distance of approximately 300 feet (see Figure 2-5). The moving sidewalk would be inside a weatherproof structure similar to the new Logan Airport pedestrian ways shown in Photos 5 and 6.

The easterly end of the moving sidewalk would interface with the second component of the people mover, a horizontal elevator, at a lobby that would also be accessible to planned adjacent development. The horizontal elevator will travel on an elevated structure a distance of approximately 1,200 feet and connect to a glass-enclosed area adjacent to the second level roadway immediately in front of the airline terminal as shown in Figure 2-5. The technology for this type of people mover is proprietary and the specifics of what the system will look like will only be refined as the project enters the design phase. Generally, however, the system would work and look much like the horizontal elevator known as the "Wellington Shuttle", an operating system located in Medford, Massachusetts that connects a large 1,500 car parking garage to the Wellington MBTA Station. Views of the station/lobby areas, cars, and structure of the Shuttle are provided in Photos 7 and 8.

2.4.3 Shuttle Service Between Providence and Warwick

The proposed electric shuttle train service between Warwick Station and Providence Station is not a part of the Preferred Build Alternative in this EA. It is described here since the planning for it should be considered in the design of the Warwick Station.

The proposed electrified shuttle service between Providence Station and the proposed Warwick Station would provide an alternate intermodal access for the thousands of travelers arriving at the Airport with destinations in downtown Providence. It is anticipated that the shuttle would operate during peak periods at approximately 30-minute intervals, however this headway is yet to be determined. The shuttle would be accommodated on a platform on the fourth track to the east of the mainline tracks.

Airline passengers arriving at Warwick Station would be able to use a connection to the Airport people mover via an escalator to the station level concourse. A connection to the Fresno Road level would also be available for access to van shuttles and taxis.

The shuttle service would likely use an electrified version of a rail car similar to the Budd (name of manufacturer) cars that were used extensively in the Boston area. The Budd cars were diesel powered self-propelled coaches that enabled the quick and easy addition or subtraction of coaches to meet various demand levels. The electrified shuttle would be operating on the NEC and therefore would have to be in the same heavy weight classification as all other trains on this rail line. An electrified Budd car would meet this classification.

FEDERAL HIGHWAY ADMINISTRATION	Site Plan of People Mover	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 2-5

Photo of Wellington horizontal elevator lobby area. Glass enclosed lobby provides excellent visibility for security and safety.

Horizontal elevator can be operated to fit demand. Photo is of Wellington shuttle lobby and schedule.

Moving sidewalks at airports must be built in pairs (one moving walkway in each direction) and with adequate space for walkers with baggage carts.

Moving sidewalks are costly to build and operate. They run continuously even if no one is using them.

SECTION 3.0 POTENTIAL IMPACT CATEGORIES

3.1 Land Use Impacts

Land uses in the project area include the following: light industrial (e.g., light manufacturing and automobile repair shops), miscellaneous commercial and residential. The abandoned Baylis Chemical plant, discussed in Section 3.22, is within the project area.

The City of Warwick enacted the Warwick Station Redevelopment District Master Plan to guide new expected growth in the district. As stated in the Master Plan, "this plan establishes the groundwork for the City of Warwick to capture some of the economic benefits that come with having T.F. Green Airport in the center of the city." The plan calls for the designation of approximately 70 acres of land west of the Airport as a new Warwick Station Redevelopment District, of which 22.4 acres will be designated as an Intermodal Zone, which will be the centerpiece of the district. The district is in the vicinity of Jefferson Boulevard, the Airport Connector and Airport Road. Enacted by the Warwick City Council in 1998, the Redevelopment District will enable the City to better guide redevelopment in an orderly manner, with a premium on enhancing economic opportunity and the quality of design and function.

The City's redevelopment plan calls for new, more intensive commercial activities related to the Airport and the flow of travelers through the area. The proposed intermodal station and people mover project is expected to support and enhance the likelihood of success for the planned redevelopment. If successful, the pattern of land use development will be concentrated along the intermodal corridor between the train station and Airport. This development pattern would represent a shift from the existing linear and strip pattern currently existing along Route 1 (Post Road), north and south of the Airport.

The proposed train station and people mover project will increase accessibility to this intermodal transfer site. It is expected that land uses such as office, hotels and related retail and commercial activities will be attracted to the site to take advantage of improved accessibility to one of New England's major airports. Further, the City of Warwick is in a strong position to channel and control these land uses due to its recently enacted Redevelopment District that includes the project site. Therefore, it is concluded that the land use impacts of the project will be developed to promote transit and pedestrian travel, and are expected to be beneficial and not require mitigation.

3.2 Park and Recreation Area Impacts

According to the RIDEM Division of Planning and Development, no Section 6(f) properties are located within the project area. (See RIDEM letter in Section 4.0). Section 6(f) properties are lands acquired, developed and/or improved for recreation areas using Federal Land and Water

Conservation Fund (L&WCF) grants and Rhode Island Open Space and Recreation Area bond issues. Therefore, no Section 6 (f) documentation is necessary because of the proposed project.

Figure 3-1 shows schools and recreational areas within and near the project area. There are no public parks within the project area. Therefore, it is concluded that the proposed project will not affect public parks and recreation facilities, and no mitigation measures for such public facilities are necessary.

3.3 Farmland Impacts

The proposed project will not affect any prime and unique farmland or any other land important for agriculture. Soils within the project area are not suited for agriculture. The land has a long history of industrial and commercial use.

The U.S. Department of Agriculture, Soil Conservation Service map of Important Farmlands, Kent and Washington Counties, Rhode Island, June 1979, indicates that no "Prime Farmland," "Unique Farmland," or "Additional Farmland of Statewide Importance" are located within the project area. According to this map of farmlands, the project site is located within "Urban and Built-up Areas." This information is consistent with the observed existing land use of the project site. Therefore, the project will not affect farmlands.

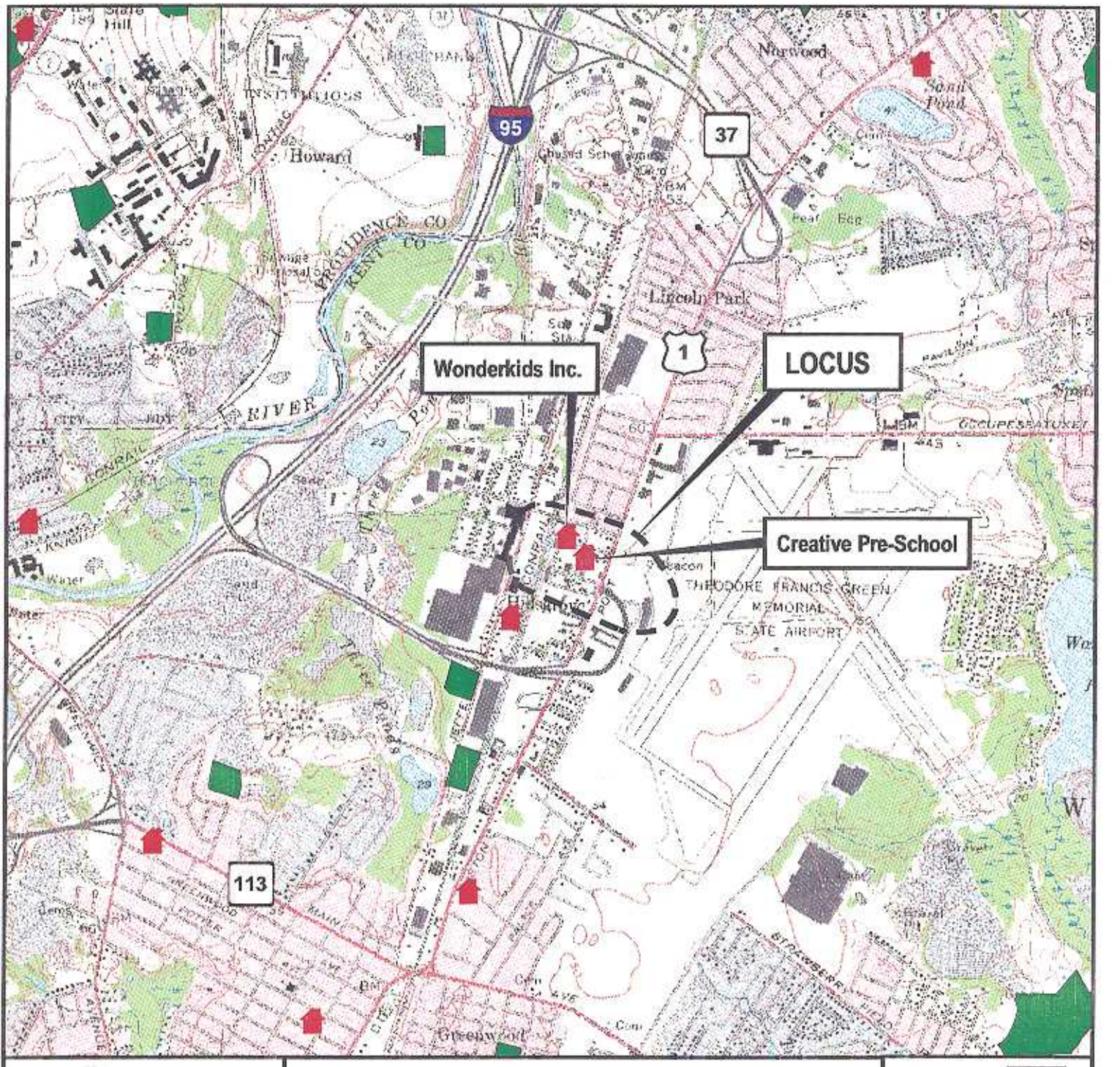
3.4 Social Impacts/Environmental Justice

The proposed project will be located within an existing industrial/commercial zone and, therefore, will not adversely affect community cohesion or community facilities.

Several beneficial social impacts are expected to occur indirectly from the proposed project. These include expansion of the City's tax base and increasing employment opportunities. As indicated in Subsection 3.1, Land Use Impacts, the project is a major supporting factor in the City of Warwick's plans for redevelopment of the surrounding area. The redevelopment is geared to increasing the City's tax base, increasing employment opportunities, and maximizing the benefits of having T.F. Green Airport in the City. All social and economic groups within the City are expected to benefit from the improved transportation facilities.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, was signed by President Clinton on February 11, 1994 and published in the February 16, 1994 Federal Register, Vol. 59, No. 32. The Executive Order (EO) focuses Federal attention on the environmental and human health condition in minority and low-income communities, promotes nondiscrimination in Federal programs affecting human health and the environment, and provides minority and low-income communities access to public information and an opportunity to participate in matters relating to the environment.

The EO requires each Federal agency to take the appropriate steps to identify and avoid any disproportionately high and adverse human health or environmental effects of Federal programs,



Base Map Source:
East Greenwich, RI
1957 USGS Quadrangle

Source data supplied by the
Rhode Island Geographic
Information System (RIGIS)

RIGIS Datalayer Information:
Schools - Revised 4/96
Land Use - Revised 1/93

Legend:

Schools

Recreational Areas

Rhode Island Department
of Transportation
Federal Highway Administration

Schools and Park Areas
Warwick Intermodal Station
at T.F.Green Airport
Warwick, Rhode Island

Scale: 1"=2,000'

N

Figure 3.1

policies, and activities on minority and low-income populations. Since anticipated impacts are expected to be beneficial, the proposed project is consistent with E.O. 12898.

Moreover, the population in geographic proximity of the project site (i.e. Census Tract 211 of the City of Warwick) was neither minority nor low income, according to 1990 Census data. Only 192 persons out of 5,382 were members of racial or ethnic minorities. Of this total, 62 were Hispanic, 55 were black and 40 were Native American/Eskimo/Aleut. The area was predominantly populated by white persons. The total population declined 8 percent to 4,948 by 1997. The households in the area were predominantly middle income with well over half (58 percent) of the households with incomes between $25,000 and $74,999. While over a third of the households had incomes below $24,999; none of them was minorities.

Therefore, based on these data, it is concluded that the project will not have disproportionately high and adverse human and health effects on the project area population.

3.5 Relocation Impacts

The proposed project will have relocation impacts for some businesses. According to Appendix 6.7, Relocation Impacts, at the end of this document, the project will require land acquisitions and displacements of 10 properties, two of which are privately-owned (see Table 1). In addition, 20 potential easements and partial takings may be required (see Table 2). The proposed project does not require the relocation or displacement of any housing units. The impacts will be related to the taking of the Budget Truck Rental maintenance site and the Leviton parking lot. The Budget Truck Rental maintenance site is an ongoing business but it may be in the process of relocating to another nearby site. If the business continues to remain at this site and it is taken by the project, relocation assistance will be provided in accordance with the Federal 1970 Uniform Relocation Act. This act provides for business owners to be compensated for their land and building at fair market value. The act also provides relocation assistance including payments for moving costs.

The Leviton parking lot is required for the project. It is currently used for employee parking. Parking capacity would be replaced by RIDOT. The Baylis property is required for the project. The property is vacant and has been abandoned by the company. No business relocation would be required for the Baylis property. The proposed people mover will be supported on a structure that may encroach onto private property along or adjacent to Fresno Road. Any required taking is expected to be minimal and not likely to require relocation of any business.

The project will have displacement and relocation impacts. These impacts will be mitigated following the Uniform Relocation Act referred to above.

A strip taking may be required adjacent to the tracks on D'Ambra Construction property. This could be necessitated by either track relocation or site remediation activities. If relocation is needed, assistance would be provided in accordance with the Uniform Relocation Act.

3.6 Economic Impacts

The increased accessibility to the intermodal station site provided by implementation of the Preferred Alternative will increase land values in the station area. This will further act as an incentive to develop the site for higher density development than at present, particularly for those uses that can benefit from proximity to the airport and rail station and easy intermodal access between them.

Further, this higher density development is consistent with the objectives of the City of Warwick's plan for the Station Development District. The proposed transportation project will support the City of Warwick's redevelopment plan. Much of the City's plan for improvements around the proposed transportation project is geared to economic benefits such as increased tax base and greater employment opportunities.

There will be short-term economic impacts such as the reduction of tax base due to the public acquisition of privately owned sites for the station and parking lots. The two largest properties to be acquired, however, have a total annual tax assessment of only $19,000. In addition, the acquisition of these sites will mean the displacement of a small number of jobs currently located at these properties. The redevelopment potentials in the station area and nearby are likely to substantially offset these short-term economic losses with a long-term, more valuable tax base in the vicinity and more employees.

In conclusion, the project can be expected to have long-term economic benefits in the Warwick Station area.

3.7 Joint Development

In addition to transportation benefits, the proposed transportation project is intended to support major commercial development geared to the Airport. With a projection of 6 million passengers by the year 2000 at the Airport, it is anticipated that Warwick could support additional hotels and commercial activities geared to these travelers. The intermodal station and people mover will allow a concentrated development in the immediate vicinity of the project. It is expected that the people mover would carry people between the train station and airport but also serve people using the hotels and restaurants that are envisioned to be constructed adjacent to the people mover. The people mover is planned so that lobby areas will be able to be directly accessed by adjacent new development. The City of Warwick's Redevelopment District master plan is in large part based on the desire and benefits of having joint development occur at this new intermodal station.

In conclusion, the proposed station/people mover project is an excellent example of a publicly initiated incentive that can attract private investment in a joint development arrangement at this site. This is because the project will increase the economic value of the site due to the increased accessibility to be provided by the intermodal project. Further, a joint development approach can maximize utility and benefits of the project, and such an approach has strong public support from

the City of Warwick and the State. The Rhode Island Economic Development Coprporation is taking the lead on the behalf of State and local interests in promoting the site for private joint development. Therefore, the project is expected to have a positive effect on joint development possibilities in the vicinity.

3.8 Pedestrian and Bicycle Movement

There are no independent bicycle paths or designated bicycle lanes within the project area. Provisions for pedestrians will be incorporated into the design of the intermodal station. Sidewalk access will be provided on both the Jefferson Boulevard and Fresno Road sides of the station. Site amenities such as fencing, lighting and landscaping will be geared to a residential and pedestrian scale.

The proposed people mover is dependent on pedestrian use and is intended to provide a quick and safe alternative to the congested roads and parking lots that now separate the railroad tracks from the Airport.

Bicycle storage racks will be provided at the station for bicyclists using the intermodal transportation services of commuter rail and bus. Bicyclists who desire to travel to or from the station may either choose to ride on roadways such as Jefferson Boulevard, Post Road and Airport Road or ride on Rhode Island Public Transit Authority (RIPTA) buses which are equipped with bicycle racks between the months of April and October.

There is an ongoing RIDOT study for the establishment of a bicycle network within the City of Warwick and is currently in the planning phase. The study does not include consideration of Jefferson Boulevard, Post Road and Airport Road as designated bicycle routes because of the existing traffic conditions on these roadways. Proposed bicycle lanes being considered by RIDOT near the station are located near the intersection of Airport Road and Warwick Avenue.

In conclusion, the project is expected to have positive effects on pedestrian and bicycle use in the area.

3.9 Air Quality Impacts

Regional Impacts

Emissions inventories are quantities of pollutants emitted over a given time period, which provide information about the various proposed project alternatives. Emissions are estimated by multiplying emission factors by source activity. Emission factors are the emissions from a single source for a unit of time or distance (e.g. a single automobile traveling on a trip to the proposed train station). The source activity would be the number of vehicle miles due to these automobile trips in a given time period, such as one day.

For this project, a reduction in vehicle miles traveled was estimated for the projected modal shifts from automobiles to train travel. Reductions in regional emissions were estimated for a 24-hour period using average summer temperatures and activity levels, to reflect conditions during the ozone season, as required in EPA's emission inventory preparation document. The average summer day conditions were selected to be consistent with the Statewide emission inventory maintained by RIDEM in accordance with the Clean Air Act (CAA). Emission factors for these computations are based on U.S. EPA databases and methodologies. Emissions were calculated based on an average traveling speed of 45 mph.

The reduction in regional emissions of volatile organic compounds (VOCs), nitrogen oxides (NOx), and carbon monoxide (CO) was estimated for the project's completion year (2000) and the project's design year (2020). These estimates consist of total motor vehicle emissions by pollutant that would be eliminated by travelers using the Warwick station, and are shown in Table 3-1. For the Year 2000 Conditions, the total amount of pollutant emissions eliminated by travelers using the Warwick Station was estimated to be 2.23 tons per year (tpy) of VOC, 4.47 tpy of NOx, and 14.20 tpy of CO. For the 2020 Conditions, the total amount of pollutant emissions eliminated by travelers using the Warwick Station were estimated to be 3.56 tpy of VOC, 7.46 tpy of NOx, and 21.67 tpy of CO.

These results demonstrate that no adverse air quality impact from this project is expected and no mitigation measures for air quality would be necessary. In effect, the project would be beneficial to air quality.

Table 3-1 Annual Emissions Reduction for 2000 and 2020 Tons Per Year (TPY)

	2000			2020		
Traveler Category	**VOC**	**NOx**	**CO**	**VOC**	**NOx**	**CO**
Airport Passengers	0.42	0.83	2.65	1.47	3.08	8.94
Airport Employees	0.59	1.19	3.78	1.11	2.32	6.75
Amtrak Commuters	0.41	0.82	2.60	0.33	0.69	2.00
RIDOT Commuters	0.81	1.63	5.18	0.65	1.37	3.98
Total Emissions Reduced	2.23	4.47	14.22	3.56	7.46	21.67

Study Area Emissions

A review of the preliminary representation of the traffic data indicates that there could be minor variations in the Vehicle Miles Traveled (VMTs) in the project study area. While the variations

are expected to show decreases in the future Build Condition compared to the future No Build Condition, these variations could also show minor increases. Any increases in the VMTs would lead to minor increases in the air pollutant emissions results for the Build Condition. Although this could be construed as an air quality impact, it is likely that any increases in emissions from this project could be contained in the mobile sources emissions calculations used in the approved Rhode Island Transportation Improvement Program (TIP). This would mean that no adverse air quality impact from these emissions is expected and no mitigation measures for air quality would be necessary.

Carbon Monoxide (CO) Concentrations at Intersections

With respect to air quality impacts due to changes in traffic volumes at nearby traffic intersections, preliminary traffic data indicates that, while there could be some small increases in traffic volumes through the intersections, no reductions in traffic Level of Service (LOS) are anticipated. Based on these assumptions, some small increases in CO concentrations could occur near the intersections. However, it appears as though there might not be any predicted exceedences of the 1-hour or 8-hour CO standards. Thus, there would likely be no adverse air quality impacts near these intersections and no mitigation measures for air quality would be necessary.

Air Quality Conformity

This project comes from a conforming plan and TIP adopted August 13, 1998. This air quality study was conducted in accordance with Federal conformity regulations (40 CFR 51 and 40 CFR 93). This is because the project is Federally funded, located in an area of critical pollutant nonattainment and has the potential for important regional and or local air quality impacts. The purpose of the conformity regulations is to demonstrate project conformity to the Clean Air Act (CAA) and the State Implementation Plan (SIP).

While the project is Federally funded, it is not projected to cause regionally important air quality impacts. There is the potential for the project to affect air quality on a local level, however, and CO hot spot screening was conducted. The local analysis was conducted to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) for VOC, Nox and CO.

The State of Rhode Island designated the region that encompasses the project study area as "non-attainment" for ozone and as "attainment" for the five remaining NAAQS criteria pollutants. Therefore, Rhode Island must maintain an EPA-approved implementation plan that provides a means to reach and sustain attainment. In order to demonstrate conformity with the applicable implementation plan, the 1990 CAA Amendments require the air quality analysis to demonstrate that the proposed activity will not:

1. Cause or contribute to any new violation of any standard;
2. Increase the frequency or severity of any existing violation of any standard; or
3. Delay timely attainment of any standard.

The above stated model results indicate that this project will adhere to the Federal requirements for air quality.

3.10 Noise Impacts

The construction of the proposed Warwick station and the people mover to the Airport may lead to potential noise impacts at nearby receptors. New noise sources because of the project are the people mover vehicle, the station parking lot traffic and Amtrak and freight train operations along the NEC. Project noise levels have been compared with existing conditions to determine the onset of impact.

The noise assessment for this Environmental Assessment included two analysis conditions: a No Build Condition and a Project Build Alternative. Under the No Build Condition, existing train activity passing through the proposed station site is composed of high speed intercity Amtrak service along with local Providence & Worcester (P&W) freight delivery service. As there are no grade crossings or existing passenger stations in Warwick, Amtrak trains travel at speeds of up to 150 mph while slower moving freight trains travel at only 50 mph. Under normal operating conditions, neither train service is required to sound their warning horns along this section of the NEC. There is currently no other train activity along this segment of the NEC.

Under the Build Alternative, the station is expected to transfer passengers from the NEC to the people mover to the Airport. In addition to Amtrak service, MBTA commuter rail service and possibly a local electric train shuttle service are expected to extend south from Providence to Warwick Station. These new train services with stops at the Warwick station are not included in the No Build Alternative. Since these additional trains will stop at the station, they will pass the area at relatively low speeds. The trains that do not stop at the station will also reduce speeds through this area. The slower speeds of the trains will result in an overall decrease in maximum passby noise levels under the Build Alternative.

According to Appendix 6.1 of this document, Noise Analysis and Impact Assessment Technical Report, January 1999, 11 residences (or FTA Category 2 receptors) are expected to experience an "Impact" condition under the Build Alternative and none is expected to experience a "Severe Impact" condition.

The Build Alternative includes the cumulative noise impact of all train sources in the NEC and the people mover, compared to the No Build Alternative which already includes significant train activity (see Section 2.2 for definition of what rail projects are included in the No Build Alternative). The Build Alternative noise impacts were also compared to the FTA criteria threshold levels. Reduced travel speeds of all non-stop trains in the station area are expected to improve safety. In addition, noise from the elevated and enclosed people mover is expected to be negligible due to the slow speed, and will not generate adverse noise impacts at any sensitive receptor locations within the project area.

Due to the overall decrease in noise levels from train operations along the NEC, a total of five sensitive receptors (four residences and one pre-school) would not experience an "Impact " condition as a result of the Build Alternative. An additional four residences are expected to experience reduced impact designations ("Severe Impact" to only "Impact") under the Build Alternative.

Due to the low traffic volumes and activity levels associated with the Warwick station parking facilities, no exceedence of either the "Impact" or "Severe Impact" is expected at any of the nearby sensitive receptors

Based on the results of the above analyses, reported in detail in Appendix 6.1, no mitigation measures are needed at this time.

3.11 Traffic Impacts

Introduction

The traffic analysis consisted of determining existing traffic volumes on the roadway network around the proposed station, forecasting future traffic volumes for the years 2000 and 2020, with and without the proposed station, and analyzing traffic operations at intersections determined to be affected by station-generated traffic.

The results of the capacity analyses were compared for "build" and "no-build" to determine if the proposed project would result in adverse impacts to traffic operations. Where potential impacts were identified, measures to mitigate significant adverse traffic impacts were developed to eliminate the impacts

A more detailed discussion of the traffic methodology and results of the analyses is located in Appendix 6.5.

Traffic Impact Analysis Methodology

The traffic analysis is based on Level of Service, (LOS), which is a qualitative measure of operational conditions within a traffic stream along a roadway segment or at an isolated intersection. Six level of service descriptors, designated by the letters "A" through "F", are, used to describe the quality of traffic flow for the condition being evaluated. Level of service "A" represents the best operating conditions and LOS "F" represents the worst operating conditions.

For an un-signalized intersection, the measure of effectiveness used to determine the level of service is the *average total delay*, defined as the total elapsed time from when a vehicle stops at the end of the queue at an intersection approach until the vehicle departs from the stop line.

For a signalized intersection, the measure of effectiveness used to determine level of service is *average stopped delay per vehicle*, a mathematical descriptor that has been shown to correlate well with driver discomfort and frustration, fuel consumption, and lost travel time.

Table 3-2
Level of Service Criteria for Intersections

	Un-Signalized	Signalized
Level of Service (LOS)	Average Total Delay (Seconds/Vehicle)	Average Stopped Delay per Vehicle (Seconds)
"A"	0 to 5	0 to 5
"B"	5 to 10	5 to 15
"C"	10 to 20	15 to 25
"D"	20 to 30	25 to 40
"E"	30 to 40	40 to 60
"F"	Over 45	Over 60

Reference: 1994 Highway Capacity Manual, TRB Special Report 209, Third Edition

Analysis of Traffic operations at intersections was performed using the latest version of the Highway Capacity Software (HCS), based on the 1994 Transportation Research Board Special Report 209, Highway Capacity Manual (Third Edition). The analyses calculated average total delay for un-signalized intersections and average stopped delay per vehicle for signalized intersections. These calculated values were then used to determine the LOS for each intersection approach and for the overall intersection based on the performance criteria described in the preceding section

Within the project limits, ten intersections were selected for capacity analysis to evaluate the level of impact resulting from station generated traffic. The intersections included seven existing un-signalized intersections, two existing signalized intersections and one new intersection proposed at the entrance to the new rail station.

The capacity analyses were performed for each intersection for A.M., midday, and P.M. peak hours, for the 1998 Existing, 2000 Build and No-Build, and 2020 Build and No-Build traffic volumes.

Intersection Analysis Results

Jefferson Boulevard at Airport Connector Eastbound Off Ramp

This un-signalized intersection operates with stop sign control on the off ramp approach to the intersection. The capacity analyses show the left turn from the off ramp and the overall intersection to be at "F" level of service for the existing 1998 A.M., midday, and P.M. peak hours. Operations in the years 2000 and 2020 for the No-Build will remain at LOS "F", with

increased delays. Addition of station traffic will increase delay further in the Build years 2000 and 2020.

Jefferson Boulevard and airport connector Westbound On-Ramp

This intersection operates at overall LOS "A" for all years, with and without station traffic.

Jefferson Boulevard and Thurber Street [No-Build]
Jefferson Boulevard at Thurber Street and Station Exit [Build]

The proposed construction of the station exit will modify the existing three leg intersection of Jefferson Boulevard and Thurber Street to a four way intersection. As an un-signlized intersection, it will operate at an overall LOS "A" for the A.M. and midday peak hours for the Build years 2000 and 2020, however, the P.M. peak hours will be LOS "E" in 2000 and LOS "F" in 2020.

Jefferson Boulevard at Station Entrance

This intersection will operate at an overall LOS "A" for Build years 2000 and 2020, for all hours analyzed.

Post Road and Airport connector Eastbound Off-Ramp

This intersection operates at overall LOS "F" for all years and hours analyzed, with and without station traffic.

Post Road and Airport Connector Westbound On-Ramp

This intersection operates at an overall LOS "A" for all years and hours analyzed, with and without station traffic.

Post Road and Fresno Road

This intersection operates at an overall LOS "A" for all years and hours analyzed, with and without station traffic.

Coronado Road at Imera Road

The intersection operates at an overall LOS "A" during the morning peak hours for all years, with and without station traffic. The intersection operates at an overall LOS "F" during the midday peak hours for all years, and without station traffic. The intersection operates at an overall LOS "A" during the evening peak hours for 1998 and for the year 2000 with and without station traffic. The P.M. peak hour LOS will be "E" in the year 2020 No-Build condition and LOS "E" n the 2020 Build condition. Heavy volumes on the through street (Coronado Road)

create long delays for traffic on Imera Road seeking to enter or cross Coronado Road, resulting in a lowered level of service.

Jefferson Boulevard at Coronado Road and Kilvert Street

The intersection will operate at an overall LOS "C" during the A.M. peak hour for 1998 and No-Build years 2000 and 2020; LOS will be "F" for Build years 2000 and 2020. For the midday peak hour and evening peak hour, the overall LOS is "F" for all years, with and without station traffic.

Post Road at Coronado Road

This intersection has been reconstructed recently, including a new traffic control signal. The intersection operates at an overall LOS "C" during the A.M. peak hour and midday peak hour for all years and hours analyzed. The intersection operates at LOS "C" for No-Build and Build in the year 2000, but will be at LOS "F" in the year 2020, with and without station traffic.

Mitigation of Adverse Traffic Conditions

Of the un-signalized intersections with adverse operating conditions identified above, two will be affected significantly by construction of the proposed station. A large percentage of station traffic will use the Airport Connector eastbound off ramp to Jefferson Boulevard, making an existing LOS "F" condition worse. While the Jefferson Boulevard intersection at Thurber Street presently functions acceptably, addition of the proposed station driveway exit will produce LOS "F" conditions in the P.M. peak hour.

Analysis showed that installation of a traffic control signal at these locations can eliminate adverse operating conditions.

Of the existing signalized intersections, traffic from the proposed station will result in a deterioration in LOS for the intersection of Jefferson Boulevard at Coronado road and Kilvert Street and the intersection of Post Road at Coronado Road and Airport Road. Improved traffic operations at these intersections can be achieved by adjusting the timing of the signal cycle and phasing to reflect new traffic demand. The intersection at Jefferson Boulevard is anticipated to require a reconstructed traffic control signal; the signal at Post Road is new and likely to require only minor modifications.

Installation of a traffic control signal at the intersection of Jefferson Boulevard at Airport connector EB Off Ramp, reconstruction of the signal at the intersection of Jefferson Boulevard at Coronado Road/Kilvert Street, and modifications to the signal timing at the intersection of Post Road at Coronado Road/Airport Road will mitigate adverse traffic impacts resulting from the proposed railroad station through the year 2020. The Rhode Island Department of Transportation has committed to making these improvements so as to avoid any decrease in level of service.

3.12 Ridership

The proposed rail station at Warwick will accommodate both commuter rail service and Amtrak service. Amtrak service is intercity travel between the major cities of the Northeast Rail Corridor while commuter rail will be weekday work trips traditionally oriented to providing access to major employment centers such as Providence and Boston.

A certain amount of both the Amtrak and commuter rail ridership will be trips to or from Warwick with the purpose of getting to or departing from T.F. Green Airport. These airport related trips represent those trips that would make use of the people mover connection between T.F. Green Airport and the Warwick Rail Station.

The table below represents total projected daily trips at the Warwick Rail Station. Both Amtrak and commuter rail trips used to access or depart from the airport are indicated as well as total airport related trips. These airport related trips provide a picture of the number of trips that would utilize the people mover. These people mover trips do not include trips between the airport and future commercial uses that may be developed in the immediate area. The total airport related trips also provides insight into the local modal shift or number of automobile trips diverted from local roads to the rail system. A more complete discussion of ridership projections is presented in Appendix 6.6.

Table 3.3 Warwick Station Daily Ridership Demand – Trips*

Passengers	Year 2000	Year 2020
Amtrak	228	524
Amtrak – Airport Related	66	152
Commuter Rail	454	558
Commuter Rail – Airport Related	232	598
Total Rail Station	980	1832
Total Airport Related (and people mover trips)	298	750

*Trip is defined as a one-way movement (a person going to and returning from the airport is computed as making two trips.)

The table below represents total projected daily trips at the Warwick Rail Station. Both Amtrak and commuter rail trips used to access or depart from the airport are indicated as well as total airport related trips. These airport related trips provide a picture of the number of trips that would utilize the people mover. These people mover trips do not include trips between the airport and future commercial uses that may be developed in the immediate area. The total airport related trips also provides insight into the local modal shift or number of automobile trips diverted from local roads to the rail system. A more complete discussion of ridership projections is presented in Appendix 6.6.

Table 3.3 Warwick Station Daily Ridership Demand – Trips*

Passengers	Year 2000	Year 2020
Amtrak	228	524
Amtrak – Airport Related	66	152
Commuter Rail	454	558
Commuter Rail – Airport Related	232	598
Total Rail Station	980	1832
Total Airport Related (and people mover trips)	298	750

*Trip is defined as a one-way movement (a person going to and returning from the airport is computed as making two trips.)

3.13 Water Quality Impacts

There are no surface water resources located within the project area as shown on the USGS map in Figure 1-1. The project area is within the Pawtuxet River Basin and Narragansett Bay Basin Watersheds as shown in Figure 3-2. According to RI Department of Environmental Management (RIDEM), Office of Water Resources, RIDEM has assigned a "degraded" water quality status to waters of the Pawtuxet River Basin and the Narragansett Bay Basin. For State waters having a "degraded" status, higher total suspended solids removal is required in the design of proposed stormwater management systems.

The proposed project is not within any of the three designated sole source aquifers in Rhode Island as shown on Figure 3-3. Groundwater within the project area is classified as GB, which is

not for use as a drinking water supply. According to the Rhode Island Geographic Information System (RIGIS), there are no private or public drinking water wells within three miles of the area. Investigation of the groundwater quality was conducted by the Office of Waste Management of the RIDEM as part of a 1997 brownfields site assessment of the T.H. Baylis site. The results of this study are discussed in detail in Section 3.20.

The project will not adversely affect water quality and has the potential to improve groundwater quality in the vicinity of the Baylis Company site. The Baylis site is proposed to be used as a connection to the people mover for the proposed station. It would be cleaned up to be in compliance with the RIDEM Remediation Regulations. Stormwater Best Management Practices (BMPs) will be incorporated into the facility drainage design so that stormwater runoff generated by the project will be treated to protect water quantity and quality.

It is concluded that the project will not generate adverse impacts to water quality. Therefore, no additional mitigation measures to those already included in applicable regulations are needed at this time.

3.14 Permits

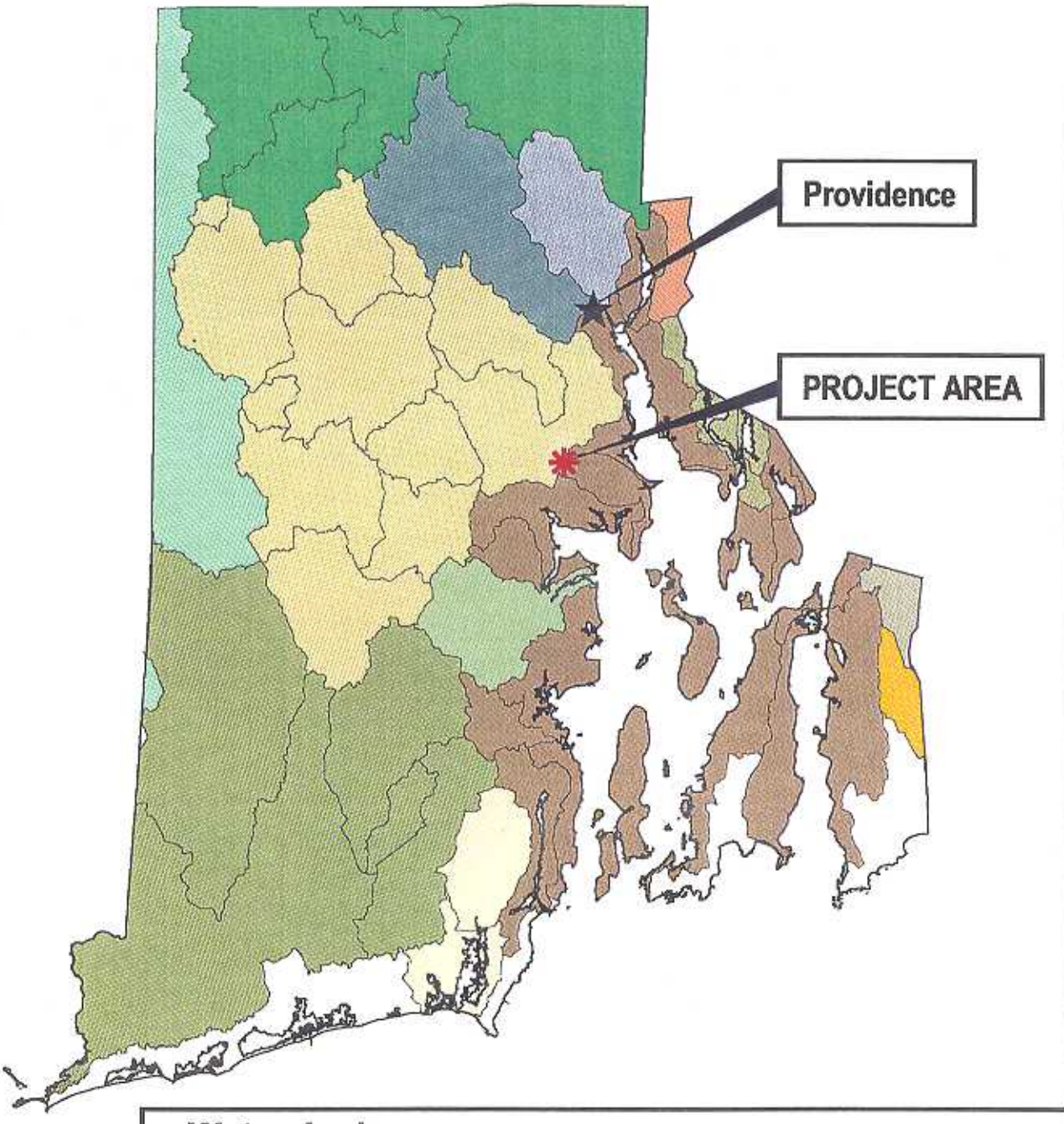
Based upon the current conceptual plans for the station and the people mover alternatives and initial comments received from the RIDEM, the project will require a Rhode Island Pollutant Discharge Elimination System (RIPDES), Storm Water Discharge Associated with Construction Activity permit and a State Water Quality Certification. The RIPDES Permit is required because the proposed project involves more than five acres of soil disturbance. For RIDEM issuance of the Water Quality Certification, the proposed project will need to include provisions for the water quality treatment of all generated stormwater runoff before discharge to any State waters, a schedule for the long-term maintenance of all proposed structures associated with the project's stormwater system and identification of the party responsible for this maintenance, and adequate erosion and sedimentation controls.

If the project's drainage system includes provisions for on-site infiltration and/or subsurface discharges of runoff for stormwater management, then the project may require a RIDEM Underground Injection Control (UIC) Permit. Project implementation involves the use of the Baylis property. Site remediation would be conducted in compliance with RIDEM regulations. (See Section 3.20 regarding hazardous waste concerns.)

3.15 Wetland Impacts

There are no wetlands within the project area as shown on Figure 3-4. The area is a fully developed area of commercial, industrial and residential land uses. The U.S. Army Corps of Engineers (COE) has been contacted in order to confirm that there are no wetland resources.

Therefore, it is concluded that the project will not adversely affect wetlands since there are none in the project area.



Source data supplied by the Rhode Island Geographic Information System (RIGIS)

RIGIS Datalayer Information: Watersheds - Revised 5/90

Watersheds

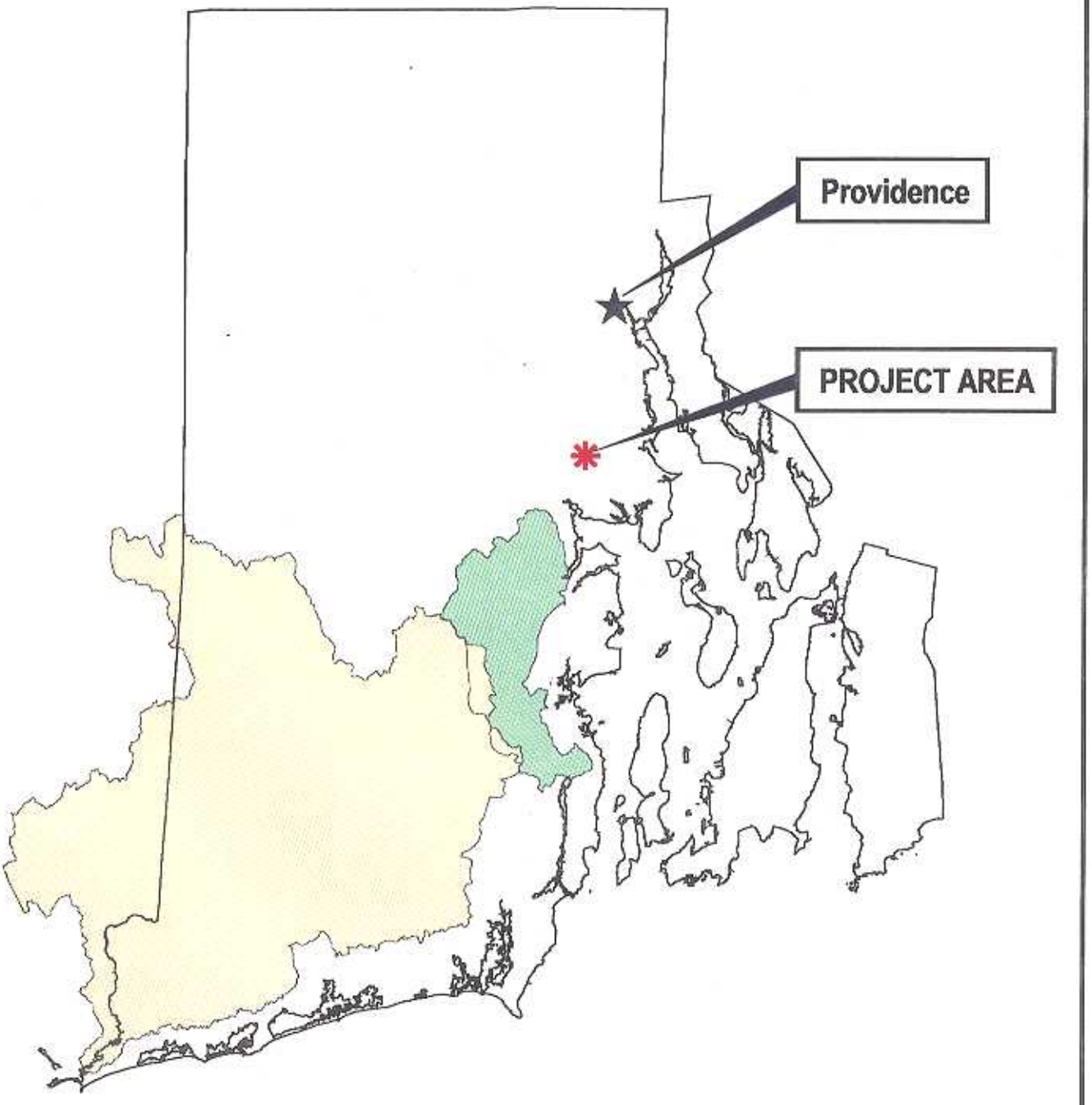
- BLACKSTONE RIVER BASIN
- HUNT RIVER BASIN
- MOOSUP RIVER BASIN
- MOSHASSUCK RIVER BASIN
- NARRAGANSETT BAY BASIN
- PAWCATUCK RIVER BASIN
- PAWTUXET RIVER BASIN
- SAUGATUCKET RIVER BASIN
- TAUNTON RIVER BASIN
- TEN MILE RIVER BASIN
- WARREN RIVER BASIN
- WESTPORT RIVER BASIN
- WOONASQUATUCKET RIVER BASIN

Rhode Island Department of Transportation
Federal Highway Administration

Drainage Basins - Watersheds
Warwick Intermodal Station at T.F.Green Airport
Warwick, Rhode Island

N

Figure 3.2



Source data supplied by the Rhode Island Geographic Information System (RIGIS)

RIGIS Datalayer Information:
Sole Source Aquifers - Revised 6/92

Sole Source Aquifers

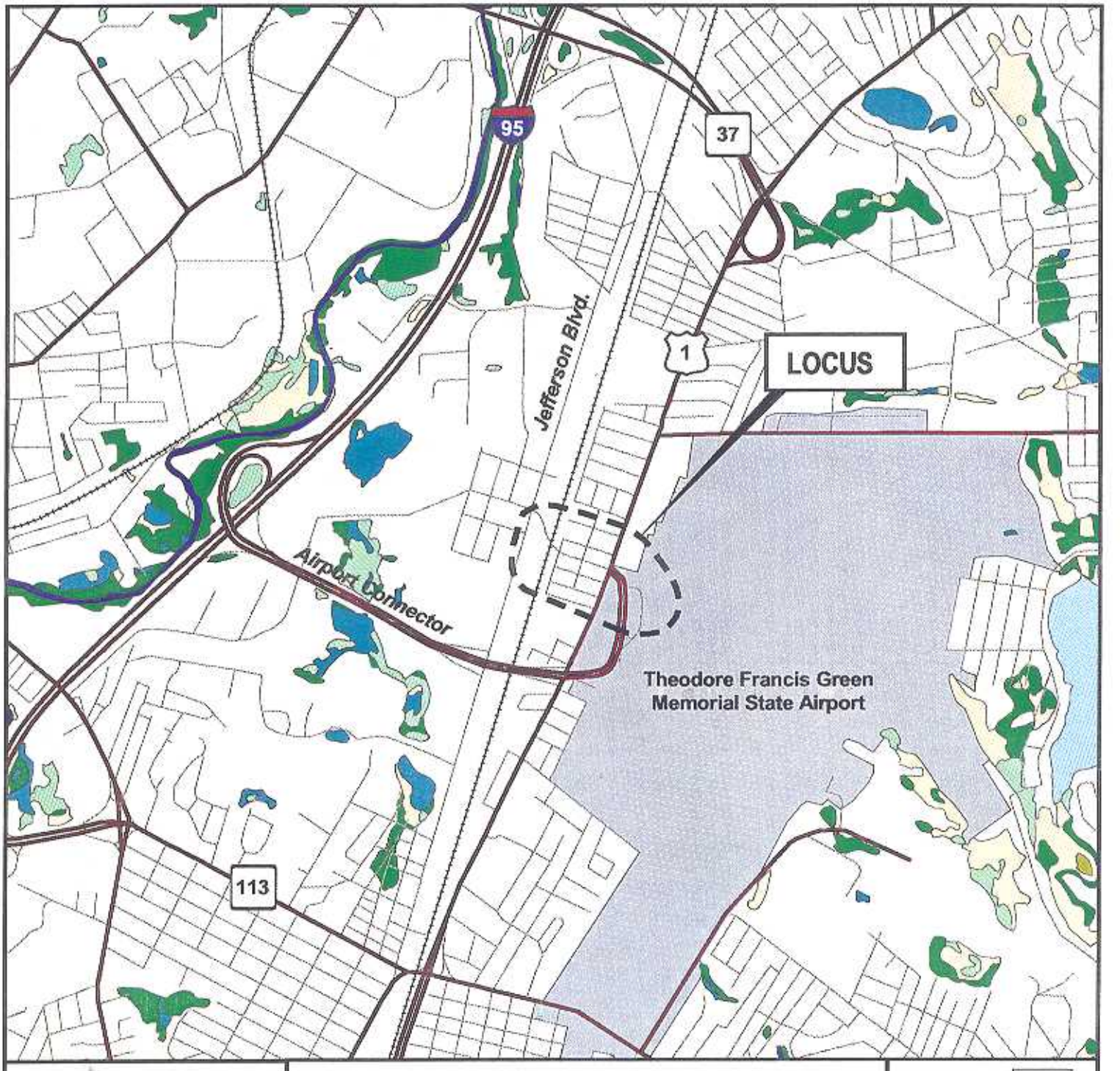
- Block Island
- Hunt, Annaquatucket, and Pettaquamscutt Basins
- Pawcatuck Basin

Rhode Island Department of Transportation
Federal Highway Administration

Designated Sole Source Aquifers
Warwick Intermodal Station
at T.F.Green Airport
Warwick, Rhode Island

N

Figure 3.3

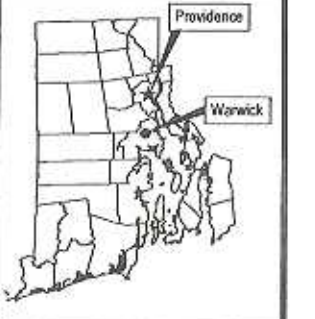


Source data supplied by the Rhode Island Geographic Information System (RIGIS)

RIGIS Datalayer Information:
Roads - Revised 11/96
Wetlands - Revised 10/93

Wetland Classification

- Emergent Wetland: Marsh/Wet Meadow
- Forested Wetland: Coniferous
- Forested Wetland: Deciduous
- Lacustrine Open Water
- Palustrine Open Water
- Riverine Nontidal Open Water
- Scrub-Shrub Wetland: Shrub Swap



Rhode Island Department of Transportation
Federal Highway Administration

Wetland Classification
Warwick Intermodal Station at T.F.Green Airport
Warwick, Rhode Island

Scale: 1"=2,000'

N

Figure 3.4

3.16 Water Body Modification and Wildlife Impacts

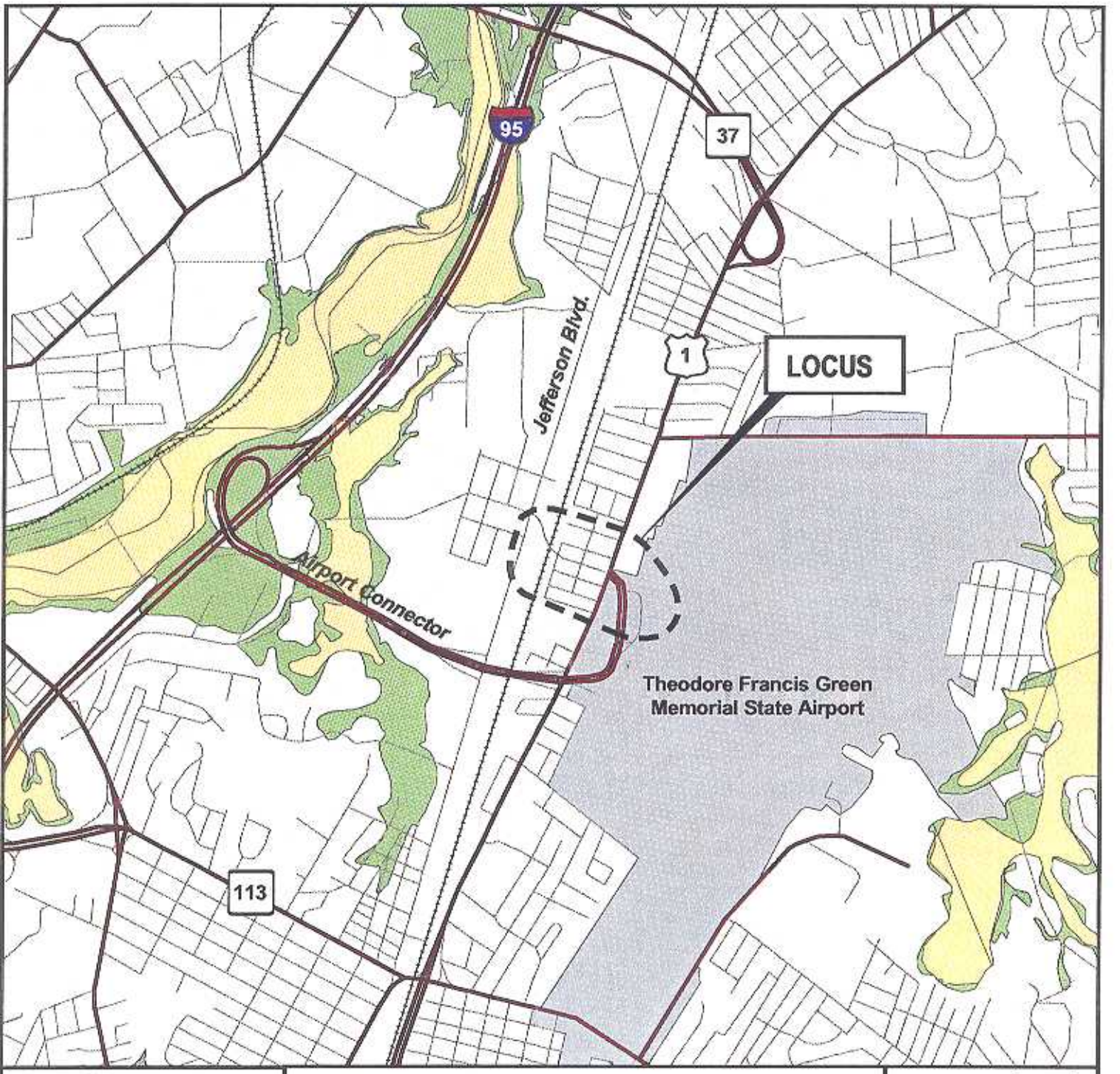
There are no wetland or water resources within the project area as discussed in Sections 3.11 and 3.13. There are no wildlife corridors along the railroad right of way or significant wildlife habitat within the area except for small areas that would be used by common species of birds and mammals that would make use of an urban setting. Accordingly, the project will not modify water bodies or affect wildlife resources.

3.17 Floodplain

The project site is not in a floodplain. The closest floodplains are located well west of the site in the vicinity of I-95. Accordingly, the project will not affect the 100-year or 500-year floodplains as shown on Figure 3-5. According to the City of Warwick, Kent County, Rhode Island Flood Insurance Rate Map (Community Panel Number 445409 0002D, latest revision April 16, 1991) prepared by the Federal Emergency Management Agency (FEMA) the project area is located within "Other Areas-Zone X". This zone designation is defined by FEMA as "Areas determined to be outside 500-year floodplain". Therefore it is concluded that the project will not have an adverse affect on a floodplain and is not expected to cause flood hazards.

3.18 Wild and Scenic Rivers

The project will not affect a river designated, or under study for designation, as a National Wild and Scenic River. According to the Rhode Island Department of Environmental Management (RIDEM) there are no rivers in Rhode Island that have been designated as Wild and Scenic.

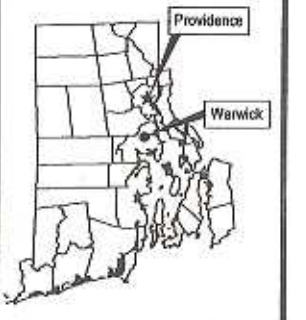


Source data supplied by the Rhode Island Geographic Information System (RIGIS)

RIGIS Datalayer Information:
Roads - Revised 11/96
Fema Firm Information - Revised 6/97

FEMA Floodplain Classifications

- Zone A - 100 Year Flood - No base flood elevation
- Zone AE - 100 Year Flood - Base flood elevation
- Zone X500 - 500 Year Flood



Rhode Island Department
of Transportation
Federal Highway Administration

FEMA Floodplain Classification
Warwick Intermodal Station
at T.F.Green Airport
Warwick, Rhode Island

Scale: 1"=2,000'

N

Figure 3.5

3.19 Coastal Zone Impacts

The project will not affect the coastal zone. According to a review of the Rhode Island Coastal Resources Management Program, prepared by the Rhode Island Coastal Resource Management Council, the project site is not located within a coastal zone. The project is approximately 3 miles west of the Providence River and 3 miles north of Greenwich Bay.

3.20 Threatened Species

According to the RIDEM, Rhode Island Natural Heritage Program, there are no known State-listed threatened or endangered species located within the project area. According to the U.S. Fish and Wildlife Service, no Federally listed threatened or endangered species are known to exist in the project area, with the exception of occasional transient bald eagles and peregrine falcons. Telephone conversation logs with representatives of these agencies are included in Section 4.0.

Therefore, it is concluded that the project will not affect threatened species.

3.21 Historic and Archaeological Preservation

In accordance with Section 106 of the National Historic Preservation Act of 1996, as amended, and Section 4 (f) of the U.S. Department of Transportation Act of 1966, coordination with the RISHPO (RI State Historic Preservation Officer, RIHP&HC) was initiated to identify all historic and archaeological resources of National Register significance lying within the project area (area of potential effects).

Above-ground Resources

The RISHPO indicated per its September 9, 1998 review letter that the project is in close proximity to the potentially significant historic mill village of Hill's Grove, which includes the former Rhode Island Malleable Iron Works building at 697 Jefferson Boulevard, the former Elizabeth Mill (Leviton Manufacturing Co.) at 745 Jefferson Boulevard, and associated mill workers residences near these factories. Accordingly, the mill village, including the two factory complexes, required a Phase II Evaluation/Determination of Eligibility for listing in the National Register of Historic Places. The required Consensus Determination of Eligibility documentation is included in Appendix 6.3 of this document and is summarized below.

Hill's Grove Historic District

The RISHPO indicated per its May 19, 1999 review letter that the Hill's Grove Mill Village qualifies for listing in the National Register of Historic Places under Criteria A and C, as a significant example of a mid-19th century planned industrial community. As indicated in Appendix 6.3 of this document, it meets Criterion A for its exemplification of the use of steam power in post-Civil War Rhode Island's metalworking and textile industries and as a surviving

example of a paternalistic workers' village laid out by an industrial entrepreneur. It meets Criterion C for its embodiment of the distinct characteristics of late 19th- and early 20th-century New England mill architecture and worker housing. Boundaries of the Hill's Grove Historic District are presented in Figure 3.6. Consensus Determination of Eligibility documentation has been sent to FHWA for concurrence and has been determined eligible through consensus.

The May 19, 1999 RISHPO correspondence also concluded that the proposed project "has a low potential to affect the historic district adversely. The majority of the project impacts will occur in an existing parking lot on the east side of Jefferson Boulevard, outside of the district boundaries. Therefore, it is our finding that the project will have no adverse effect on the Hill's Grove historic district, provided that the RIHP&HC continues to review project plans, including those for the new Leviton parking lot, to insure that there are no visual or physical intrusions into the district." These comments were provided in accordance with Section 106 of the National Historic Preservation Act. RIDOT intends to continue to coordinate with RISHPO throughout design and construction.

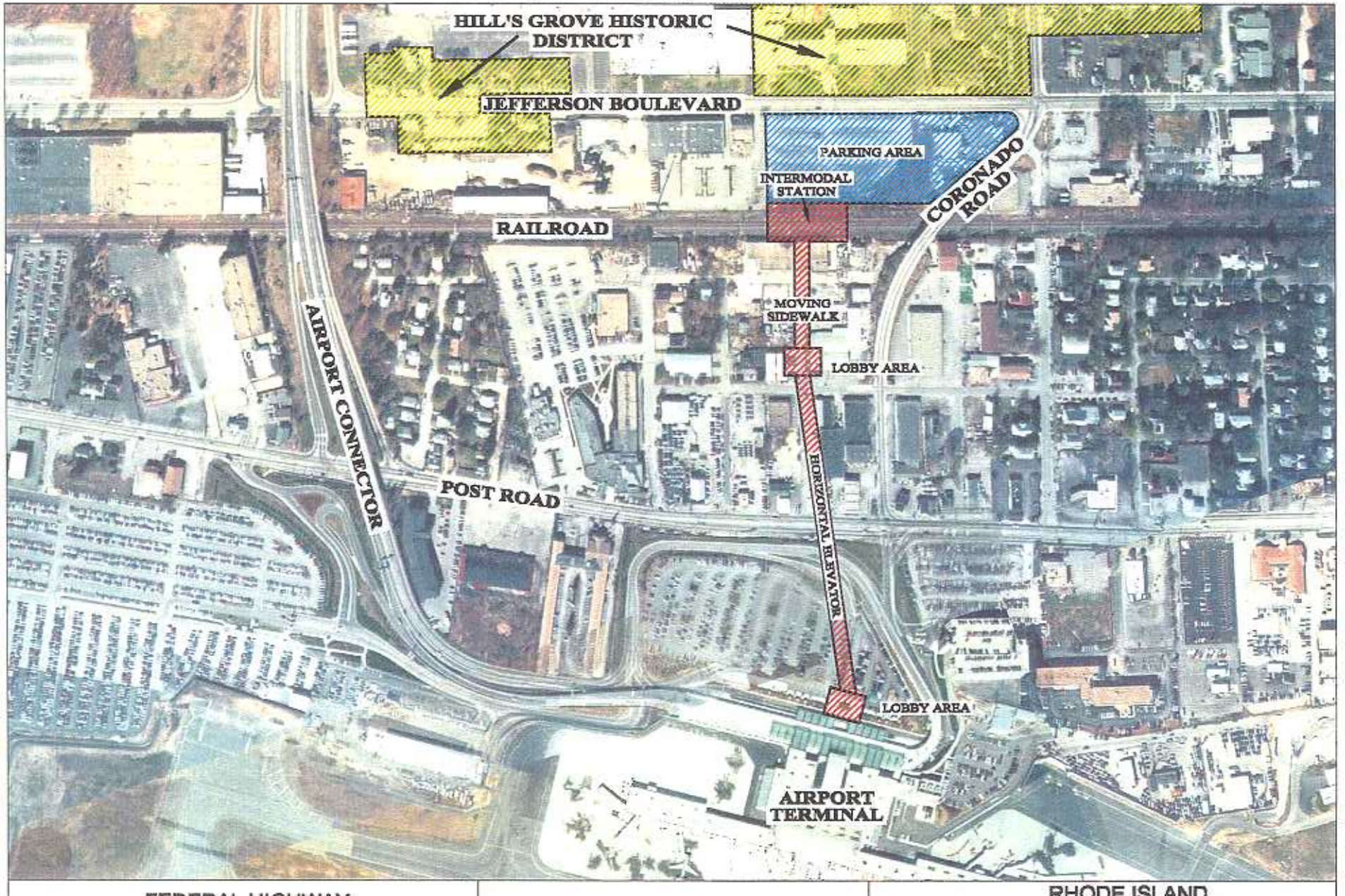
Below-ground Resources

As a result of this coordination, the RISHPO indicated per their December 18, 1998 review letter that (1) the project area is sensitive for Native American archaeological resources and (2) that a Phase I (b) archaeological reconnaissance survey was warranted to determine whether or not any significant resources are present. Accordingly, a Phase I (b) archaeological reconnaissance survey was conducted. Findings of this study are presented in Appendix 6.3. Fieldwork was monitored by Narragansett Indian Tribal Historic Preservation Officer (NITHPO) John Brown and Project Director Doug Harris. At the completion of fieldwork, the NITHPO agreed that these locations had been adequately tested. No evidence of significant archaeological resources were identified during the reconnaissance survey.

The RISHPO, in May 19, 1999 correspondence indicated that "it appears that there will be no effect to significant archaeological resources in the areas that have been studied. Two areas still require archaeological study. These are the area of contamination on the T.H. Balis property and the location of the People Mover structural system. Provided that the RISHPO reviews and approves appropriate archaeological study of these areas once site remediation is undertaken and the location of the People Mover is confirmed, it is our finding that the proposed undertaking will have no adverse effect on archaeological resources." These comments were provided in accordance with Section 106 of the National Historic Preservation Act. Further archaeological study will be conducted when site remediation and People Mover structural systems are designed. Coordination will be maintained with the RISHPO during design and construction.

Summary

Summary Documentation For a Finding of No Adverse Effect, including conditions recommended by the RISHPO, has been transmitted by the FHWA to the Advisory Council on



FEDERAL HIGHWAY ADMINISTRATION	Historic Sites	RHODE ISLAND DEPARTMENT OF TRANSPORTATION

Figure 3-6

Historic Preservation (ACHP) for a 30-day review. It is anticipated that the ACHP will concur with the No Adverse Effect determination with conditions. These conditions are as follows:

(1) The FHWA and the RIDOT will provide the RISHPO the opportunity to review all project plans, including those for the new Leviton Company parking lot, to insure that there are no visual or physical intrusions in the Hill's Grove Historic District.

(2) The FHWA and the RIDOT will ensure that the RISHPO reviews and approves the archaeological study of the T. H. Baylis property and the location of the People Mover structural system-- the two outstanding areas not yet subjected to a Phase I (b) archaeological survey.

Section 4(f)

In compliance with Section 4(f) of the 1966 U.S. Department of Transportation Act (U.S. Law codified in 49 U.S.C. 303 and 23 U.S.C. 138), Federal Highway Administration's Environmental Impact and Related Procedures (23 CFR 771) require that a Section 4(f) Evaluation be prepared for any Federal Highway Administration-funded transportation project which uses property from an historic site or structure considered eligible for inclusion in the National Register of Historic Places and/or a significant publicly-owned park, recreational area, or wildlife/waterfowl refuge.

With respect to Section 4(f), since the project does not involve "use" of land from any significant, publicly-owned parks, recreational areas, wildlife/waterfowl refuges, or an significant historic resources, the FHWA has determined that a Section 4(f) Evaluation will not be required.

3.22 Hazardous Waste Sites

The RIDEM completed the Brownfield Site Assessment for the T.H. Baylis property in February 1998. It investigated the nature and extent of contamination at the site. A fact sheet published by the RI Office of Waste Management is included at the end of this subsection. Hazardous wastes sites within the area are shown on Figure 3-7.

The RIDOT has initiated further investigations to determine the extent of groundwater contamination to adjacent properties, and to quantify the financial impacts to the Warwick Intermodal Station project. Test wells have been recently installed within and abutting the project area to determine the extent of the chlorinated solvent plume which has migrated in a general southwesterly direction from the Baylis property.

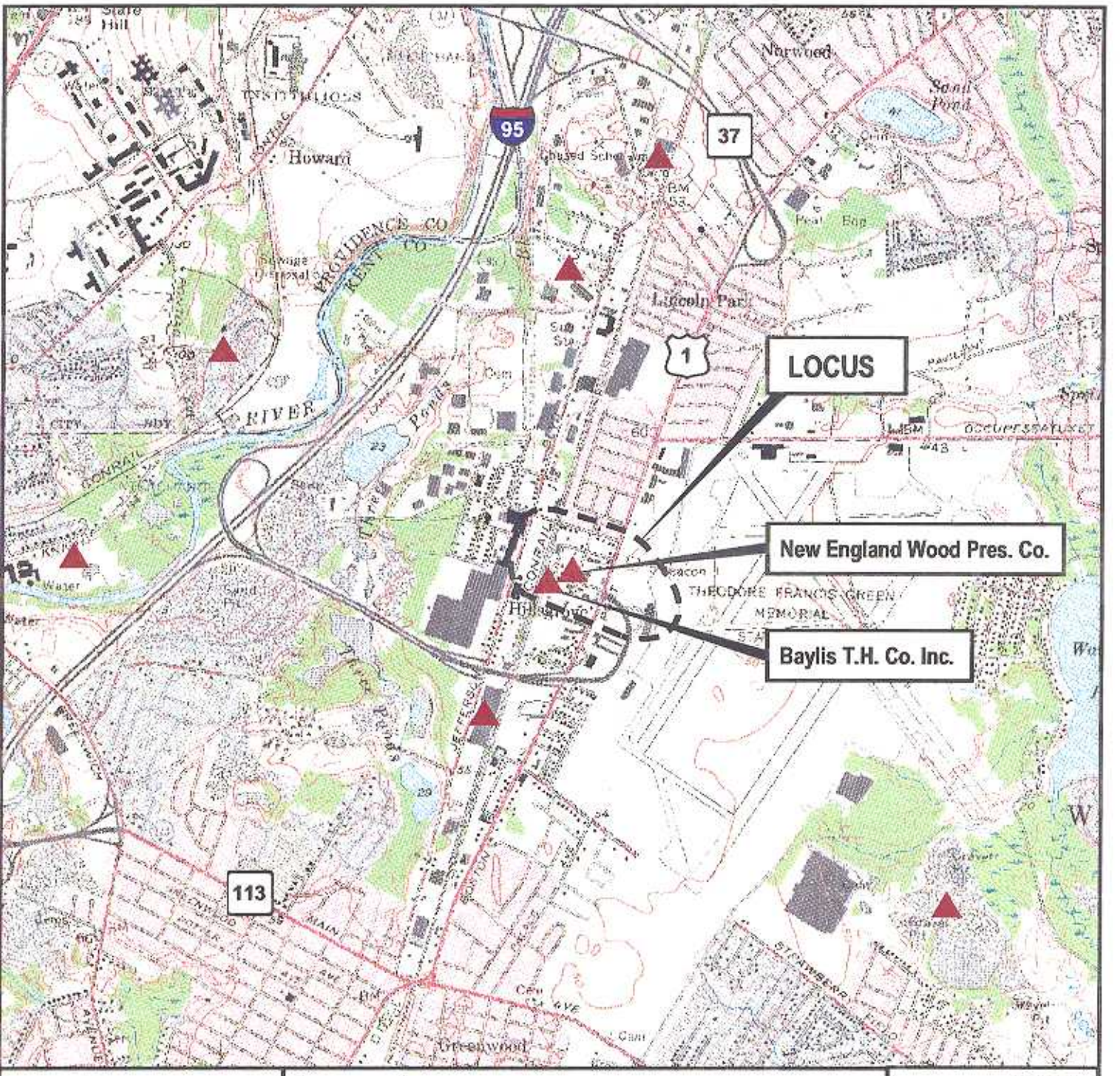
A Phase I Environmental Site Assessment for other properties within the project area has been completed. The properties presently located in the area of the proposed intermodal train station include a paved parking area associated with Leviton Manufacturing, and paved parking areas and buildings currently used by Budget Car Rentals and a portion of D'Ambra Construction.

Properties located in the area of the proposed people mover, include T.H. Baylis, one unpaved parking area, Airport Autobody, Gaspee Automotive, R. Johnson & Sons, Netcoh, a building that formerly housed the Rhode Island Institute of Baseball, Sierra Tools, a Shell Gasoline Service Station and an Exxon Gasoline Service Station.

The Phase I Environmental Site Assessment is included in Appendix 6.2 of this document. The Phase I investigative work included review of available RIDEM records, research of historical land use, and observation of current land use. RIDEM reports included an open file regarding a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) site located at the corner of Coronado Road and Imera Avenue, which is a property with low levels of soil contamination, and a closed file pertaining to a Leaking Underground Storage Tank (LUST) site, identified as the EXXON Station located at the corner of Post Road and Fresno Road, which may have possible residual concentration located off-site.

Historical land use research has determined that a transformer yard was at one time located on the Budget property, and that manufacturing shops were located at both corners of Fresno Road and Imera Avenue. A former woodworking company operated at the northern corner of Fresno Road and Imera Avenue.

Based upon the preliminary results of the Phase I Environmental Site Assessment, recommendations include that Phase II testing be conducted on certain properties. These tests include sampling for PCB material at the Budget property in the location of the former transformer yard and the D'Ambra property. Sampling should also be performed by subsurface test hole drillings along either side of Fresno Road depending on the selected location of the people mover. The Phase II testing will be completed before any property acquisition and the



Base Map Source:
East Greenwich, RI
1957 USGS Quadrangle

Source data supplied by the Rhode Island Geographic Information System (RIGIS)

RIGIS Datalayer Information:
Cerclis Sites - Revised 3/97

Legend:

▲ CERCLIS Potential Hazardous Waste Sites

Rhode Island Department
of Transportation
Federal Highway Administration

Potential Hazardous Waste Sites
Warwick Intermodal Station
at T.F.Green Airport
Warwick, Rhode Island

Scale: 1"=2,000'

N

Figure 3.7

necessary hazardous waste remediation will be performed before project construction activities are undertaken.

3.23 Visual Impacts

Given the existing visual appearance of the intermodal station site, the proposed project will have a significant beneficial impact on the visual environment. The station architecture is intended to improve the visual image and complement the surrounding area. In addition, the proposed people mover project will be designed to complement planned commercial buildings in the City's redevelopment district.

The people mover will connect to the Airport terminal and will complement the architectural statement of that building. During design, close coordination with RIAC staff and interested public officials and citizens will take place to address the visual character of the proposed structure. Design features prominent on the airport terminal building such as glass could be used on the people mover for consistency.

3.24 Energy

The proposed people mover will require electricity to supply power needs for the electric motors operating the horizontal elevator. The horizontal elevator is the preferred alternative for the longer section of the people mover connection for several reasons including that it is energy-efficient. In addition, the intermodal station will be designed to take advantage of the latest energy saving features including energy-efficient lighting. Overall energy use may be reduced by the project. The use of electricity to power the people mover system is expected to be offset by reduction in the use of gasoline-powered vehicles in the area. Therefore, it is concluded that the project will affect energy resources. The level of such use has not been estimated. However, it is not expected that such use will require any special mitigation.

3.25 Construction Impacts

Project construction impacts are expected to be minimal, particularly on sensitive receptors, since residential areas are not located near the station site. Most local streets will remain open to traffic during construction with the exception of Fresno Road as explained below.

Potential noise, dust, and glare associated with construction activities and construction vehicles are not expected to affect residential neighborhoods.

Construction of the pedestrian concourse over the mainline NEC tracks may require nighttime construction activities so as not to disrupt Amtrak service, but such activities are expected to be of short duration.

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

FACT SHEET

Office of Waste Management

Brownfields Site Assessment
T. H. Baylis
61 Glenham Avenue, Warwick, RI
August 1998

Introduction: The purpose of a Brownfields Site Assessment (BSA) is to investigate the nature and extent of a contaminated site, ascertain the actual and potential impacts of releases of hazardous materials to the environment and propose appropriate remedial alternatives with the goal of facilitating both environmental protection and beneficial reuse. There are presently ten properties which have undergone or are presently undergoing Brownfields investigations by the Department.

Background: The T. H. Baylis Company (Baylis) operated as a chemical distributor, wholesaler and hazardous waste storage facility on the property from 1981 to April 1988. From 1981 to the present there were six documented chemical spills, two fires, and the facility was cited nine times for various violations of the rules and regulations for hazardous materials management. The site was listed on the United States Environmental Protection Agency's (USEPA's) Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) database on 30 July 1991. CERCLIS is an inventory managed by the USEPA of sites which may be eligible to be considered a national priority (i.e., the National Priority List (NPL) or Superfund). Numerous chemicals in drums, containers and tanks remained on-site after Baylis went out of business in 1988. In September 1992 USEPA determined that the amount of material remaining on-site and the deteriorating conditions of the facility represented an imminent and substantial endangerment to the public and the environment. In January 1993 USEPA initiated an emergency removal action which included the testing, removal and disposal of approximately 2100 containers of various sizes and materials on-site and the testing and disposal of the contents of eight above-ground storage tanks and four underground storage tanks. The emergency removal was completed in July 1993. There are no hazardous materials remaining on-site.

Site Characteristics: The Baylis property consists of 11 lots and is approximately 2.1 acres in size. There are five facility buildings on the property which were associated with former operations of the T. H. Baylis Company, including a main building (office and storage), an acid handling building, a hazardous waste storage building, a laboratory building and a flammable material storage building. The buildings and the property have been vacant and unused since 1992. Surrounding property use is mixed industrial/commercial, railroad and residential. The current owner of the property is THBC, Inc., an insolvent Delaware corporation and a subsidiary of parent holding company Sanitas, Inc., an insolvent Connecticut corporation.

RIDEM's 1997 BSA Investigation: The scope of the Brownfields investigation conducted at the Baylis property by the Department included environmental sampling of surface and subsurface soil, soil-gas and groundwater. Groundwater at the site is classified as GB (not for use as a drinking water supply) and there are no private or public drinking water wells within three miles of the site. The investigation determined that the levels of volatile organic compounds (VOCs) in soil and groundwater on the property exceed the Department's soil and groundwater standards applicable to the area. The investigation identified three large areas of soil contamination, several small areas of soil contamination and what appear to be two plumes of groundwater contamination on the property. A Supplemental Soil and Groundwater Investigation (SSGI) was conducted by the Department in April 1998 to further characterize groundwater and soil at and surrounding the Baylis property. The SSGI confirmed concerns identified by the original BSA that VOC contaminated groundwater in exceedance of the Department's standards is migrating off-site to the west in two distinct plumes. The full lateral downgradient extent of the plumes has not been determined. The estimated total on-site remediation cost range to bring the Baylis property into compliance with the Department's Remediation Regulations is $ 1,150,000 to $ 2,270,000.

For further information, please contact:

Rhode Island Department of Environmental Management
Office of Waste Management
235 Promenade Street
Providence, Rhode Island 02908
(401) 222-2797

The construction of the people mover will take place over some 1,500 feet and cause some temporary traffic detours as support structures are constructed. Disruptions to the flow of traffic on the streets within the construction area are unavoidable. It is anticipated that Fresno Road will be closed to vehicular traffic during construction. In addition, some temporary congestion and delays will result on other adjacent streets, including Post Road. Where detours must be implemented, designated detour routes will be available to accommodate diverted traffic.

Some minor detours of traffic and parking space loss are also expected within the Airport's short-term parking area due to the construction of support piers for the people mover. Close coordination with RIAC staff will be required to minimize disturbance.

The project is expected to have construction impacts such as traffic detours and parking space displacements. These impacts are temporary in nature and can be mitigated by implementation of Maintenance of Traffic Plan and a Construction Mitigation Plan. Such plans can be prepared during the subsequent design process. Further, such plans are included in the construction specifications of bid documents. The contractor is usually responsible to carry out such plans during the construction process.

3.26 Access Impacts

The proposed transportation improvements are being planned so as to meet all Americans with Disabilities Act (ADA) requirements. Full access will be available from station entrances on Fresno Road and Jefferson Boulevard. Full access via elevator will be available to all of the station platforms and all platforms will be high level.

SECTION 4.0 COMMENTS AND COORDINATION

4.1 Introduction

The process of preparing an EA involves substantial coordination with numerous local officials, State and Federal agencies, organizations, elected officials and citizens. The majority of the coordination is relatively subject-specific and involves dealing directly with a specific agency on a specific issue. Another type of coordination has the goal of maintaining liaison so that potential issues of interest can be identified and addressed. Both types of coordination have been carried out during the preparation of this document and are discussed below.

A Public Notice of Intent, which is included at the end of this section, was published in the *Providence Journal* and *Warwick Beacon* on August 20, 1998, notifying the public of RIDOT's intent to prepare the EA for the Warwick Intermodal Station at T.F. Green Airport. The notice was issued in the event that an Environmental Impact Statement (EIS) was required.

The various public workshops and agency coordination meetings are described below. These meetings were supplemented by numerous phone conversations, correspondence and on-site meetings with agencies, area business owners and residents to maintain an ongoing coordination process.

4.2 Public Workshops

Three public meetings were held during the scoping/project development phase of the project at the Radisson Hotel in Warwick. The initial Public Meeting was held on August 3, 1998. Two additional public meetings were held on August 27 and October 20, 1998. Presentations at these meetings provided agency staff and the general public a project overview, a review of the development of alternatives, and a discussion of the various people mover technologies. Opportunities for public comment were available at each meeting. All comments at the meetings, both verbal and written received written responses from RIDOT.

A fourth Public Information Meeting on January 7, 1999 presented the findings of the preliminary EA.

Copies of the newspaper advertisements and agendas of the public meetings are included at the end of this section.

4.3 Agency Coordination

An agency-scoping meeting took place on August 27, 1998 at RIDOT with the Director of the Rhode Island Department of Transportation and Division Administrator of the Federal Highway

Administration. Scoping for the project was discussed and each agency represented was asked to provide comment, if any, at the meeting.
The meeting was attended by:

- Environmental Protection Agency (EPA)
- Federal Aviation Administration (FAA)
- Federal Transit Administration (FTA)
- Federal Railroad Administration (FRA)
- U.S. Army Corps of Engineers (USACE)
- Rhode Island Department of Environmental Management (RIDEM)
- Rhode Island Economic Development Corporation (RIEDC)
- Rhode Island Public Transit Authority (RIPTA)
- National Railroad Passenger Corporation (Amtrak)
- City of Warwick

The agencies have been divided into Cooperating Agencies and Coordinating Agencies for purposes of this project. The following agencies were requested, in writing, to be a Cooperating Agency:

- FRA
- FAA
- EPA
- FTA
- RI Historic Preservation and Heritage Commission (HPHC)
- RIPTA
- RIDEM
- RI Airport Corporation (RIAC)

The following agencies, designated as Coordinating Agencies, have been provided all project information and updates as necessary:

- City of Warwick
- Amtrak
- MBTA
- Narragansett Indian Tribe
- RIEDC

On December 7, 1998 the FHWA approved the project's purpose and need statement and EA Scope of Work. Both the approved Purpose and Need Statement and EA Scope of Work were forwarded to all the agencies listed above.

On May 7, 1999, a second agency meeting took place at the Rhode Island Department of Transportation. The purpose of the meeting was to provide an opportunity for the agencies to comment on a review copy of the Environmental Assessment distributed in April 1999.
Coordination has been ongoing with State and Federal transportation agencies. Major meetings include the following:

- RIDOT met with director Jonathan Stevens of the Warwick Planning Department on October 5, 1998. The meeting resulted in the City sending a letter to RIDOT stating preference for the Fresno Road people mover alignment. A follow-up meeting was held on December 29, 1998. City staff has also attended the three public information meetings.

- RIDOT met with the FRA Administrator and The City of Warwick Mayor Lincoln Chafee on August 26, 1998 at the T.F. Green Airport Conference Room to brief them on the project.

- Meetings were held with RIDOT staff involved with the Freight Rail Improvement Project (FRIP) on March 10, 1998 and October 16, 1998. Coordination will continue through the process.

- RIDOT met with the Rhode Island Airport Corporation staff on September 25, November 2 and December 15, 1998. Coordination centered on access onto T.F. Green Airport property and the people mover connection to the terminal building. On November 18, 1998, RIDOT's Director presented the project to the RIAC Board of Directors. This resulted in a Board resolution supporting the project and the people mover alignment alternatives. RIAC staff has also attended all three public information meetings.

- RIDOT met with Amtrak staff in New York City on June 9, 1998 and in Providence on December 7, 1998. Coordination included NEC railroad operations, electrification construction and the proposed railroad station.

Agency coordination letters received to date are included at the end of this section.

In addition to the agency coordination, one private citizen provided site information on the proposed train station during the October 20, 1998 Public Information Meeting. An on-site meeting was held and information on a possible electrical transformer station on the Budget Site was provided. Subsequent investigation confirmed the location and the information was included in the Phase I Environmental Site Assessment performed for this document. Finally, per request, RIDOT met twice with area business owners along Fresno Road to discuss the status of the project.

SECTION 5.0 DISTRIBUTION LIST

This EA has been sent to the following Federal, State and local agencies and others for review and comment.

FEDERAL AGENCIES

Federal Highway Administration
Federal Aviation Administration
Federal Railroad Administration
Federal Transit Administration Region I
U.S. Army Corps of Engineers, New England Division
U.S. Environmental Protection Agency, Region I
U.S. Department of Interior, Office of Environmental Project Review
Advisory Council on Historic Preservation
Council on Environmental Quality

STATE AGENCIES

Rhode Island Department of Transportation
Rhode Island Division of Planning, State Planning Office (Clearinghouse)
Rhode Island Department of Environmental Management
Rhode Island Airport Corporation
Rhode Island Economic Development Corporation
Rhode Island Historical Preservation and Heritage Commission
Rhode Island Public Transit Authority

MUNICIPALITIES AND LOCAL AND REGIONAL AGENCIES

City of Warwick: Mayor, Planning Department, City Council, Library
Central Rhode Island Chamber of Commerce
MBTA
Amtrak
Narragansett Indian tribe

INTEREST GROUPS AND INDIVIDUALS

Interested groups and individuals will also receive a copy of the EA upon request.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
HISTORICAL PRESERVATION & HERITAGE COMMISSION
Old State House • 150 Benefit Street • Providence, R.I. 02903-1209
Preservation (401) 222-2678 FAX (401) 222-2968
Heritage (401) 222-2669 TDD (401) 222-3700

May 19, 1999

Mr. William Chuck Alves
Chief
Division of Intermodal Planning
Rhode Island Department of Transportation
2 Capitol Hill
Providence, RI 02903-1124

Re: Draft Environmental Assessment
Warwick Intermodal Train Station at T.F. Green Airport
Warwick

Dear Mr. Alves:

The Rhode Island Historical Preservation and Heritage Commission staff has reviewed the Draft Environmental Assessment for the above-referenced project. We have the following comments.

The document correctly identifies two categories of potentially significant cultural resources in the project impact area: the historical mill village of Hill's Grove and previously unidentified archaeological sites which may exist. Studies undertaken for the preparation of this document have assessed both the mill village and the archaeological potential to determine whether any resources are present that would be eligible for listing on the National Register of Historic Places.

Hill's Grove Historic District Appendix 6.3 of the Draft EA contains the Phase II survey/National Register determination of eligibility documentation for the Hill's Grove historic district. This report provides a thorough assessment of the historical significance and integrity of this mill village. Based upon our review of the document we have concluded that the district as described qualifies for listing on the National Register of Historic Places under Criteria A and C, as a significant example of a mid-19th century planned industrial community.

We have concluded from our review that the Intermodal Train Station project has a low potential to affect the historic district adversely. The majority of the project impacts will occur in an existing parking lot on the east side of Jefferson Boulevard, outside of the district boundaries. Therefore, it is our finding that the project will have no adverse effect on the Hill's Grove historic district, provided that the RIHP&HC continues to review project plans, including those for the new Leviton parking lot, to insure that there are no visual or physical intrusions into the district.

Archaeological Resources As the Draft EA notes, a Phase I archaeological survey of the project's physical impact area was undertaken. We have reviewed the Memorandum of Completion prepared by Timelines for these investigations. As described in the Memorandum, the archaeologists found no evidence of significant archaeological deposits; thus it appears that there will be no effect to significant archaeological resources in the areas that have been studied.

Two areas still require archaeological study. These are the area of contamination on the T.H. Baylis property and the location of the People Mover structural system. Provided that the RIHP&HC reviews and approves appropriate archaeological study of these areas once site remediation is undertaken and the location of the People Mover is confirmed, it is our finding that the proposed undertaking will have no adverse effect on archaeological resources.

These comments are provided in accordance with Section 106 of the National Historic Preservation Aact. If you have any questions or comments, please contact Richard E. Greenwood, Project Review Coordinator for this office.

Very truly yours,

Edward F. Sanderson

Edward F. Sanderson
Executive Director
Deputy State Historic
Preservation Officer

cc: Michael Hebert, RIDOT

(L:41)

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
HISTORICAL PRESERVATION & HERITAGE COMMISSION
Old State House • 150 Benefit Street • Providence, R.I. 02903-1209
Preservation (401) 277-2678 FAX (401) 277-2968
Heritage (401) 277-2669 TDD (401) 277-3700

May 19, 1999

Mr. Vincent Palumbo, P. E.
Principal Civil Engineer
RIDOT/Engineering Division
2 Capitol Hill, Room 226
Providence, RI 02903-1124

Re: Phase IB Archaeological Survey Memorandum of Completion
Warwick Intermodal Train Station at T.F. Green Airport
Warwick

Dear Mr. Palumbo:

The Rhode Island Historical Preservation and Heritage Commission staff has reviewed the Memorandum of Completion prepared by Timelines for their Phase IB archaeological investigations at the proposed Warwick Intermodal Train Station project area. We have the following comments.

The archaeological investigations as described in the Memorandum appear to have been conducted in a thorough and professional manner which satisfies that RIHP&HC Survey Standards. We note that the archaeologists found no evidence of significant archaeological deposits; thus it appears that there will be no effect to significant archaeological resources in the areas that have been studied. Consequently we concur with their recommendations that no further work is warranted in these areas.

Two areas still require archaeological study. These are the area of contamination on the T.H. Baylis property and the location of the People Mover structural system. Provided that the RIHP&HC reviews and approves appropriate archaeological study of these areas once site remediation is undertaken and the location of the People Mover is confirmed, it is our finding that the proposed undertaking will have no adverse effect on archaeological resources. We will need to confirm these findings by reviewing the complete Phase IB Report.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions or comments, please contact Richard E. Greenwood, Project Review Coordinator for this office.

Very truly yours,

Edward F. Sanderson
Executive Director
Deputy State Historic
Preservation Officer

cc: Michael Hebert, RIDOT
John Brown, NITHPO

(L:40)

A	C	I	
		✓	DA
			ADA
			FM
		✓	TP
			BR
			RW
			A1
			A2
			AAE
			CMCS
			FC
			SEC 1
			SEC 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

May 5, 1999

MAY 6 1999

Ms. Melissa L. Ridenour, Administrator
Federal Highway Administration
380 Westminister Mall, Room 547
Providence, Rhode Island 02903

RE: Draft Environmental Assessment, Warwick Intermodal Station at T.F. Green Airport
Warwick, Rhode Island

Dear Ms. Ridenour:

Our agency has been participating in the preliminary meetings for the proposed Warwick Intermodal Train Station. We have reviewed the draft environmental assessment (EA) for the proposed project. We believe that the project will provide an opportunity for a change from automobile use to rail for trips going to and from T.F. Green Airport. EPA has encouraged the use of alternative forms of transportation to help reduce highway congestion and promote improved air quality conditions. Further, the preferred alternative will provide an additional environmental objective which involves the clean up of the T.H. Baylis property. The removal of hazardous wastes and ground water contamination form the Baylis site will enhance environmental quality in the area.. EPA supports project of this type provided they are accomplished in an environmentally sound manner.

Thank you for the opportunity to comment on the draft document. We look forward to review of the final EA. If you have questions, please feel free to contact Peter Holmes at 617/918-1397.

Sincerely,

Robert E. Mendoza, Director
Rhode Island State Program
Office of Ecosystem Protection

Post-it® Fax Note 7671	Date 5/6/99	# of pages ▶ 1
To Chuck Alves	From Ralph Rizzo	
Co./Dept.	Co.	
Phone #	Phone # 528-4548	
Fax # 222-2207	Fax #	

U.S. Department of Transportation
Federal Aviation Administration

New England Region

12 New England Executive Park
Burlington, MA 01803-5299

April 29, 1999

Mr. William Chuck Alves
Chief, Division of Intermodal Planning
Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903-1124

MAY 3 1999

Dear Mr. Alves:

The Federal Aviation Administration is commenting on the Draft Environmental Assessment (EA), "Warwick Intermodal Station at T.F. Green Airport, Warwick Rhode Island.

We enthusiastically support this planned project and believe that the EA adequately assesses environmental impact. We believe that the project represents a win situation for T.F. Green Airport, the City of Warwick, Rhode Island and Massachusetts transit users, environmental interests associated with air quality and hazardous waste remediation, and, perhaps most importantly from our perspective, an efficient an environmentally sensitive air transportation system.

In 1988, when we completed an Environmental Assessment for terminal area development at T.F. Green, we recommended that RIDOT, then the operator of the airport, consider long-term air quality mitigation in the form of a transit connection to the airport. We are even more excited now with the increased intermodal and community development aspects of the proposal.

As you may be aware, we have devoted considerable attention over the last few years to planning for an efficient airport system for the Boston-Providence-Manchester metropolitan area. We have consistently followed up with infrastructure investment when air passenger demand emerged at T.F. Green and Manchester. These airports are now two of fastest growing in the United States. In addition to these efforts, we have also supported a number of intermodal projects to improve access to the three airports, including the Third Harbor Tunnel and increased high-occupancy-vehicle use for Logan International Airport, a new limited access highway to Manchester Airport, and high-speed rail between Boston and New York. Finally, we are currently involved with are own Environmental Impact Statement for a new runway, taxiway improvements, and reductions in poor-weather instrument approach minimums at Logan. While we have seen tremendous growth at T.F. Green and Manchester, we believe these Logan improvements are a critical part of a systems approach to reducing substantial aircraft delays.

All of these efforts, including the Warwick Intermodal Station, are excellent examples of the Clinton-Gore Livability Agenda and EPA's Smart Growth initiatives. We have signed a Memorandum of Agreement with the Environmental Protection Agency to promote transportation projects which reduce urban sprawl and contribute to growth in urban core

areas, while at the same time taking advantage of opportunities to improve air and water quality. This project will accomplish much to achieve these objectives.

Sincerely,

John C. Silva
Manager, Environmental Programs

cc: Gordon Hoxie, FHWA
Elaine Roberts, RIAC
Betsy Higgins, EPA

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

INTER-OFFICE MEMO

TO: William Chuck Alves, Chief of Intermodal Planning

DEPT: Department of Administration

DATE: 26 April 1999

FROM: Stephen Majkut, Chief, Office of Air Resources

DEPT: Department of Environmental Management

SUBJECT: Warwick Intermodal Station EA

The Department of Environmental Management, Office of Air Resources has reviewed the draft environmental assessment report for the Warwick Intermodal Station as it relates to air quality impacts. In addition, a review of the KM Chng Environmental technical report was completed, which addressed the carbon monoxide impacts from vehicle traffic, at intersections in the project study area.

The environmental assessment was prepared in support of the train station project proposed by the Rhode Island Department of Transportation. The analysis provided a positive air quality evaluation from the expected decrease in vehicle miles traveled as a result of the projected modal shift from automobiles to train travel.

Results of the air quality analysis would also conclude that the proposed project will not cause or contribute to a violation of the NAAQS for the pollutant carbon monoxide.

The Office of Air Resources is in agreement with the air quality analysis as submitted in the draft EA dated January 1999 for the above project. This office should be notified with any significant changes to the project, which would require a revised air quality analysis.

cc: S. Devine
P. Silva

APR 28 1999

wk.train/rsm

State of Rhode Island and Providence Plantations
Inter-Office
TELEPHONE MEMO

April 1999

Project: Warwick Intermodal Station
FAP TFG-STAT (001)
RIC 97102

Person Calling: Emilie Holland
Agency: RIDOT

Person Called: Steve DiLorenzo
Agency: ACOE

SUBJECT I called Stephen in order to clarify whether or not the letter dated 9/1/98 had in fact been mailed out. The copy in my file is not signed.

Steve stated that the letter WAS MAILED to Chuck Alved, and is recorded in the "log book" at ACOE. He further stated that his file copy is unsigned, as is normal for their files.

No signed copies of the letter are available, according to Steve, and he verified that his records show Chuck Alves as the addressee for the original correspondence.

ACTION REQUIRED:

cc: Devine, file

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

April 21, 1999

Mr. William Chuck Alves, Chief
Rhode Island Department of Transportation
Intermodal Planning Division
Two Capitol Hill, Room 372
Providence, RI 02903

APR 26 1999

RE: Warwick Intermodal Station Project at T. F. Green Airport
Environmental Assessment (EA)

Dear Mr. Alves:

Personnel from the Rhode Island Department of Environmental Management (the Department) Office of Waste Management (Office) have received and reviewed the above referenced EA dated January 1999. This Office has no comments on the EA at this time. Office personnel will continue to work directly with you, Stephen Devine of your Department and with the Department of Transportation's (DOT's) consultants on this project.

If you have any questions please contact me at 401-222-2797 (x7109).

Sincerely,

Joseph T. Martella II, Senior Engineer
Office of Waste Management

cc: Terrence D. Gray, Chief, RIDEM/OWM
Greg S. Fine, Supervising Engineer, RIDEM/OWM
Ronald Gagnon, Chief, RIDEM/OC&TA
Stephen Devine, RIDOT/IPD

thb dot ea review.doc/jm

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

April 14, 1999

Mr. William Chuck Alves, Chief
Department of Transportation
Division of Intermodal Planning
Two Capitol Hill
Providence, RI 02903-1124

APR 19 1999

Subject: Draft Environmental Assessment - Warwick Intermodal Station at T.F. Green Airport, Warwick, Rhode Island

Dear Mr. Alves:

Thank you for forwarding advance copies of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report to the Department of Environmental Management (DEM) for review and comment. Thanks to the close coordination which has taken place between our two agencies throughout the development of this project, we have no concerns regarding the completeness and accuracy of the information presented in the draft document. Our comments, which follow below, are in response to questions which you asked of us in your March 24, 1999 letter to Carolyn Weymouth, of my staff.

Water Quality

The following water quality classifications apply to the water bodies in the vicinity of the project.

Waterbody	Water Quality Classification	303(d) List*
Warwick Pond	B	Yes
Buckeye Brook	B	Yes
Freshwater Wetlands	A	
Three Ponds Brook	B	

The water quality classifications shown above are consistent with the RI Water Quality Regulations. The water bodies listed on the 303(d) list* are considered to be degraded water bodies. Rule 9.B of the Water Quality Regulations states that activities shall not further degrade low quality waters.

Wells

DEM's *East Greenwich Quadrangle Wellhead Protection Areas and Public Wells*, CPB 12/03/96 map does not show any public wells in the vicinity of the proposed project. DEM does not have mapping of private wells.

Permits

A RIPDES General Permit for Stormwater Discharges Associated with Construction Activity will be required if the disturbed area is greater than or equal to 5 acres with a point source discharge. This permit will be triggered if the stormwater discharges to a storm drain which ultimately discharges to a surface water.

A RIPDES General Permit for Stormwater Associated with an Industrial Activity will be required if the facility meets at least one of the conditions in the definition of "stormwater discharge associated with industrial activity" (see RIPDES Rule 31.b.15). To determine whether an Industrial Activity permit is required, the applicant should make a through review of Rule 31.b.15 and the Standard Industrial Classification of the proposed facility.

Should you have questions regarding these comments or water quality or RIPDES permitting issues, please contact me or Ms. Jean Lambert, of the DEM Office of Water Resources, RIPDES Program, at (401) 222-6820. We look forward to continuing to work with you as this project goes forward.

Sincerely,

Ronald Gagnon

Ronald Gagnon, Chief
Office of Technical and Customer Assistance

RHODE ISLAND PUBLIC TRANSIT AUTHORITY

APR 15 1999

April 9, 1999

Mr. William Chuck Alves
Rhode Island Department of Transportation
Division of Intermodal Planning
Two Capitol Hill
Providence, RI 02903-1124

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)

Dear Mr. Alves:

The Rhode Island Public Transit Authority (RIPTA) Planning Department has reviewed the Draft Environmental Assessment for the Warwick Intermodal Station at T.F. Green Airport. We appreciate the opportunity to provide comment. RIPTA is pleased to see that the plans for the Station recognize the important role of transit in reducing congestion and improving access to T.F. Green. We realize that the proposal presented is strictly in draft form. However, we want to take this opportunity to express to you the types of concerns we have regarding an intermodal transportation facility.

In regards to the alignment of the separate access roads for buses and automobiles, we would like to offer the following comments:

- We assume that the access road for buses will be exclusive for buses and shuttles. Is this assumption correct?

- To effectively serve the Station RIPTA will need space along the bus access road for dedicated RIPTA bus berths. At least two (2) 60' long berths will facilitate our service.

- With the proposed alignment in the Draft Environmental Assessment (EA), patrons entering the Station from the upper level ramp have easier access to the tracks and the people mover. We feel that having the buses enter at the lower level of the Station discourages transit use because the lower level is the more inconvenient of the two entrances. The Warwick Intermodal Station could reward transit use by having automobiles use the lower level and making the upper level access road exclusive to buses to increase the convenience for mass transit patrons. This is an opportunity to

265 MELROSE STREET, PROVIDENCE, RI 02907 • 401-784-9500 • FAX 401-784-9513
For Schedule Information, 401-781-9400, 1-800-224-0444, or www.RIPTA.com

promote the goals of TEA-21 by giving priority to mass transit over single occupancy vehicles.

We would also like to bring attention to the importance of pedestrian access into the Station. It is probable that people living and working along the Jefferson Boulevard corridor will be walking into and out of the facility. We hope that the final design of the Station will provide safe and convenient access for pedestrians.

RIPTA also has concerns pertaining to two proposals in the Draft EA. We feel that proposals to introduce commuter rail service between Warwick and Providence, or the introduction of an electrified rail shuttle between Providence and T.F. Green, could be subject to opposition by the Amalgamated Transit Union (ATU) Local 618 based on Section 13c provisions. Any potential loss of work for members of the ATU Local 618 attributable to either of these proposals would need to be investigated.

RIPTA is committed to the success of the Warwick Intermodal Station. We look forward to working with you and providing input into the final design. If you have any questions concerning our remarks please do not hesitate to call me at (401) 784-9500 ext. 152.

Sincerely,

Mark R. Therrien
Planning Director

U.S. Department
of Transportation
**Federal Railroad
Administration**

APR 12 1999

628-2 Hebron Ave
Suite 303
Glastonbury, CT 06033

April 8, 1999

Mr. William Chuck Alves
Chief, Division of Intermodal Planning
Rhode Island Department of Transportation
Two Capitol Hill
Providence, Rhode Island 02903-1124

Dear Mr. ~~Alves~~ Chuck:

I have reviewed the Draft Environmental Assessment for the Warwick Intermodal Station at T.F. Green Airport and have no comments at this time. I do encourage you to resolve the railroad track configuration issues at the Warwick Station as soon as possible to ensure that the current and future needs of all existing and potential rail users--intercity, commuter, freight and shuttle--are accommodated. I would be happy to work with you in this regard.

Thank you for the opportunity to participate in the early coordination phase of this important project.

Sincerely,

Michael T. Saunders

Michael T. Saunders
Director, Northeast Corridor Program Office

RHODE ISLAND AIRPORT CORPORATION

T.F. Green Airport
2000 Post Road
Warwick, RI 02886-1533

April 1, 1999

Mr. W. Chuck Alves, Chief
Division on Intermodal Planning
R.I. Dept. of Transportation
Two Capitol Hill
Providence, RI 02903-1124

Subject: Warwick Intermodal Train Station Project at T. F. Green Airport
Draft Environmental Assessment

Dear Chuck;

The Rhode Island Airport Corporation (RIAC) has reviewed the draft Environmental Assessment (EA), and has the following comments:

PURPOSE AND NEED:

In the "Purpose and Need" Section of the report, there are several stated primary purposes of the train station development. The first purpose is stated, "*to relieve peak hour traffic conditions on the I-95 corridor in the Providence Metropolitan area by diverting drivers of single occupant vehicles to use the rail station and people mover to access the airport.*"

We would like to note that the current peak hour roadway traffic volume for metro commuters occurs at different times then the peak hour arrival and departure schedules of the majority of the airline traffic at T. F. Green. Therefore, we believe that further evaluation may be necessary to determine the amount of peak hour trips which would be reduced by the presence of the rail station.

The second stated purpose of the rail station is "*to provide an important additional mode of travel for area residents to access jobs in Providence and Boston.*" While RIAC supports the concept of regional transportation planning which encourages multiple modes of access to jobs for commuters, we will be looking to ensure that future design of the station and people mover avoid having commuters use airport parking facilities for their daily parking needs. We would be glad to work with you during the design to accomplish the proper separation of passenger purpose.

TEL: 401-737-4000 FAX: 401-732-4953 TDD: 401-732-7741

The third stated purpose of the rail station is to support the City's redevelopment plan of approximately 70 acres. RIAC is "on record" supporting the redevelopment of existing areas of incompatible use with the airport in favor of compatible development. Depending on the type of development that occurs in the redevelopment district, however, the effect of such new development may be to actually encourage more ground trips by passenger vehicles. RIAC shares Warwick and DOT's concerns for increasing the traffic volume in the area of the airport, especially at peak travel times. RIAC is a member of the newly created redevelopment agency and will be participating in an attempt to identify and mitigate any potential impact of the redevelopment of the area.

The final stated purpose within the draft EA includes environmental impacts. The goals of reducing traffic congestion and environmental clean up of documented environmental impacts on parcels located within the redevelopment area are supported by RIAC.

ALTERNATIVES:

RIAC has reviewed the preferred alternative alignment which includes the Fresno Street corridor, as well as the potential interface into, or near the terminal building. RIAC supports the Fresno Street alignment as a preferred alternative and would like to reiterate its preferred terminus of the horizontal elevator section at the upper level roadway across from the entrances of the terminal building. This is based on the evaluation of senior RIAC management staff, which has been outlined in previous memorandum to you regarding our review. To reiterate, direct physical connection of the people mover system into the terminal building will prove very difficult in terms of passenger congestion, and will certainly raise passenger security concerns of the Federal Aviation Administration. In light of the estimated volumes of passengers arriving at the terminal per hour, it is believed by RIAC management that the goals of the intermodal connection are best served by terminating at the upper level roadway without direct connection to the terminal building. RIAC anticipates addressing this issue during the design phase of the project.

PROJECTED RIDERSHIP:

Potential ridership is difficult to project at this time; however, we have one comment regarding the analysis. The use of the period 6:00 a.m. until 8:00 a.m. as the morning peak period may not be fully representative of passenger behavior. As you know, approximately 25% of our departures occur between 6:00 a.m. and 8:30 a.m. Passengers arriving for these flights typically arrive at least one hour prior to departure. As a result, the optimal arrival time for passenger trains destined to T. F. Green from destinations north and south of the airport might more accurately be from 5:00 a.m. to 7:30 a.m. as the peak period. The afternoon/ evening peak period typically occurs between 4:00 p.m. and 8:00 p.m.

Thank you for the opportunity to review the draft Environmental Assessment. We look forward to being part of the design process to further refine options for the intermodal connection.

If you have any questions or comments, please contact me or Wayne Schuster.

Sincerely,

Elaine Roberts

Elaine Roberts
Executive Director

pc: Governor L. Almond
Mayor L. Chafee
Dr. Ankner, RIDOT
J. Swen, RIEDC

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 25, 1999

Mr. Richard Stang
Legal Counsel
Rhode Island Development Corporation
1 West Exchange Street
Providence, RI 02903

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Mr. Stang:

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

3/26/99 Carolyn Weymouth called
Water Resources - will respond in writing to questions
Air Quality - Has tech report
Haz Waste - No comment
Respond separately
working with us

Ms. Carolyn Weymouth
Office of Environmental Coordination
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02903

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Ms. Weymouth:

In January, 1999 we forwarded to you advance copies of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Specifically, we ask that you review the sections of the EA that refer to the following issues:

A. *Section 3.11 of EA - Water Quality*
Has a water quality rating been assigned for specific waterbody segments or the entire watershed of the Pawtuxet River Basin and Narragansett Bay Basin? What is the water quality status of waters in or near to the project area?
Are there any private or public wells in the project vicinity?

B. *Section 3.12 of EA - Permits*
The project is in the preliminary design phase and the stormwater management system has not been determined. If the runoff from the project is added to the existing closed drainage system, will a RIPDES for Stormwater Discharge Associated with Construction Activity permit, or a RIPDES for Stormwater Associated with an Industrial Activity permit be required? What thresholds would trigger these permits?

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Mr. Robert Mendoza
United States Environmental Protection Agency - Region 1
John F. Kennedy Federal Building
Boston, MA 02203-1911

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Mr. Mendoza:

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Mr. Greg Fine
Office of Waste Management
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Mr. Fine: Greg

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

Chuck

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Mr. John C. Silva
Federal Aviation Administration
12 New England Executive Park
Burlington, MA 01803

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Mr. Silva:

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Ms. Beverly Scott
General Manager
Rhode Island Public Transit Authority
265 Melrose Street
Providence, RI 02907

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Ms. Scott: Bev

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

Chuck

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Representative Denise Aiken
Rhode Island State Representative District 35
87 Baywood Street
Warwick, RI 02886

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Representative Aiken:

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Ms. Elaine Roberts, Executive Director
Rhode Island Airport Corporation
T.F. Green Airport
2000 Post Road
Warwick, RI 02886

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Ms. ~~Roberts~~: Elaine

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Mr. Richard H. Doyle, Administrator
Federal Transit Administration
Kendall Square
55 Broadway - Suite 920
Cambridge, MA 02142-1093

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Mr. Doyle:

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Transportation
DIVISION OF INTERMODAL PLANNING
Two Capitol Hill
Providence, RI 02903 - 1124

OFFICE (401) 277-2694
FAX (401) 277-2207
TDD 277-4971

March 24, 1999

Mr. Michael T. Saunders
Federal Railroad Administration
658-2 Hebron Avenue
Glastonbury, CT 06033

RE: Warwick Intermodal Station at T.F. Green Airport
Environmental Assessment (EA)
Warwick, Rhode Island

Dear Mr. ~~Saunders~~: Mike

In January, 1999 we forwarded to you an advance copy of the Warwick Intermodal Station Draft Environmental Assessment (EA) Report for your review and comment. We are currently undertaking an archaeological survey as part of the EA, and once completed, we will finalize the EA report

At this time we are requesting that you provide comments, if any, on the document forwarded to you in January. Specifically, we ask that you review the sections of the EA that refer to areas of concern or jurisdiction for your agency. Please review the accuracy and completeness of data included in the report, and any other subsequent information your agency may have received since January. Your comments will be incorporated into the final version of the EA, which must be approved by the Federal Highway Administration (FHWA). The document will then be available for public review.

Please provide comments to this office by April 15th, 1999. Thank you for your attention to this matter. If you have any questions, please contact Stephen Devine, Project Manager, at 222-4203, X 4063.

Sincerely,

William Chuck Alves
Chief

cc: Stephen Devine

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

U.S. Department of the Interior
1849•1999

STATE ...
DEPT. ...
MAR 22 ...
DIV. OF ...

March 18, 1999

RE: Warwick Intermodal Train Station
Warwick, RI

Vincent J. Palumbo
Rhode Island Dept. of Transportation
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124

Dear Mr. Palumbo:

We have reviewed your request for information on endangered and threatened species and their habitats for the above-referenced project. Based on the project description and location, it appears that no impacts to federally-listed species will occur. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

We suggest that you contact the Rhode Island Natural Heritage Program, 235 Promenade Street, Providence, Rhode Island 02908, at 401-277-2776, for information on state-listed species that may be present.

A list of federally-designated endangered and threatened species in Rhode Island is enclosed for your information.

Sincerely yours,

Jeannine Duke

for Michael Amaral
Endangered Species Specialist
New England Field Office

Enclosure

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508
Planning & Development
Phone No. 222-2776
Fax. No. 222-2069

Vincent J. Palumbo
Engineering Division
RI Department of Transportation
Two Capitol Hill, Room 226
Providence, RI 02903-1124

March 2, 1999

RE: Warwick Intermodal Train Station, Warwick, RI
R.I.F.A.P. NO: TFG-STAT(001)
R.I.C. NO: 97102

Dear Mr. Palumbo:

Thank you for contacting the Rhode Island Natural Heritage Program for information regarding the presence of rare and endangered species, or exemplary natural communities within the vicinity of the above-referenced site as identified in your letter and maps received by this office on February 25, 1999.

Review of the Program database indicates there are no rare or endangered species or exemplary natural communities within the vicinity of this site. As our inventory is ongoing, more information may become available on this location in the future. If I can provide any additional information regarding this review, please contact me at the number above, extension 4308.

Sincerely,

Richard W. Enser, Coordinator
RI Natural Heritage Program

DEPT.
MAR

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3435; TDD 401-222-4971

January 7, 1999

Mr. John Brown, Tribal Historic Preservation Officer
Narragansett Indian Tribe
P.O. Box 700
Wyoming, RI 02898

Re: Warwick Intermodal Train Station at T.F. Green Airport
RIC No. 97102
RIFAP No. TFG-STAT (001)
Phase I (b) Archaeological Reconnaissance Survey

Dear Mr. Brown:

As a result of yesterday's telephone conversation between Michael Hébert and yourself, we have mutually agreed to reimburse your office for consulting services via a sub-consultant agreement with the firm of Edwards and Kelcey, Inc., the prime engineering firm for the Warwick Intermodal Train Station Project. This method of reimbursement has been selected due to project scheduling constraints. The funding contract for reimbursement of monitoring services (per the Memorandum of Understanding) will take approximately two months, at a minimum to establish; utilizing this method of payment for your consulting services would significantly delay the project.

The nature of the monitoring work and the rates for compensation will be those identified in Exhibit A of the Memorandum of Understanding. Upon receipt of your written response to monitor the Phase I (b) archaeological reconnaissance survey, we will transmit to your office a Scope of Work with a request for a fee proposal to be sent to Edwards and Kelcey, Inc.

We greatly appreciate your cooperation and look forward to continued coordination with your office as this project progresses. Should you have any questions, please contact Michael Hébert, Principal Historic Preservation Specialist, RIDOT at 222-2023, x 4040.

Respectfully,

Vincent F. Palumbo, P.E.
Principal Civil Engineer

cc: Messrs. Bennett, Alves, Devine, Berman-FHWA

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3435; TDD 401-222-4971

JAN 6 1999

January 5, 1999

Mr. John Brown
Tribal Historic Preservation Officer
Narragansett Indian Tribe
P.O. Box 700
Wyoming, RI 02898

Re: Warwick Intermodal Train Station at T.F. Green Airport
Warwick, RI
RIC No. 97102
RIFAP No. TFG-STAT (001)
Phase I (b) Archaeological Reconnaissance Survey

Dear Mr. Brown:

As you are aware, we have previously notified your office of the above referenced project. We are herewith informing your office that per the enclosed December 18, 1998 letter from the RIHPHC, a Phase I (b) archaeological reconnaissance survey is to be conducted due to the project areas' sensitivity for the presence of Native American archaeological sites.

Per Article No. 1 of the RIDOT/NITHPO Memorandum of Understanding concerning monitoring, we request your response as to whether or not your office wishes to monitor the Phase I (b) archaeological reconnaissance survey. Should your reply be affirmative, we will transmit to your office a Scope of Work.

Please transmit your written response to our office by January 14, 1999. Should you have any questions, please contact Michael Hebert, Principal Historic Preservation Specialist, RIDOT at 222-2023, x 4040.

Respectfully,

Michael Hebert
for Vincent J. Palumbo, P.E.
Principal Civil Engineer

Enclosure
cc: Messrs. Bennett, Alves, Devine, Berman-FHWA

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3435; TDD 401-222-4971

January 5, 1999

Mr Stephen DiLorenzo
Permits & Enforcement Section
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

RE: WARWICK INTERMODAL TRAIN STATION
WARWICK, RHODE ISLAND
R.I.F.A.P. NO: TFG-STST(001)
R.I.C. No: 97102

Dear Mr. DiLorenzo;

Following approval of the Preferred Alternative by the Federal Highway Administration (see enclosed letter dated December 7, 1998), the Rhode Island Department of Transportation (RIDOT) is beginning the design process for the above referenced project. The proposal consists of a new Commuter Rail Station, to be constructed in Warwick, Rhode Island, along the existing Amtrak Northeast Corridor line, and a people mover connection between this station and the near-by T. F. Green Airport. The Preferred Alternative will utilize the Leviton parking lot, Bayliss Chemical, and Budget Rental parcels for the station building site, and the Fresno Street alignment for the people mover. The purpose of the proposed project is twofold. The first improvement will be the creation of alternative access to and around the rapidly expanding Green Airport. Secondly, the new station will provide a new mode of travel for area residents to jobs in Providence and Boston, thereby reducing the number of single occupancy vehicles along this portion of the I-95 corridor.

At this time, RIDOT believes that this project will not require any wetland permits to be obtained from the Army Corps of Engineers (ACOE), and is requesting written conformation of this finding. Enclosed for your review is a copy of the Executive Summary from the Draft Environmental Assessment, as well as several graphics showing all of the considered alternatives for the project.

If there are any questions or concerns regarding this matter please contact Ms. Emilie Holland, RIDOT Senior Natural Resources Specialist, at (401) 222-2023, Ext. 4051.

Sincerely;

Vincent J. Palumbo, P.E.
Principal Civil Engineer

VJP/MEH
Enclosures
cc: Parker, Bennett, Alves, file

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3435; TDD 401-222-4971

November 5, 1998

Mr. John Brown
Tribal Historic Preservation Officer
Narragansett Indian Tribe
P.O. Box 700
Wyoming, RI 02898

Re: Warwick Intermodal Train Station at T.F. Green Airport
Warwick, RI
RIC No. 97102
RIFAP No. TFG-STAT (001)
Project Notification

Dear Mr. Brown:

The Rhode Island Department of Transportation (RIDOT), in cooperation with the Federal Highway Administration (FHWA), is initiating an environmental assessment (EA) for the Warwick Intermodal Train Station in Warwick, RI. Since the project has the potential to affect properties that may be eligible for listing in the National Register of Historic Places, coordination with the RISHPO is being conducted. We are also notifying your office of the project per Section 106 of the National Historic Preservation Act of 1966, as amended.

The Intermodal Station is necessary to take advantage of the proximity of the Northeast Corridor rail line to the new terminal at T.F. Green Airport. The station will provide the opportunity for passengers to arrive at and depart from the growing airport terminal without the use of single occupant vehicles. The station will be a multi-modal complex integrating rail, transit and pedestrian opportunities for airline patrons; it should also help alleviate future local traffic congestion, with attendant energy, air quality, and public safety benefits.

Alternatives for the proposed station include: (1) no action, (2) construction on the Leviton Manufacturing Co. parking lot site, (3) construction on a combination of the Leviton Co. parking lot and the Bayliss Chemical site, and (4) construction on a combination of the Leviton Co. parking lot and the Budget truck rental site.

Enclosed is a location map, photographs of the sites under study and conceptual sketches of the proposed station. Should you require any additional information or have any questions, please contact Mr. Stephen Devine at 222-2023, x 4063.

Respectfully,

Vincent J. Palumbo, P.E.
Principal Civil Engineer

Enclosure
cc: Messrs. Bennett, Alves, Devine, Berman-FHWA; File

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House • 150 Benefit Street • Providence, R.I. 02903-1209

Preservation (401) 222-2678 FAX (401) 222-2968
Heritage (401) 222-2669 TDD (401) 222-3700

October 2, 1998

Mr. Gordon G. Hoxie
Division Administrator
Federal Highway Administration
Region One
380 Westminster Mall, Room 547
Providence, RI 02903

Re: Environmental Assessment
T. F. Green Intermodal Station
Warwick

Dear Mr. Hoxie:

I have reviewed your letter of September 14, 1998 inviting the Rhode Island Historical Preservation and Heritage Commission to participate as a cooperating agency in the environmental assessment being prepared for the T. F. Green Intermodal Station in Warwick.

Given the project's potential to affect properties that are listed or potentially eligible for listing on the National Register of Historic Places we concur that our participation in the environmental assessment is appropriate. We look forward to cooperating with you and the other participating agencies in this valuable transportation project.

Please contact Richard E. Greenwood, Project Review Coordinator of this office if you have any questions or comments for our consideration.

Very truly yours,

Edward F. Sanderson
Executive Director
Deputy State Historic
Preservation Officer

cc: Michael Hebert, RIDOT

(5)

10-30-98;11:02AM; ;401+528+4542 # 6

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

A	C	I	
			DA A10/1
		✓	AD 10/5
			FM
		✓	TP
			BP
			HW
			A1
			A2
			AAE
			CMCS
			PC
			SEC 1
			SEC 2

September 28, 1998

Mr. Gordon Hoxie, Division Administrator
Federal Highway Administration, Region I
380 Westminster Mall, Rm 547
Providence, RI 02903

Subject: **Environmental Assessment (EA)**
T.F. Green Intermodal Station
Warwick, R.I.

Dear Mr. Hoxie:

In response to your request of September 14, 1998, the Rhode Island Department of Environmental Management (RIDEM) would be pleased to serve as a cooperating agency through out the National Environmental Policy Act (NEPA) process.

RIDEM appreciates the potential that an intermodal station serving the airport has to reduce the use of single occupancy vehicles by arriving and departing airline passengers. The resulting reduction in vehicle miles traveled (VMT) is highly desirable from an air quality point of view and should help alleviate local traffic congestion. We strongly support the intermodal concept and are committed to working with you to assure the realization of this project in the form which best addresses environmental and transportation goals.

We would like to take this opportunity to provide you with the following comments and information regarding water resources permitting concerns.

Stormwater

- In order for the proposed project to be in compliance with the State Water Quality Regulations, water quality treatment for all aspects of the stormwater associated with this project (train station, people mover, associated parking areas, storage areas, service areas, truck loading areas, utility buildings, etc.) must be provided prior to discharge to any State waters. When more specific information is provided regarding proposed type(s) of stormwater treatment and location of proposed

10-30-98;11:02AM; ;401+528+4542

discharge(s), the RIDEM Water Quality Certification Program will provide more specific guidance regarding this issue. For State waters where water quality is currently degraded, higher total suspended solids removal may be required. Other pollutants associated with this project, which could cause impairment to the receiving water, may require additional water quality treatment prior to discharge.

- A specific maintenance schedule for the long-term maintenance of all proposed structures associated with the proposed stormwater system must be provided. Also, the party responsible for the long-term maintenance of the stormwater facility must be identified.

- RIDEM understands, from previous coordination with T.F. Green Airport personnel on stormwater regulatory issues, that the airport currently accepts a significant portion of stormwater from outside the airport proper. If this proposal calls for larger amounts of stormwater to pass through the airport's current stormwater system, coordination with airport personnel is recommended.

- Proposed erosion and sedimentation controls for during and after construction will be reviewed by the Water Quality Certification Program.

Underground Injection Control

- Proposed subsurface discharges may require an Underground Injection Control (UIC) permit. It should also be noted that on-site absorption also represents a discharge from the site, although such discharge is not a surface discharge.

Freshwater Wetland

- Any proposed filling of State water would most likely require a Freshwater Wetlands permit as well as a Water Quality Certification review.

General Permit RIPDES Storm Water Discharge Associated with Construction Activity

- If the proposed project involves a point source discharge and involves five or more acres of soil disturbance, a RIPDES Construction Permit will be required. In addition, depending on the types of activities proposed at the site, a RIPDES permit for stormwater discharges associated with industrial activities may also be required.

This concludes RIDEM's comments at this time. Thank you for the opportunity to participate in the scoping process for this project.

The Office of Technical and Customer Service will serve as RIDEM's point of contact on this project. We will be happy to invite appropriate RIDEM staff to meetings and to distribute materials to the appropriate parties. Please direct you communications to this Office rather than to the individual programs to facilitate RIDEM's internal coordination.

We look forward to working with you as this most important project progresses.

Sincerely,

Ronald Gagnon

Ronald Gagnon, Chief
Office of Technical and Customer Assistance

cc: S. Devine
S. Majkut
E. Szymanski
F. Vincent
T. Walsh

10-30-98;11:02AM; ;401+528+4542 # 5/

RHODE ISLAND AIRPORT CORPORATION

T.F. Green Airport
2000 Post Road
Warwick, RI 02886-1533

✓ 10/3

September 25, 1998

Mr. Gordon G. Hoxie, Division Administrator
U.S. Dept. of Transportation
Federal Highway Administration
Region One
380 Westminster Mall, Room 547
Providence, RI 02903

Subject: Environmental Assessment
T. F. Green Airport Intermodal Station

Dear Mr. Hoxie:

I have received your letter dated September 14, 1998 inviting the Rhode Island Airport Corporation (RIAC) to be a cooperating agency in the above project. From your letter, I understand that you are requesting RIAC to be included in attendance at meetings, providing comments on environmental documents and technical studies before publication, as well as expressing RIAC's views for issues and concerns that are in our jurisdiction.

RIAC would be pleased to be a cooperating agency. The contact person for this project will be Mr. Wayne Schuster, Director of Planning and Development. He may be reached at (401) 737-4000, ext. 273.

If I can be of further assistance, please contact me.

Sincerely,

Elaine Roberts

Elaine Roberts
Executive Director

TEL: 401-737-4000 FAX: 401-732-4953 TDD: 401-732-7741

10-30-98;11:02AM; ;401+528+4542 # 2

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

September 1, 1998

Regulatory Branch
CENAE-CO-R-199802399

William Chuck Alves, Chief
Rhode Island Department of Transportation
Division of Intermodal Planning
Two Capitol Hill
Providence, RI 02903-1124

RE: Warwick Intermodal Train Station Project

Dear Mr. Alves:

We have determined that a Department of the Army permit is not required for your project that is located in Warwick, Rhode Island.

This determination is based on the information supplied at the scoping meeting of August 27, 1998 at the RIDOT Traffic Operations Center.

Our regulatory jurisdiction encompasses all work in or affecting navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899 and the discharge of dredged or fill material into all waters of the United States, including adjacent wetlands, as well as the excavation and grading within those waters, under Section 404 of the Clean Water Act. Since your proposal does not include any of the aforementioned activities, a Department of the Army permit is not required.

Please note that performing work within our jurisdiction without a Corps of Engineers permit can result in prosecution by the U.S. Government.

MRR: See attached memo dated Aug 27, 1998

Violations of Section 10 can result in criminal prosecution with fines ranging from $500 to $2,500 per day of violation and/or imprisonment for up to one year. Violations of Section 404 are punishable by civil fines of up to $25,000 per day and/or imprisonment for up to one year.

Finally, our Corps permit process does not supersede any other agency's jurisdiction. Therefore, if other Federal, State, and/or local agencies have jurisdiction over your proposed activity, you must receive all other applicable permits before you can begin work.

If you have any questions regarding this letter, contact Mr. Stephen DiLorenzo, Senior Project Manager, at (978) 318-8373, (800) 343-4789 or (800) 362-4367 within Massachusetts.

Sincerely,

Robert J. DeSista
Chief, Permits & Enforcement Section
Regulatory Branch

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN RHODE ISLAND

Common Name	Scientific Name	Status	Distribution
FISHES:			
Sturgeon, shortnose*	Acipenser brevirostrum	E	Atlantic coastal waters and rivers
REPTILES:			
Turtle, green*	Chelonia mydas	T	Oceanic straggler in southern New England
Turtle, hawksbill*	Eretmochelys imbricata	E	Oceanic straggler in southern New England
Turtle, leatherback*	Dermochelys coriacea	E	Oceanic summer resident
Turtle, loggerhead*	Caretta caretta	T	Oceanic summer resident
Turtle, Atlantic ridley*	Lepidochelys kempii	E	Oceanic summer resident
BIRDS:			
Eagle, bald	Haliaeetus leucocephalus	T	Entire state, occasional
Falcon, American peregrine	Falco peregrinus anatum	E	No current nesting; entire state-migratory
Plover, Piping	Charadrius melodus	T	Atlantic coast, Washington and Newport Counties
Roseate Tern	Sterna dougallii dougallii	E	Atlantic coast
MAMMALS:			
Whale, blue*	Balaenoptera musculus	E	Oceanic
Whale, finback*	Balaenoptera physalus	E	Oceanic
Whale, humpback*	Megaptera novaeangliae	E	Oceanic
Whale, right*	Eubalaena spp. (all species)	E	Oceanic
Whale, sei*	Balaenoptera borealis	E	Oceanic
Whale, sperm*	Physeter catodon	E	Oceanic
MOLLUSKS:			
NONE			
INSECTS:			
Beetle, American burying	Nicrophorus americanus	E	Washington
Beetle, northeastern beach tiger	Cicindela dorsalis dorsalis	T	Washington, extirpated
PLANTS:			
Small Whorled Pogonia	Isotria medeoloides	T	Providence, Kent Counties
Gerardia, Sandplain	Agalinus acuta	E	Washington

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service

Rev. 6-15-98

SECTION 6.0 APPENDICES

This section contains a record of field investigations and technical memos used to prepare several sections of this EA document. The appendix is divided into the following sections:

6.1 Noise Analysis
6.2 Hazardous Materials Investigation
6.3 Historical and Archaeological Reports
6.4 Natural Systems
6.5 Traffic
6.6 Ridership
6.7 Relocation Impacts

6.1 Noise Analysis

Noise Assessment report prepared by KM Chng Environmental, December 17, 1998.

Noise Assessment

1.0 Introduction

A noise assessment was prepared to determine the potential noise impacts associated with the proposed Warwick Station/T.F. Green People Mover EA. The noise assessment included two analysis conditions: a No Build (or Do Nothing) and a Project Build Alternative. Under the No Build Condition, existing train activity in the vicinity of the proposed Warwick Station is composed of high speed intercity Amtrak service along with local RIDOT freight delivery service. As there are no grade crossings or passenger stations presently in Warwick, Amtrak trains travel at speeds of up to 150 mph, while slower moving freight trains travel at only 50 mph. Under normal operating conditions, neither train service is required to sound their warning horns along this section of the Northeast Corridor (or NEC).

Under the proposed Build Condition, Warwick Station is expected to transfer passengers from the NEC to the Automated People Mover (APM) with connecting service to T. F. Green Airport. In addition to Amtrak service, MBTA commuter rail service, as well as the Providence local shuttle service, is expected to extend passenger service south from Providence to Warwick Station.

Cumulative project noise impacts under the Build Condition were determined for all train sources operating along the Northeast Corridor and the proposed Automated People Mover. Project noise levels were compared to the FTA impact criteria thresholds to determine total impacts. These impacts were then compared with the cumulative noise impacts associated with the No Build (or Do Nothing) Condition to determine the relative change in noise upon implementation of the Build Condition.

2.0 Modeled Noise Sources

Potential noise sources included in the noise impact assessment include Amtrak Express (AM-XP) and Conventional (AM-CV) trains, MBTA Commuter Rail trains (COM), the Providence Shuttle service (SHU), RIDOT freight deliveries (FRT), and the Automated People Mover (APM). All future Amtrak trains will include electrically powered locomotives, while the commuter rail and the freight trains will continue to use diesel locomotives. The Providence shuttle would be similar to an electrically driven light rail transit vehicle (or LRT) and the APM vehicle would be cable drawn on elevated tracks.

With the exception of the APM vehicle, all reference noise levels for each train (locomotives and railcars) were taken from the FTA rail noise database. Due to the lack of noise data available for APM vehicles, a noise measurement program was undertaken to better quantify typical passby noise levels. To support the noise predictions, noise measurements were collected at the MBTA Wellington Station in Medford, Massachusetts of an APM vehicle similar to the one proposed at Warwick Station.

Other potential project noise sources include the grade crossing-type warning bell that would be located along the passenger platform area at Warwick Station. The warning bell would ring for up to two minutes for each approaching train, including freight trains. Motor vehicle traffic associated with the commuter rail short-term and the Amtrak long-term parking facilities were also included in the noise impact assessment. The sounding of an onboard warning horn for all non-stop through trains is not required at stations (per Amtrak and RIDOT) and was, therefore, not included in the modeling analysis.

Due to the various ambient noise levels measured in the project area, the project study area was divided into three distinct areas to better account for the various neighborhood land-uses. These three areas include the Hillsgrove North section located just north of Coronado Road and east of the NEC, the Hillsgrove South section located south of Coronado Road also east of the NEC, and the Jefferson Boulevard section located west along the NEC.

3.0 Noise Impact Assessment

Project related noise impacts were assessed at the discrete receptors used in the measurement program as well as in terms of total impacts along the NEC within the project area. The project area encompassed an area along the tracks approximately one-quarter mile north and south of the proposed Warwick Station, and bounded to the east by Post Road and to the west by Jefferson Boulevard. Noise levels from train activity were determined for both the No Build Condition and the project Build Condition. Cumulative project related noise levels under the Build Condition were compared with the FTA criteria threshold levels as well as with the corresponding No Build Condition to determine the actual change in overall noise exposure at nearby sensitive receptors.

3.1 No Build Condition

As shown in Table 1, maximum passby noise levels from trains traveling along the NEC under the No Build Condition range from 72 dBA at a residence along Carmell Road and Jefferson Boulevard to 79 dBA at a residence along Kilvert Street. These maximum noise levels are dominated by the Amtrak Express trains which are expected to travel at speeds up to 150 mph along this section of the NEC. Cumulative day-night noise levels (or Ldn) from all train operations are expected to range from 53 dBA at a residence along Carmell Road and Jefferson Boulevard to 58 dBA at a residence along Kilvert Street. These Ldn noise levels include Amtrak and freight operations only, as there is presently no MBTA commuter rail or Providence Shuttle service along this section of the NEC. As shown in Table 1, these levels are well below the FTA criteria threshold levels for residential receptors.

Along the one-half mile section of NEC track which comprises the project area, a total of 15 residences (or FTA Category 2 receptors) are expected to be impacted from current train operations. As shown in Table 2, 11 residences are expected to experience an 'Impact' condition, while an additional four residences are expected to experience a 'Severe Impact' condition. Only one institutional receptor (or FTA Category 3), a pre-school on Alhambra Road, is expected to exceed the FTA 'Impact' criterion under the No Build Condition. There are no Category 1 receptors (serene outdoor land-uses) expected to be adversely affected under the No Build Alternative.

3.2 Build Condition

Under the Build Condition, passenger service to Warwick Station would experience reduced speeds along this section of the NEC. For improved safety, all non-stop trains, such as freight and several Amtrak Express trains, are expected to reduce their speeds as well, as they pass through the passenger platform area. Further safety enhancements at the Station would include a stationary warning bell which would ring for all approaching trains. Noise from the elevated APM vehicle is expected to be negligible due to its slow speed.

Maximum passby noise levels from reduced speed Amtrak trains under the Build Condition are expected to range from 69 dBA at a residence along Carmell Road and Jefferson Boulevard to 76 dBA

at a residence along Kilvert Street. The Lmax noise levels under the Build Condition would be noticeably quieter than under the No Build Condition. The Lmax levels from the APM vehicle would be significantly lower, ranging from 50 dBA at a residence along Carmell Road and Jefferson Boulevard to 54 dBA at a residence along Kilvert Street. Project Ldn noise levels from all train operations are expected to range from 51 dBA at a residence along Carmell Road to 56 dBA at a residence along Kilvert Street. As shown in Table 1, these Ldn noise levels under the Build Condition are well below both the FTA criteria threshold levels for residential receptors, as well as the levels under the No Build Alternative. This reduction in noise levels at nearby sensitive receptors is due primarily to the reduction in Amtrak train speeds between the No Build and Build Alternatives.

A total of 11 residences (or FTA Category 2 receptors) are expected to experience an 'Impact' condition under the Build Alternative and no receptors are expected to experience a 'Severe Impact' condition. As shown in Table 2, four residences are expected to be reclassified from 'Impact' under the No Build Condition to 'No Impact' under the Build Condition. In addition, four residences are also expected to experience reduced noise levels, as they would be reclassified from 'Severe Impact' under the No Build Condition to only 'Impact' under the Build Condition. The pre-school on Alhambra Road (FTA Category 3 receptor) is also expected to experience a decrease in overall noise as it would be reclassified from an 'Impact' condition under the No Build Alternative to 'No Impact' under the Build Condition.

There are no Category 1 receptors (serene outdoor land-uses) or other Category 3 receptors (schools and institutions) expected to be adversely affected under the Build Alternative.

Due to the low traffic volumes and activity levels associated with the Warwick Station parking facilities, no exceedances of either the 'Impact' or 'Severe Impact' criteria are expected at any of the nearby sensitive receptors.

4.0 Mitigation

Due to the overall decrease in noise levels from train operations along the NEC, a total of five sensitive receptors (four residences and one pre-school) would not experience an 'Impact' condition as a result of the Build Condition. An additional four residences are expected to experience reduced impact designations ('Severe Impact' to only 'Impact') under the Build Condition. Therefore, no mitigation measures are needed at this time.

Table 1

Project Noise Levels at Discrete Receptors (in dBA)

Receptor Description		No Build Condition		Build Condition		FTA Criteria Threshold Levels[1]	
		Lmax	Ldn	Lmax	Ldn	'IM'	'SV'
1	71 Kilvert St. - Hillsgrove North	79	58	76	56	60	66
2	34 Carmell Rd. - Hillsgrove South	72	53	69	51	58	64
3	867 Jefferson Blvd. - Jefferson Blvd.	72	53	69	52	65	72

1 The FTA criteria include 'Impact' (IM) and 'Severe Impact' (SV) threshold levels.

Table 2

Number of Residential Receptors Impacted by Train Noise Under the No Build and Build Alternatives

Project Area Section	No Build[1]			Build[1]			Impact Reduction Assessment (BD-NB)[1]	
							'Impact'	'Severe Impact'
	'IM'	'SV'	SUM	'IM'	'SV'	SUM	'IM'->'NO'	'SV->IM'
Hillsgrove North	8	1	9	8	0	8	1	1
Hillsgrove South	3	3	6	3	0	3	3	3
Jefferson Blvd	0	0	0	0	0	0	0	0
Totals	11	4	15	11	0	11	4	4

1 'IM' indicates an 'Impact' condition, 'SV' defines a 'Severe Impact' condition, and 'NO' defines a 'No Impact' condition as defined by the FTA Criteria.

6.2 Hazardous Materials Investigation

Phase I Environmental Site Assessment prepared by BETA Consulting Engineers, December 1998.

Phase I Environmental Site Assessment

Intermodal Station and People Mover

Warwick, RI

December 1998

Prepared for:

Rhode Island Department of Transportation
Mr. John Ball
Edwards & Kelcey
95 Cedar Street
Providence, RI 02903

Submitted by:

BETA

Consulting Engineers, Scientists & Planners

6 Blackstone Valley Place, Lincoln, RI 02865

TABLE OF CONTENTS

EXECUTIVE SUMMARY 2

1.0 INTRODUCTION 3

1.1 PURPOSE 3
1.2 SPECIAL TERMS AND CONDITIONS 3
1.3 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT 3
1.4 LIMITING CONDITIONS AND METHODOLOGY USED 3

2.0 SITE DESCRIPTION 4

2.1 LOCATION AND DESCRIPTION 4
2.2 SITE AND VICINITY CHARACTERISTICS 4
2.2.1 Intermodal Train Station 4
2.2.2 Proposed People Mover 5
2.3 HISTORICAL USE INFORMATION 8

3.0 RECORDS REVIEW 16

3.1 NATIONAL PRIORITIES LIST (NPL) 16
3.2 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY INFORMATION SYSTEM (CERCLIS) 16
3.3 RHODE ISLAND STATE LIST 19
3.4 RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM (RCRA) 20
3.5 LEAKING UNDERGROUND STORAGE TANKS 20
3.6 UNDERGROUND STORAGE TANKS 22
3.7 GROUNDWATER OVERLAP MAPS 24

4.0 FINDINGS AND CONCLUSIONS 26

4.1 FINDINGS 26
4.2 CONCLUSIONS 27

5.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS 28

6.0 REFERENCES 29

6.1 PERSONAL COMMUNICATIONS AND REFERENCE MATERIAL 29
9.2 PERSONAL VISITS 30

APPENDICES

Appendix A New England DataMap First Search Results
Appendix B Sanborn Fire Insurance Maps
Appendix C Polk City Directories
Appendix D Aerial Photos
Appendix E Subject Site Information: Property Field Cards and Deeds
Appendix F RIDEM Documentation on Sea Pro Boats

EXECUTIVE SUMMARY

This report presents the findings of our Environmental Site Assessment for the proposed Intermodal Station and People Mover located in Warwick, RI. The environmental assessment included in the area for the proposed train station to be located on the T.H. Baylis site and the Leviton Parking Lot. The People Mover covers the entire roadway of Fresno Road and portions of Glenham Avenue.

The properties presently located in the area of the proposed intermodal train station include a paved parking area associated with Leviton Manufacturing, paved parking areas and buildings currently utilized by Budget Car Rentals, a portion of D'Ambra Construction, and eight lots of land formerly occupied by the T.H. Baylis Company. These properties are located southwest of the Coronado Road Extension, and north and south of the National Railroad Passenger Corporation. The properties along both sides of Fresno Road were inspected with regard to the proposed elevated people mover. These properties include one unpaved parking area, Airport Autobody, Gaspee Autmotive, R. Johnson & Sons, Netcoh, a building that formerly housed the Rhode Island Institute of Baseball, Sierra Tools, a Shell Gasoline Service Station, and an Exxon Gasoline Service Station.

There are numerous RIDEM files located within the proposed project area including the following:

- Sea Pro Boats: This property is located immediately south of the property formerly owned by the T.H. Baylis Company. The property was listed on Rhode Island State lists after drums were observed to be improperly stored or labeled on or adjacent to the property.
- T.H. Baylis: Located in the western portion of Fresno Street, in the area of the proposed intermodal station, the Baylis property has been detected to have a contaminated plume migrating off of the property. BETA is currently investigating the extent of this plume.
- New England Wood Preserving: New England Wood Preserving is located at 93 Alhambra Road, approximately 500 feet north of Fresno Street which has documented soil contamination.

The historical review found a 1945 Sanborn Map detailing a transformer yard located on the current Budget property. No information was found regarding whether PCB containing material was stored at this yard.

The conclusion of the Phase I report is that the following should be completed prior to taking ownership of the subject properties:

- Soil sampling should be conducted in the former transformer yard for PCB containing material.
- Soil sampling should be conducted along Fresno Street due to past and current industrial and commercial uses.
- Soil sampling should be conducted at Sea-Pro Boats for petroleum contaminated soil.

1.0 Introduction

1.1 Purpose

This report presents the findings of our Environmental Site Assessment for the proposed Intermodal Station and People Mover located in Warwick, RI. The environmental assessment included the area for the proposed train station to be located on the Budget Car Rental property and the Leviton Parking Lot. The People Mover covers the entire roadway of Fresno Road and portions of Glenham Avenue.

The purpose of this assessment was to identify any negative environmental conditions with the site that need to be considered during the design of any construction. BETA reviewed all conditions associated with the site that are obvious through a visual site inspection and a review of relevant records concerning reported releases of hazardous chemicals or petroleum products at the roadway. The visual site inspection was limited to the outside of each property. The report does not anticipate future problems resulting from continued use of existing properties or proposed uses along the site.

1.2 Special Terms and Conditions

This site assessment study and report has been prepared on behalf of and for the exclusive use of Edwards & Kelcey and the Rhode Island Department of Transportation. This report and the findings contained herein shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party in whole or in part, without the prior written consent of BETA Engineering, Inc.

1.3 Limitations and Exceptions of Assessment

Since no subsurface investigation or groundwater sampling was conducted during this study, there is a possibility of site contaminants being present within the ground water and/or soil that were not observed or detected. Surface observations were limited to visible portions of the soils near the surface along and on the roadway. BETA's assessment is limited to those sources identified and referenced in this report. We make no assessment of information or records not referenced here.

1.4 Limiting Conditions and Methodology Used

The Environmental Site Assessment was performed to determine if there are actual or suspected environmental problems on or related to the project site. The assessment was prepared in accordance with generally acceptable engineering practices, utilizing as a guide, when applicable, the American Society of Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation E1527-93).

2.0 Site Description

2.1 Location and Description

The environmental assessment covered the area for the proposed train station to be located on the Budget Car Rental property, and the Leviton Parking Lot. The People Mover also covers the entire roadway of Fresno Road and portions of Glenham Avenue. Please refer to the attached USGS Topographical map (Figure 2-1) for the site location.

2.2 Site and Vicinity Characteristics

The general area is characterized by industrial and commercial properties, including several automotive repair facilities, gasoline service stations, and various other commercial properties. Commercial properties include Sierra Tools and Finds, Fountain Coffee Sales and Service, and Budget Car Rentals. The Leviton Manufacturing Company is an industrial facility that is located at the intersection of Jefferson Boulevard and Thurber Street. Residential properties were noted in the area of Montebello Road.

Figure 2-2 shows with a yellow highlight the location of the proposed intermodal train station and the green highlight shows the probably location of the elevated people mover. For the proposed people mover along Fresno Street, BETA looked at properties along either side of Fresno Street.

2.2.1 Intermodal Train Station

The properties presently located in the area of the proposed intermodal train station include a paved parking area associated with Leviton Manufacturing, and paved parking areas and buildings currently utilized by Budget Car Rentals and a portion of D'Ambra Construction. These properties are located southwest of the Coronado Road Extension, and north and south of the National Railroad Passenger Corporation. Information regarding the zoning, current property uses, building history, assessment details, and the property inspection of the aforementioned properties are provided below. The Property field cards and select deeds for the properties have been included in Appendix E.

D'Ambra Construction, Plat 323, Lot 519

A portion of the D'Ambra Construction is located in the southeast corner of the proposed intermodal train station. This property is occupied by a single structure with a footprint of 9,639 square feet. According to the Assessors' field card for the property, the building is serviced by public utilities and is utilized as office space. No records or permits for D'Ambra construction were present at the building department at the time of the investigation. Information in the Assessors' field card indicates that the building was constructed in 1946, and is zoned for general industrial use.

Leviton Parking Lot, Plat 323, Lot 292

The Leviton Parking Lot is located immediately northwest of the D'Ambra Construction property. The paved parking area occupies approximately 3.55 acres of land, and is utilized for Leviton employee parking. Minor surficial staining was noted on the surface of the pavement at the time of the inspection. One transformer, which could potentially contain PCBs was noted along Jefferson Boulevard, immediately northwest of the parking lot. According to the Assessors' field card for the property, the parking lot was constructed in 1970, and is serviced by no utilities. No files pertaining to the parking area were available at the Warwick Building Department. The deed for the property indicates that the Ridgeway Realty Company has owned the property since June, 1957 (Book 287, Page 369).

Budget Car Rentals, Plat 323, Lot 293

The property currently utilized by Budget Car Rentals is located immediately north of the Leviton Parking Lot, and has been owned by Mr. Donald E. Watson since November 1, 1984 (Book 620, Page 141). The property is occupied by a single 3,600 square foot structure that is utilized as office space and a warehouse. The Assessors' field card for the property indicates that the building is serviced by public utilities. A paved parking was observed surrounding the property structure. The property file was reviewed at the City of Warwick Building Department; however, no environmentally sensitive issues were identified in the file. According to the Assessors' field card, the building was constructed in 1986. The property is zoned for general industrial use.

2.2.2 Proposed People Mover

The properties along both sides of Fresno Road were inspected with regard to the proposed elevated people mover. These properties include T.H. Baylis, one unpaved parking area, Airport Autobody, Gaspee Autmotive, R. Johnson & Sons, Netcoh, a building that formerly housed the Rhode Island Institute of Baseball, Sierra Tools, a Shell Gasoline Service Station, and an Exxon Gasoline Service Station. Information regarding the zoning, current property uses, building history, assessment details, and the property inspection for the aforementioned properties are provided below:

T. H. Baylis Company, Plat 323, Lots 301, 302, 303, 304, 308, 311, 312, 515

These properties are associated with land formerly utilized by the T.H. Baylis Company, and are zoned for light industrial use. According to the property deed, the site was purchased by the City of Warwick in June, 1998 (Book 2962, Page 215). The Baylis property is currently vacant; however, the property was occupied by a pressure treated lumber company and by a plastics company in the past. Numerous chemicals, including trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, acetone, methyl ethyl ketone, isopropanol, methanol, methylene chloride, mineral spirits, trichlorotrifluoroethane, toluene, and xylene were reportedly used at the property during its operational history. At the time of the investigation, several aboveground storage tanks were observed in the northern portion of the property. Several groundwater monitoring wells were noted at the property during the investigation, which are indicative of subsurface evaluation at the property. Additional information regarding the historic storage and use of oil and hazardous materials at this property, as well as subsurface groundwater and soil quality information is provided in Section 4.1.2 (CERCLIS review).

Three structures presently exist at the property. The main building is located in the central portion of the property and has a footprint of 20,270 square feet. The building is constructed from concrete blocks, and was utilized in the past as a warehouse. According to the Assessors' field card, the property was serviced by public utilities during its operational history. Two additional buildings, both utilized as warehouses, were noted northeast of the main property building. Both buildings have footprints of approximately 900 square feet and were serviced by public utilities prior to vacancy.

The remaining lots associated with the Baylis Company are paved and are currently vacant. Assorted debris including wood, plastics, tires, glass, and bricks was noted in various areas of the site at the time of the investigation.

Pertinent files regarding environmentally sensitive issues with regard to the T.H. Baylis Company were reviewed at the City of Warwick Building Department. Relevant information included a site plan from November, 1979, detailing one of the smaller warehouses located in the northern portion of the property. Existing underground storage tanks are depicted immediately north of the warehouse; new underground pipe lines are drawn from the existing storage tanks to a new pit inside the warehouse. An additional site plan dated July, 1982 includes information regarding underground storage in the vicinity of the main Baylis building. According to this plan, nine existing storage tanks were located immediately north of the site building. The plan indicates that six of these tanks were to be removed, and replaced with new storage tanks. The number, type, and location of storage tanks that currently exist at the site was not available from the Building Department at the time of the investigation.

Unpaved Parking Area, Plat 323, Lot 353, 355, 357, and 359

An unpaved parking area was noted to include four lots of land along the southern side of Fresno Road. The property is zoned for light industrial use, and is utilized as a parking area for cars and trucks. Small amounts of household debris were noted within the parking area. The westernmost lot of the parking area is owned by Sanitas Security (former owners of the T.H. Baylis Company). The remaining three lots are owned by Mr. Richard A. Pariseault and Ms. Grace M. Pariseault. No structures are currently present within the parking area; no records of any construction were found at the Building Department.

Airport Autobody, 40 Fresno Road, Plat 323, Lot 361

The property currently occupied by Airport Autobody is located immediately northwest of the intersection of Fresno Road and Imera Road in the central portion of the roadway. The property is zoned for light industrial use and is occupied by a single building constructed from aluminum siding. The property is owned by Richard and Grace Pariseault, and is utilized as an autoparts facility. A paved parking area was noted immediately north and east of the property, along Fresno Road and Imera Roads. Assorted debris was noted in an alley immediately southwest of the site building. One pole-mounted transformer, which could potentially contain PCBs was noted immediately southeast of the property. No records pertaining to this property were available at the Warwick Building Department. Information included in the property field card indicates that the structure was built in 1973.

Former T.H. Baylis Company, Plat 323, Lot 517

This property represents a portion of the land formerly occupied by the T.H. Baylis Company. The land that abuts Fresno Road is currently a vacant paved area. One small structure is present in the northern portion of the property. The structure is currently vacant and boarded up. Various debris, including glass and wood were noted in this area at the time of the investigation. One abandoned 275-gallon AST was noted near the site building. One monitoring well and two manholes were noted in the central portion of the property. The property field card for this lot was not available at the time of the investigation. No pertinent files were found at the Warwick Building Department.

R. Johnson & Sons: Engine Service, Inc., Plat 323, Lot 380

Located in the northwest portion of the roadway, along the northern side of Fresno Road, this property is occupied by a single structure with a footprint of 3,977 square feet. Information included in the property field card indicates that the current property owners are John and George Harrington. The property is zoned for light industrial use, and, according to the Assessors' field card, is utilized for light manufacturing. The building is constructed from aluminum siding and has a concrete foundation. A gas meter was noted along the western side of the structure; gas lines were marked along the western property border. No files were available at the building department pertaining to the property; however, according to the property field card, the building was constructed in 1965.

Gaspee Automotive, Plat 323, Lot 388

Gaspee Automotive is located immediately north of the intersection of Fresno Road and Imera Road. The property is owned by John and George Harrington and is occupied by a single 19,083 square foot structure that was built in 1955. The building is constructed from aluminum siding. According to the Assessors' field card, the building is utilized as a warehouse. One pole-mounted transformer was noted east of the property, along Imera Road, and three pole-mounted transformers were noted on the northern portion of the property. Pole-mounted transformers could potentially contain PCBs. One possible vent pipe was noted along the eastern side of the property building. A closer inspection of the area was not possible due to limited site access. The property is zoned for light industrial use. No information was available regarding environmentally sensitive issues at the property at the City of Warwick Building Department.

Sierra Tools, Fountain Coffee Sales and Service, Victorian Romance, Plat 323, Lot 365

This property, located south of the intersection of Imera Road and Fresno Road, is occupied by a single structure with three tenants. The building is composed of concrete blocks, and has a footprint of 5,040 square feet. The property is owned by Vincent and Barbara Palazzo. The property is zoned for light industrial use, and is serviced by public utilities. No debris was noted at the property during the surficial site inspection. No information regarding environmentally sensitive issues at the property was available from the Warwick Building Department.

Netcoh Sales, Co., Bill's Upholstery, Plat 323, Lot 390
This property, located southeast of the intersection of Fresno Road and Imera Road, contains a single property building that houses both Netcoh Sales and Bill's Upholstery. The building has a footprint of 5,030 square feet, and was constructed in 1950 out of concrete cinder blocks. According to the Assessors' field card for the property, the land is owned by the Vincent J. Nassa Revocable Trust, Vincent J. Nassa Trustee. No debris was noted at the property during the surficial site inspection. No information regarding environmentally sensitive issues at the property was available from the Warwick Building Department.

Shell Oil Company, Plat 323, Lots 373 and 377
The Shell Oil Company is located immediately northwest of the intersection of Fresno Road and the Post Road. The two plots of land that are owned by Shell contain a structure with a footprint of 1,568 square feet, and a paved parking area. According to the property field card, the area is zoned for light industrial use. During the surficial site inspection, three vent pipes were noted along the western side of the building. According to UST files, three 10,000-gallon gasoline USTs are present at the site. With the exception of small amounts of staining on the surface of the pavement, no evidence of significant spillage was observed at the property. Files at the building department contained an electrical permit application dated March 25, 1986. The application indicated a proposal to remove and replace four gasoline dispensers, and re-pull wires to dispensing islands.

Abandoned Building, Plat 323, Lot 400
A vacant building, last owned by the Alliance Energy Corporation, is located immediately north of the intersection of Fresno Road and the Post Road. The building has a footprint of 1,176 square feet, and was boarded up at the time of the investigation. According to the property field card, the building was built in 1987, and was last utilized as a retail store. No information regarding environmentally sensitive issues was available for this property at the City of Warwick Building Department.

Rhode Island Institute of Baseball, Plat 323, Lots 394,396, and 398
A building formerly occupied by the Rhode Island Institute of Baseball is located along Fresno Road, between Imera Road and the abandoned building located at the intersection of Fresno Road and the Post Road. The building is constructed from concrete block. The rear portion of the building (occupying lots 393, 521, 522, and 397) is occupied by PJ's Automotive Service and a suite of law offices. Property field cards for this building were unavailable at the Warwick Assessors' office at the time of this investigation. Information regarding environmentally sensitive issues at the property was unavailable at the building department.

2.3 Historical Use Information

A historical use file search was conducted by BETA through the Rhode Island Historical Society and the Rhode Island Department of Administration Aerial Department. The search provided data on the former uses of the roadway as far back as 1922. The historical search was conducted using the following references:

- Sanborn Maps - These are historic fire insurance maps that date back to the late 1800's. These maps were only produced for highly commercialized areas.

- Polk City Directories - These directories are organized by street addresses and date back to the 1940's for some towns and cities. Along with the addresses, the associated use for each property is shown (such as a lawyer, manufacturer, gasoline station, etc.).
- Aerial Photography - These are aerial photos taken from a statewide fly over. These photos show clear indications of development of the site but details are difficult due to the small scale. These photos are maintained by the Rhode Island Department of Administration.

Sanborn Maps, located at the Rhode Island Historical Society Library in Providence, Rhode Island, were reviewed for information concerning past uses of the roadway, as well as evidence of the storage and use of oil and hazardous material on and in the vicinity of the roadway. Sanborn Maps from 1922, 1945, 1951, 1958, and 1969 were reviewed, and are described below.

1922: The 1922 Sanborn Fire Insurance map depicts the portion of the roadway located in the area of the proposed intermodal station. At this time, the Coronado Extension had yet to be constructed; historic Kilvert Street existed as far west as Cottage Street. The portion of the roadway that received coverage, currently occupied by Budget Car Rentals and the Leviton Parking Lot, was undeveloped in 1922. The property located southwest of the intersection of Hazard Street (now Thurber Street) and Jefferson Avenue (now Jefferson Boulevard), which is currently utilized by Leviton Manufacturing, was occupied by Elizabeth Mills. According to the map, Elizabeth Mills was a manufacturer of cotton yarns. Other abutting properties included United Wire and Supply Company, and several residential properties. The portion of the roadway located along Fresno Street did not receive coverage in the 1922 Sanborn map series.

1922, revised to 1945: The 1945 Sanborn Fire Insurance map depicts the same portion of the roadway as that depicted in the original 1922 map. At this time, the portion of the roadway currently occupied by Budget Car Rentals was occupied by a transformer yard. Abutting properties included Leviton Manufacturing, Rhode Island Malleable Iron Works, and several residential properties.

1922, revised to 1951: The 1951 Sanborn Map depicts the same portion of the roadway as that depicted in the original 1922 map. Few changes took place in the area between 1945 and 1951. Among these changes were the removal of the transformer yard located at the intersection of Jefferson Boulevard and Kilvert Street, and the addition of the Campanella and Cardi Construction Company in the area immediately south of former transformer yard. This property is currently occupied by D'Ambra Construction Company, and is located at the southern border of the roadway. Abutting properties were nearly identical to those depicted in the 1945 map, with the exception of the addition of the United Wire and Supply Company in the place of Rhode Malleable Iron Works. The Fresno Street portion of the roadway did not receive coverage in this series of Sanborn maps.

1958: The 1958 Sanborn Map depicts the area covered by the proposed intermodal train station and the people mover. The portion of the roadway that is currently occupied by the Leviton Parking Lot and Budget Car Rentals was vacant at this time. The property currently occupied by D'Ambra Construction was occupied by a single structure. Abutting properties along this

section of the roadway included Leviton Manufacturing, United Wire and Supply Company, and several residential properties. The property located at the intersection of Fresno Road and Glenham Avenue, currently occupied by the former T.H. Baylis company, was utilized by the Weather Products Corporation. According to the map, this building was used for the manufacturing of aluminum sash and doors. The properties located immediately south of Weather Products Corporation were occupied by four warehouses. An iron works company was noted at the intersection of Imera Avenue and Fresno Street, and a filling station was noted at the intersection of Fresno Street and the Post Road. The location of the gas tanks associated with this filling station could not be discerned from the map. A restaurant was located in the area of the current Exxon Gasoline Service Station. An additional gasoline service station was noted at the intersection of Coronado Road and the Post Road. Abutting properties in this portion of the roadway consisted of machine shops and warehouses.

1969: The 1969 Sanborn Map depicts the area covered by the proposed intermodal train station and the people mover. The property currently occupied by the Leviton Parking Lot and Budget Car Rentals was vacant at this time; the property currently occupied by D'Ambra construction was occupied by a single structure. Abutting properties in this area included Leviton Manufacturing, United Wire Supply Company, and several residential properties. Several buildings associated with the former T.H. Baylis Company are depicted in the 1969 Sanborn Map. Structures located along Fresno Road between Glenham Avenue and Imera Avenue included an engine repair facility (currently occupied by J. Johnson and Sons: Engine Services), a woodworking facility (currently occupied by Gaspee Automotive), and two vacant buildings in the location of a current unpaved parking area. A wood treatment plant (New England Wood Preserving Company) was noted north of the engine repair facility. This property is discussed in greater detail in the CERCLIS review section of this report. The properties located east of Imera Avenue along Fresno Street included a surfboarding manufacturing facility, a cabinet shop, a machine shop, a filling station, and a restaurant. Abutting properties included a car rental facility and several machine shops.

A Polk City Directories search was conducted through the Rhode Island Historical Society on October 27, 1998. Due to the size of the roadway, only non-residential listings were summarized in Table 2-1.

Table 2-1: Historical Property Use of the Roadway from the Polk City Directories

Year	Property Address and Name
1982	30 Fresno Road – Gold Star Gym 31 ½ Fresno Road – Kurt's Machine Shop 32 Fresno Road – Sierra Tool & Findings, Inc. 33 Fresno Road – Bill's Auto Top 35 Fresno Road – Warwick Hydraulic Company 40 Fresno Road – Conway-White Associates Inc. 745 Jefferson Boulevard – Leviton Manufacturing Company, Inc. Glenham Avenue – Baylis T. H. Company Overflow Glenham Avenue – Baylis T. H. Company Chemicals 93 Imera Avenue – vacant
1970	61 Glenham Avenue – Baylis T.H. Company Chemicals 745 Jefferson Boulevard Leviton Manufacturing Company, Inc. 30 Fresno Road Crompton Cabinet Company, Inc – retail kitchen cabinets 32 Fresno Road - Tuioli Jewlers 33 Fresno Road - United Rebuilders – machinery 35 Fresno Road - Hillsgrove iron Craft wrought iron products 40 Fresno Road - Chemicon Corporation – plating supplies 40 Fresno Road – Norton Welding Supplies
1960	35 Fresno Road – Hillsgrove Iron Craft – wrought iron products 745 Jefferson Boulevard – no return

BETA viewed aerial photography at the Rhode Island Department of Administration on October 15, and November 16, 1998. Four historical photos were reviewed for the site. A summary of each photo is listed in Table 2-2.

Table 2-2 Summary of Aerial Photos

Date/ Photo Number	Description
3/16/1992 Photo #21-809	The properties along Fresno Road appear to be industrial and commercial in nature. Budget Car Rentals and a paved parking area associated with Leviton Manufacturing are located between the railroad and Jefferson Boulevard, near the western portion of the roadway. No oil or hazardous material can be discerned from the photograph.
4/13/88 Photo #10-18	No changes were noted between the 1988 aerial photograph and the 1992 aerial photograph.
4/13/1981 Photo #12-20	The Budget Car Rental facility was not present in 1981. In its place was a transformer storage area. The properties that lined Fresno Road appear to have been commercial and industrial in nature, as they were in 1992.
4/11/75 Photo # 21-146	The Coronado Extension was not yet in existence in 1975. A building was noted in the location of the present Coronado. This building may have been included in the structures associated with the T.H. Baylis site. One transformer was noted in the location of the present Budget property. Fresno Road appears to have been constructed prior to 1975. The buildings along the road appear to have been used for storage purposes. The structures located along Fresno Road between Glenham Avenue and Imera Road appear to have been part of the T.H. Baylis Company.
4/28/70 Photo #19-1324	The Coronado Road Extension, depicted in the aerial photographs from 1992 and 1981 was not in existence in 1970. According to the 1970 aerial photograph, Kilvert Street, intersected Jefferson Boulevard near the western portion of the roadway. The transformer storage area and Leviton paved parking area were present in 1970. The properties surrounding Fresno Street appear to have been commercial and industrial in nature; however, development was not as significant at this time.
4/6/1965 Photo #20-1230	No significant changes from 1970 photo.
10/26/51 Photo #3H-65	According to the 1951 photograph, the Leviton Manufacturing building had been constructed, but the associated parking lot currently located east of the building, across Jefferson Boulevard, was not yet constructed. The majority of land in the vicinity of Leviton was undeveloped at this time. A few houses were noted along the Post Road, near the eastern portion of the roadway.
5/15/39 Photo #869	According to the photograph, in 1939, a ball park was present in the current location of D'Ambra Construction. Several residential properties were noted along Kilvert Street.

Historical ownership information was obtained from a review of title history cards on file at the City of Warwick Assessors' Office. Deeds are provided for reference in Appendix E for properties currently occupied by the Leviton Manufacturing paved parking area (Plat 323, Lot 292), Budget Car Rentals (Plat 323, Lot 292), and the property formerly occupied by T.H. Baylis (Plat 323, Lot 308).

Leviton Manufacturing Plat 323, Lot 292; Lot 1 Elizabeth Mills Plat		
Date	Book/Page	Owner
June 25, 1923	111/76	Thomas J. Hill Estates; William C. Peirce, et.al.
June 28, 1924	115/242	Elizabeth Mills
January 13, 1927	124/346	Santo Lombardi
January 13, 1927	124/348	Elizabeth Mills
August 24, 1931	141/494	The Wollen Company
March 22, 1933	145/339	Frank M. Castiglioni
April 20, 1933	145/424	Consumers Brewing Company, Inc.
July 15, 1940	162/302	Ridgeway Realty Company, Inc.
August 23, 1955	271/65	Violet Ajootin
June 26, 1957	287/369	Ridgeway Realty Company
Plat 323, Lot 292; Lot 2 Elizabeth Mills Plat		
October 1, 1926	124/126	Rhode Island Malleable Iron Works
July 17, 1950	225/541	United Wire & Supply Company
December 21, 1983	Not listed	Francis G. Carter et al.
November 2, 1984	Not listed	Richard A. Hallisey & Edward Lee Hallisey
November 2, 1984	Not listed	Donald Watson

Portion of Former T.H. Baylis Property Plat 323, Lot 148		
Date	Book/Page	Owner
June 25, 192?	111/76	Wm. C. Peirce et. al.
September 23, 1925	119/307	Prov. Real Estate Impr. Co.
November 7, 1934	147/661	John Zarsky
July 23, 1951	235/71	Henry A. Conti et. ux. Ann C.
July 20, 1972	429/181	O'Connor Lumber Company, Inc.
March 20, 1979	Not listed	O'Connor Lumber Company of Rhode Island, Inc.
June 27, 1980	Not listed	T.H. Baylis Company
March 23, 1984	Not listed	Baylis Realty Associates
April 10, 1985	Not listed	Sanitas Security Services Corporation
June 23, 1998	2926/217	City of Warwick

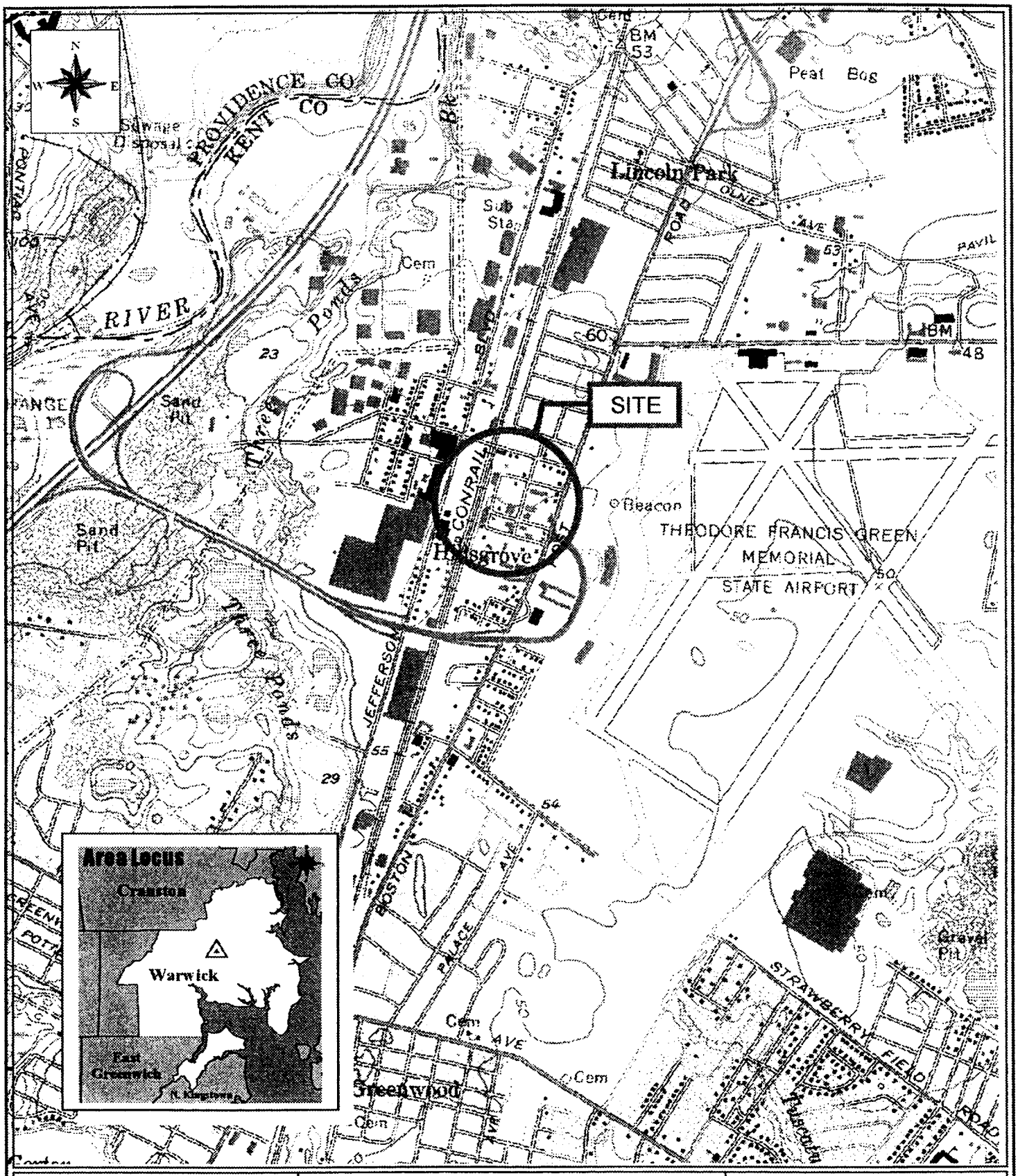
Portion of Glenham Avenue Plat 323, Lot 380		
Date	Book/Page	Owner
June 25, 1923	111/76	Wm. C. Peirce et. al.
September 23, 1925	110/307	Prov. Real Est. Impr. Co.
June 1, 1940	162/54	Edward J. McConnell
March 24, 1953	250/350	Alan V. Young
July 8, 1960	311/301	Bankers Realty Corporation
October 24, 1960	314/114	Alan V. Young
August 8, 1961	320/98	Walter M.I. Scheibe et ux. And Sophie L.
September 8, 1989	Not listed	John T. Harrington and George E. j/t

Railroad Plat 323, Lot 509		
Date	Book/Page	Owner
1954	Not listed	N.Y., N.H. & H.R.R. Company
March 12, 196?	396/698	Penn Central Company
April 1, 1976	Not listed	Amtrak
October 26, 1978	Not listed	Consolidated Rail Corporation
October 26, 1978	Not listed	National Railroad passenger Corporation

Lot 83, Hillsgrove Center Plat 323, Lot 371		
Date	Book/Page	Owner
June 25, 1923	111/76	Wm. C. Peirce et. al.
September 23, 1925	119/307	Prov. Real Est. Impr. Co.
June 6, 1928	131	Napoleon Breault et. ux.
November 25, 1931	104/218	Helen Mac Cue
June 4, 1932	143/99	Napoleon Breault et. ux.
November 4, 1953	256/508	Dorothy Breault
February 24, 1955	266/314	Willard G. Scheibe et. ux. Marjorie E.
November 26, 197?	447/1051	Willard G. Scheibe et. ux. Marjorie E.

Lot 82, Hillsgrove Center Plat 323, Lot 369		
Date	Book/Page	Owner
June 25, 1923	111/76	Wm. C. Peirce et. al.
September 23, 1925	119/307	Prov. Real Est. Impr. Co.
December 18, 1928	132/495	Napoleon Breault et. ux.
September 23, 1952	256/508	Dorothy Breault
February 24, 1955	266/314	Willard George Scheibe et. ux. Marjorie E.
November 26, 1973	447/1051	Willard George Scheibe et. ux. Marjorie E.

Lot 62, Hillsgrove Center Plat 323, Lot 400		
Date	Book/Page	Owner
June 25, 1923	111/76	Wm. C. Peirce et. al.
September 23, 1925	119/307	Prov. Real Est. Impr. Co.
February 9, 1942	166/634	Jane M. Potter
December 31, 1942	170/513	John Zanni et. ux.
November 12, 1970	410/221	Anthony Zanni & Egidio Zanni
April 24, 1974	452/457	Egidio Zanni & Anthony Zanni
February 4, 1987	Not listed	John B. Giusti & Ethel M. t/e
March 8, 1990	1444/341	Exxon Corporation
December 17, 1996	2635/258	Alliance Energy Corporation



Legend

Area Location

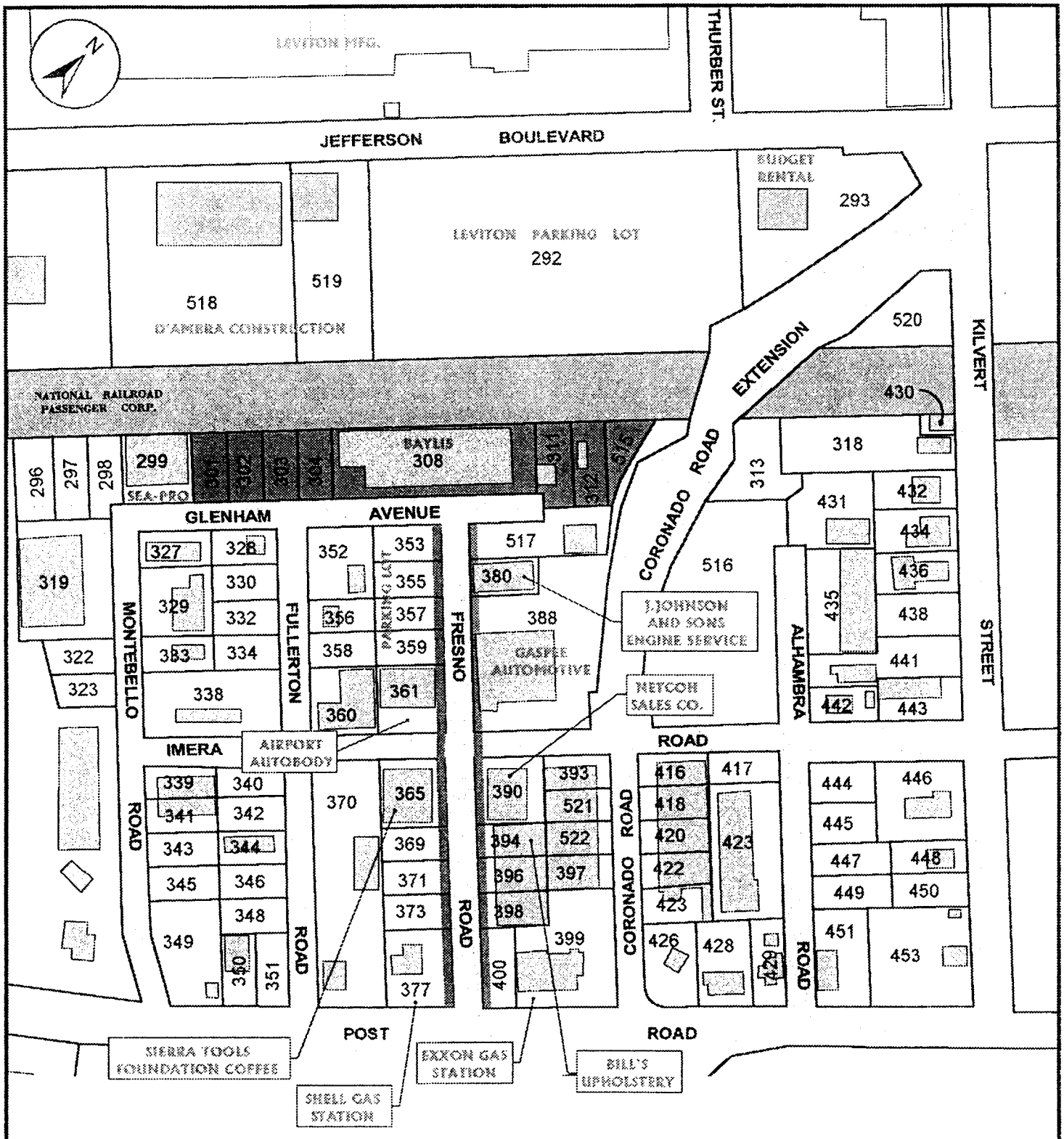
Site Location

Source: RIGIS and USGS

Phase I ESA
Intermodal Station and People Mover
Warwick, RI
BETA Engineering, Inc.

Figure 2-1
USGS Locus Map

NOT TO SCALE



LEGEND

- PROPOSED INTERMODEL STATION LOCATION
- PROPOSED PEOPLE MOVER LOCATION

FIGURE 2-2 : PRESENT SITE LAYOUT
PHASE I
ENVIRONMENTAL SITE ASSESSMENT
INTERMODEL STATION AND PEOPLE MOVER
WARWICK, RHODE ISLAND

Photograph Log

Project Name: Edwards & Kelcey-Phase I ESA
Site Location: Intermodal Station & People Mover, Warwick, RI
Project Number: 1353-03
By: CMR **Date:** 11/19/98

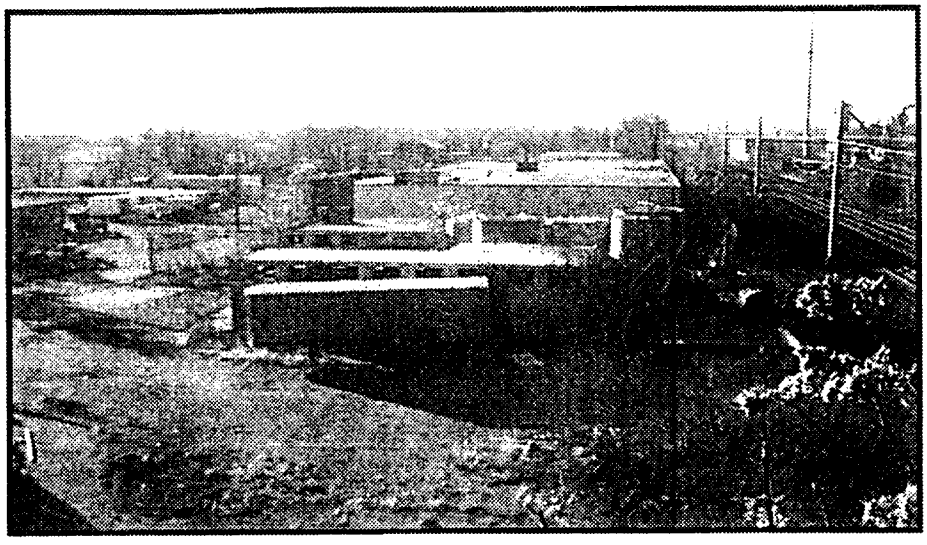


Photo 1 Description: View of the T.H. Baylis site.

Photo 2 Description: View of the Leviton Parking Lot off of Jefferson Boulevard.

BETA

BETA Engineering, Inc.
Scientists/Engineers/Planners

6 Blackstone Valley Place Lincoln, RI 02865 (401) 333-2382 FAX (401) 333-9225 1420
Providence Highway Norwood, MA 02062 (781) 255-1982 FAX (781) 255-1974

File name: 1353-3PHOTO.PM6

Photograph Log

Project Name: Edwards & Kelcey-Phase I ESA
Site Location: Intermodal Station & People Mover, Warwick, RI
Project Number: 1353-03
By: CMR **Date:** 11/19/98

Photo 3 Description: View of Gaspee Auto and Netcoh Sales off of Fresno Street.

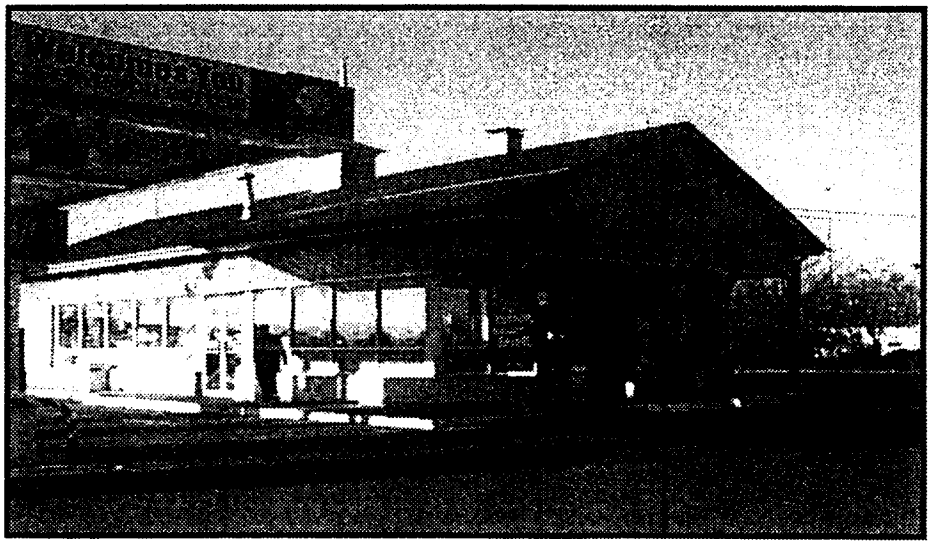


Photo 4 Description: View of Shell Station off of Fresno Street.

BETA Engineering, Inc.
Scientists/Engineers/Planners

6 Blackstone Valley Place Lincoln, RI 02865 (401) 333-2382 FAX (401) 333-9225 1420
Providence Highway Norwood, MA 02062 (781) 255-1982 FAX (781) 255-1974

3.0 Records Review

A file search was conducted by BETA through New England DataMap on NPL and CERCLIS properties, leaking underground storage tanks (LUST), registered underground storage tanks, RCRA hazardous waste generators, and RCRA TSD Facilities. BETA also reviewed the Rhode Island Department of Environmental Management (RIDEM) files for information in this report. The results of the New England DataMap search are presented in Appendix A.

3.1 National Priorities List (NPL)

The NPL, also known as the Superfund List, is an EPA listing of abandoned and uncontrolled hazardous waste sites. This list is primarily based upon a score which the site receives from the EPA's hazardous ranking system. These sites are targeted for possible long-term remedial action under the Superfund Act.

There are no National Priority List sites located within the search area on the list dated July 16, 1998.

3.2 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)

CERCLIS is a comprehensive listing of known or suspected uncontrolled or abandoned hazardous waste sites. These sites have either been investigated or are currently under investigation by the Federal EPA for the release, or threaten release of hazardous substances. Once a site is placed on CERCLIS, it may be subjected several levels or review and evaluation and ultimately placed on the National Priorities List.

There are three CERCLIS sites located within the project search area on the list dated July 16, 1998. These sites include New England Wood Preservation, located on Alhambra Road, approximately 350 feet northeast of the roadway, and Kenney Manufacturing Company, located at 1000 Jefferson Boulevard, approximately 1,700 feet southwest of Fresno Street. Baylis T.H. Co., Inc. is a CERCLIS site that is located along the roadway, at 61 Glenham Avenue. This property is located east of the intersection of Glenham Avenue and Fresno Road.

T. H. Baylis, 61 Glenham Avenue RID001962190

The property occupied by T.H. Baylis is located in the western portion of the roadway, near the intersection of Glenham Avenue and Fresno Road. The property is believed to have been undeveloped prior to 1946. In the 1950s, the property was reportedly occupied by a pressure treated lumber company. Subsequently, the property was occupied by a plastics company in the 1960s, and by an additional lumber company in the 1970s. Thomas H. Baylis began to acquire the eleven lots that comprise the property in 1967, and construction of the main building on the property began in 1979. T.H. Baylis utilized the property for chemical distribution and hazardous waste storage between 1981 and 1988. The following chemicals were expected to be handled throughout the operational history of the T.H. Baylis Company: trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, acetone, methyl ethyl ketone, isopropanol, methanol, methylene chloride, mineral spirits, trichlorotrifluoroethane, toluene, and xylene. According to USEPA and RIDEM facility inspection reports, the company handled about 50 to 60 drums of chemicals each month.

State and federal involvement with the property began in January, 1981, when the T.H. Baylis Company filed a Notification of Hazardous Waste Activity with the USEPA. During a subsequent RIDEM and USEPA RCRA inspection, violations of hazardous waste rules and regulations were reported, and a Notice of Violation and Order

was issued to the company. Additional violations regarding the operation of an unpermitted hazardous waste storage facility, and deficiencies in storage and labeling of hazardous waste were observed in April, 1982. Four Letters of Deficiency were issued to T.H. Baylis between July, 1984 and January, 1986, and a Notice of Violations and Order and Penalty was issued to the company in July, 1987. Four spills occurred at the property in 1986 and 1987, involving Unichrom 98 Solution (containing chromic acid), an unknown amount of 56% acetic acid, 50 gallons of hydrochloric acid, and 15 gallons of sodium hydroxide.

The T.H. Baylis Company ceased all business operations and changed its name to THBC, Inc. in April, 1988. THBC notified RIDEM of its intent to close its permitted hazardous waste storage facility in June, 1988. Consequently, an Immediate Compliance Order was issued to THBC, requiring that the company identify, label, containerize and document the disposal of all hazardous waste or materials and develop a sampling plan to investigate the nature and extent of contamination resulting from spills and releases throughout all portions of the facility.

Recent investigations performed at the property by the Rhode Island Department of Environmental Management (RIDEM) include a Site Assessment (February, 1998) and a Supplemental Soil and Groundwater Assessment (August, 1998). RIDEM investigated the property in order to ascertain the actual and potential impacts of releases of hazardous materials to the environment as a result of elevated concentrations of contaminants in the soil and groundwater known to exist at the property. A site inspection performed by RIDEM revealed thirteen ASTs containing hydrochloric acid, acetic acid, sulfuric acid, trichloroethylene, tetrachloroethylene, hydrogen peroxide, and other unknown solvents. Four closed USTs that formerly held diesel fuel (7,500 gallons), isopropyl alcohol (10,000 gallons), methanol (10,000 gallons) and methyl ethyl ketone (10,000 gallons) were noted in the paved parking area in the southern portion of the property. Two smaller USTs (1,000- and 1,500- gallon) were installed at the property on or around 1970, and were removed and closed in 1986.

Recent soil and groundwater analytical data was included in the February, 1998 site assessment. Soil sampling included the collection of soil samples, as well as the excavation of test pits and the advancement of test borings. According to this report, several VOCs were detected at concentrations below the applicable RIDEM soil criteria in six of the ten soil samples collected. Analytical results indicated that the PCE concentration in one soil sample located at the northeast end of the former drum storage area exceeded both the Industrial/Commercial Direct Exposure Criteria (I/C DEC) and GB Leachability Criteria (GBLC). Low concentrations of TPH (<1 to 147 mg/kg) were also detected in the majority of the soil samples; however, there were no exceedances of the I/C DEC or GBLC for TPH. The concentrations of two SVOCs detected in one soil sample were found to exceed the I/C DEC. TCE concentrations in soil from three test pits and PCE concentrations from soil in four test bits and one boring were found to exceed the GBLC. Groundwater analytical data indicated the presence of chlorinated VOCs in all groundwater wells. PCE concentrations at eight wells, 1,1-DCE concentrations at three wells, cis-1,2-DCE concentrations at one well, and TCE concentrations at five wells were found to exceed the GB Objectives. There were no exceedances of the UCLs for GB Groundwater.

Based on analytical data, three source areas of concern were identified. These areas include (1) VOC contamination in subsurface soil in the vicinity of the former acid and chemical handling buildings north of the main facility building. The other two areas include regions of VOC contamination in subsurface soil in exceedance of GB Leachability Criteria. These areas are located (2) in the vicinity of the former on-site sewer disposal system and former residential house foundation area located south of the main facility building, and (3) in the vicinity of the former drum storage area and flammable materials storage building east of the main facility building. Additional areas of concern include VOCs, SVOCs, and arsenic in soils in exceedance of Industrial/Commercial Direct Exposure Criteria, and VOC contamination in groundwater in exceedance of GB objectives.

Several remedial alternatives were proposed in the 1998 assessment, in an effort to address the aforementioned areas of concern. With respect to the former acid and chemical handling buildings, as well as the former on-site sewer disposal system, RIDEM proposed excavation with off-site disposal, dual phase extraction, and soil phase extraction. RIDEM proposed excavation with off-site disposal and soil vapor extraction with regard to the former drum storage area and the flammable materials storage building. RIDEM recommended excavation and off-site disposal and risk assessment to deal with the localized areas of toluene, arsenic, and semi-volatile organic compound exceedances, and risk assessment / natural attenuation, pump and treat, and soil vapor extraction with in situ air sparging as an alternative to sitewide volatile organic compounds in groundwater.

A Supplemental Soil and Groundwater Assessment as submitted on behalf of T.H. Baylis in August, 1998. This supplemental investigation revealed tetrachloroethylene (38 mg/kg and 9.5 mg/kg) concentrations in two soil geoprobe soil samples. In addition, chlorinated VOCs were detected in soil samples both on and off the THB site, including 1,1,1-trichloroethane, trichlorethylene, tetrachloroethylene, and cis-1,2-dichloroethylene. Groundwater samples from the property were analyzed for halogenated VOCs by modified EPA Method 8010, and two samples were analyzed for aromatic VOCs by EPA Method 8020. With the exception of two locations, chlorinated VOCs were detected in groundwater samples from all wells, microwells, and geoprobe soil borings tested in April, 1998. These VOCs included tetrachloroethylene, trichloroethylene, cis-1,2-dichloroethylene, and 1,1-trichloroethane.

Based on the supplemental investigation, RIDEM concluded that the VOC contaminated groundwater in exceedance of the GB Objectives migrates off-property to the west in two distinct plumes. Determination of the extent of GB Objective exceedances requires additional investigations. RIDEM recommended excavation and off-site disposal of all areas of contaminated soil. RIDEM also recommended an additional investigation of the extent of groundwater contamination migrating off-property. To this end, RIDEM suggested the installation of additional monitoring wells to determine the downgradient extent of groundwater contaminant migration. RIDEM suggest hydraulic control using a conventional pump and treat system, installation of an in-situ passive groundwater treatment zone as possible groundwater management alternatives.

According to the most recent groundwater flow elevation data, groundwater flow direction in the unconsolidated deposits beneath the majority of the property is primarily to the west. BETA is currently completing a site investigation on the Baylis property and determining the extent of the off-site plume.

New England Wood Preserving Company, Alhambra Road, RID0001693092

This property, located approximately 500 feet north of the central portion of Fresno Street, is currently occupied by a multi-tenant building, day-care center, and storage building. Historic uses of the property included light industrial operations primarily involving building and lumber materials supply. According to available information, wood-preserving activities occurred at the property between 1979 and 1985, when the property was leased to two different lumber companies. The property was investigated as a CERCLIS site because wood preserving processes generate wastes that may contain hazardous substances including organic contaminants, polycyclic aromatic hydrocarbons, chlorinated phenols, arsenic, chromium, copper, sodium fluoride, and zinc. An investigation performed by the Roy F. Weston, Inc. Alternative Remedial Contract Strategy (Weston/ARCS) team in 1992 revealed no volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, or PCBs above reference values in soil samples. Elevated concentrations of inorganic elements, including arsenic (up to 12.8 ppm), beryllium (up to 0.84 ppm), chromium (up to 43.1 ppm), and copper (up to 32 ppm) were reported for all sample locations. According to Weston/ARCS, however, these concentrations are within naturally occurring ranges and their attribution to past site operations questionable. Groundwater flow information was not included in the report. No evidence of contaminant migration was noted in the submitted report; therefore, this property is not expected to impact environmental conditions at the roadway.

Kenney Manufacturing Company, 1000 Jefferson Boulevard, RID0014557845

The Kenney Manufacturing Company has utilized this property, located approximately 0.5 miles south of the central portion of Fresno Street, since 1959 for the purpose of manufacturing drapery hardware primarily for residential and institutional markets. According to a Preliminary Assessment – Plus Final Report prepared for the property by TRC Companies, Inc. (TRCC) Alternative Remedial Contract Strategy (ARCS/Region 1), areas of concern at the property include three USTs, one VOC Aeration Tower, a former plating operations area, a hazardous waste storage area, paint spray hoods, former treated plating waste leaching ponds, E-coat painting room, a satellite drum storage area, a battery shop, and a chemical storage area. Hazardous wastes utilized at the property include treated plating solutions (6.7 million cubic feet), machine oils and coolants (one to two 55-gallon drums per month for thirty-three years), and paint spray solvents and thinners (one to two 50-gallon drums each year for thirty- three years). At the time of the TRC investigation, the primary wastes generated by Kenney included machine coolants and oils, lacquer thinners, ventilation hood filters, and wood and metal scraps.

Investigative work was performed at the property by Vanasse Hangen Brustlin, Inc (VHB), including an analysis for the possible presence of cyanide plating residues in cement and soil beneath the former plating area. The investigation included the advancement of ten test borings and analysis of soil samples for total and reactive

cyanide. Analytical results revealed total cyanide concentrations ranging from 0.05 to 2.20 mg/kg and reactive cyanide concentrations less than 0.5 mg/kg. The concrete dust from the ten borings was composited and analyzed; reported concentrations for total cyanide and reactive cyanide were 323 mg/kg and <250 mg/kg, respectively. VHB concluded that the area beneath the former plating operations contained limited areas of relatively low level stable cyanide compounds.

According to the TRC report, Kenney was cited for several violations observed during inspections performed by the RIDEM Division of Air and Hazardous Materials. TRC noted that the deficiencies were adequately addressed and that there were no documented spills or spill events at the property. TRC noted no significant releases or outstanding violations during the 1992 site reconnaissance. The EPA recommended that the Kenney Manufacturing Company be deferred to the RCRA program for further evaluation at this time. Due to the distance of the Kenney Facility from the roadway, any concerns at the facility are not expected to impact the roadway.

3.3 Rhode Island State List

The State List is an inventory of properties upon which the RIDEM Division of Site Remediation has reviewed site assessment data either via a voluntary submittal or as part of a regulatory action under either the RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases or the RIDEM Oil Pollution Control Regulations.

There are nine State List files located within the search area on the list dated July 21, 1998. These properties include:

- Airport Autobody (AAB-HWM): This property is currently located in the central portion of the roadway. At the time of its listing as a state site, however, the business occupied land located approximately 500 feet north of the roadway. The property was added to Rhode Island state lists due to failure to remove drums of hazardous waste from the premises at the time of vacancy. This property is described below.
- Sea Pro Boats (SEA-HWM): This property is located immediately south of the property formerly owned by the T.H. Baylis Company. The property was listed on Rhode Island State lists after drums were observed to be improperly stored or labeled on or adjacent to the property. This property is discussed more completely below.
- T.H. Baylis (THB-SFA and THB-HWM): Located in the western portion of the roadway, in the location of the proposed intermodal station, the Baylis property is listed twice on Rhode Island state lists. This property is discussed in detail in Section 4.1.2 (CERCLIS review).
- Air Cargo, Inc., T.F. Green Airport (AIRC-HWM, TFGA-HWM, and TFG-FUDS): These properties are all included in the land currently utilized by the T.F. Green Airport. Information regarding these properties is included in Section 4.1.6 (Leaking Underground Storage Tank review).
- Kenney Manufacturing Company (KMFG-SFA): This property is located at 1000 Jefferson Boulevard, approximately 0.5 miles south of the roadway. Kenney Manufacturing is discussed in Section 4.1.2 (CERCLIS review).
- New England Wood Preserving (NEWP-SFA): New England Wood Preserving is located at 93 Alhambra Road, approximately 500 feet north of the roadway. This property is discussed in Section 4.1.2 (CERCLIS review).

Sea Pro Boats, 103 Glenham Avenue, SEA-HWM

Sea Pro Boats, located adjacent to the property formerly occupied by the T.H. Baylis Company, was issued a Notice of Violation in December, 1989, after an inspection of the property revealed approximately thirty drums containing various amounts of hazardous waste. The drums were observed to be improperly stored and labeled on or adjacent to the property. The material was reportedly generated as a result of operations conducted by the former Sea Pro boats and the subsequent eviction by the property owner. Laboratory analyses of the material inside the drums revealed that the material was hazardous waste composed of solvents, paints, and resins. On April 20, 1990, a sample from an area of visibly stained soil located at the northeast corner of the property revealed elevated concentrations of petroleum. According to a field investigation report dated June 18, 1990, the visibly stained soil appeared to have been removed. Information regarding the direction of groundwater flow and contaminant migration in the area was not included in the DEM file. The impact of this property on the roadway is unconfirmed; however, the property is located adjacent to T.H. Baylis, at which numerous subsurface investigations have been performed in order to characterize subsurface contamination.

Airport Autobody, Kilvert Street, AAB-HWM

Airport Autobody, formerly located approximately 500 feet north of the roadway at the intersection of Kilvert Street and Alhambra Road, was issued a Notice of Violation and Penalty in February, 1990 regarding the containers of hazardous waste and materials which were left on the property after the business vacated the property. Airport Autobody is currently located at 40 Fresno Street, in the central portion of the roadway. According to an investigation performed by RIDEM at the previous location, three 55-gallon drums of waste oil and water, as well as one 30-gallon drum of oil and water were observed outside the building. In addition, several 5-gallon cans of paint solvent and various cans of paint and resin were observed inside the building. One sample obtained from a 5-gallon container labeled acrylic laquer thinner, and one sample obtained from a 30-gallon container of waste thinner were analyzed for flashpoint. Analytical results yielded a flashpoint less than 70° F for both samples. An additional sample was obtained from a 55-gallon drum that contained approximately 30 gallons of waste oil. This sample was analyzed for VOCs and EPTOX lead. Lead was detected at a concentration less than 0.04 mg/L; toluene (780 ppm), ethylbenzene (340 ppm), and xylenes (2,000 ppm) were also detected. A subsurface investigation was not performed at this property, therefore information regarding contaminant migration and groundwater flow direction was not included in the DEM file. The impact hazardous waste present at this property on the roadway is uncertain.

3.4 Resource Conservation and Recovery Information System (RCRIS)

The RCRIS listing contains information pertaining to facilities that generate hazardous waste or meet other applicable requirements of the RCRA Act. A large RCRA generator is a business that produces over 1000 kg of hazardous waste per month. A small RCRA generator is a business that produces between 100 kg and 1000 kg of hazardous waste per month. These businesses are under strict record keeping guidelines for the generation and disposal of the waste.

Several properties along the roadway and in the vicinity of the roadway were listed as RCRA sites. The T.H. Baylis Company is the only property along the roadway that was cited on RCRA lists. Other properties within 0.25 miles of the roadway that were included on the RCRA list include the Warwick Hydraulics Company, Inc., the Karick Corporation, Sandstrom Carbide Product, Exxon Company USA (northern abutter), Airport Shell Food Mart.

3.5 Leaking Underground Storage Tanks

The leaking underground storage tank list is compiled by RIDEM and is a comprehensive list of all leaking underground storage tanks located within the State of Rhode Island.

Five leaking underground storage tanks (LUST) are located within one-half mile of the subject site on the list dated April 9, 1998. These include Leviton Manufacturing, an Exxon Gasoline Service Station, Hertz Rental Car / T.F. Green Airport, the T.F. Green Airport, and a Mobil Gasoline Service Station. Four out of five LUST properties are reviewed below; the Mobil

Gasoline Service Station is not reviewed due to its distance (0.46 miles northeast) from the roadway.

Exxon Gasoline Service Station, 3523 - LS

The Exxon Gasoline Service Station is located immediately northeast of the roadway. This property was investigated by Geologic Services Corporation (GSC) in November, 1996 in order to establish baseline environmental conditions. According to this report, the Exxon Gasoline Service Station has a total storage capacity of 30,000 gallons, consisting of three double wall fiberglass gasoline USTs. Subsurface investigations at the property revealed MTBE (32.6 µg/kg) in one soil sample and TPH (22 mg/kg and 17.6 mg/kg) in two soil samples. Detectable concentrations of BTEX/MTBE and / or TPH were reported for seven of the eight groundwater monitoring well samples obtained at the property. Based on observed depths to groundwater and calculated water table elevations, GSC concluded that groundwater flowed in an easterly direction, away from the roadway. Therefore, environmental conditions at the Exxon Gasoline Service Station are not expected to influence the roadway.

T.F. Green Airport, Airport Road, 3540-LS

Several reports have been issued on behalf of T.F. Green Airport with regard to UST inventory and removal activities. A UST Closure Assessment prepared on behalf of T.F. Green by Triangle Environmental and dated July 11, 1994 indicated that two 25,000-gallon jet fuel USTs were removed from the property. According to the closure report, visually contaminated soils were not encountered at any time during the closure proceedings, nor were elevated total organic vapor concentrations observed in the soils surrounding the tanks. Analytical results for a composite soil sample revealed non-detectable concentrations of VOCs, and a TPH concentration of 258 mg/kg beneath one 25,000-gallon tank. TPH was reported at 64.9 mg/kg in stockpiled soil. Triangle Environmental indicated that the tanks were in good condition with no visual evidence of holes or cracks, an that the elevated concentrations of TPH could be possibly contributed to one or several overfills of the tanks throughout their history. Based on this information, Triangle Environmental was of the opinion that no further action was necessary at the property, and that former tanks did not appear to have been a significant threat to human health and safety. Triangle Environmental also supervised the removal of a 1,000-gallon jet fuel UST from the T.F. Green property on August 23, 1994. Visually contaminated soils were encountered during the closure proceedings and highly elevated total organic vapor concentrations were observed in the soils surrounding the tank. The highest concentrations of total organic vapors was approximately 300 ppm. A composite soil sample taken from beneath the UST indicated a TPH concentration of 126 mg/kg. Approximately 250 cubic yards of soil was subsequently stockpiled. The visual and analytical data indicated that a release of petroleum product from the UST or from its product lines had occurred. Based on these results, Triangle Environmental recommended the submittal of a Release Characterization Report and the completion of a Site Investigation Report. Triangle recommended that the investigation include the installation of a minimum of three groundwater monitoring wells, and the advancement of a series of borings holes to determine the lateral extent of petroleum contamination in the areas surrounding the UST. Triangle Environmental also recommended that a corrective action plan be submitted based on the results of the site investigation.

An additional report issued on October 1, 1991 by the Department of the Army indicated the presence of four additional USTs. At the time of the Army investigation, three fuel oil USTs were located in front of the airport hangar. These tanks include two 3,000-gallon USTs containing an unspecified type of fuel oil, and one 10,000-gallon No. 4 fuel oil UST. A fourth UST was noted to be a 50,000-gallon UST located underneath a paved parking area and connected to a truck fill station. The report included a proposal of the removal and disposal of the 50,000-gallon UST, its contents, and its associated piping. No other information was found regarding the conclusion of these studies.

Hertz Rental Car, 2000 Post Road, 3523-LS

A UST Closure Assessment was prepared on behalf of Hertz Rental Car indicated that one 1,000-gallon No. 2 fuel oil UST and one 500-gallon waste oil UST were removed from the property on December 27, 1994. The USTs and associated piping were found to be in fair to good condition with no evidence of leakage or failure. According to the report, no physical evidence of UST leaking was noted with regard to the removal of the fuel oil UST. Spillage was, however, observed beneath the spill containment of the fill port of the waste oil UST. Approximately 6 cubic yards of visible impacted soil was stockpiled. Laboratory analytical results revealed no detectable TPH in a

confirmation soil sample taken from the bottom of the excavation of the waste oil UST. The consultant concluded that no further action was necessary at the time of the investigation.

An additional UST Closure Report was submitted for the property by Cistar Associates, Inc (Cistar) on January 23, 1995. According to the report, Cistar personnel supervised the removal of one 3,000-gallon UST of No. 2 fuel oil. Field screening of soil samples obtained from the bottom and sidewalls of the excavation revealed concentrations of VOCs slightly above a background concentration of 0.4 ppm and concentrations of TPH in the range of between 50 and 300 ppm. Cistar stated that all soil samples that were analyzed for headspace volatiles and TPH exhibited concentrations that were close to background and not indicative of a spill or release. Five soil samples from the bottom of the excavation were analyzed for TPH by USEPA Method 8100 Modified; results ranged from ND in two samples, to 174 ppm. Based on analytical information and the condition of the subject UST, Cistar was of the opinion that the environment in the immediate vicinity of the UST had not been significantly impacted from the storage of No. 2 fuel oil, and recommended that no further action be performed at the property with regard to the UST.

Leviton Manufacturing, 745 Jefferson Boulevard, 3544-LS

A Closure Certificate dated February 21, 1995 indicated that one 70,000-gallon No. 6 fuel oil on the property of Leviton Manufacturing was closed and filled in place. According to a UST Closure Inspection Report Checklist, some contamination was noted along the fill pipe and supply lines of the tank during the closure. No contaminant migration was noted. Soils were removed using visual and analytical data. Available information indicates that excavation and tank destruction occurred between December 12 and 19, 1993. Nine soil samples were submitted for laboratory analysis of TPH. The highest concentration of TPH reported was 133 mg/kg. According to a State of Rhode Island and Providence Plantations Inter-Office Memo dated February 15, 1995, this LUST did not require further action at the time of the limited soil removal.

3.6 Underground Storage Tanks

The underground storage tank list (dated January, 14, 1998) is compiled by RIDEM and is a comprehensive list of all registered underground storage tanks located within the State of Rhode Island.

There are fourteen properties on or in the vicinity of the roadway that had or still do have underground storage tanks. The files for twelve of these properties were reviewed at RIDEM. This information is summarized in Table 4-1. The properties include D'Ambra Construction, the T.H. Baylis Company, Leviton Manufacturing Company, the Matec Building of Johnson and Wales, Supreme Dairy Farms, Inc., Alliance Exxon, Post Road Coastltion, Hillsgrove Service Center, Avis Rent-a-car, the Shell Oil Company, National Car Rental, and Johnson and Wales College.

Table 3-1: List of Underground Storage Tanks Surrounding the Property

Name	UST Description Quantity; Storage	Comment
D'Ambra Construction 800 Jefferson Boulevard; southwestern portion of roadway	(3) 4,000 gallon; unspecified storage	Steel with double wall steel suction piping
T.H. Baylis Company; 61 Glenham Avenue; western portion of roadway (intermodal station)	10,000-gallon; diesel fuel 10,000-gallon; isoporpyl alcohol 10,000-gallon methanol 10,000-gallon methyl ethyl ketone 1,500-gallon No. 2 diesel fuel 1,000-NO. 2 diesel fuel	Removed Removed Removed Removed Removed Removed
Leviton Manufacturing Company; 745 Jefferson Boulevard; western portion of roadway	53,000-gallon; No. 6 fuel oil 70,000-gallon; No. 6 fuel oil (2) 2,000-gallon; unspecified gasoline 4,000-gallon; diesel fuel 4,000-gallon unspecified gasoline 3,000-gallon; unspecified gasoline 1,500-gallon; No. 2 fuel oil 4,000-gallon; No. 2 fuel oil	In use Filled in place Removed In use In use Removed Removed In use
Matec Building 60 Montebello Road 0.11 miles southwest of roadway	500-gallon; No. 2 fuel oil	Removed in May, 1994; tank was observed to be severely corroded, no holes were observed during removal
Supreme Dairy Farms Company 111 Kilvert Street 0.12 miles northwest	5,000-gallon; unspecified type of storage	Constructed from steel, with pressurized bare steel piping
Alliance Exxon 2003 Post Road 0.15 miles southeast	10,000-gallon; regular gasoline 10,000-gallon; plus gasoline 10,000-gallon; supreme gasoline	All three tanks and lines tested tight on July 17, 1996; all passed pressure decay tests and were determined to be Stage II operational
Post Road Coastaltion 1995 Post Road 0.15 miles southeast	(2) 10,000-gallon; gasoline	Issued a notice of non-compliance on May 20, 1998 with regard to tank tightness testing

Name	UST Description Quantity; Storage	Comment
Hillsgrove Service Center 1965 Post Road 0.16 miles northeast	3,000-gallon; gasoline	Closure notice dated November 15, 1985
	4,000-gallon; gasoline	Closure notice dated November 15, 1985
	2,000-gallon; gasoline	Last used on August 1, 1988; closure notice dated August 23, 1988
	8,000-gallon; regular / midgrade unleaded gasoline	Constructed from alcohol resistant steel, cathodic protection
	6,000-gallon; diesel fuel	Constructed from alcohol resistant steel, cathodic protection
	6,000-gallon; regular / midgrade unleaded gasoline	Constructed from alcohol resistant steel, cathodic protection
	4,000-gallon; super unleaded gasoline	Constructed from alcohol resistant steel, cathodic protection
Avis Rent –A- Car 2033 Post Road 0.16 miles southeast	500-gallon; No. 2 fuel oil	Removal notice dated January 14, 1992
	500-gallon; waste oil	Removal notice dated January 14, 1992
	10,000-gallon; gasoline	Removal notice dated June 27, 1985
	4,000-gallon; gasoline	Removal notice dated June 27, 1985
Shell Oil Company 2025 Post Road 0.16 miles southeast	(3) 8,000-gallon; gasoline	Filled in place 2/3 full with concrete on September 26, 1986; holes witnessed at each end, but no contamination was discovered
	550-gallon; waste oil	Last used in July, 1989, removed, removed in July, 1989
	(3) 10,000-gallon; gasoline	Constructed from fiberglass reinforced plastic
National Car Rental 2953 Post Road 0.17 miles southeast	500-gallon; waste oil	Removal notice dated October 15, 1993
	4,000-gallon; gasoline	Fill-in-place notice dated October 15, 1993
	10,000-gallon; type of storage not specified	Depicted in site plan, but not mentioned in reports
Johnson & Wales College 2082 Post Road 0.18 miles southeast	10,000 gallon; No. 2 fuel oil	Closure notice dated May 11, 1989; tank filled in place

3.7 Groundwater Overlap Maps

These groundwater overlay maps determine groundwater classification areas for each town and city in Rhode Island. These maps are maintained by RIDEM Division of Water Resources.

According to this map, the entire roadway lies in a GB area. GB is groundwater that may not be suitable for public or private drinking water use without treatment due to known or presumed degradation.

4.0 Findings and Conclusions

4.1 Findings

The Environmental Assessment revealed the following:

- This report presents the findings of our Environmental Site Assessment for the proposed Intermodal Station and People Mover located in Warwick, RI. The environmental assessment covered the area for the proposed train station to be located on the T.H. Baylis site and the Leviton Parking Lot. The People Mover covers the entire roadway of Fresno Road from Glenham Avenue to the Post Road, as well as portions of Glenham Avenue.

- The properties presently located in the area of the proposed intermodal train station include a paved parking area associated with Leviton Manufacturing, paved parking areas and buildings currently utilized by Budget Car Rentals, a portion of D'Ambra Construction, and eight lots of land formerly occupied by the T.H. Baylis Company. These properties are located southwest of the Coronado Road Extension, between the Post Road and Jefferson Boulevard. The properties along both sides of Fresno Road were inspected with regard to the proposed elevated people mover. These properties include one unpaved parking area, Airport Autobody, Gaspee Autmotive, R. Johnson & Sons, Netcoh, a building that formerly housed the Rhode Island Institute of Baseball, Sierra Tools, a Shell Gasoline Service Station, and an Exxon Gasoline Service Station.

- There are numerous RIDEM files located within the proposed project area including the following:
    - Sea Pro Boats: This property is located immediately south of the property formerly owned by the T.H. Baylis Company. The property was listed on Rhode Island State lists after drums were observed to be improperly stored or labeled on or adjacent to the property.
    - T.H. Baylis: Located at the western terminus of Fresno Street, at Glenham Avenue, the Baylis property has been found to have a contaminated plume migrating off of the property. BETA is currently investigating the extent of this plume.
    - New England Wood Preserving: New England Wood Preserving is located at 93 Alhambra Road, approximately 500 feet north of Fresno Street which has documented soil contamination.

- The historical review found a 1945 Sanborn Map detailing a transformer yard located on the current Budget property. No information was found if PCB containing material was stored at this yard.

4.2 Conclusions

Based upon the results of the site inspection and review of relevant federal, state and local files, BETA Engineering presents the following conclusions to the Rhode Island Department of Transportation:

- Soil sampling should be conducted in the former transformer yard for PCB containing material.
- Soil sampling should be conducted along Fresno Street due to past and current industrial and commercial uses.
- Soil sampling should be conducted at Sea-Pro Boats for petroleum contaminated soil.

5.0 Signatures of Environmental Professionals

The studies and investigations described in this Phase I were conducted either by or under the supervision of qualified personnel of BETA Engineering, Inc. These personnel include experienced engineers registered in the State of Rhode Island, geologists and environmental scientists. BETA has considerable experience in conducting the type of investigations and evaluations described throughout this report.

Mr. Richard Hittinger who directed this work has over 20 years of experience evaluating property for environmental contamination. Mr. Hittinger is an LSP (licensed site professional) in the Commonwealth of Massachusetts. Mr. Chris Reynolds, Environmental Engineer, has over three years of experience performing environmental evaluations throughout the New England region.

FOR

Richard C. Hittinger, Vice President

Chris Reynolds, Environmental Engineer

6.0 References

6.1 Personal Communications and Reference Material

1. Rhode Island Department of Environmental Management Division of Air and Hazardous Materials Complaint Report #89-1415, dated December 6, 1989.
2. Certificate of Analysis from Rhode Island Analytical regarding Airport Autobody samples, dated January 22, 1990.
3. Underground Storage Tank Closure Report for 2000 Post Road, Warwick, Rhode Island. Cistar Associates, Inc. January 23, 1995.
4. UST Closure Assessment: Hertz Corporation, T.F. Green Airport, Warwick, Rhode Island. Hoffman Engineering, Inc. January 9, 1995.
5. UST Closure Assessment: Northstar Aviation, T.F. Green Airport, Warwick, Rhode Island. Triangle Environmental. October 19, 1994.
6. UST Closure Assessment: Plat 321, Lot 4, Airport Road, Warwick, Rhode Island. Triangle Environmental. July 11, 1994.
7. Closure Certificate for Underground Storage Facilities: T.F. Green Airport. RIDEM. November 21, 1994.
8. Site Survey Summary Sheet for DERP-FUDS Site NO. D01RI034000, T.F. Green Airport. Department of the Army. October 1, 1991.
9. Certificate of Closure for Underground Storage Facilities: Airport Shell Station. RIDEM. September 25, 1986.
10. Application for Underground Storage Facilities: Shell Oil Company. RIDEM. November 18, 1985.
11. Certificate of Registration for Underground Storage Facilities: Supreme Dairy Farms, 111 Kilvert Street, Warwick, Rhode Island. RIDEM. January 31, 1995.
12. Certificate of Registration for Underground Storage Facilities: D'Ambra Construction, 800 Jefferson Boulevard, Warwick, Rhode Island. RIDEM. January 31, 1995.
13. Underground Tank and Line Testing Job Report: Exxon Company USA. Crompco Corporation. July 17, 1996.
14. Certificate of Closure for Underground Storage Facilities. Johnson and Wales College, 2082 Post Road, Warwick. RIDEM. May 11, 1989.
15. Closure Certificate for Underground Storage Facilities: Matec Building, Johnson and Wales University. RIDEM. November 2, 1994.
16. Underground Storage Tank Registration Form for Existing Tanks, Replacement Tanks, and Installation of New Tanks: Leviton Manufacturing, Inc., 745 Jefferson Boulevard, Warwick, Rhode Island. RIDEM. January 13, 1993.
17. Letter from RIDEM to Mr. Robert S. Potter regarding Cathodic Protection and Interior Lining Upgrade for USTs at Pro Oil Texaco located at 1995 Post Road, Warwick Rhode Island. Dated July 23, 1998.
18. Certificate of Closure for Underground Storage Facilities: Avis Rent-A-Car, 2033 Post Road, Warwick, Rhode Island. RIDEM. January 14, 1992.
19. Application for Underground Storage Facilities: Avis Rent-A-Car, 2033 Post Road, Warwick, Rhode Island, RIDEM, July 20, 1987.
20. Closure Inspection Report for Underground Storage Facilities: National Car Rental, 2053 Post Road, Warwick, Rhode Island. RIDEM. October 15, 1993.
21. Certificate of Closure for Underground Storage Facilities: Airport Texaco, 1965 Post Road, Warwick, Rhode Island. RIDEM. November 15, 1985.

22. **Baseline Environmental Assessment: Exxon Facility R/S #3-9869, 2003 Post Road, Warwick, Rhode Island. Geologic Services Corporation. November, 1996.**
23. **State of Rhode Island and Providence Plantations Inter-Office Memo dated February 15, 1995, regarding UST Closure at Leviton Manufacturing.**
24. **Closure Certificate for Underground Storage Facilities: Leviton Manufacturing. RIDEM. February 21, 1995.**
25. **Final Site Inspection Report for New England Wood Preserving Company, Warwick, Rhode Island. Roy F. Weston, Inc. April 31, 1993.**
26. **Preliminary Assessment – Plus: Kenney Manufacturing Company, Warwick, Rhode Island. TRC Companies, Inc. August 28, 1992.**
27. **Field Investigation Report: Sea Pro Boat, Inc. Department of Environmental Management Division of Air and Hazardous Materials. June 18, 1990.**
28. **State of Rhode Island and Providence Plantations Inter-Office Memos regarding Sea Pro Boats, Inc. June 29, and December 19, 1989.**
29. **Notice of Violation and Order: Sea Pro Boats, Inc. RIDEM Division of Air and Hazardous Materials. January 4, 1990.**
30. **RIDEM Division of Air and Hazardous Materials Complaint Report regarding Sea Pro Boats, dated October 10, 1989.**
31. **Brownfields Site Assessment: T.H. Baylis, Warwick, Rhode Island. RIDEM Office of Waste Management. February, 1998.**
32. **Supplemental Soil and Groundwater Assessment: T.H. Baylis, Warwick, Rhode Island. RIDEM Office of Waste Managemetn. August, 1998.**

6.2 Personal Visits

A) Warwick Town Hall: Mr. Chris Reynolds, October 29, 1998, Nora Klein, November 24, 1998
- Tax Assessor's Office
- Clerk's Office
- Building Department

B) Rhode Island Department of Environmental Management: Mr. Chris Reynolds, October 22, and November 19, 1998.
- Office of Compliance and Inspection
- Office of Technical Assistance
- Division of Site Remediation

C) Rhode Island Department of Environmental Management: Mr. Chris Reynolds, October 29, 1998.
- Division of Underground Storage Tanks
- Office of Water Resources

D) Rhode Island Historical Society: Mr. Chris Reynolds, October 27, 1998.

E) Site Reconnaissance: Mr. Chris Reynolds, October 15, and November 19, 1998.

F) Rhode Island Department of Administration, Aerial Photography: Mr. Chris Reynolds, October 15, and November 16, 1998.

6.3 Historical Survey

National Register of Historic Places Registration Form, prepared by Edward Connors and Associates, December 1998 (DRAFT, 3/2/99).

Draft Report of a Phase 1B Archaeological Excavation at the Leviton, Budget Rental, and Baylis Properties in Warwick, Rhode Island, prepared by Timelines, Inc., May 17, 1999.

NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

DRAFT
3/2/99

National Register of Historic Places Registration Form

1. Name of Property

historic name: Hill's Grove

other name/site number: Rhode Island Malleable Iron Works, Elizabeth Mill, Leviton Manufacturing Co.

2. Location

street & number: 745 Jefferson Boulevard and vicinity

not for publication: N/A

city/town: Warwick vicinity: N/A

state: RI county: Kent

3. Classification

Ownership of Property: Private

Category of Property: site

Number of Resources within Property:

Contributing	Noncontributing	
69	11	buildings
1		sites
0		structures
		objects
70	11	Total

Number of contributing resources previously listed in the National Register: 0

Name of related multiple property listing: N/A

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ___ meets ___ does not meet the National Register Criteria.

____ See continuation sheet.

Signature of certifying official Date

State or Federal agency and bureau

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

____ See continuation sheet.

Signature of commenting or other official Date

State or Federal agency and bureau

5. National Park Service Certification

I hereby certify that this property is:

_____ entered in the National Register _____ _____
_____ See continuation sheet.
_____ determined eligible for the National Register _____ _____
_____ See continuation sheet.
_____ determined not eligible for the National Register _____ _____
_____ removed from the National Register _____ _____

_____ other (explain): _____

Signature of Keeper Date of Action

6. Function or use

Historic: Industry, worker housing Sub: Manufacturing,
Current: Industry, private residential Sub: Manufacturing

7. Description

Architectural Classification:

Romanesque Revival
20th century industrial
Greek revival

Other Description: _____

Materials: foundation granite, brick roof _____
walls brick, wood other _____

Describe present and historic physical appearance.

X See continuation sheet.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties: locally

Applicable National Register Criteria: A, B and C

Criteria Considerations (Exceptions): N/A

Areas of Significance: Industry, Architecture

Period(s) of Significance: 1867 1926

Significant Dates: 1867 1875 1918

Significant Person(s): Thomas Jefferson Hill

Cultural Affiliation: N/A

Architect/Builder:

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

X See continuation sheet.

9. Major Bibliographical References

X See continuation sheet.

Previous documentation on file (NPS):

__ preliminary determination of individual listing (36 CFR 67) has been requested.
__ previously listed in the National Register
__ previously determined eligible by the National Register
__ designated a National Historic Landmark
__ recorded by Historic American Buildings Survey # ___
__ recorded by Historic American Engineering Record # ___

Primary Location of Additional Data:

___ State historic preservation office
___ Other state agency
___ Federal agency
___ Local government
___ University
x Other -- Specify Repository: Rhode Island Historical Society Library
121 Hope Street
Providence, RI 02903

10. Geographical Data

Acreage of Property: 600 acres

UTM References:	Zone	Easting	Northing		Zone	Easting	Northing
A	19	296350	4622600	B	19	296350	4621780
C	19	296420	4621780	D	19	296420	4622620

_____ See continuation sheet.

Verbal Boundary Description: X See continuation sheet.
Boundary Justification: X See continuation sheet.

11. Form Prepared By

Name/Title: Edward Connors, Project Manager

Organization: Edward Connors and Associates Date: December 1998
Street & Number: 14 Brook Street Telephone: 401 433-2871
City or Town: Barrington State: RI ZIP: 02806

DESCRIPTION

The Hillsgrove Mill Village Historic District is located on a flat, former agricultural tract of central Warwick known historically as the "plains." In the early 19th-century, this topography attracted the attention of rail surveyors planning the Providence & Stonington Railroad and, in the 20th-century it attracted the nascent airline industry, the subsequent growth of which (along with automobile-based development) has come to dominate the area. Within its bounds are two adjoining mill complexes first developed after the Civil War, a mill village to the west and south of the mills, and a mixed neighborhood of single-family mill and private houses north of Kilvert Street. This area is dominated by the 1875 Elizabeth Mill (fronting on Jefferson Boulevard), and an Amtrak line (the descendant of the Providence & Stonington Railroad line that first traversed Warwick in 1837). The Elizabeth Mill, a 3-story brick structure with front and rear towers, is now the northernmost of a series of attached buildings of Leviton Corporation, a manufacturer of electrical components. It has been altered most notably by the removal of its original windows and mansard tower roof. The southern elevation of the original mill, which included a picker house and a separate power house, was incorporated into a modern, 1-story addition built by Leviton in 1957. Leviton maintains a grove area behind the westernmost of these additions near the intersection of Graystone and Dorrance Streets. This space is for the use of Leviton employees and is enclosed by a chain-link fence. Despite this lack of access, it is a use similar to the original grove intended by Thomas Hill.

Next to the Elizabeth Mill is the site of the former Rhode Island Malleable Iron Works. Much of the original brick structure was lost in a 1918 fire; the current layout is the product of a rebuilding after the fire and the successive demolition of buildings related to the various industrial processes associated with the iron works. The 1918 1- to 2-story brick pier building is undistinguished but for its 2-story central block (see inventory). Across from the mills on the opposite side of Jefferson Boulevard is an area once maintained as a grove, for which the area took its name. In the early 20th-century this tree-lined, grassy meadow was sold off to various commercial and industrial interests. Leviton, however, still uses part of the former grove for employee parking. But for the 1957 abandonment of the east block of Dorrance Street to accommodate Leviton expansion, and the widening of Marvin (formerly Mill) Street, the street grid is essentially unchanged from that of the original late 19th-century rectilinear plan.

The Malleable Iron Works property dates to 1867. Immediately after its construction, Thomas Hill set about the building of worker housing in the lot behind the iron works, an area bounded by Kilvert Street on the north, Graystone Street on the west, Thurber Street on the south, and Cottage Street on the east. This block remains a single property of individual rentals today (Plat 278, Lot 30). It is composed of eight frame, one-and-a-half story, flank gable duplexes and one four-family house with a common center yard which at one time had a well and outhouses. Despite alterations on the individual houses, the appearance of the block remains relatively intact due to minimal intrusions of additions, fences and outbuildings.

To the south of this block is an area defined by Thurber, Dorrance, Marvin, and Graystone. These two blocks contain a mix of duplexes similar to those described above, a succession of 2 1/2 story end gable houses on the west side of Cottage Street, and a four-family boarding house at the corner of Marvin and Thurber Streets. On Cottage, Quimby, and Blackburn Streets north of Kilvert is a mix of 2-story houses--some associated with the mills and some built privately in the late 19th century. To the south of the Elizabeth Mill along Jefferson Boulevard and Brownell (formerly Budlong) Street is a succession of

eleven 1 1/2-story duplexes similar to those west of the mills. These latter houses date from the period of expansion of the Elizabeth Mill.

Related to the historic district is an area on the east side of Jefferson Boulevard (north of Kilvert) and east of the railroad tracks defined by the extension of Kilvert Street. This area once included the Hill's Grove Depot (demolished) and a small commercial district that served the village. It was also the location of the schoolhouse; the Methodist, Roman Catholic, and Baptist churches; and the combination post office/store that now houses Sandwich Junction. Because of the intrusion of industrial properties, commercial growth along Post Road and Jefferson Boulevard, inaccessibility due to high-speed rail traffic, and the demolition or heavy alteration of buildings on east Kilvert Street, this area is not included in this nomination.

Inventory

Contributing structures include those industrial, commercial and company-built houses associated with the operation of the Rhode Island Malleable Iron Works under the ownership of Thomas Hill (from 1867 to 1892) and the operation of the Elizabeth Mill (1875 to 1926). There are also a number of private houses built by those drawn to the village for its quality as a "sylvan retreat," as one 19th-century account described it.

There are four general types of company-built houses referred to in the inventory below. These will be designated by the letters *A, B, C* and *D*. Departures from a standard form will be described in the individual listing. All houses are of frame construction.

Type A (photo No. 6): A 1 1/2-story, rectangular plan, flank-gable-roof duplex of frame construction with brick interior chimneys. Front and rear elevations are identical. These 8-bay houses were originally sheathed in clapboard with 6/6 double hung windows and a two-light transom over each of the doors. Greek Revival detailing includes a projecting cornice above the entrances and windows and a simple, pedimented gabled dormer at the center of the roof. The roofs are of asphalt shingle. The earliest company houses have granite slab foundations; later houses have brick foundations. The predominant front stair form consists of three steps of poured concrete. This is likely a 20th-century replacement of a simple wooden stringer stairway.

Type B (photo No. 7): A variation of type A with a series of four small attic windows below the roof line.

Type C (photo No. 8): A 2 1/2-story, single family, rectangular plan, end-gable-roof house with a 2-story bay window. There is a central interior chimney and matching gabled dormers at the center of the side elevations. Original sheathing was clapboard and detailing at the entrance included a simple shed roof with consoles. The foundation is brick; the roof is asphalt shingle. Original windows were 2/2 double hung.

Type D (photo No. 9): A 1 1/2-story, single-family, rectangular plan, end-gable-roof house with interior chimney. The 3-bay front elevation consists of two 2/2 double hung windows and an entrance with a bracketed hood and consoles and pendant. Original sheathing was clapboard, with a brick foundation and asphalt shingle roof.

CONTRIBUTING STRUCTURES

JEFFERSON BOULEVARD

697 Rhode Island Malleable Iron Works (1867 and 1918). A two-story, flat-roofed, brick pier and stone central block flanked by a single-story building (corner of Jefferson and Kilvert) and a two-story brick building (corner of Jefferson and Thurber) with segmental arch windows. Designed by Jackson, Robertson and Adams of Providence, the central block is notable for its limestone corner quoins, window lintels and Federal period entrance detailing. In 1962 Rhode Island Malleable Iron Works relocated to Providence. The building had subsequent use as a wire works and, again, as a foundry. Recent use has been a combination of light industrial and service companies. The complex now is mostly vacant with some commercial storage. *Photos 3 and 4*

745 Elizabeth Mill (1875) with non-contributing additions identified as B, C, D and E. This 3-story, 394' by 70' flat roofed building is of brick construction, its 45-bay front and rear elevations dominated by a central tower. In both the 4-story front and the 3-story rear towers the original mansard roof has been removed.[1] Above the third story front tower windows is the inscription: *Elizabeth Mill.* The original double-hung sashes have been replaced with modern windows on the front elevation. In the rear, original 12/12 double-hung windows are found on the first floor. Industrial buildings of this period often draw from different architectural styles; while the mansard roof and tower arched openings are Second Empire influences, a more general Romanesque influence is seen in the hoodmoulded windows and corbeled brick cornice. At the southwest corner of the building is a 1957 addition which incorporated the 1875 boiler and picker houses into its north elevation. The successive additions of Leviton Corporation extend into a large expanse of land used by the Elizabeth Mill for sheds and as the terminus of a rail spur line. *Photos 1 and 2*

The 1922 Sanborn map describes the use of the building as follows: carding, spinning and reeling on the first floor; combing, drawing, slubbing and fly frames on the second; spinning on the third. Interior floors are wooden plank.

At the rear of the building is an open concrete cistern, part of the original water supply that is now used for aeration. Directly behind the 1875 mill is a modern steel panel warehouse.

Apart from the removal of the mansard roofs, there were no major alterations or additions to the mill until the construction in the 1950s of a series of single-story brick expansions by Leviton Corporation. These buildings are described briefly in the Non-Contributing section of this inventory.

829-831 Elizabeth Mill house (ca 1880). A type A house with yellow vinyl sheathing, brick foundation, and a surviving projecting cornice and transom over the entrances. This mill house retains its original 6/6 double-hung windows.

832-834 Elizabeth Mill house (ca 1880). A type B house with white vinyl sheathing, shutters, brick foundation, and a gabled aluminum hood supported by aluminum columns at the front entrances.

833-835 Elizabeth Mill house (ca 1880). A type A house with yellow vinyl sheathing, shutters, brick foundation, and aluminum hood at the front entrances. The right hood is supported by wrought-iron columns. This house may be a type B mill house with the row of attic windows filled in.

846-848 Elizabeth Mill house (ca 1880). A type B house with asbestos shingle sheathing, a brick foundation and a bracketed hood at the front entrances.

847-849 Elizabeth Mill house (ca 1880). A type A house with green vinyl sheathing, a brick foundation, and aluminum hood at the front entrances.

855-857 Elizabeth Mill house (ca 1880). A type A house with yellow vinyl sheathing, shutters, brick foundation and aluminum hood at the front entrances.

865-867 Elizabeth Mill house (ca 1880). A type A house with white vinyl sheathing, brick foundation and aluminum hood at the front entrances.

875-877 Elizabeth Mill house (ca 1880). A type A house with yellow vinyl sheathing, brick foundation, and a four-bay enclosed porch with side entrance.

876-878 Elizabeth Mill house (ca 1880). A type B house with white vinyl sheathing, brick foundation, and a four-bay, screened central porch.

885-887 Elizabeth Mill house (ca 1880). A type B house with beige vinyl sheathing, brick foundation, and aluminum hood at the front entrances. *Photo 7*

BROWNELL (FORMERLY BUDLONG) STREET

48-50 Elizabeth Mill house (ca 1880). A type A house with yellow vinyl sheathing, shutters, a brick foundation, and aluminum hood at the front entrances.

GRAYSTONE (FORMERLY GROVE) STREET

102-104 Rhode Island Malleable Iron Works mill house (ca 1870). Type A house with intact clapboard sheathing, projecting cornice over two-light transom and Greek Revival detailing on its gabled dormer. Original 6/6 double-hung sashes have been replaced with modern windows. Foundation is of brick. This duplex and following entry (112-114 Graystone) were singled out in the 1981 RIHPC survey of Warwick as the least altered of the many mill houses in the district; they remain so at the time of this survey.

112-114 Rhode Island Malleable Iron Works mill house (ca 1870). Type A house as above with some applied stucco on the brick foundation. *Photo 6*

166-168 Elizabeth Mill house (ca 1880). Type B with white vinyl siding and replacement windows. This is the most heavily altered of the duplex mill houses. Interior chimneys have been replaced with sheet metal stacks; the gabled dormer has been removed.

THURBER (FORMERLY HAZARD) STREET

56-58 Elizabeth Mill house (ca 1870). Type A house with yellow vinyl sheathing, shutters, and two 1-bay entrance porches. The horizontal projecting element in the triangular gable pediment survived the application of vinyl siding. Windows are of the modern, replacement type.

69-71 Rhode Island Malleable Iron Works mill house (ca. 1870). Type A house with white asbestos shingles. The foundation is of granite, indicative of the earliest houses built by the Rhode Island Malleable Iron Works after 1867. The two-light transom has been filled and covered over; modern windows replace the originals. The diseased tree trunk at the front corner of the lot may be from Thomas Hill's original plantings.

77-79 Rhode Island Malleable Iron Works mill house (ca. 1870). A 2 1/2 story, four-family house with granite foundation and single-story symmetrical wings of early 20th-century construction. These wings have a concrete block foundation. Front and rear gabled dormers break through the eaves at the center of the roof line. This building has the same bay configuration as the Type A duplex. Sheathing is brown asbestos shingle; modern windows replace the originals. *Photos 12 and 16*

86-88 Elizabeth Mill house (ca. 1870). Type A house with white vinyl siding and replacement windows. Original entrance is altered, with aluminum hood. The foundation is brick.

89-87 Rhode Island Malleable Iron Works mill house (ca 1870). Type A house with wood shingle sheathing. The foundation is brick. The transoms have been filled or covered with a wood panel and the entrance has been altered.

BLACKBURN STREET

53-55 House (ca 1900). A 2 1/2-story, two-family house with a 2-story bay window. This house is similar to a Type C but for the double door entrance. It is sheathed in tan vinyl.

54-56 Mill house (1880?). Similar to a Type B mill house, it is sheathed in tan vinyl with pressure-treated porches and aluminum hoods. This house does not appear on the 1895 survey map. It does appear in this location on the 1922 Sanborn. Its design (window, door, and chimney placement) is very similar to that of a Type B mill house. Its concrete block chimney and foundation suggest that this dwelling may have been moved from elsewhere in the village and placed on this concrete foundation. *See also 44-46 Cottage Street.*

61 House (ca 1920). A 1 1/2-story rectangular plan, end gable house with enclosed full front porch. It is sheathed in wood shingle.

65 House (ca 1900). A 2 1/2-story, rectangular plan, 3-family house with open full (3-bay) front porch. It is sheathed in a mix of asbestos shingle (upper) and vinyl (lower).

66 House (ca 1890). A 1 1/2-story, rectangular plan, single-family house with cross gables and side porch. The house is sheathed in clapboard with an ornamental shingle pattern in the

gables. The windows are 2/2 double hung with a slightly projecting cornice. Despite the screening-in of the porch, original turned columns and balustrade railing are visible. *Photo 13*

72 House (ca 1890). A 1 1/2-story, rectangular plan, single-family house with cross gables and side porch similar to 66 Blackburn. The house is sheathed in vinyl. The porch, however, is open as original.

73 Herbert Kent House (ca 1885). A 1 1/2-story, rectangular plan, end gable house with a small gabled hood porch on wooden columns. It is sheathed in grey asbestos shingle with shutters. See also entry for 66 Cottage Street. When Kent purchased this land from Thomas Hill in 1884 it was specified in the deed that he build a "good, respectable dwelling." (Warwick Land Evidence Book 42:59) *Photo 11*

78 House (ca 1890). A 2 1/2-story, rectangular plan, 3-bay, end gable house with an open porch wrapping around part of the front and north sides. It is sheathed in grey asbestos shingle with vinyl sheathing in the eaves.

79 House (ca 1900). A 1 1/2-story, rectangular plan, end gable house with a small wing on the north side and an open porch. It is sheathed in white vinyl with shutters.

84-86 House (ca 1890). A 2 1/2-story, rectangular plan, end gable house with a 2-story bay window and open porch. It is sheathed in blue asbestos shingle.

85 House (ca 1890). A 1 1/2-story, rectangular plan, end gable house with a small wing on the north side and an open porch. It is sheathed in grey asbestos shingle.

91 House (ca 1890). A 1 1/2-story, rectangular plan, end gable house with matching shed dormers and an open porch. It is sheathed in yellow asbestos shingle.

COTTAGE STREET

44-46 Mill house (1880?). It is sheathed in blue vinyl with an enclosed 6-bay porch. This building may have been moved from elsewhere in the village. *See entry for 54-56 Blackburn Street above.*

50 House (ca 1890). A 2-story, square-plan, hipped roof house of three bays with an open porch. There is a side entry with a hipped roof and an exterior stairwell on the north side. The house is sheathed in green vinyl with a surrounding chain-link fence.

53 Elizabeth Mill house (before 1877). A 1 1/2-story, rectangular plan, end gable house with a small wing on the north side and an open porch. It is sheathed in grey asbestos shingle. There is a slight projecting cornice on the double-hung windows. This house was already standing at the time of the 1877 creation of Hill's Grove Plat. The 1922 Sanborn map shows this house sharing a double lot with 61 Cottage (below). *Photo 14*

56 House (ca 1890). A 1 1/2-story, rectangular plan, end gable house with a small wing on the south side and a full open porch. It is sheathed in yellow vinyl. The south addition has an exterior cinder block chimney.

61 Elizabeth Mill house (before 1877). A 1 1/2-story, rectangular plan, end gable house with an open porch. It is sheathed in white vinyl with shutters and an attached fiberglass-roof carport. *See entry for 53 Cottage Street.*

65 Elizabeth Mill house (ca 1890). A heavily altered, multi-family house with a gabled rear wing perpendicular to the street and a hip-roofed front wing parallel to the street. The front entrance has a hood with consoles. There is also a south elevation side entrance. Sheathing is white vinyl and asbestos shingle.

66 Herbert Kent House (ca 1882). A gothic revival cottage with an end gable and two symmetrical gabled wings with a 1-story bay window on the street elevation as well as the south side. An added side porch with concrete block foundation is on the south elevation. Despite the survival of the bargeboarding, replacement windows and vinyl sheathing have compromised the integrity of this house. A surviving clapboard unattached garage and barn give some idea of the original sheathing. *Photo 11*

71 Thomas J. Hill Cottage (ca 1890). A Type D house with yellow vinyl sheathing and shutters. This house is identified on the 1892 plat map as "Thomas Hill's Cottage." It is possible that Hill maintained a more modest cottage in this location around the time of the first development of the area. *Photo 10*

76 House (ca 1890). A Type D house with southeast side wing and porch. Sheathing is tan vinyl.

77 Elizabeth Mill house (ca 1890). A Type D house with original clapboard sheathing and projecting cornice over 2/2 windows. *Photo 9*

81 Elizabeth Mill house (before 1877). A Type D house with unattached garage. Sheathing is grey vinyl.

89 Elizabeth Mill house (before 1877). A Type D house with a northwest rear corner addition (with chimney) and an oculus on the north side below the eaves. Sheathing is blue asbestos shingle.

105-107 Rhode Island Malleable Iron Works house (ca 1870). A type A house with wood shingle sheathing and a granite foundation.

117-119 Rhode Island Malleable Iron Works house (ca 1870). A type A house with wood shingle sheathing and a granite foundation.

135-137 Elizabeth Mill house (ca 1880). A type C house with white tan vinyl sheathing subdivided for two families. A hip-roofed outbuilding sits at the front left of the chain-link enclosed property.

144-146 Elizabeth Mill house (ca 1880). A type A house with white vinyl sheathing, a stuccoed brick foundation, and a cinder block exterior chimney on the left side.

145 Elizabeth Mill house (ca 1880). A type C house with yellow vinyl sheathing, an aluminum hood at the front entrance and a chain-link fence.

152-154 Elizabeth Mill house (ca 1880). A type A house with white vinyl sheathing, a stuccoed brick foundation, and aluminum hood at the front entrances.

155 Elizabeth Mill house (ca 1880). A type C house with asbestos shingle sheathing. *Photo 8*

162-164 Elizabeth Mill house (ca 1880). A type A house with white vinyl sheathing, shutters, a brick foundation, wrought iron front railing, and aluminum hood at the front entrances.

163 Elizabeth Mill house (ca 1880). A type C house with wood shingle sheathing.

170-172 Elizabeth Mill house (ca. 1880). A type A house with tan vinyl sheathing and altered entrances.

173 Elizabeth Mill house (ca 1880). A type C house with white vinyl sheathing, a brick stairway, and aluminum hood at the front entrance.

181 Elizabeth Mill house (ca 1890). A type C house with a mix of white vinyl and shingle sheathing.

MARVIN (FORMERLY MILL) STREET

3 Elizabeth Mill boarding house (ca. 1880). A 2 1/2 -story house originally built as a four-family boarding house. It is now subdivided to six apartments. There are central gabled dormers on each roof flank. Both front and rear entrances have aluminum hoods. Sheathing is of white and tan vinyl.

11-13 Elizabeth Mill house (ca 1880). A type A house with green vinyl sheathing, a brick foundation, and fiberglass/aluminum hoods at the front entrances.

19-21 Elizabeth Mill house (ca 1880). A type A house with white vinyl sheathing, a brick foundation, and aluminum hood at the front entrances.

29-31 Elizabeth Mill house (ca 1880). A type A house with white vinyl sheathing, a brick foundation, and a gabled aluminum/vinyl hood supported by wrought-iron columns at the front entrances.

37-39 Elizabeth Mill house (ca 1880). A type A house with asbestos shingle sheathing, a brick foundation, and matching rough-faced stone stairs at the entrances. Although the two-light transom has been filled, the projecting cornice survives.

DORRANCE STREET

45-47 Elizabeth Mill house (ca 1880). A type A house with wood shingle sheathing, a brick foundation, and a gabled hood supported by wooden columns at the front entrances.

57-59 Elizabeth Mill house (ca 1880). A type A house with tan vinyl sheathing, a brick foundation, and a four-bay, central enclosed porch.

87-89 Elizabeth Mill house (ca 1880). A type B house with tan vinyl sheathing, a brick foundation, and aluminum hood at the front entrances.

KILVERT STREET

183 House (ca. 1900). A end-gambrel-roofed, rectangualr plan, frame house sheathed in a mix of asbestos shingle and vinyl. Three symmetrical shed-dormers are found on the lower roof pitch. The front entrance has a flat hood supported by two large Doric columns. A rear porch hood is supported by plain, turned columns. There is an unattached two-car garage to the left and rear of the property.

188 Rhode Island Malleable Iron Works industrial building (1919). A 28' x 40', 3-story, flat roofed brick building with concrete floors and roof. This building, identified on insurance maps as a pattern vault is of fireproof construction. It was built after the 1918 fire that destroyed many of the patterns in inactive use at the time of the fire.

202-204 This ca 1870 Rhode Island Malleable Iron Works mill house was destroyed by fire ca 1997. Its loss is a significant intrusion on the regularly spaced grid of mill houses on this otherwise well-preserved block. There is no building in this location now.

210-212 Rhode Island Malleable Iron Works mill house (ca 1870). A type A house with wood shingle sheathing and granite foundation.

220-222 Rhode Island Malleable Iron Works mill house (ca 1870). A type A house with wood shingle sheathing and granite foundation.

COMMON YARD ON BLOCK BOUNDED BY GRAYSTONE, COTTAGE, THURBER AND KILVERT STREETS:

Common yard of Plat 278, Lot 30 (see plat map). This inner yard was shared by the residents of the block. Two rectangular concrete sills are visible in the location of the common privies inscribed *L* for latrine on the 1922 Sanborn map. There is also a square piece of flagstone with the broken stub of an iron pipe rising from the center, the remains of a common well. Anecdotal evidence also suggests the existence of gardens. The large maple tree in this yard is likely from Hill's original plantings. A diseased stump of approximately 20' in height in the front yard of 69-71 Thurber Street may also be from that period. *Photos 14*-16

NON-CONTRIBUTING ELEMENTS

JEFFERSON BOULEVARD

745 Four Leviton additions to the Elizabeth Mill. Building B East (1958) is attached to the south elevation of the Elizabeth Mill. It is single-story, brick, 518' by 200'. In the same year, immediately to the west of this addition, Leviton built a 252' by 300' building (Building B West). A year later, Building C (1959) with dimensions of 415' by 300'. Later additions include Building D (1963), with dimensions of 353' by 300' and, later, Building E, with dimensions of 550' by 350'.

874 House (after 1930). A small, rectangular-plan, flank gable, frame house with a left side wing. This house is in the back of 876-878 Jefferson Boulevard (see entry below). It is sheathed in white vinyl with an exterior brick chimney on the north side.

KILVERT STREET

157 House (after 1930). A small, 1-story, end gable house with a gabled wing on the east side. Sheathing is wood shingle. The foundation is rough-faced concrete block.

163 Grove Diner (ca 1930). A heavily altered commercial building sheathed in vinyl.

175-177 House (after 1951). A 2-story, flank gable duplex with side entry.

GRAYSTONE STREET

146 House (after 1951). A modern garrison colonial built on one of two adjacent undeveloped properties sold in the 1926 auction of Elizabeth Mill properties.

156 House (after 1951). A modern garrison colonial as above.

COTTAGE STREET

45-47 House (after 1951). A modern ranch two-family house with symmetrical wings.

SIGNIFICANCE

Summary of Significance

The two mill complexes at Hillsgrove are the product of a century of expansion and adaptation of an industrial property first developed in the years immediately following the Civil War. The associated mill village, first platted in the late 1860s to house the workers of the Rhode Island Malleable Iron Works, retains much of its original appearance. Several factors have contributed to the relative isolation and, thus, distinctive aspect of this neighborhood: the minimal residential development along Jefferson Boulevard, the location of the village in the crook of an *L*-shaped industrial property, and the wooded area to the west of Graystone Street. While the individual mill houses are undistinguished and, in most cases, altered, their repetitive forms and symmetrical siting along the rigid grid formed by Kilvert, Graystone, Marvin, Dorrance, Thurber and Cottage Streets make these houses significant as a group. This paternalistic industrial village reflects the hand of 19th century industrialist and engineer, Thomas Jefferson Hill.

Hill, whose life spanned the 19th century (1805-1894), learned the machining and metalworking trades in Pawtucket early in its industrial history. He entered the employ of Samuel Slater for a short time as a young man, and was associated again with him in business until the time of Slater's death in 1835. Spawning numerous enterprises over the century, Hill was, throughout his later years, revered as a living link to Slater and the beginnings of the American industrial revolution. Most notable among his enterprises was the purchase of several hundred acres of agricultural land along the property of the Providence and Stonington Railroad on the plains of Warwick in 1863. There he established an iron works and a village, which he named Hill's Grove. As pointed out in the 1981 Historical Preservation Report, *Warwick, Rhode Island*, Hillsgrove was a village built on steam. Needing no waterpower for its operation, its siting was dependent on access to steam-powered railways and its establishment would have been impossible without the development of reliable, economical steam engines.[2]

The present complex comprises the 1875 Elizabeth Mill and its additions; the site of Rhode Island Malleable Iron Works as rebuilt after a fire in 1918; some 42 surviving worker houses to the west and south of the mills; and single-family mill and private houses along Cottage and Blackburn Streets.

The Hillsgrove Mill Village thus meets National Register **Criterion A** for its exemplification of the use of steam power in post-Civil War Rhode Island's metalworking and textile industries and as a surviving example of a paternalistic workers' village laid out by an industrial entrepreneur.

It meets **Criterion B** for its association with Thomas Jefferson Hill, a prominent Rhode Island industrialist, entrepreneur and public servant.

It meets **Criterion C** for its embodiment of the distinctive characteristics of late 19th- and early 20th-century New England mill architecture and worker housing.

Thomas Jefferson Hill

Thomas Jefferson Hill was born in Pawtucket, Rhode Island, in 1805. His father, a blacksmith, left Rehoboth, Massachusetts, five years earlier to find work in the growing industrial town where Samuel Slater had begun water-powered cotton spinning in 1793. According to one account young Hill was already at work in the White Mill by the age of eight. During these early years Hill was employed briefly by Samuel Slater. In 1821 the sixteen-year-old Hill entered an apprenticeship at the machine shop of Pitcher and Gay, also in Pawtucket. Pitcher and Gay built power looms based on the design of William Gilmore, who had introduced these machines to Rhode Island textile manufacturing in 1816. Hill learned toolmaking and metalworking during the nine years he spent with this company. In 1825 Hill married Betsey Brown, the daughter of Slater associate Sylvanus Brown.[3]

In 1828 members of the Slater family invested in the Providence Steam Cotton Manufacturing Company, one of the first American textile mills run exclusively on steam power. A few years later Samuel Slater, one of the original investors, came into complete ownership of this mill. As was common practice at the time, a machine shop was set up to repair and fabricate parts for the plant's machinery. Two years into the new operation, Slater hired Thomas Hill to run this machine shop. In 1832 Slater and Hill entered into a partnership that created the Providence Machine Works, a manufacturer of textile machinery.[4] Upon the death of Slater in 1835, his interest in the Machine Works was sold to other parties. With the rapid growth of the steam plant, Hill sought room for expansion. He purchased the former property of the Stonington Depot farther south on Eddy Street, moving the machine shop from its location within the mill complex. Hill purchased the remaining interest in this company, becoming sole proprietor in 1846.

Over a forty-year period Hill involved himself in various enterprises in Rhode Island and throughout New England. In 1837 he purchased the Lee Mill in Willimantic, Connecticut, manufacturing thread and machinery.[5] He joined with a group of Boston capitalists in 1850 to purchase a waterpower site on the Androscoggin River in Lewiston, Maine. Over the next few years they built four mills. Hill independently established a foundry and machine company, also in Lewiston.[6] In 1859 Hill purchased the Peckham Mill in East Greenwich, renaming it the Bay Mill and outfitting it with a capacity of 6,000 spindles. In 1866 he established the Providence Dredging Company, and in 1874, the Providence Pile Driving Company.[7]

Hill's Grove

With the purchase in 1863 of about 600 acres of land along the line of the Providence and Stonington Railroad, Hill embarked on his most ambitious enterprise. In partnership with Samuel Kilvert (who had been foundry foreman at the Providence Machine Works) and Smith Quimby, Hill established the Rhode Island Malleable Iron Works on the plains of Warwick in 1867. This area, called Colgrove's Corner (now the corner of Kilvert Street and Jefferson Boulevard) was described in a 1910 reminiscence as ". . .a forest or trees, dirt roads, [and] a few scattered farms." [8] Capitalized at $100,000, this steam-powered mill consisted of a brick building, 247 feet along Jefferson Avenue (the original name of the present boulevard) and 60 feet wide. This main building included an annealing room. An ell (165' by 60') used for molding, extended down Kilvert Street. The output of the mill was ship chandlery, agricultural implements and machinery. This mill property was defined by Jefferson Avenue, Kilvert Street, Dorrance Street, and Mill (now Marvin) Street. By 1869 the works employed thirty men.[9] The 1880 U.S. Census describes an operation utilizing one 15 HP steam engine and the labor of 44 operatives.[10]

The following description of the manufacturing process at the iron works appeared in Fuller's 1875 *History of Warwick:*

> In the melting process, the iron does not come in direct contact with the coal, as in ordinary furnaces used in the production of common castings, but is in a receptacle by itself, where the refining process is carried on by carefully skimming off the dross as it collects upon the surface, leaving only the pure metal for the moulder's ladle. This separation of the iron from the coal in the process of melting incurs an increased expenditure of coal, about a ton of the latter being required to bring a ton of iron to the desired point. After cooling, the castings are closely packed in iron boxes, iron scales being used in packing; the boxes are then placed in a furnace, where they are subjected to a certain degree of heat for the space of nine days, for the purpose of annealing them. The carbon is by this time thrown off, and they are found to be as tough and pliable as wrought iron. A multitude of different articles are thus manufactured. of all sizes and shapes, from garden rakes and coffee mills to the larger pieces used in connection with cotton and woolen machinery. They use principally for these purposes the kind of iron known to the craft as cold blast charcoal iron.[11]

Thomas Hill sold his holdings in the iron works around 1892. While engaged almost exclusively in war production, a fire broke out in the annealing room on August 24, 1918, quickly spreading to the roof. Three buildings were destroyed, including the 2-story brick main building. The company rebuilt a complex of 1- and 2-story brick pier buildings immediately after the fire. These buildings housed the following operations: an annealing room fronting on Jefferson Boulevard and Thurber Street; a central building housing the tumbling operation and offices; two iron foundries; a brass foundry; a pattern and carpenter shop; a core room; and a pipe fitting building at the rear of the property. At the time of the fire, a separate company, Rhode Island Fittings Co., was located within the complex, fronting on Thurber Street.

The Elizabeth Mill

Thomas Hill expanded his enterprise in 1875 with the erection of the Elizabeth Mill, named after his third wife, the former Elizabeth C. Kenyon. The 3-story building to the south of the iron works was 324 feet long along Jefferson Avenue and 70 feet wide. It included an 80' by 28' attached picker house at the southwest corner. Housing 20,000 spindles, the mill produced fine yarn thread and warps. By 1890 this capacity had been increased to about 28,000 spindles, with a staff of some 265 operatives. In 1910 the mill was expanded 70' on the north side, adding nine window bays.

A "sylvan retreat"

The 1895 Everts and Richards map indicates an area directly across Jefferson Avenue from the mills as a *grove*. This grove gave the name to the village that was created to house the workers of the iron works. An 1890 line drawing suggests that the grove extended some distance to the south beyond the rail spur line that curved behind the Elizabeth Mill.

Webb's Gazetteer describes "several houses" in its 1869 description of the village of Hill's Grove. These first houses were laid out symmetrically on the block defined by Thurber (formerly Hazard), Cottage, Kilvert, and Graystone (formerly Grove) Streets. This block consisted of nine duplexes and one four-family house with a common center yard (Plat 278, Lot 30). Hill constructed all but two of these buildings with granite foundations, switching to brick foundations on his later mill houses. As described by Fuller:" The village is not large, but is on the increase, several tasteful dwellings having been erected within the past year or two, and is entitled to a place in the sisterhood of enterprising villages in the town of Warwick." [12]

With the growing capacity of the mills, Hill expanded the worker housing at Hillsgrove. Most of the village was concentrated in the area to the west of the mills. By 1895 there were 42 single- and multi-family dwellings in the village, numbered among these was a group of duplexes, similar to those erected earlier, on Jefferson Avenue and Brownell (formerly Budlong) Street to the south of the mill. Construction after 1895 includes some infill along Graystone and Dorrance Streets. A description published in the *Board of Trade Journal* in 1890 gives some idea of life in the village:

> Since the [Elizabeth] mill was started a great improvement has been made in the surrounding property. In truth, it can be said that mill and the neighboring Rhode Island Malleable Iron Works have made a veritable town of what was before exhausted farm lands. Houses have been built in great numbers, not merely for the accommodation of the hundreds of people employed in the mills and iron works, but substantial private residences have, in considerable numbers, been built by Providence business men who gladly hasten to the sylvan retreat in this village at the close of each day from the busy hum and turmoil of city life.[13]

Hill attended to the needs of this community in varied ways. The grove was bounded by Jefferson Avenue, Kilvert Street, and the railroad tracks; Cottage Street (running through the center of the mill village) extended south to the edge of Crystal Lake. Shortly after forming the iron works, Hill spent $4,000 in the construction of a schoolhouse (1869) on the eastern section of Kilvert Street beyond the tracks. In 1870 Hill donated a lot to the east of the tracks and split the cost of a train depot with the Providence and Stonington Railroad. This depot has since been demolished. He donated land and a gift of $3,000 for the erection of a Methodist Church near the school on Kilvert Street.[14] The commercial district of Hillsgrove developed on the east side of the tracks along Kilvert Street. A 1910 account of this area describes two general merchandise stores, a barber shop, ice cream shop, and post office.[15]

Hill divested himself of his holdings in the iron works around 1892. He died in 1894 at the age of 89, his heirs retaining interest in the Elizabeth Mill. Among his many contributions to the civic life of Rhode Island were his seats on the Providence City Council (1848-52, 1855-56, 1878) and the Rhode Island General Assembly, as well as his association with banks, insurance companies and charities.

The end of an era

The movement of textile capital to the non-union south in the 1920s brought hard times to the Rhode Island textile industry. The Elizabeth Mill, which had known no serious interruptions in nearly fifty years of operation, reduced its hours to "short" time in 1923, closing its doors in the spring of 1926. About 400 workers, many of whom were renting houses in the village for as little as five dollars a month, lost their jobs. Many remained in the factory-owned houses awaiting word on a possible re-opening.

Fifty-three lots, including the mill and its housing were sold at public auction on August 24, 1926. As described in the Providence Journal, the sale included ". . .more than 200 acres of land, six one-family houses, 36 two-family houses, a superintendent's house at the corner of Post Road and Kilvert Street, a four-family boarding house, and the so-called Cranberry Hall, which is situated on the Post Road." [16] The mill itself, with a tax valuation of $250,000, sold for $60,000. The receipt for the entire property was $174,950.

Two years after the closing of the Elizabeth Mill, the Bourdon Aircraft Corporation set up shop on the first floor of the mill. On April 18 of that year the first "Kitty Hawk" plane came off the assembly line. This 22-foot long plane had a five-hour cruising range, a wing span of 28 feet, and a weight of 1,888 lbs. The company built only thirteen of these planes; in October 1929 the corporation announced that it was

leaving the state in a merger agreement with the Viking Flying Boat Company of New Haven, Connecticut. A spokesman for the manufacturer cited the ". . .failure of the State Airport Commission to make a suitable field for development of aviation in this State." [17] Shortly before Bourdon's incorporation, the State of Rhode Island had authorized the expenditure of $300,000 to create a Warwick airport. While not the first aircraft manufacturer in Rhode Island, Bourdon's location at Hillsgrove[18] links it to the air commerce that would come to dominate Warwick in the 20th century.

After the relocation of Bourdon Aircraft, the mill was occupied by the Consumer's Brewing Company from 1933 to about 1939. The Elizabeth Mill was purchased in 1941 by Leviton Manufacturing Company of Brooklyn, NY. This electrical components manufacturer, begun in a Brooklyn, NY, basement in the early 'teens by Isidor Leviton, had earlier purchased American Insulated Wire of Pawtucket, expanding its operation to Hillsgrove. Beginning in 1958, Leviton expanded the mill to the south and west, all one-story additions. At this time the original mill, as expanded 70' to the north in 1909, is used for office space. Leviton Corporation has now occupied the Elizabeth Mill longer than its original occupants.

MAJOR BIBLIOGRAPHICAL REFERENCES

Government Documents:

Warwick, RI. Statewide Historical Preservation Report K-W-1. Rhode Island Historical Preservation Commission, 1981

Tax Books, Warwick RI. 1867-1962

U.S. Government, Bureau of the Census, 1880. *Products of Industry*

Articles:

Bell, Hattie. "Sixty Years Ago." *The Hills Grove Star* 1 (March 1910): 1

"Bourdon Aircraft Company Merged; To Leave State." *Providence Journal* (17 October 1929): 14

"Elizabeth Mills Sold For $174,950." *Providence Journal* (25 August 1926): 2

"Hillsgrove Fire Loss is $500,000." *Providence Journal* (25 August 1918): 7

"Hillsgrove Losing Grip on Industry." *Providence Journal* (1 August 1926): 4

"Hillsgrove Mills Will Be Reopened." *Providence Sunday Journal* (16 January 1927): 5

"How the cost of production was reduced." *Board of Trade Journal* 21 (April 1909):196-7

"Isidor Leviton Dies at 79, Founder of Leviton." *Providence Journal* (10 June 1965): 26

"Kitty Hawk Airplane Wins Official Sanction." *Providence Journal* (4 April 1929): 5

Place, Janice. "Thomas Hill started industrialization of Jefferson Blvd. over 100 years ago." *Warwick Beacon* (30 April 1981), Commerce and Industry Review

"Providence Machine Company." *Board Of Trade Journal* 1 (October-November 1890): 45

"Rhode Island Boasts Aeroplane Building Company." *Providence Magazine* 39 (December 1928): 510

"Thomas J. Hill." *Board of Trade Journal* 2 (1891): 340

Books/Directories:

Bayles, Richard M. (Ed.). *History of Providence County.* New York: W.W. Preston & Co., 1891

Cameron, E.H. *Samuel Slater, Father of American Manufactures.* Freeport, ME: Bond wheelwright, 1960

Cole, J.R. *History of Washington and Kent Counties.* New York: W.W. Preston and Co., 1889

D'Amato, Donald. *Images of America: Warwick.* Dover, NH: Arcadia Publishing, 1996

Davis, William T. (ed.) *The New England States,* Volume IV. Boston: D.H. Hurd and Company, 1897

Fuller, Oliver Payson. *The History of Warwick, Rhode Island.* Providence: Angell, Burlingame and Co., 1875

Grieve, Robert and John P. Fernald. *The Cotton Centennial, 1790-1890.* Providence: J.A. and R.A. Reid, 1891

Kulik, Gary and Julia C. Bonham. *Rhode Island: An Inventory of Historic Engineering and Industrial Sites.* Washington: Historic American Engineering Record, 1978

Representative Men and Old Families of Rhode Island, Vol. 1. Chicago, J.H. Beers and Co., 1908

Van Slyck, J.D. *Representatives of New England Manufacturers,* Vol. 1. Boston, Van Slyck and Co., 1879

Webb's New England Railway and Manufacturer's Gazetteer. Providence: Providence Press Co., 1869

Williams, Alfred and William F. Blanding. *Men of Progress.* Boston: New England Magazine, 1896

Maps and Insurance Drawings

MAPS:

Beers Atlas map of Hill's Grove (1870)

Plat of Old and New Roads at Hill's Grove, Warwick (1871). Plat card 22, Warwick City Hall

Plat of Building Lots at Hill's Grove Belonging to Thomas J. Hill. Plat card 76 (1877), Warwick City Hall

Plan of Lots at Hill's Grove Belonging to Thomas J. Hill. Plat card 113 (1892), Warwick City Hall

Map of Hills Grove Plat. Plat card 148 (1898), Warwick City Hall

Everts and Richards map of Hill's Grove (1895)

Portion of NY, NH & H Railroad operated by same from Survey Station 2814+55 to Sta. 2867+35 undated, showing station, platform and related buildings

Map of Land Belonging to Elizabeth Mill (July 1926), J.A. Latham and Son.
Plat card 346 (detail of card 345), Warwick City Hall

Warwick Tax Assessor's plat maps No. 277, 278, 322 and 323 (1998)

INSURANCE DRAWINGS:

Sanborn Insurance Maps (1922, 1945, 1951)

United Wire and Supply Corporation, Factory Mutual drawing (1953, revised 1978)

American Insulated Wire Corporation (Hillsgrove, RI), Factory Mutual drawing (1964)

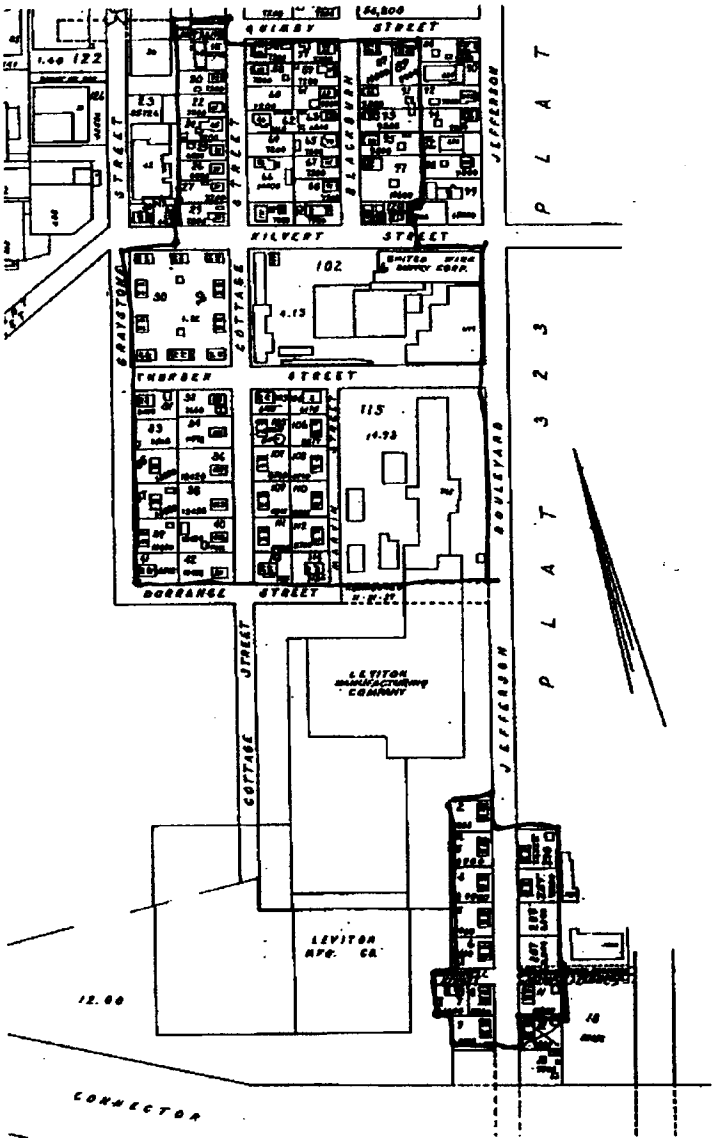
Geographical Data

Verbal Boundary Description:

The discontinuous boundaries of the Hillsgrove Mill Village conform to portions of Warwick Tax Assessor's Plat 277 and 278 as shown on the accompanying map.

Boundary Justification:

These boundaries define the land, mills and village of worker housing historically associated with the Rhode Island Malleable Iron Works and the Elizabeth Mill. This period extends from the creation of the iron works (1867) and the platting of Thomas Hill's land for residential development to the time of the closing of the Elizabeth Mill (1926).



Photographs:

Hillsgrove Mill Village
745 Jefferson Boulevard and vicinity
Warwick
Kent County, Rhode Island

Photographer: Edward Connors

Date: November and December 1998, January 1999

Original Negatives: Rhode Island Historical Preservation and Heritage Commission
150 Benefit Street, Providence, RI 02903

1. Tower and partial front elevation of Elizabeth Mill, view west

2. Partial rear elevation of Elizabeth Mill, view southeast

3. Rhode Island Malleable Iron Works, view southwest

4. Rhode Island Malleable Iron Works, view northwest

5. Rhode Island Malleable Iron Works pattern vault (188 Kilvert Street), view south

6. Type A mill house (112-114 Graystone Street), view southeast

7. Type B mill house (885-887 Jefferson Boulevard), view southwest

8. Type C mill house (155 Cottage Street), view southwest

9. Type D mill house (77 Cottage Street), view northwest

10. Thomas Hill Cottage (71 Cottage Street), view northwest

11. Herbert Kent House (66 Cottage Street), view east

12. Four-family mill house (77-79 Thurber Street), view north

13. House (66 Blackburn Street), view southeast

14. House (53 Cottage Street), view northwest

15. Common yard of Plat 278, Lot 30, view southwest
    Showing old well location and what is likely a maple tree from Hill's original plantings

16. Common yard of Plat 278, Lot 30, view south
    Showing soncrete sill of common privy with 77-79 Thurber Street in background.

Notes:

1. The front mansard was removed before 1910; the rear survived until at least 1959.

2. Despite its historic connection to steam, in 1909 the Rhode Island Malleable Iron works was one of the first area plants to convert from steam to electric motor operation. This process was described in an April 1909 *Board of Trade Journal* article. See: "How the Cost of Production was Reduced" (page 196).

3. The Sylvanus Brown House is located at the Slater Mill Historic Site in Pawtucket.

4. The surviving buildings of the Providence Machine Works are located at 564 Eddy Street in Providence.

5. Hill divested himself of this mill in 1845.

6. The machine shop was closed in 1856; his remaining interest in the foundry was sold in 1866.

7. This latter company built the Crawford Street Bridge for the City of Providence.

8. Hattie Bell. "Sixty Years Ago." *The Hills Grove Star* 1 (March 1910): 1. In her article Bell refers to the area as "Colgrow's Corner."

9. "Hill's Grove." *Webb's New England Railway and Manufacturer's Statistical Gazetteer*: 423

10. 1880 U.S. Census (manuscript), *Products of Industry*

11. Oliver Payson Fuller, *The History of Warwick* (1875): 269.

12. Ibid, p. 270

13. "The Elizabeth Mill." *Board of Trade Journal* 1 (October/November 1890): 54

14. In 1900 the Hill Estate donated land for the erection of a Roman Catholic Church on Jeffferson Street, prior to this time Catholic families in the village, among them French-Canadians, had been conducting worship in the school on Kilvert Street. This was followed in 1907 by the donation of land for the erection of a Swedish Baptist Chapel.

15. Hattie Bell, "Sixty Years Ago."

16. "Elizabeth Mills sold for $174,950." *Providence Journal* (25 August 1926): 2

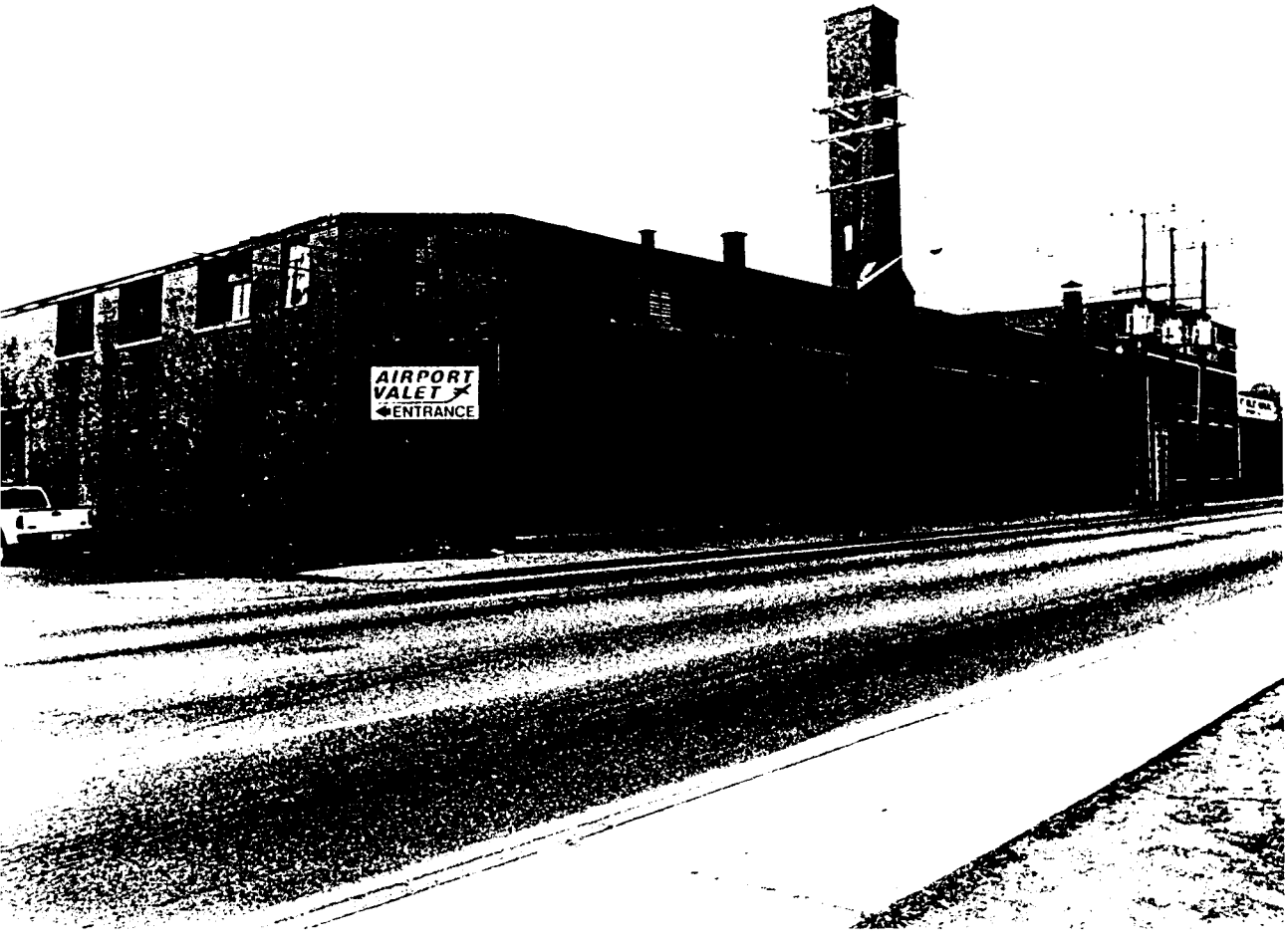
17. "Bourdon Aircraft Company merged; to leave state." *Providence Journal* (17 October 1929): 14

18. The spelling of Hill's Grove has changed progressively over the years. From its original two-word possessive, the apostrophe was dropped by early in the twentieth century--although it remained two words. In our time, the two words have become one.

No 1.

No 2

No. 3



No. 4

No.5

No.6

No. 7

No. 8

No. 9

No. 10

No. 11

No. 12

No. 13

No. 14

No. 15

No. 16

DRAFT REPORT OF A

PHASE 1B ARCHAEOLOGICAL EXCAVATION

AT THE LEVITON, BUDGET RENTAL,

AND BAYLIS PROPERTIES

IN WARWICK, RHODE ISLAND

Prepared for:

Edwards and Kelcey, Inc.
95 Cedar Street, Suite 102
Providence, Rhode Island 02903

Submitted By:

Deena Duranleau
Timelines, Inc.
410 Great Road, B-14
Littleton, MA 01460

May 17, 1999

Table of Contents

LIST OF FIGURES AND TABLES iii

I. ABSTRACT 1

II. MANAGEMENT SUMMARY 2

III. PROJECT INFORMATION 3
- A. Project Location 3
- B. Project Description 3

IV. RESULTS OF PREVIOUS INVESTIGATIONS 5
- A. Environmental Context 5
- B. Archaeological Research 5
  - 1. Known Archaeological Sites 5
  - 2. Potential For Archaeological Sites 5
- C. Historic Background 6
  - 1. Leviton and Budget Rental Car Parking Lots 6
  - 2. Baylis Property 9

V. PHASE 1B RECONNAISSANCE SURVEY 11
- A. Research Design 11
- B. Research Objectives 11
- C. Field Work Methodology and Results 11
  - 1. The Budget Rental Property 11
    - a. Interpretations 12
  - 2. The Baylis Property 12
    - a. Trench A 12
    - b. Trench B 16
    - c. Trench C 17
    - d. Trench D 18
    - e. Interpretations 18
  - 3. Leviton Parking Lot 18
    - a. Trench 1 19
    - b. Trench 2 19
    - c. Trench 3 19
    - d. Trench 4 21
    - e. Trench 5 21
    - f. Trench 6 22
    - g. Trench 7 22
    - h. Trench 8 23
    - i. Trench 9 23
    - j. Trench 10 24
    - k. Interpretations 24

4. The Leviton Wooded Area 24
a. Block 1 24
b. Test Pits 25
c. Railroad Spur Trench 27
d. Railroad Trench 29
e. Interpretations 29
5. Elevated People Mover 29
E. Laboratory Processing and Analysis 30

VI. RECOMMENDATIONS 31

REFERENCES CITED 32

LIST OF FIGURES AND TABLES

Figure 1 - Project location on USGS quad map 4
Figure 2 - Map of project area showing groundwater depths 7
Figure 3 - USGS quad map showing the thirty meter contour interval 8
Figure 4 - 1889 lithograph of Elizabeth Mills, showing pasture in the present location of the Leviton parking lot (Rhode Island Historical Commission 1981:22) 9
Figure 5 - Everts and Richards atlas map of Hill's Grove (1895) 10
Figure 6 - Map of testing strategy for the Budget Rental property 13
Figure 7 - Wall profile of STP excavated on the Budget Rental property 14
Figure 8 - Map of testing strategy for the Baylis property 15
Figure 9 - Wall profile of Trench B STP excavated on the Baylis property 17
Figure 10 - Map of testing strategy for the Leviton property 20
Figure 11 - Wall profile of dug pit in Trench 6 22
Figure 12 - Wall profiles of test pit and trench from the Leviton Woods 28

I. ABSTRACT

An intermodal train station connecting the railroad and airport is proposed for the Budget Rental, Baylis, and Leviton properties in Warwick, Rhode Island. A Phase 1B archaeological survey was conducted under Permit No. 99.3 on these three properties to look for evidence of Narragansett Indian and significant historic habitation. No archaeological resources indicating Narragansett habitation were identified. The only artifacts recovered were associated with farming and railroad construction and maintenance.

II. MANAGEMENT SUMMARY

As part of an Environmental Assessment , a Phase 1B archaeological survey was conducted on the Budget Rental, Baylis, and Leviton properties in Warwick, Rhode Island. The goals of a Phase 1B Reconnaissance Survey as described by the RIHPHC (1998) are "(1) to determine if the project area contains recorded archaeological sites, (2) to evaluate the area's potential for containing archaeological sites that have not yet been discovered and recorded, and (3) to make recommendations for further intensive testing in specific areas." This survey involves "only minimal subsurface testing to evaluate soil disturbances and profiles, or to evaluate predictions concerning the presence of archaeological sites (7-8). Upon completion of this survey, Timelines archaeologists and the Narragansett Indian Tribal Historic Preservation Office determined that no evidence of Narragansett Indian or significant historic occupation was uncovered during this archaeological survey and recommended that no further archaeological investigations were warranted.

I. PROJECT INFORMATION

A. Project Location

The project is located on the East Greenwich USGS quadrangle in the city of Warwick, Rhode Island. The Leviton and Budget Rental properties are located along Jefferson Boulevard across from the Leviton building and the Rhode Island Malleable Iron Works factory. The Baylis property is located on the eastern side of the railroad tracks, at the intersection of Glenham Avenue and Fresno Road (Figure 1).

B. Project Description

The Rhode Island Department of Transportation (RIDOT) is installing an intermodal train station on Jefferson Boulevard in the Leviton and Budget Rental Car parking lots. On the east side of the railroad tracks, the station will extend onto the Baylis Property. The total area impacted by this construction is approximately 7.28 acres. This project also includes the installation of an elevated people mover, which will extend eastward along Fresno Road from the Baylis property to the airport terminal and includes two lobby areas.

Before this train station is built, an Environmental Assessment of the area must be completed. Part of this assessment calls for an evaluation of the potential that these properties contain archaeological resources. In order to assess this potential, the Rhode Island Historical Preservation and Heritage Commission (RIHPHC) and the Narragansett Indian Tribal Historic Preservation Office (NITHPO) requested a Phase 1B Reconnaissance Survey be conducted by Timelines archaeologists. The goals of a Phase 1B Reconnaissance Survey as described by the RIHPHC (1998) are "(1) to determine if the project area contains recorded archaeological sites, (2) to evaluate the area's potential for containing archaeological sites that have not yet been discovered and recorded, and (3) to make recommendations for further intensive testing in specific areas." This survey involves "only minimal subsurface testing to evaluate soil disturbances and profiles, or to evaluate predictions concerning the presence of archaeological sites (7-8).

In order to meet these goals, Timelines archaeologists excavated 50 x 50 cm. test pits in transects, and used heavy machinery to excavate 20 x 1.5 m. trenches in areas deemed testable by archaeologists, in conjunction with representatives of the Narragansett Indian Tribal Historic Preservation Office (NITHPO).

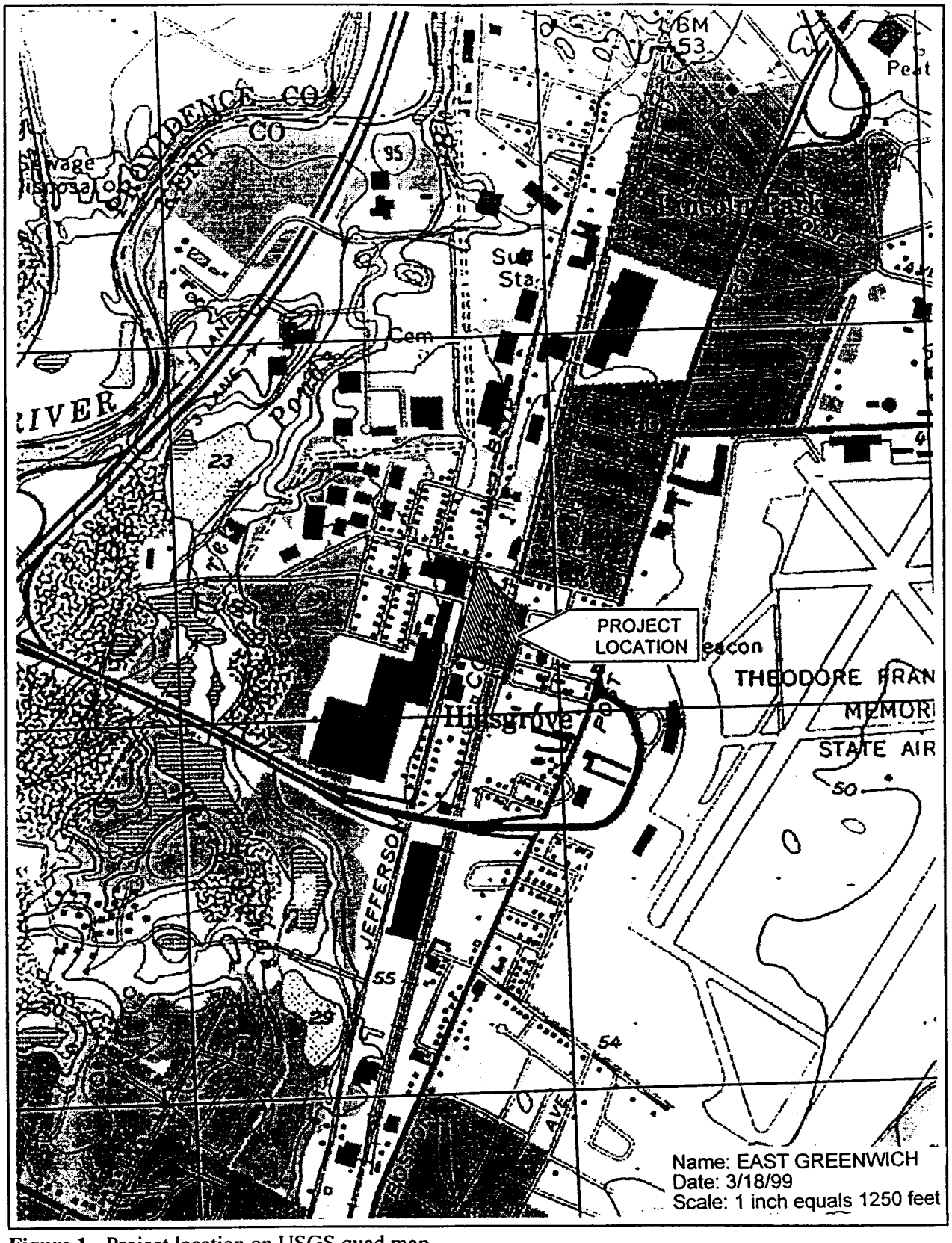


Figure 1 - Project location on USGS quad map.

III. RESULTS OF PREVIOUS INVESTIGATIONS

A. Environmental Context

The soils in the Baylis property and the Leviton and Budget Rental parking lots are described as urban land in the Soil Survey of Rhode Island (United States Department of Agriculture 1981). According to the USDA, "These areas consist mostly of sites or buildings, paved roads, and parking lots. Most areas are in intensely built-up portions of Providence and Newport Counties...Slopes range from 0 to 10 percent but are dominantly 0 to 5 percent." (USDA 1981:42). The portion of the Leviton property located northeast of the railroad spur was described as Merrimac Urban land complex, which consists of well drained Merrimac soils and areas of Urban land. According to the USDA, these soils are:

> on terraces and outwash plains in densely populated areas of the state...Slopes are mainly about 1 percent but range from 0 to 15 percent. The complex is about 40 percent Merrimac soil, 40 percent Urban soils, and 20 percent other soils...Typically the Merrimac soils have a surface layer of dark brown sandy loam 8 inches thick. The subsoil is yellowish brown and dark yellowish brown sandy loam 17 inches thick. The substratum is light yellowish brown gravelly sand to a depth of 60 inches or more. (USDA 1981:24).

B. ARCHAEOLOGICAL CONTEXT

1. Known Archaeological Sites

Previous archaeological research of the area along the railroad right of way was conducted by the Public Archaeology Laboratory Inc. (PAL). The conclusion reached by PAL in their "Phase I Archaeological Assessment Survey, Freight Rail Improvement Project" and agreed to by the Rhode Island Historical Preservation and Heritage Commission was that there were no significant archaeological resources within the railroad right of way and therefore, "no additional archaeological investigations are required" (letter from RIHPHC to Deborah Cox, president of PAL: March 26, 1997). This investigation eliminates the need for archaeological testing along the railroad right of way, but it doesn't eliminate the need for archaeological investigations on either side of this right of way.

Although there are no Narragansett Indian sites documented by the RIHPHC in the area, it is believed that human burials were encountered when the airport was being built in the 1930s. The airport is within 1500 feet of the proposed train station.

Our historic research also indicates that there are no historic structures that will be impacted by the proposed development on any of the properties.

2. Potential for Archaeological Sites

Archaeological sites have been identified in a variety of settings, but are found most often in particular environmental contexts (Funk 1972; Root 1978; Thorbahn et. al. 1980; McManamon 1984; Mulholland 1984; Thorbahn 1984; Nicholas 1990). Archaeological potential models have been developed to predict

the location of archaeological resources.

In southern New England archaeology, site location is typically linked to three variables -- terrain, soils, and water -- in the formula "flat to low slope, well-drained sandy soil, near water." These variables, in turn, combine with other factors, which include the collection of special resources (e.g. lithic material for tools, clay, seasonal nuts, fruits, and seeds, small fish, game, etc.), the pursuit of special tasks, often seasonally determined (e.g. the exploitation of fish runs), and the use of transportation routes (provided by bays, rivers, brooks, and streams). The combination of all these factors provides a framework within which the settlement of Warwick, and indeed most of southern New England, can be analyzed, and upon which archaeological site location is predicted.

The areas which will be impacted by the construction of the Intermodal Train Station meet all of these requirements. Based on an analysis of the groundwater and topography of the area, we know that the natural stratigraphy of the project area is slightly elevated because the groundwater drains down from this area into the Three Ponds wetland complex (Figure 2). The project area is also located inside the thirty meter contour interval, a contour which extends to within 800 feet of this wetlands complex (Figure 3) . Narragansett Indian knowledge, perhaps most importantly, also indicates that the whole area, stretching back from Narragansett Bay towards Three Ponds and the presently name Pawtuxet River, was once a large Narragansett Indian metropolis (personal communication:John Brown, March 1999). All of these factors indicate that the project area has a high potential for containing evidence of Narragansett Indian habitation.

C. Historic Background

1. Leviton and Budget Rental Car Parking Lots

The areas east of Jefferson Boulevard that will be impacted by the building of the train station are presently parking lots for the Leviton Manufacturing Company and Budget Rental Car. The Leviton Manufacturing Company itself is located on the west side of Jefferson Boulevard and will not be impacted by the train station, but the company's use of the project area as a parking lot has altered the area's topography.

Leviton, an electrical components manufacturer, has been in its present location since 1941. From 1933 to about 1939, the property was owned by the Consumer's Brewing Company. In 1928, the Bourdon Aircraft Corporation bought the property and began producing "Kitty Hawk" planes. This company closed its doors in October of 1929 and relocated to New Haven, Connecticut. Before 1926, this property and its buildings were called the Elizabeth Mills, named after the wife of Thomas Hill, one of the founding fathers of mill building in Rhode Island (Connors 1998).

In 1863, Thomas Hill (1805-1894) bought about 600 acres of agricultural land on the plains of Warwick, along the line of the Providence and Stonington Railroad, which was completed in 1837. There, he established an iron works and the village of Hill's Grove. The iron works, named the Rhode Island Malleable Iron Works, is located north of Elizabeth Mills, on the west side of Jefferson Boulevard. At this time, Thomas Hill also established a grove on the land between the railroad tracks and Jefferson Boulevard, extending south from Kilvert Street to the railroad spur, from which he derived the name of the village (Connors 1998).

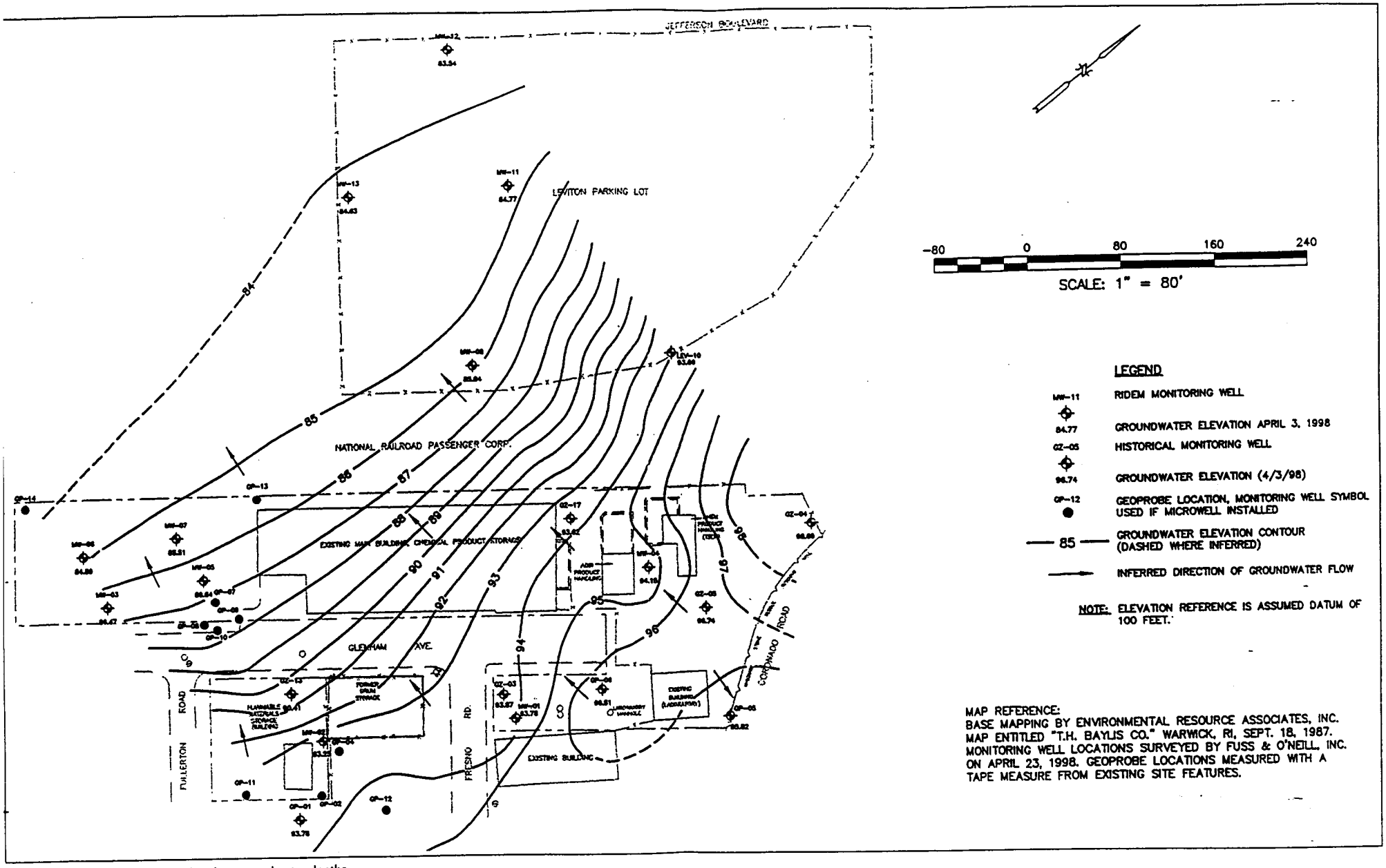


Figure 2 - Map of project area showing groundwater depths

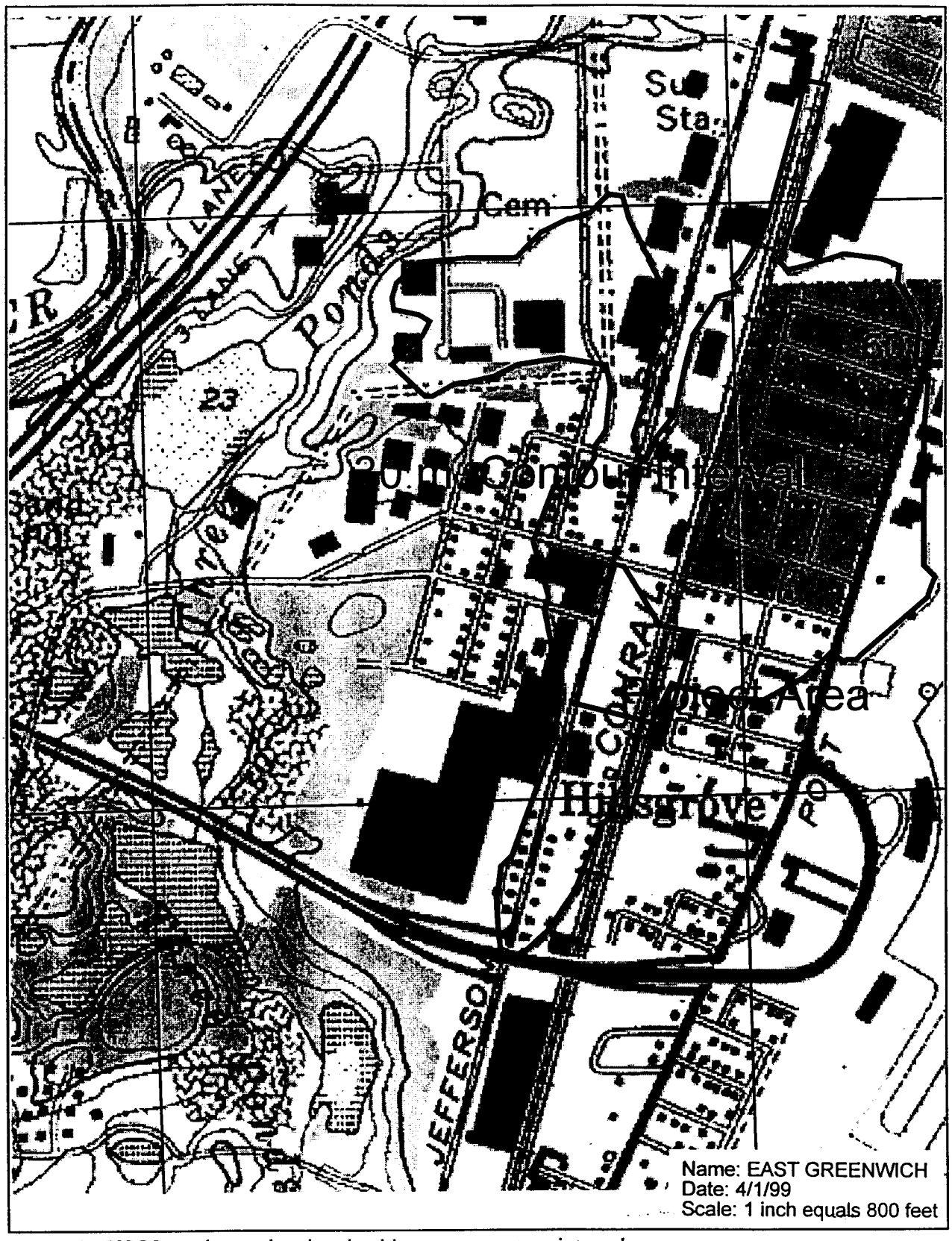


Figure 3 - USGS quad map showing the thirty meter contour interval

Thomas Hill expanded his business in 1875 with the building of Elizabeth Mill south of the Iron Works, on the west side of Jefferson Boulevard. This mill produced cotton thread, and after fifty years of uninterrupted service, finally closed its doors in 1926, when it was sold at public auction for less than one quarter of its value (Connors 1998).

The grove on the eastern side of Jefferson Boulevard includes the locations of the current parking lots. Based on the historical maps of this area and descriptions of the property (see Figures 4 and 5), this area has never been built upon. This indicates that there may be soil horizons under the asphalt which have been plowed, but have not undergone any serious alteration.

2. *The Baylis Property*

The Baylis property, located on the eastern side of the railroad tracks, was included in the 600 acre purchase Thomas Hill made in 1863. The historic map shows that this property was left undeveloped by Hill (Figure 5). It isn't until 1946 that the property is finally built upon. By the 1950's, the property is being used for industry, which over the next twenty years included a pressure treated lumber company, a plastics company, and another lumber company (Beta Engineering 1998:16). The present building shown on the plat map of the property wasn't built until 1979, when the T.H. Baylis Company began utilizing the property for chemical distribution and hazardous waste storage.

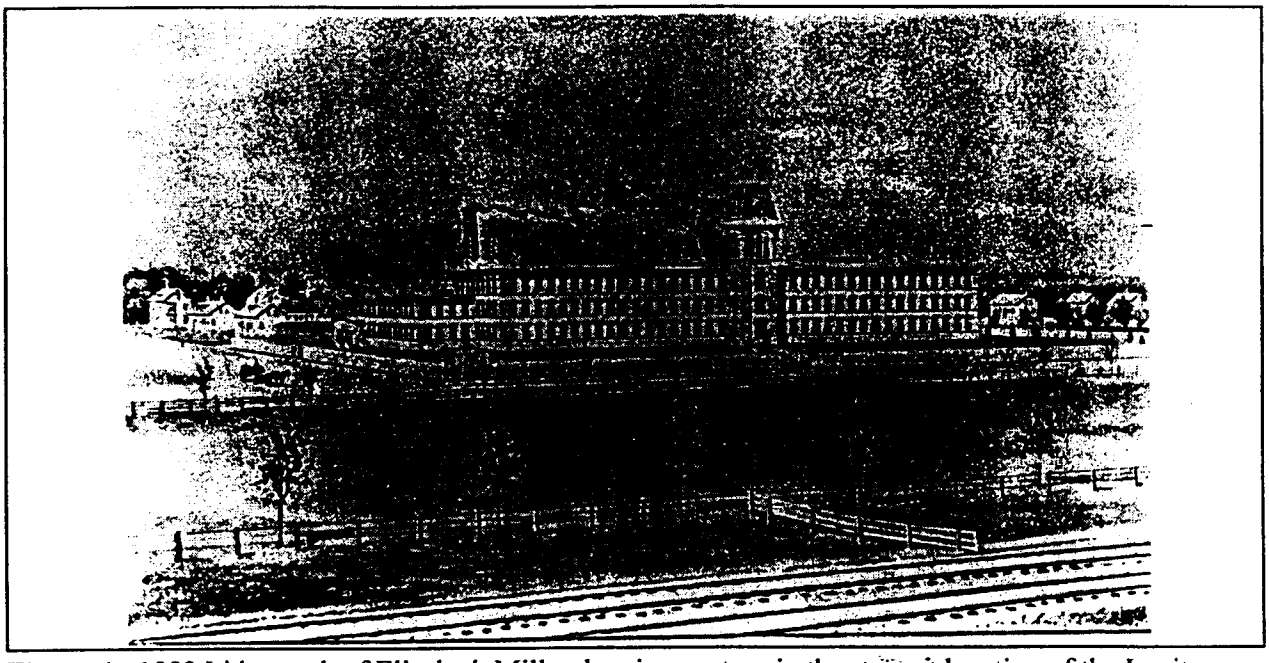


Figure 4 - 1889 Lithograph of Elizabeth Mills, showing pasture in the present location of the Leviton parking lot (Rhode Island Historical Preservation Commission 1981:22)

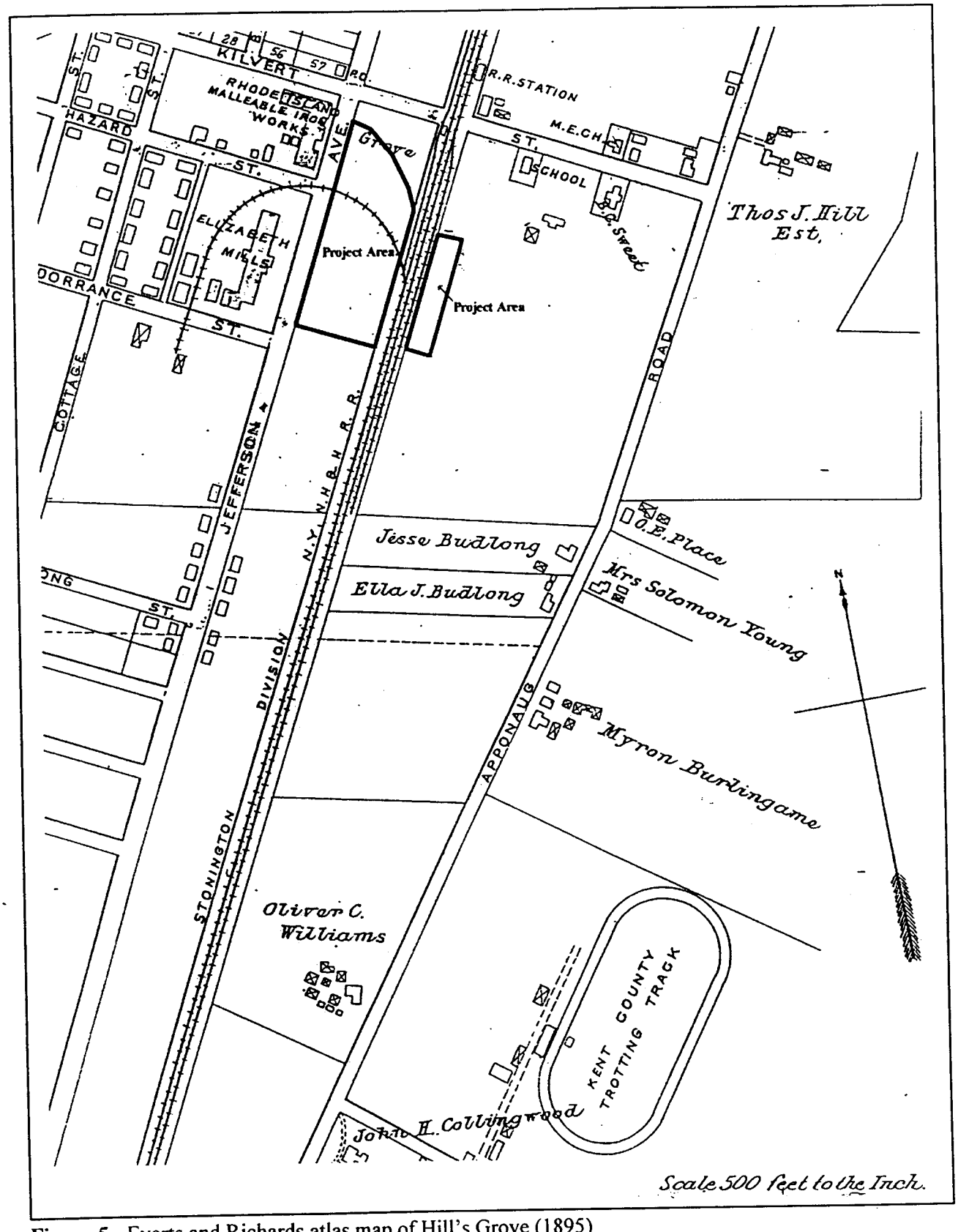


Figure 5 - Everts and Richards atlas map of Hill's Grove (1895)

IV. PHASE 1B RECONNAISSANCE SURVEY

A. Research Design

Archaeological sensitivity is developed after analyzing the topographical characteristics of the area, the recorded archaeological resources of the project and its general vicinity, archaeological results from nearby sites with similar topography, and other appropriate reports.

Archaeological sites are generally small and typically diffuse, requiring testing to be systematic and at appropriate intervals. Lightfoot found that a testing interval of 10 m., using 30 x 30 cm. test pits, yields a nearly 1.0 probability of locating sites that are 12 m. or more in diameter, while a testing interval of 20 m. yields about a 0.3 probability, assuming uniform distribution of artifacts within a site (Lightfoot 1986: 493-494). A site 8 m. in diameter had only a 0.5 probability of being detected through a testing interval of 10 m., but a less that 0.15 probability at a testing interval of 20 m. (Lightfoot 1986: 493-494). Kintigh notes that within high density sites, small test pits are likely to yield an artifact, while within low density sites the simulations favored larger test units for artifact recovery (Kintigh 1988: 702-703). The use of 50 x 50 cm. test pits, with an average excavated depth of 50 cm. will have over 2.5 times the volume of 30 x 30 cm. test pits excavated to the same depth.

Testing at 10 m. intervals with 50 x 50 cm. test pits confers a high probability of encountering the most common wetland margin sites, and a low probability of finding small sites and find spots, which would incur considerably greater costs. The 10-m. interval testing provides an optimal balance between detection probability and costs, given the nature of the expected prehistoric sites in the project area.

When dealing with excessive fill layers in urban environments, the use of a flat bladed backhoe to remove the asphalt and fill layers is an efficient method of reaching buried soil horizons. When it is also known that the land has been plowed, using the same machinery to gradually remove the plowzone down to the topsoil/subsoil interface also provides the opportunity to examine the interface for evidence of intrusion into the subsoil, which may indicate Narragansett or post-contact occupation. This method of excavation was used to excellent effect on the Leviton and Baylis properties.

B. Research Objectives

The objectives of a Phase 1B Reconnaissance Survey are "(1) to determine if the project area contains recorded archaeological sites, (2) to evaluate the area's potential for containing archaeological sites that have not yet been discovered and recorded, and (3) to make recommendations for further intensive testing in specific areas." This survey involves "only minimal subsurface testing to evaluate soil disturbances and profiles, or to evaluate predictions concerning the presence of archaeological sites" (RIHPHC 1998:7-8).

C. Field Work Methodology and Results

1. The Budget Rental Property

In order to determine if there were any archaeological resources on the Budget Rental property, six 50 x

50 cm. test pits were excavated on the north side of the property, between the Budget building and Coronado Road (Figure 6). Borings from this area indicated that there were no excessive fill layers underneath the pavement, so the testing strategy called for using heavy machinery to remove 2 x 2 m. squares of asphalt. However, once the asphalt was removed, fill layers ranging from 1 to 1.5 meters were discovered lying on top of a natural soil horizon (Figure 7). Heavy machinery was used to dig through these fill layers and then Timelines archaeologists excavated 50 x 50 cm. test pits into the natural soil horizon and down to sterile subsoil. The soil was screened through one quarter inch mesh and artifacts recovered from the fill layers included coal, coal ash, slag, bottle glass, and a wire nail. These artifacts indicate the fill was deposited during the mid twentieth century. No artifacts were recovered from the natural soil horizons.

a. Interpretations

The fill layers were deposited in order to elevate the natural ground surface so that it was level with Jefferson Boulevard. Based on the artifacts, this depositional episode probably occurred during the mid twentieth century.

2. *The Baylis Property*

The Baylis property was used as a holding and storage plant for hazardous materials in the past and is now contaminated with a variety of substances. The testing strategy for this property included the placement of trenches in areas outside the "hot zones," areas of heavy contamination the Rhode Island Department of Environmental Management (RIDEM) has deemed unsafe for subsurface testing. Timelines and NITHPO agreed to avoid these heavily contaminated areas during archaeological testing, with the caveat that when these soils are eventually removed, provisions will be made to have representatives from these two organizations on site during this process.

On the Baylis property, there were only two areas outside of the standing building footprints which were not heavily contaminated and could be tested. These areas were to the north and south of the building (Figure 8). To the north of the building, one 20 m. x 1.5 m. exploratory trench was excavated with heavy machinery, revealing very shallow fill layers on top of a soil horizon where the topsoil (A horizon) had been stripped. Once it was known how shallow the fill layers were for this area north of the building, two more 20 x 1.5 m. trenches were excavated with heavy machinery down to the top of the natural soil horizon and then Timelines archaeologists dug 50 x 50 cm. test pits by hand inside these trenches. The test pits extended through the natural soil horizon into sterile subsoil and the soil was screened through one quarter inch mesh (Figure 9).

a. Trench A

Three test pits were excavated into the buried natural soil horizon of Trench A after heavy machinery stripped off approximately 30 cm. of fill. These fill layers began underneath 5 cm. of asphalt with a 4 cm. wide lens of light olive brown sand and gravel, under this was a 17 cm. thick layer of olive brown sand and gravel, and finally a 4 cm. wide lens of compact dark gray sandy silt. Underneath this compact fill layer was an 8 cm. wide very dark brown silty A horizon remnant. Underneath this topsoil remnant

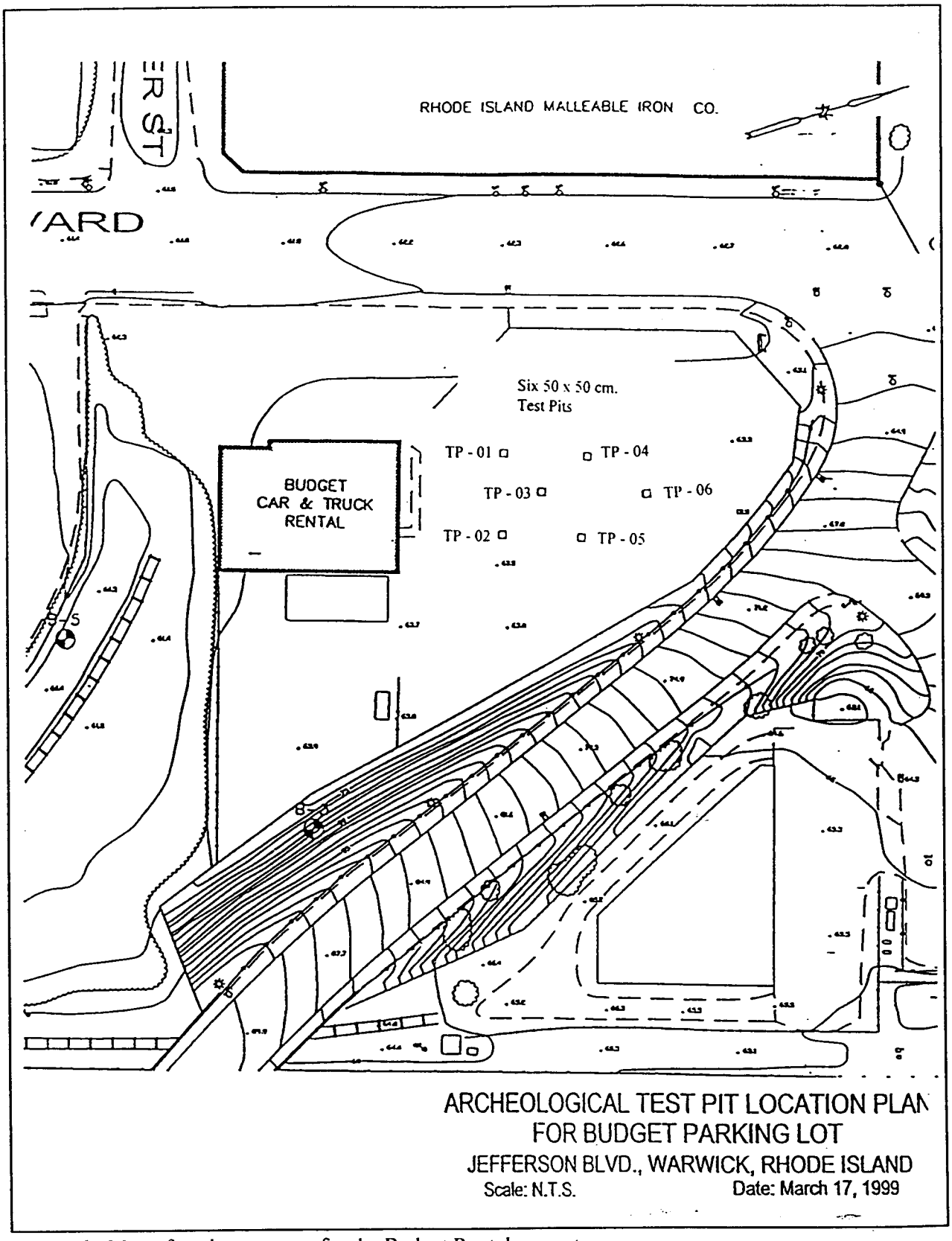


Figure 6 - Map of testing strategy for the Budget Rental property

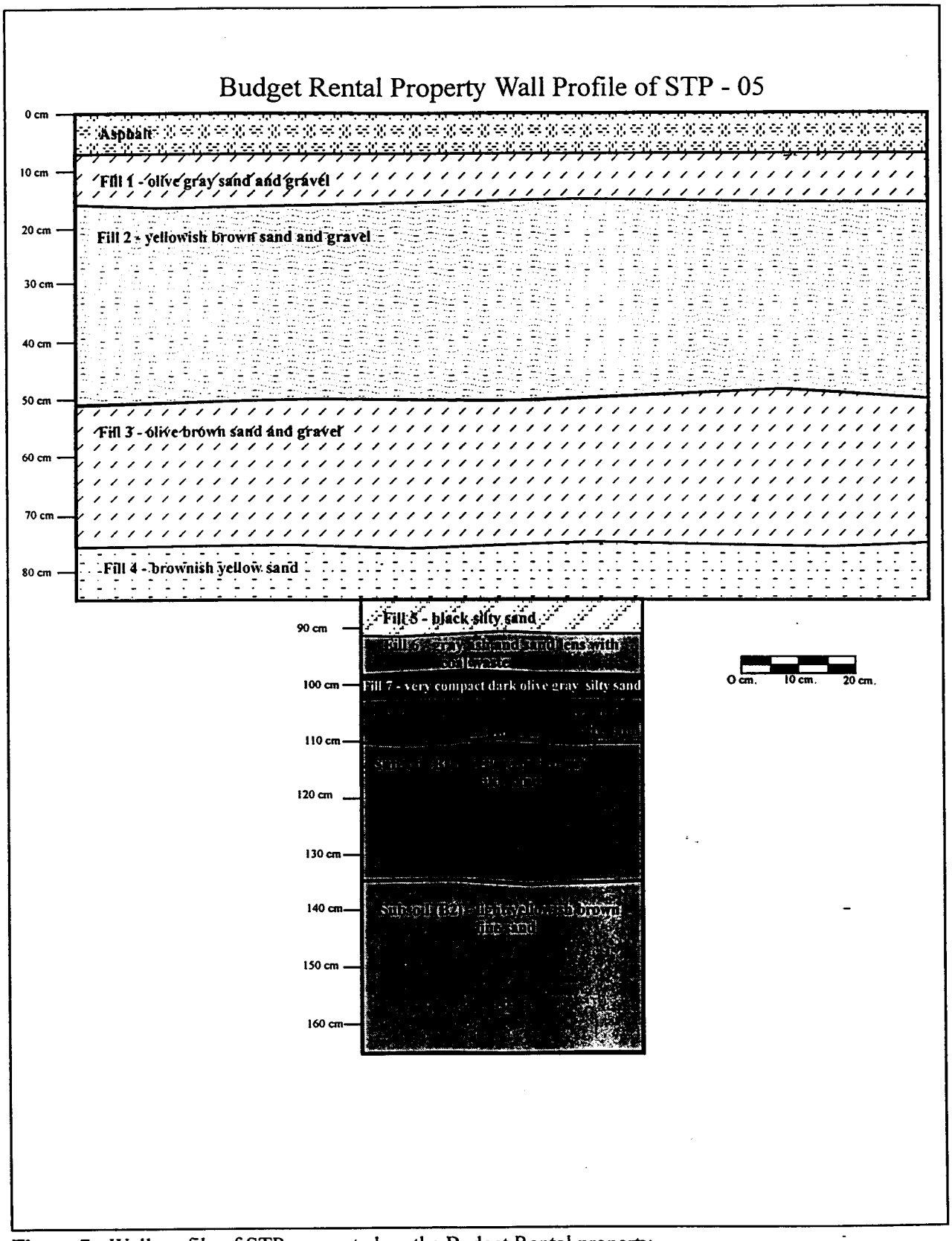


Figure 7 - Wall profile of STP excavated on the Budget Rental property

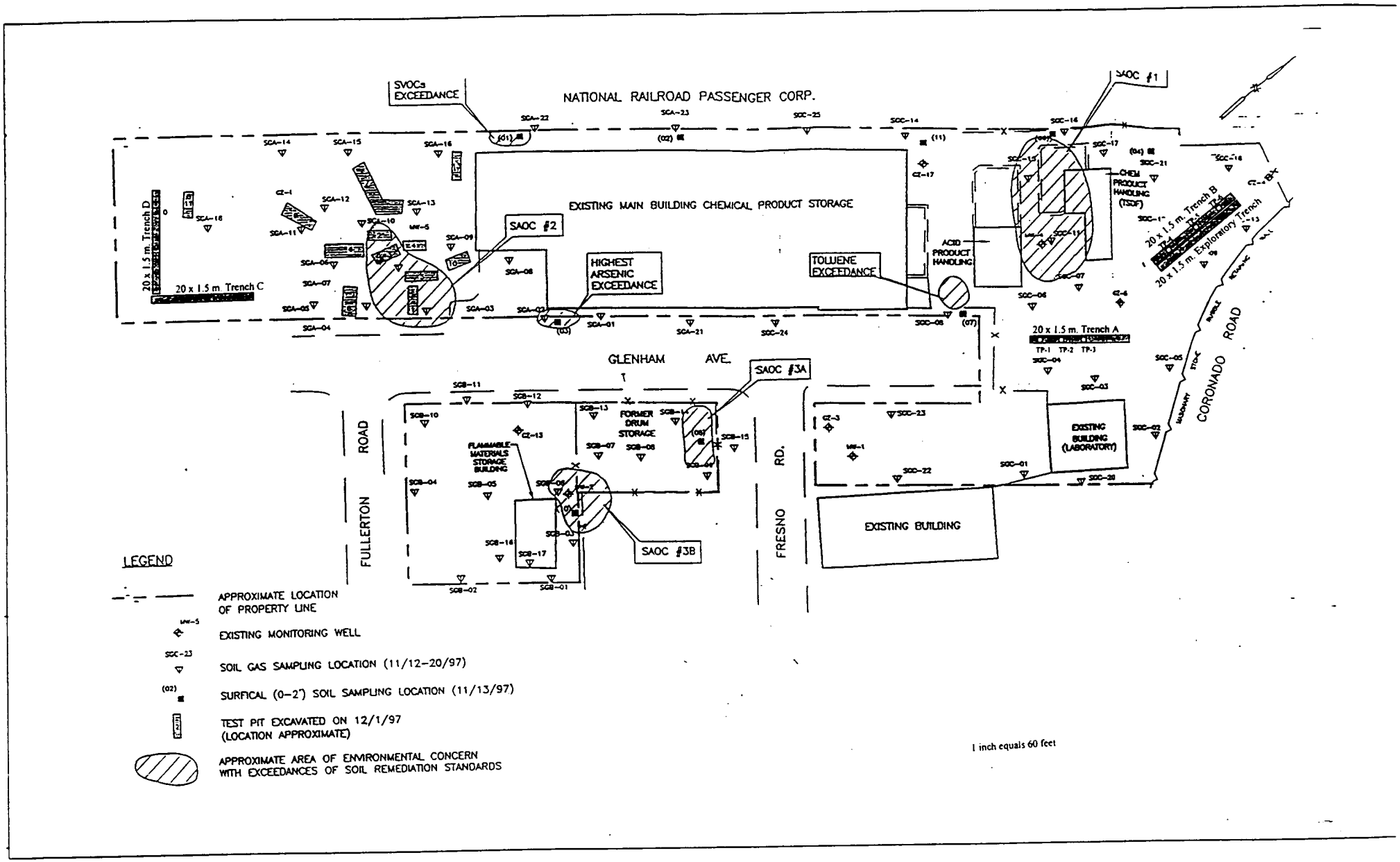


Figure 8 - Map of testing strategy for the Baylis property

were layers of subsoil, beginning with a 12 cm. wide olive sandy silt B1 horizon, 11 cm. wide olive brown silty sand B2, and a 16 cm. wide olive silty sand B3. The test pit was excavated from the top of t : compact dark gray sandy silt down 50 cm. through the B3 subsoil. No artifacts were recovered from this test pit or from the fill layers above it.

T -2 had almost all of the topsoil stripped off when four layers of fill were laid down. These fill layers began under the asphalt with a 5 cm. wide lens of fray sand and gravel. Under this lens was an 8 cm. wide layer of dark gray sand and gravel, which had under it a 10 cm. wide layer of light yellowish brown s d and gravel. The next fill episode was a 14 cm. wide layer of dark gray silty sand mottled with yellowish brown and olive brown, identified as a mixture of the topsoil remnant churned into the fourth fill layer. The subsoil began underneath this level, at about 42 cm. below the surface (cm. B.S.). This l ht olive brown silty sand B1 horizon stretched down 14 cm. and had underneath it an olive brown silty sand B2 horizon. No artifacts were recovered from this test pit, which began at 30 cm.B.S. and stretched down to 70 cm.B.S.

TP-3 also had most of the topsoil stripped off and four fill layers deposited on top of the subsoil. These fill layers began with a 2 cm. wide lens of olive gray sand under the asphalt. Under this lens was a 10 c 1. wide fill episode of gray sand and gravel and below this episode was a 15 cm. wide brownish yellow sand and gravel. Beneath this fill episode was a 26 cm. wide dark olive gray sandy silt mottled with olive and olive brown. This layer was a mixture of the topsoil remnant combined with the fill episode. l neath this churned up horizon was a natural subsoil, a light olive brown silty sand B1 stretching down to 82 cm.B.S. with an olive brown silty sand B2 underneath it. The test pit began at 40 cm.B.S. and extended down to 90 cm.B.S. No artifacts were recovered from the test pit or from the fill layers above i

b. Trench B

Trench B had fill layers on top of buried and partially stripped topsoil, with undisturbed subsoil l derneath. The second of the fill layers was an oily, compact, very dark gray sandy silt, probably r ated to the railroad, which is located less that 100 feet west of the trench. Heavy machinery removed the first 50 cm. of fill layers, then three test pits were dug through the remaining fill down through the t osoil remnant into the sterile subsoil, and the dirt was screened through one quarter mesh.

TP-1 had a yellow brown sand and gravel fill layer 14 cm. wide underneath 5 cm. of asphalt. Beneath t s fill layer was the railroad related fill: 40 cm. of compact and oily very dark gray sandy silt. Under this fill was a 19 cm. wide layer of very dark grayish brown silty sand topsoil. Beneath this A horizon was a 12 cm. wide olive gray silty sand subsoil, with a gray sand B2 underneath. The test pit began at 48 c 1.B.S. in the railroad fill and extended down to 110 cm.B.S. Artifacts recovered from the bottom of the railroad fill, from 48 to 58 cm.B.S. included a wire nail, slag, brick, bottle glass, and flat glass all dating back to the early twentieth century.

TP-2 had the same two fill layers beneath the asphalt (Figure 9): 21 cm. of yellowish brown coarse sand and gravel followed by 32 cm. of compact, oily, very dark gray sandy silt railroad related fill. Beneath t is compact fill episode is a 7 cm. wide topsoil remnant of brown sandy silt mottled with brownish yellow. Beneath this A horizon remnant is 27 cm. thick olive silty sand subsoil B1, with a light olive brown silty sand B2. The test pit began at 50 cm.B.S. and extended down to 105 cm.B.S. Artifacts

recovered from the bottom of the railroad fill: 50-58 cm.B.S., included bottle glass and polished marble, dating back to the early twentieth century.

TP-3 had the same fill layers beneath the asphalt: 24 cm. of light yellowish brown sand and gravel, with 21 cm. of oily, compact, very dark gray sandy silt railroad related fill underneath. Beneath this fill was a 10 cm. thick dark grayish brown silty sand topsoil remnant, with a 16 cm. wide olive brown silty sand subsoil beneath it. Underneath the B1 was a light olive gray sand B2. The test pit began at 50 cm.B.S. and extended down to 100 cm.B.S. No artifacts were recovered from this test pit.

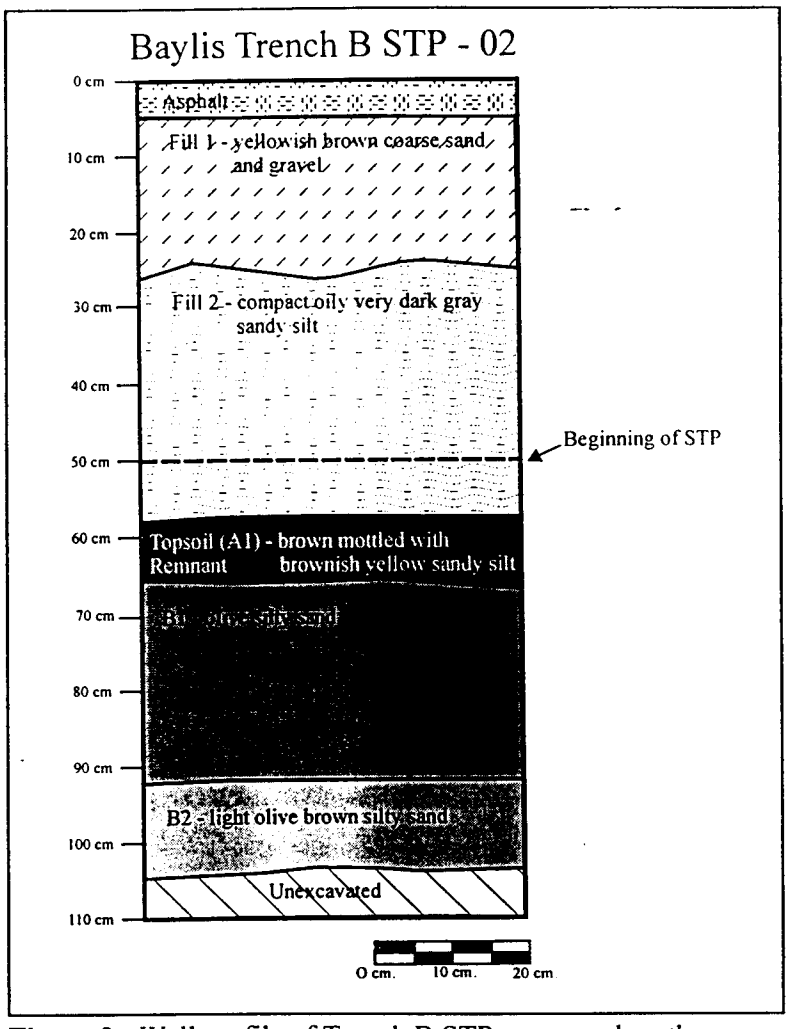


Figure 9 - Wall profile of Trench B STP excavated on the Baylis property

c. Trench C

In the southern section of the Baylis property, the soil stratigraphy consisted of shallow fill layers on top of a plowed topsoil. Since the topsoil was plowed, the testing strategy involved excavating through the fill layers and the plowzone with heavy machinery down to the topsoil/subsoil interface. At the interface of the plowzone and the subsoil, the trench was closely examined for soil stains extending into the subsoil which may provide evidence of Narragansett or historic occupation. Using this method, one historic trash pit, deposited no earlier than 1909 (the date of a Wheat penny found in the pit) was found in the trench. We bisected the trash pit and excavated half of it at 10 cm. intervals to look for evidence of internal stratigraphy. We discovered that it was a pit dug into and through the plowzone and represented a single dumping episode. Other artifacts recovered from this pit, designated Feature 1, included screw top bottles, a bottle cap, coal, an ironstone dish, and the remains of a paint can. The six shallow fill layers on top of this pit and the plowzone stretched down about 31 cm.B.S.:

Fill 1 - 0-6 cm.B.S. light olive gray silt
Fill 2 - 6-10 cm.B.S. loose light gray sand
Fill 3 - 10-16 cm.B.S. light olive brown silty sand
Fill 4 - 16-20 cm.B.S. dark yellowish brown silty sand
Fill 5 - 20-26 cm.B.S. light gray sand

Fill 6 - 26-31 cm.B.S. olive brown silty sand.

The 10 cm. thick plowed topsoil began at 31 cm.B.S. and was a dark olive gray silty sand, with a light yellowish brown sandy subsoil beneath it. The dug pit extended 25 cm. into the subsoil and was a mottled dark olive brown and yellowish brown silty sand. The subsoil was a light brownish yellow coarse sand with gravel.

d. Trench D

Trench D was excavated with heavy machinery through the shallow fill layers and plowzone to the topsoil/subsoil interface. The shallow fill layers began at the surface with 7 cm. of dark yellowish brown sand. Beneath this fill was another layer 8 cm. thick of brownish yellow sand. At 15 cm.B.S. the plowed topsoil, 6 cm. of an olive brown silty sand, was observed. The heavy machinery carefully stripped away this plowzone down to the topsoil/subsurface interface. One disturbance at the interface was noticed, but it was due to the environmental testing conducted by the Rhode Island Department of Environmental Management. Besides this soil disturbance and two small root burns, there were no other intrusions into the subsoil, which was a brownish yellow silty sand. One piece of shell was recovered form the plowzone, but it was not associated with any evidence of Narragansett habitation.

e. Interpretations

The northern portion of the Baylis property has undergone considerable alteration due to the railroad and the use of the property as a chemical storage facility. This alteration included the removal of the topsoil over most of the landscape and the addition of fill layers deposited during railroad construction and maintenance, and also deposited to level off the area for an asphalt parking lot.

The southern section of the property, on the contrary, demonstrates little alteration from the time it was plowed farmland. This portion of the property had very shallow fill layers dating back to 1909 lying on top of a plowed landscape.

3. *The Leviton Parking Lot*

The Leviton property was divided into two segments: the parking lot and the wooded area (Figure 10). In the parking lot, ten 20 x 1.5 m. trenches were excavated with heavy machinery down to the topsoil/subsoil interface. At the interface, the trenches were skimmed by hand to locate any subsoil disturbance which would indicate historic or Narragansett habitation. The trenches had levels of fill lying on top of a plowed soil horizon with plowscars extending into the subsoil. The wooded area had deep layers of railroad fill along the railroad spur and edge of the railroad tracks. Once we moved away from these areas, the soil profiles appeared natural, with a developing organic topsoil lying on top of a very old plowzone which had been leaching into the subsoil for a long time. The wooded area contained oak trees dating back a century or more, which are perhaps remnants of the original Hill's Grove.

a. Trench 1

Trench 1 contained fill layers on top of a well-defined plowzone with plowscars running east/west at 60-70 cm. intervals. The four fill layers were under 4 cm. of asphalt:

Fill 1 - 4-10 cm.B.S. very compact dark olive gray silt
Fill 2 - 10-13 cm.B.S. light olive brown sand
Fill 3 - 13-18 cm.B.S. yellowish brown coarse sand and gravel
Fill 4 - 18-24 cm.B.S. olive yellow coarse sand.

Beneath this fourth fill layer was a compressed organic layer: 1-2 cm. of dark olive brown loamy silt. Beneath this buried organic layer was a 6 cm. wide layer of olive brown loamy sand topsoil, with a dark yellowish brown silty sand plowzone underneath. At the topsoil/subsoil interface, there were plowscars extending 5 cm. into the yellowish brown silty sand subsoil. No artifacts were recovered from the fill layers, but the buried topsoil contained bottle glass, transfer printed whiteware, brick, and iron fragments.

b. Trench 2

Trench 2 contained fill layers on top of a buried plowzone. Heavy machinery was used to remove the fill layers and excavate through the plowzone to the topsoil/subsoil interface. The asphalt was two layers thick, and extended down 8 cm. Beneath the asphalt were five layers of fill:

Fill 1 - 8-11 cm.B.S. dark olive gray silt.
Fill 2 - 11-27 cm.B.S. light yellowish brown coarse sand and gravel
Fill 3 - 27-45 cm.B.S. olive brown silty sand, with a lens of light yellowish brown coarse sand and gravel and another lens of light olive brown sand with gravel
Fill 5 - 45-60 cm.B.S. dark yellowish brown silty sand with gravel.

Beneath this final fill layer was a discontinuous lens of very dark gray sandy silt organic topsoil which was about 1 cm. thick. The plowzone underneath this organic lens was about 4 cm. of olive brown silty sand with plowscars. The subsoil was a dark yellowish brown silty sand. Artifacts from the fill layers included asphalt, bottle glass, iron fragments, brick, whiteware, a wire nail, and coal ash. The plowzone contained whiteware and iron fragments, and coal ash was recovered from the bottom of the plowzone.

c. Trench 3

Trench 3 had a double asphalt layer on top of five fill layers and a plowzone remnant. The fill layers were:

Fill 1 - 7-15 cm.B.S. olive gray coarse sand and gravel mottled with olive brown
Fill 2 - 15-17 cm.B.S. discontinuous lens of olive brown sand.
Fill 3 - 17-26 cm.B.S. dark yellowish brown silty sand mottled with light yellowish brown.
Fill 4 - 26-35 cm.B.S. brown sand mottled with dark yellowish brown and pockets of light gray coarse sand.

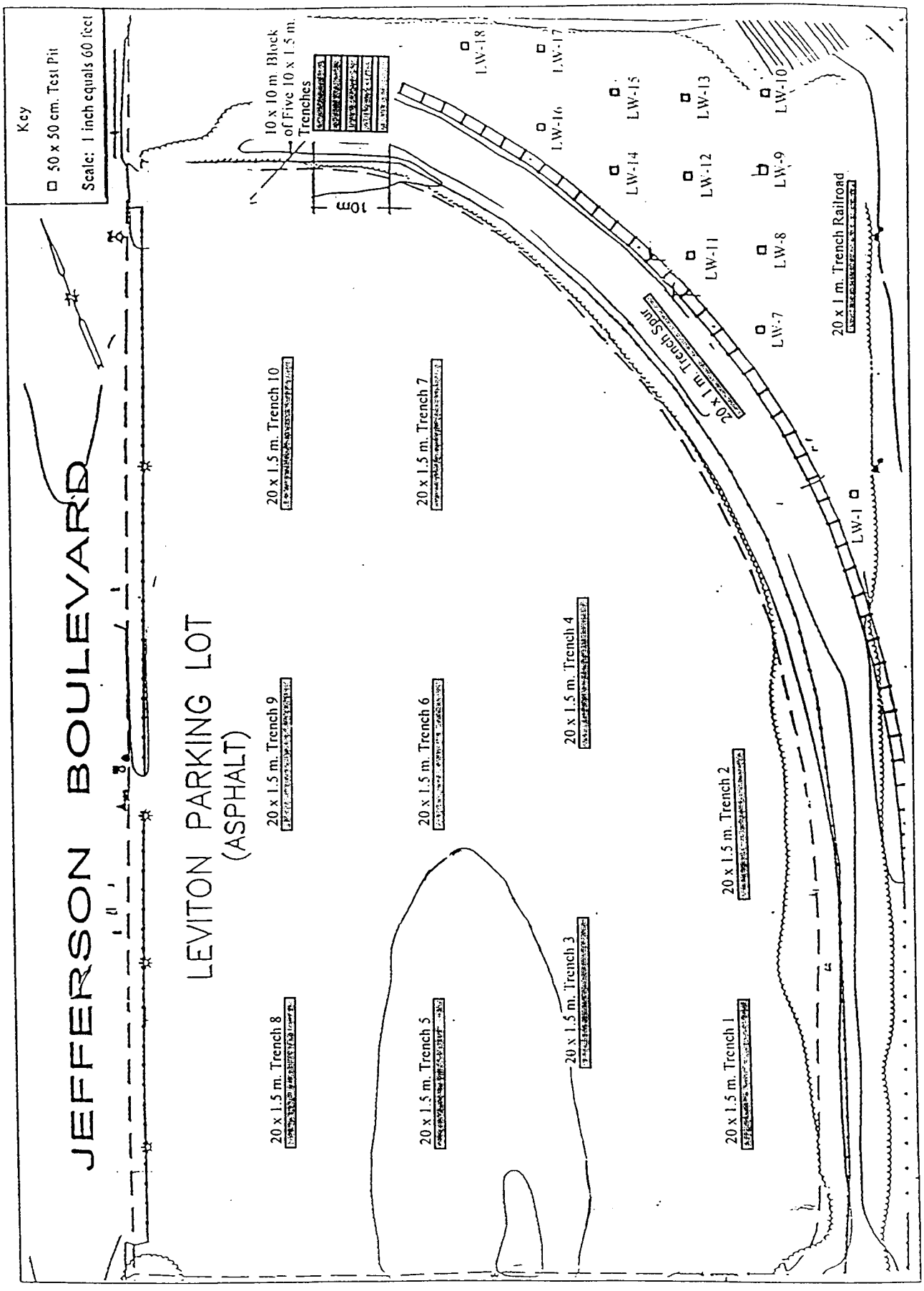


Figure 10 - Map of testing strategy for the Leviton property

Fill 5 - 35-42 cm.B.S. brown sand mottled with yellowish brown and gray with lenses of plastic electrical components from the Leviton Manufacturing Corporation across the street.

Beneath this fill layer there was a 4 cm. thick brown silty sand remnant of the plowzone with plowscars. Under this plowzone remnant was a yellowish brown sandy subsoil. Artifacts recovered from the fill included plastic electrical components, whiteware, bottle glass, metal wire fragments, and a screw. No artifacts were recovered from the plowzone.

d. Trench 4

Trench 4 had a single asphalt layer with eight layers of fill and a plowzone beneath the fill. The fill layers were:

Fill 1 - 8-29 cm.B.S. olive gray coarse sand and gravel with cobbles
Fill 2 - 29-35 cm.B.S. light olive gray mottled with yellowish brown coarse sand and a pocket of mortar
Fill 3 - 35- 40 cm.B.S. dark olive brown sandy silt
Fill 4 - 40-48 cm.B.S. light gray silty sand with a pocket of light gray coarse sand
Fill 5 - 48-53 cm.B.S. discontinuous lens of brown sandy loam
Fill 6 - 53-60 cm.B.S. light gray coarse sand
Fill 7 - 60-74 cm.B.S. dark yellowish brown sand with gravel and small 10 cm. deep and 20 cm. wide brown silty sand refuse pit containing bottle glass

Beneath this seventh fill layer was a brown silty sand plowed topsoil 8 cm. thick with plowscars stretching 5 cm. into the dark yellowish brown sandy subsoil. Artifacts recovered from the fill layers included plastic electrical components from the Leviton Manufacturing Corporation, metal wire, stoneware, and bottle glass dating back to the early twentieth century. From the plowed topsoil, one oyster shell was recovered.

e. Trench 5

Trench 5 contained six fill layers underneath 6 cm. of asphalt and on top of a plowed topsoil. These fill layers were:

Fill 1 - 6-9 cm.B.S. light gray sand
Fill 2 - 9-20 cm.B.S. olive brown silty sand
Fill 3- 20-22 cm.B.S. lens of olive gray coarse sand
Fill 4 - 22-28 cm.B.S. light gray coarse sand
Fill 5 - 28-33 cm.B.S. lens of very dark gray silt with plastic electrical components

Lying underneath this lens of Leviton refuse was a plowed topsoil of brown silty sand that extended down to 43 cm.B.S. and contained plowscars that extended 5 cm. into the dark yellowish brown silty sand subsoil. Artifacts recovered from the fill layers included plastic electrical components from the Leviton Manufacturing Corporation. Artifacts from the plowed topsoil included mold blown bottle glass dating back to the second half of the nineteenth century, whelk shell, brick, and whiteware.

f. Trench 6

Trench 6 had a double layer of asphalt overlying three fill layers and a plowed topsoil (Figure 11). The fill layers were:

Fill 1 - 6-23 cm.B.S. olive gray coarse sand and gravel
Fill 2 - 23-36 cm.B.S. dark yellowish brown coarse sand and gravel
Fill 3 - 36-41 cm.B.S. dark grayish brown silt with plastic electrical components

Beneath this Leviton lens was a plowed topsoil from 41-54 cm.B.S. This plowzone was a mottled brown and dark yellowish silty sand. Extending through this plowzone and into the subsoil was a dug pit about 2 m. wide and 42 cm. deep. Artifacts recovered from this pit included iron fragments, a clay pipe fragment, and milk bottle glass, which dates the pit to sometime after the 1920s. Artifacts from the plowzone included bottle glass, yellowware, and whiteware.

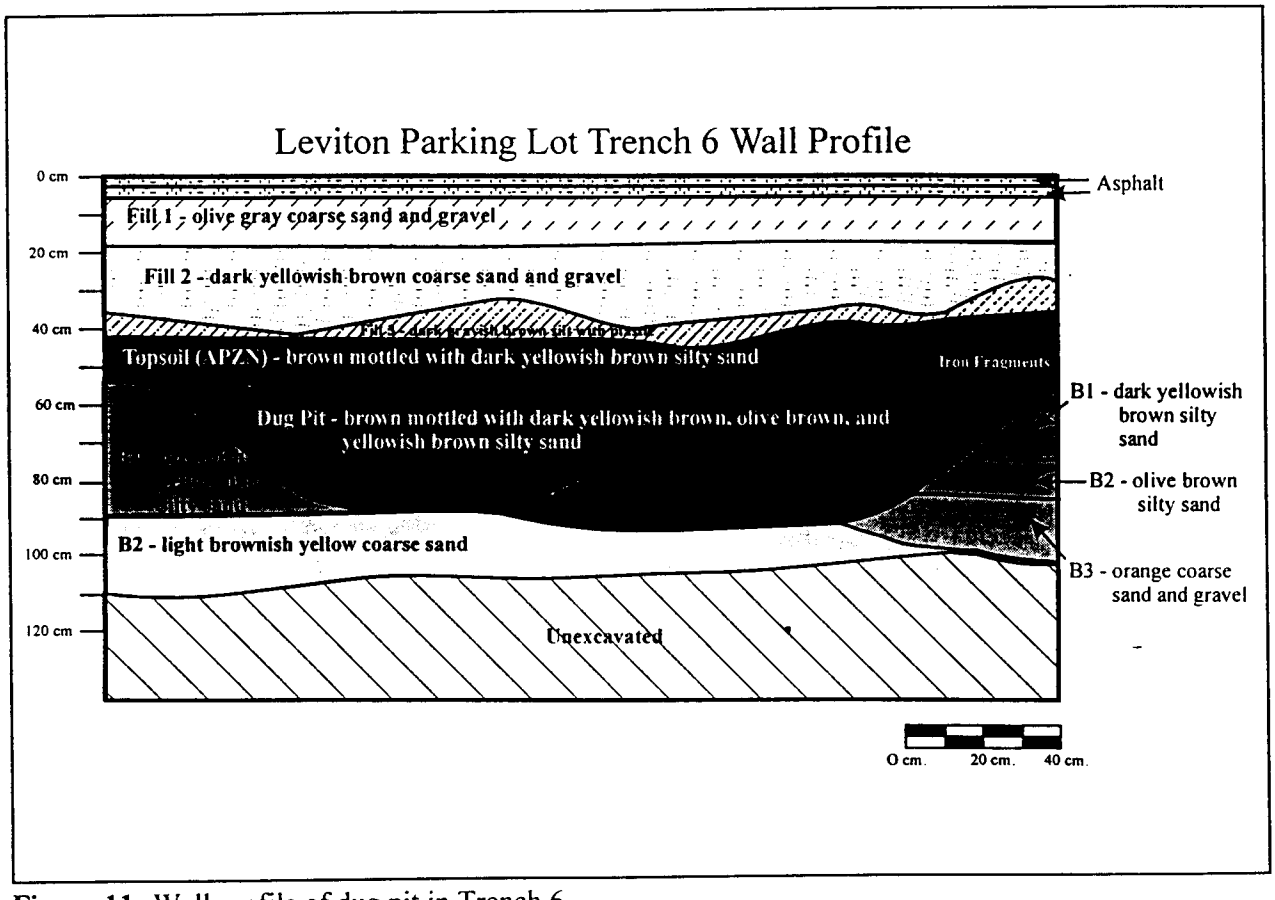


Figure 11 -Wall profile of dug pit in Trench 6

g. Trench 7

Beneath a single layer of asphalt there were seven layers of fill on top of a plowed topsoil. The fill layers

included:

Fill 1 - 6-21 cm.B.S. olive gray coarse sand with cobbles and gravel
Fill 2 - 21- 25 cm.B.S. dark olive gray silty sand
Fill 3 - 25-32 cm.B.S. light olive gray silty sand
Fill 4 - 32-42 cm.B.S. dark grayish brown silty sand
Fill 5 - 35-55 cm.B.S. discontinuous pocket of dark yellowish brown coarse sand
Fill 6 - 42-55 cm.B.S. discontinuous pocket of light gray fine sand
Fill 7 - 55-60 cm.B.S. discontinuous lens of dark grayish brown silt and plastic electrical components

Beneath this seventh level of fill was a plowed topsoil of dark olive brown silty sand that extended from 60-80 cm.B.S. , with plowscars intruding into the dark yellowish brown coarse silty sand subsoil. Artifacts recovered from the fill included plastic electrical components, brick, and a length of copper pipe. From the interface of the seventh fill layer and the top of the plowzone, a Coca Cola bottle was recovered.

h. Trench 8

Trench 8 had a double layer of asphalt lying on top of three shallow fill layers which covered a plowed topsoil. The fill layers were:

Fill 1 - 6-8 cm.B.S. olive gray fine sand and silt
Fill 2 - 8-10 cm.B.S. olive gray coarse sand
Fill 3 - 10-14 cm.B.S. light yellowish brown coarse sand with pockets of dark gray silty sand

Beneath these fill layers was a brown silty sand plowed topsoil that stretched down to 30 cm.B.S. and was on top of a dark yellowish brown sandy subsoil. Artifacts recovered from the fill layers included whiteware, bottle glass, and strap iron. The plowzone contained milk bottle glass, whiteware, ironstone, brick, oyster shell, and lead and iron fragments.

i. Trench 9

Trench 9 contained three fill layers underneath a double layer of asphalt and on top of a plowed topsoil. The fill layers included:

Fill 1 - 7-13 cm.B.S. dark gray silty sand
Fill 2 - 13-29 cm.B.S. light gray coarse sand with cobbles
Fill 3 - 29-32 cm.B.S. dark grayish brown silt with plastic electrical components

Beneath these fill layers was a plowed brown silty sand topsoil stretching from 32-43 cm.B.S. which was on top of a dark yellowish brown silty sand subsoil. Artifacts recovered from the plowzone included shell fragments, a hand-painted whiteware saucer, glass button, bottle glass, and strap iron.

j. Trench 10

Trench 10 had a single layer of asphalt overlying four fill layers and a plowed topsoil. The fill layers were:

Fill 1 - 8-23 cm.B.S. dark gray coarse sand and gravel with cobbles
Fill 2 - 23-27 cm.B.S. dark olive gray silt
Fill 3 - 27-38 cm.B.S. light gray coarse sand and gravel
Fill 4 - 38-42 cm.B.S. dark grayish brown silty sand with plastic electrical components

Beneath this fourth fill layer was a brown silty sand plowed topsoil that stretched down to 58 cm.B.S. and had plowscars that extended 4 cm. into the dark yellowish brown silty sand subsoil. Plastic electrical components from the Leviton lens (fill layer 4) were noted but not saved. Artifacts recovered from the plowed topsoil included ironstone and wire nail fragments.

k. Interpretations

Based on the stratigraphy of the trenches, it appears as though the northeastern portion of the parking lot was higher than the rest of the property when the land was plowed and used as a grove. When the parking lot was built by the Leviton Manufacturing Corporation during the 1940s, they used heavy machinery to level off the plowed ground surface. This interpretation accounts for the deeper fill layers lying on top of thicker and better defined plowzones in the southwestern portion of the property. The thinner plowzones found in the northern portions of the parking lot indicate that they were partially stripped in order to level off the ground surface for the installation of the parking lot.

4. Leviton Wooded Area

One 10 x 10 m. block of five 10 x 1.5 m. trenches with 50 cm. balks was excavated in the disturbed area between the fenced Leviton parking lot and the Budget Rental property (Figure 10). Thirteen 50 x 50 cm. test pits located at 10 m. intervals were excavated by Timelines archaeologists down to sterile subsoil. Two 20 x 1 m. trenches were excavated through the fill layers and plowed topsoil down to the topsoil/subsoil interface using heavy machinery: one on the south side of the railroad spur and the other along the railroad right of way.

a. Block 1

A 10 x 10 m. block of five 10 x 1.5 m. trenches was excavated with heavy machinery on the western edge of the wooded area, along Jefferson Boulevard between the fenced parking lot and the Budget Rental property. The block had thick fill layers lying on top of a plowed topsoil:

Fill 1 - 0-8 cm.B.S. gray coarse sand and gravel
Fill 2 - 8-30 cm.B.S. dark yellowish brown coarse sand and gravel
Fill 3 - 30-38 cm.B.S. light yellow coarse sand and gravel
Fill 4 - 38-44 cm.B.S. black coal and silt with roots

Fill 5 - 44-53 cm.B.S. brown silty sand
Fill 6 - 53-68 cm.B.S.dark grayish brown silty sand with slag/coal/coal ash

Fill layer four was the ground surface for a period of time after the railroad spur was filled in. It was exposed long enough for an organic layer to develop, and then the top three fill layers were placed over this organic lens. Fill layer six was associated with the construction and maintenance of the railroad spur. The spur was built off of the main tracks probably in the 1870's, because the 1895 map shows the spur, and it was built to join the main tracks with the Rhode Island Malleable Iron Works and Elizabeth Mills, which were not built until 1863 and 1875 respectively. Beneath this railroad related fill was a brown silty sand plowed topsoil extending down to 77 cm.B.S. which had underneath it a dark yellowish brown silty sand subsoil.

b. Test Pits

Thirteen test pits were excavated in the northern section of the wooded area. The first of these test pits to be dug was STP-01, located between the intersection of the railroad right of way and the railroad spur. This test pit contained six fill layers on top of a natural soil horizon:

Fill 1 - 0-10 cm.B.S. dark gray sand
Fill 2 - 10-13 cm.B.S. olive gray sand
Fill 3 - 13-25 cm.B.S. dark gray sand
Fill 4 - 25-32 cm.B.S. grayish yellow sand
Fill 5 - 32-37 cm.B.S. dark gray sand
Fill 6 - 37-66 cm.B.S. yellowish brown mottled with dark yellowish brown sand

Beneath these fill layers, deposited during the construction and maintenance of the railroad tracks and spur, there was a natural soil horizon, a dark gray silty sand topsoil, followed by an olive brown silty sand subsoil (B1), and a light olive fine sand B2. The test pit ended at 88 cm.B.S. and artifacts recovered from the fill layers included a piece of a railroad tie, wire nail fragments, and bottle glass. From the buried topsoil, a soda bottle was recovered which dates from the 1850s-1870s.

After excavating this test pit, it was determined that the test pits originally located near the railroad right of way and to the south of the railroad spur would be replaced with two trenches dug with a small piece of heavy machinery. The rest of the test pits were dug by hand because the soil horizons to the north and west of the areas impacted by the railroad were relatively undisturbed. These test pits excavated in the Leviton Woods (LW) were: LW-7, LW-8, LW-9, LW-10, LW-11, LW-12, LW-13, LW-14, LW-15, LW-16, LW-17, and LW-18.

LW-7 had 49 cm. of fill from the railroad spur overlying an organic layer and a plowed topsoil. The fill layers had coal, coal ash, slag, and brick, none of which were saved. Nothing was recovered from the plowzone.

LW-8 had a natural soil horizon: an organic layer with a gray fine sandy podzol beneath it, and a brown sandy loam plowed topsoil on top of an olive brown loamy sand subsoil. No artifacts were recovered from this test pit (Figure 12).

LW-9 had the organic lens and gray podzol on top of an olive brown silty sand topsoil which had beneath it a light olive brown silty sand subsoil. No artifacts were recovered from this test pit.

LW-10 contained fill layers from the construction of Coronado Road, an overpass for the railroad tracks. Fill 1 extended from 0-9 cm.B.S. as a dark olive brown coarse silty sand. Beneath this was a light olive brown coarse sand with gravel that stretched down to 14 cm.B.S. Under this second fill layer was a very dark gray sandy loam plowed topsoil, with beneath it an olive brown sandy silt subsoil. Modern glass and asphalt were recovered from the fill layers. Nothing was recovered from the buried topsoil.

LW-11 contained four fill layers on top of an organic lens and a plowed topsoil. The fill layers started underneath a developing organic layer:

Fill 1 - 8-13 cm.B.S. light gray sand
Fill 2 - 13-20 cm.B.S. grayish brown silty sand
Fill 3 - 20-36 cm.B.S. yellowish brown coarse sand with gravel
Fill 4 - 36-42 cm.B.S. brownish yellow sand

Beneath the fourth fill layer was an organic lens lying on top of a plowed dark yellowish brown silty sand topsoil. Under this plowzone was a yellowish brown silty sand subsoil (B1) followed by a light olive brown sandy B2. From the fill layers slag and coal were identified but not saved. Nothing was recovered from the plowzone.

LW-12 had a relatively undisturbed soil profile, with an organic layer followed by a gray sandy loam podzol, which was overlying a plowed mottled olive gray and brown silty sand. Under the plowzone was a dark yellowish brown silty sand subsoil, followed by a yellowish brown silty sand B2. No cultural material was recovered from this test pit.

LW-13 also had a relatively undisturbed profile, with an organic layer, followed by the gray podzol and an olive brown loamy sand plowed topsoil. Beneath the topsoil was a dark yellowish brown silty sand subsoil, followed by a light yellowish brown silty sand. One small bottle glass fragment was recovered from the organic layer.

LW-14 was located one meter north of the railroad spur and because of this, four fill layers were found on top of a plowed topsoil. The fill layers began beneath 4 cm. of organic material:

Fill 1 - 4-8 cm.B.S. light olive gray sand
Fill 2 - 8-18 cm.B.S. very compact grayish brown coarse sand
Fill 3 - 18-34 cm.B.S. very compact dark yellowish brown mottled with olive brown coarse sand
Fill 4 - 34-40 cm.B.S. very compact dark gray silt

Beneath this fourth fill layer was a brown plowed topsoil, with a dark yellowish brown silty sand with gravel under the plowzone. Coal, coal ash, and slag were identified from the fill layers, but not saved.

LW-15 had a relatively undisturbed soil profile with a thick organic layer on top of a plowed grayish brown silty sand. The plowzone was followed by a dark yellowish brown silty sand subsoil, which had underneath it a yellowish brown silty sand with some gravel. From the top of the plowzone glass and coal ash was recovered.

LW-16 was located one meter east of the railroad spur and contained 65 cm. of fill on top of a plowed topsoil. The fill layers began under an 8 cm. thick developing organic layer and included:

Fill 1 - 8-11 cm.B.S. light olive gray coarse sand
Fill 2 - 11-18 cm.B.S. grayish brown coarse sand with coal waste
Fill 3 - 18-35 cm.B.S. dark gray sand with coal waste
Fill 4 - 35-52 cm.B.S. brownish yellow coarse sand
Fill 5 - 52-55 cm.B.S. light gray silty sand
Fill 6 - 55-60 cm.B.S. dark yellowish brown silty sand
Fill 7 - 60 65 cm.B.S. dark gray silt

Beneath the seventh fill layer was a brown silty sand plowed topsoil lying on top of a yellowish brown silty sand subsoil. From the fill/topsoil interface, a cut nail was recovered.

LW-17 had three fill layers on top of a plowed topsoil. The fill layers were under a 7 cm. thick organic layer:

Fill 1 - 7-14 cm.B.S. dark gray sandy silt
Fill 2 - 14-21 cm.B.S. dark yellowish brown silty sand
Fill 3 - 21-29 cm.B.S. olive gray silty sand

Beneath the third fill layer was a dark yellowish brown plowed topsoil, followed by a yellowish brown silty sand subsoil. No artifacts were recovered from this test pit.

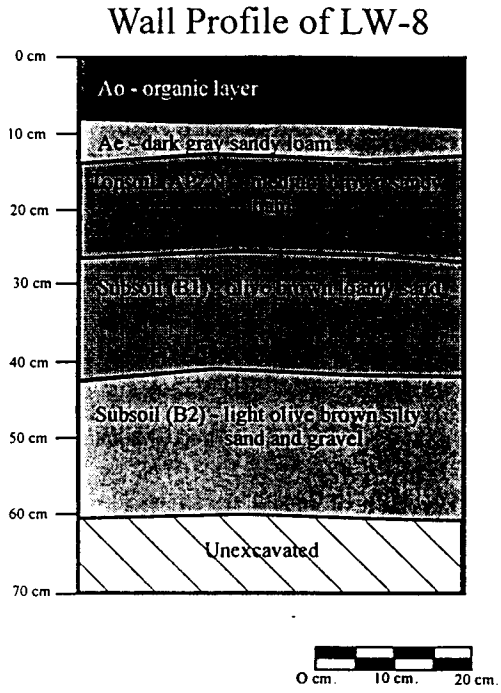
LW-18 had a series of fill layers lying on top of a plowed topsoil. The fill layers included:

Fill 1 - 0-15 cm.B.S. light gray coarse sand
Fill 2 - 15-22 cm.B.S. very dark gray loamy sand
Fill 3 - 22-35 cm.B.S. olive brown coarse sand
Fill 4 - 35-48 cm.B.S. dark olive gray silty sand
Fill 5 - 48-50 cm.B.S. brownish yellow silty sand
Fill 6 - 50-61 cm.B.S. olive gray silty sand

The second fill layer appeared to be an old organic lens that developed before the top fill layer was laid down. Beneath the sixth fill layer was a brown silty sand plowed topsoil, which had underneath it a dark yellowish brown silty sand subsoil. No artifacts were recovered from this test pit.

c. Railroad Spur Trench

The trench for the railroad spur was located just south of the spur and contained a thick layer of fill from the spur's construction and maintenance (Figure 12). Beneath 5 cm. of a developing organic layer was a lens of dark yellowish brown silty sand, beneath which was a very dark gray fill layer stretching down to 48 cm.B.S. This fill zone contained granular coal waste. At 48 cm.B.S., the plowed brown silty sand topsoil began. an under this layer, was a yellowish brown fine silty sand subsoil. One fragment of olive bottle glass dating back to the turn of the century was recovered from the interface of the railroad fill and the plowed topsoil.



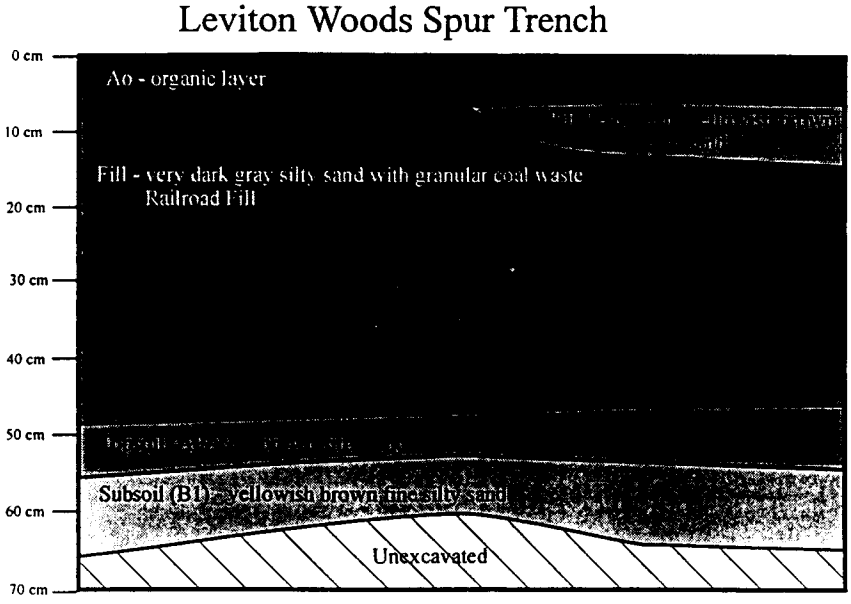


Figure 12 - Wall profiles of test pit and trench from the Leviton Woods

d. Railroad Trench

A trench was excavated with a small piece of heavy machinery along the railroad right of way because it was determined when LW-1 was excavated that there were deep fill layers in this area lying on top of a partially stripped topsoil, with a subsoil beneath. The four fill layers began beneath a 7 cm. thick organic layer and included:

Fill 1 - 7-15 cm.B.S. gray sand
Fill 2 - 15-24 cm.B.S. dark yellowish brown sand
Fill 3 - 24-32 cm.B.S. olive brown silty sand with a discontinuous lens of dark gray brown sand
Fill 4 - 32-36 cm.B.S. dark brown silty sand with quartz trap rock from railroad maintenance

Beneath this fourth fill layer was a remnant of an olive brown silty sand topsoil, which was probably plowed, but did not have any plowscars. Beneath this thin topsoil remnant was an olive gray silty sand subsoil. Artifacts recovered from the fill layers included coal, copper pipe, quartz trap rock, a railroad spike, plastic, machine made decanter glass from the early to mid twentieth century, and a stoneware pipe fragment. No artifacts were recovered from the topsoil.

e. Interpretations

The land along the railroad right of way and on either side of the railroad spur contained thick fill layers composed of coal, coal ash, slag, and trap rock. The layers began being deposited when the railroad was first constructed in the 1830s and continued to develop during railroad maintenance. The railroad spur was constructed during the 1870s and extended across Jefferson Boulevard to the Rhode Island Malleable Iron Works and The Elizabeth Mills. Because the railroad ties have the year 1934 imprinted on their nails, we know that the spur was maintained into the 1930s, The last time the rails themselves were replaced was in 1902, according to their stamp.

The areas that were not impacted by the railroad right of way and spur had relatively undisturbed soil profiles. These profiles contained an old plowzone that had leached into the subsoil and was no longer as distinct as the plowed topsoil under the parking lot. Above this old plowzone was a developing organic layer composed of forest debris deposited for decades by large oak trees that may be original members of Hill's Grove.

This area was plowed before it was bought by Thomas Hill in the 1860s. After he bought the property, maps that show the area as a grove have been supported by the soil profiles from the block, test pits, and trenches excavated on the property.

5. *The Elevated People Mover*

No archaeological testing has yet been conducted for the elevated people mover. This people mover is still in the preliminary design stages, and it is not know where the footings will be located and how deeply these footings will extend into the ground. When these design plans have been decided upon, we will develop a plan that tests the footing locations in order to assess their archaeological potential.

E. Laboratory Processing and Analysis

The recovered artifacts are in the process of being cleaned, identified, and catalogued. No Narragansett Indian cultural materials were identified and the conservation procedures for the historic artifacts are following the guidelines of the Rhode Island Historical Preservation Commission Standards for Storage and Custody of Archaeological Collections (RIHPHC 1999). The artifacts will then be placed in labeled, resealable plastic bags and acid-free containers for long-term curation at a RIHPHC approved curatorial facility. A complete catalogue of all recovered artifacts will be included in the final report.

VI. RECOMMENDATIONS

No significant archaeological deposits were identified during the Phase 1B archaeological survey conducted on the Budget Rental, Baylis, and Leviton properties. It is our recommendation, as well as the recommendation of the Narragansett Indian Tribal Historic Preservation Office, that no additional archaeological investigations are warranted for these three properties.

REFERENCES CITED

Beta Engineering, Inc.
1998 Phase I Environmental Assessment, Intermodal Station and People Mover, Warwick, RI. prepared for Edwards and Kelcey, Inc.

Connors, Edward
1998 United States Department of the Interior National Register of Historic Places Registration Form: Hillsgrove Mill Village, Warwick, Kent County, RI. NPS Form 10-900.

Funk, Robert E.
1972 Early Man in the Northeast and the Late Glacial Environment. Man in the Northeast 4:7-39.

Kintigh, Keith
1988 The Effectiveness of Subsurface Testing: A Simulation Approach. *American Antiquity* 53:686-707.

Lightfoot, Kent
1986 Regional Surveys in the Eastern United States: The Strengths and Weaknesses of Implementing Subsurface Testing Programs. *American Antiquity* 51:484-504.

McManamon, Francis P.
1984 Prehistoric Cultural Adaptations and Their Evolution on Outer Cape Cod. In Chapters in the Archaeology of Cape Cod I, Vol. 2, edited by Francis P. McManamon, pp. 339-417. Cultural Resources Management Study No. 8. Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston, MA.

Mulholland, Mitchell T.
1984 Patterns of Change in Prehistoric Southern New England: A Regional Approach. Unpublished Ph.D. dissertation, Department of Anthropology, University of Massachusetts, Amherst, MA.

Nicholas, George P.
1990 The Archaeology of Early Place: Early Postglacial Land Use and Ecology at Robbins Swamp, Northwestern Connecticut. Unpublished Ph.D. dissertation, University of Massachusetts, Amherst. University Microfilms, Ann Arbor, MI.

Rhode Island Historical Preservation and Heritage Commission
1998 Performance Standards and Guidelines for Archaeological Projects.

Rhode Island Historical Preservation Commission
1981 Warwick, Rhode Island Statewide Historical Preservation Report K-W-1.

Root, Dolores
1978 Predictive Model of Prehistoric Subsistence and Settlement on the Outer

Continental Shelf. Institution for Conservation Archaeology, Peabody Museum, Harvard University, Cambridge, MA.

Thorbahn, Peter
1984 Survey and Planning Project Completion Report, Prehistoric Land Use Zones Along the Taunton River. Report on file at the Massachusetts Historical Commission, Boston, MA.

Thorbahn, Peter, Leonard W. Loparto, Deborah C. Cox and Brona Simon
1980 Prehistoric Settlement Processes in New England: A Unified Approach to Cultural Resource Management and Archaeological Research. Report on file at the Massachusetts Historical Commission, Boston, MA.

United States Department of Agriculture
1981 *Soil Survey Report of Rhode Island.* United States Department of Agriculture, Washington, D.C.

6.4 Natural Systems

TELEPHONE CONVERSATION LOG

Conversation with: Michael Amaral, Senior Endangered Species Biologist
United States Department of the Interior
Fish and Wildlife Service
New England Field Office
(603) 225-1411

Placed by: Michelle Komar, KOMAR

Date: November 6, 1998

Re: Warwick Intermodal Station project

Summary of discussion:

Asked Mr. Amaral if any federally-listed and proposed, endangered or threatened species were known to occur within the Warwick Intermodal Station project area. Mr. Amaral responded that no such species were known to occur within the project area, with the exception of occasional, transient bald eagles and peregrine falcons.

TELEPHONE CONVERSATION LOG

Conversation with: Terry Walsh, Environmental Scientist
Rhode Island Department of Environmental Management
Office of Water Resources
(401) 222-6820

Placed by: Michelle Komar, KOMAR

Date: November 6, 1998

Re: Warwick Intermodal Station

Summary of discussion:

Ms. Walsh indicated that the RIDEM has assigned a "degraded" water quality status to the waters of both the Pawtuxet River Basin and the Narragansett Bay Basin which probably are receiving runoff from the project area. If the project requires the issuance of a RIDEM Water Quality Certification, the project will need to include provisions (BMPs) for the water quality treatment for all generated storm water runoff before discharge to any State waters.

TELEPHONE CONVERSATION LOG

Conversation with: Rick Enser, Rhode Island Natural Heritage Program Coordinator
Rhode Island Department of Environmental Management
(401) 222-2776

Placed by: Michelle Komar, KOMAR

Date: November 4, 1998

Re: Warwick Intermodal Station project

Summary of discussion:

Asked Mr. Enser if any known rare/endangered species or ecologically significant natural communities were located within the Warwick Intermodal Station project area. Mr. Enser responded that there are none known to be located within the project area.

TELEPHONE CONVERSATION LOG

Conversation with: Joseph Diaz, Deputy Chief
Rhode Island Department of Environmental Management
Division of Planning and Development
(401) 222-2776

Placed by: Michelle Komar, KOMAR

Date: November 6, 1998

Re: Warwick Intermodal Station project

Summary of discussion:

Asked Mr. Diaz if there are any Section 6(f) properties located within the Warwick Intermodal Station project area. Mr. Diaz responded that there are no Section 6(f) properties within the project area.

6.5 Traffic

Traffic analysis report prepared by Edwards and Kelcey, Inc., December 1998.

TABLE OF CONTENTS

1. INTRODUCTION 1
   A. Proposed Project 1
   B. Traffic Overview 1

2. EXISTING ROADWAY NETWORK 4

3. TRAFFIC DATA COLLECTION AND PROJECTION 4
   A. Existing Traffic Volumes 4
   B. Future Traffic Volumes 8
   C. Station Generated Traffic 8

4. CAPACITY ANALYSIS 16
   A. Level of Service Criteria 16
   B. Traffic Capacity Analysis 17
   C. Assessment of Traffic Impacts 30
   D. Potential Mitigation of Adverse Traffic Conditions 31

5. TRAFFIC SIGNAL WARRANT ANALYSIS 35

LIST OF TABLES

Table 6.5-1 Level of Service Criteria for Intersections 16
Table 6.5-2 Jefferson Boulevard at Airport Connector Off Ramp (Un-signalized) 20
Table 6.5-3 Jefferson Boulevard at Airport Connector Westbound On Ramp (Un-signalized) 21
Table 6.5-4 Jefferson Boulevard at Thurber Street and Station Exit (Un-signalized) 22
Table 6.5-5 Jefferson Boulevard at Station Entrance (Un-signalized) 23
Table 6.5-6 Post Road at Airport Connector Eastbound Off Ramp (Un-signalized) 24
Table 6.5-7 Post Road at Airport Connector Westbound On Ramp (Un-signalized) 25
Table 6.5-8 Post Road at Fresno Road (Un-signalized) 26
Table 6.5-9 Coronado Road at Imera Road (Un-signalized) 27
Table 6.5-10 Jefferson Boulevard at Coronado Road and Kilvert Street (Signalized) 28
Table 6.5-11 Post Road at Coronado Road (Signalized) 29
Table 6.5-12 Jefferson Boulevard at Airport Connector Eastbound Off Ramp (If Signalized) 32
Table 6.5-13 Jefferson Boulevard at Thurber Street and Station Exit (If Signalized) 32
Table 6.5-14 Post Road at Airport Connector Eastbound Off Ramp (If Signalized) 33
Table 6.5-15 Jefferson Boulevard at Coronado Road and Kilvert Street (If Signal Timing Revised) 33
Table 6.5-16 Post Road at Coronado Road and Airport Road (If Signal Timing Revised) 34
Table 6.5-17 Signal Warrant Analysis 35

LIST OF FIGURES

Figure 6.5-1 Location Map 2
Figure 6.5-2 Station Site Plan 3
Figure 6.5-3 Annual Average Daily Traffic Year 2000 No-Build 5
Figure 6.5-4 Peak Hour Volumes 1998 Existing Conditions 6
Figure 6.5-5 Average Travel Speeds 1998 Existing Conditions 7
Figure 6.5-6 Peak Hour Volumes, Year 2000 No-Build 10
Figure 6.5-7 Peak Hour Volumes Year 200 No-Build 11
Figure 6.5-8 Trip Distribution - Station Generated Traffic 12
Figure 6.5-9 Peak Hour Volumes Station Generated Traffic 13
Figure 6.5-10 Peak Hour Volumes Year 2000 Build 14
Figure 6.5-11 Peak Hour Volumes Year 2020 Build 15

1. INTRODUCTION

A. Proposed Project

The Rhode Island Department of Transportation (RIDOT) proposes to construct an Amtrak and commuter rail station along the Northeast Rail Corridor (NEC) tracks in the Hillsgrove section of the City of Warwick, and an elevated automated people mover connection between the railroad station and the terminal building at the nearby T. F. Green Airport. The station will include parking for approximately 400 cars, with 25 percent of the spaces allocated to long term parking for Amtrak passengers.

The proposed station site is the southeast quadrant of the Jefferson Boulevard - Coronado Road intersection. Vehicular access to the station and parking will be from Jefferson Boulevard, with the station driveway entrance located about 400 feet south of the intersection with Coronado Road. The station locus is shown on Figure 6.5-1; the station site plan is shown on Figure 6.5-2.

It is expected that the station will be operational in the year 2000. The planning horizon for traffic analysis is the year 2020.

B. Traffic Overview

The proposed station is forecast to accommodate 616 daily boarding passengers in the year 2000, and daily boardings are projected to increase to 757 by 2020 (see Appendix 6.6). Ridership is expected to consist of Amtrak passengers, airport passengers, airport employees, and work trip commuters with destinations in Providence and Boston. Traffic impacts from the proposed project include added trips generated by patrons of the station, and reduced trips resulting from patrons switching travel from automobile to transit.

The traffic impact analysis methodology consists of the following steps:

1. Determine existing traffic volumes on the adjacent roadway network, and forecast future volumes without the proposed project (i.e., "no-build") for the opening year 2000 and horizon year 2020.

2. Forecast station generated traffic volumes, allocate the volumes to the roadway network, and add these volumes to the "no-build" conditions developed in step 1 to establish "build" volumes.

3. Perform traffic capacity analyses to determine operational conditions under the "no-build" and "build" conditions for the analysis years.

4. Compare traffic operations for "build" and "no-build" to determine if the proposed project may result in adverse impacts to traffic operations.

5. Evaluate possible measures to mitigate significant adverse traffic impacts.

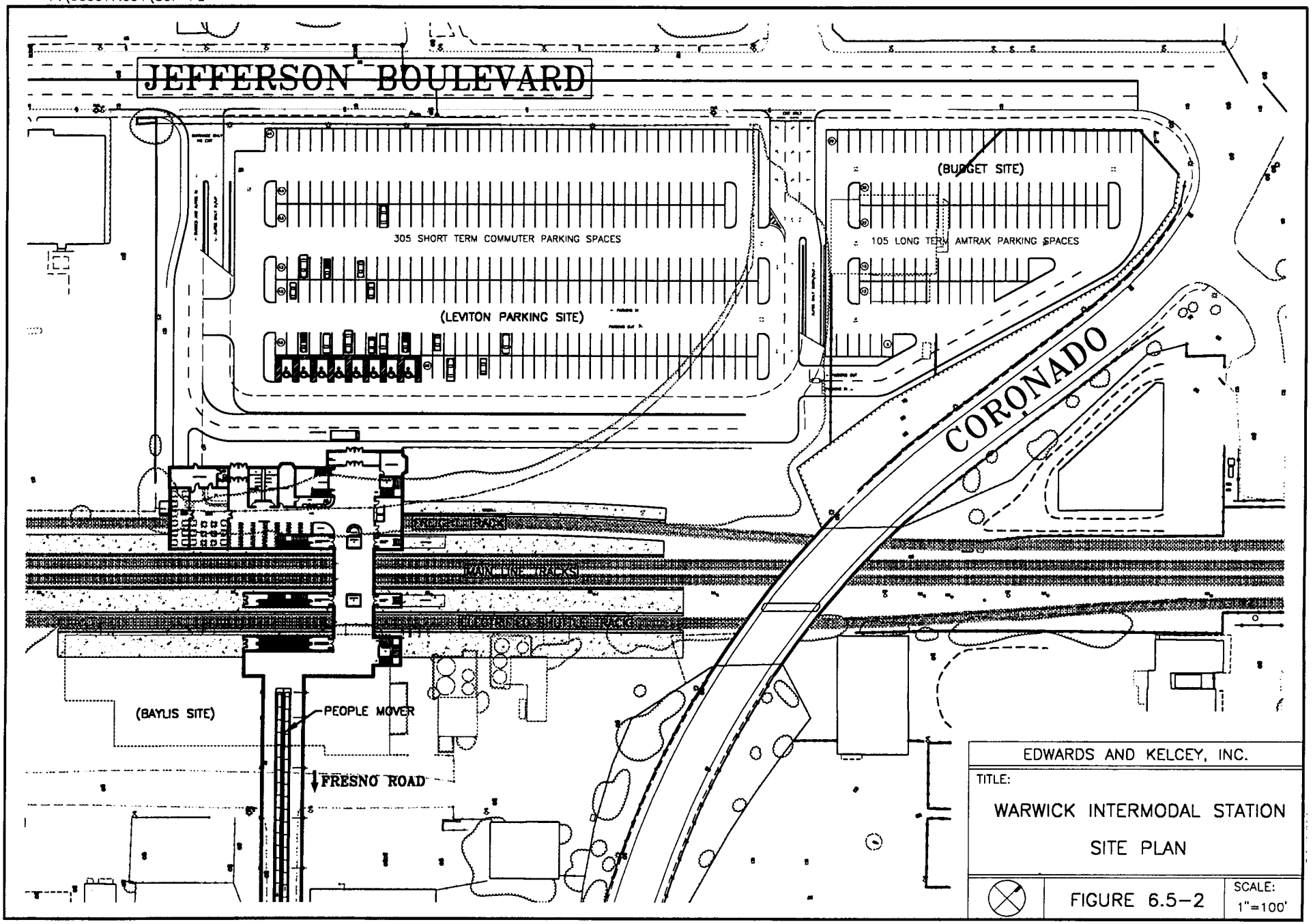
EDWARDS AND KELCEY
THE SCHRAFFT CENTER, 529 MAIN ST.
BOSTON, MA 02129
TEL. (617) 242-9222 FAX (617) 242-9824

WARWICK INTERMODAL STATION
LOCATION MAP

SCALE 1" = 800'± | FIGURE 6.5-1

P:\980017.004\LOC-MAP.DWG

P:\980017.004\SOF-PL



2. EXISTING ROADWAY NETWORK

The general vicinity of the proposed station site includes four roadways that serve as principal access routes to the station and to T. F. Green Airport. The project area roadway network and projected year 2000 Annual Average Daily Traffic volumes are shown on Figure 6.5-3.

- **Interstate Route I-95/Airport Connector** - I-95, a principal north-south highway through Rhode Island, traverses the westerly side of the project area. The Airport Connector begins at an interchange with I-95 and extends easterly to T. F. Green Airport. There are on and off ramps from the connector to Jefferson Boulevard and Post Road. The Airport Connector presently carries approximately 43,000 vehicles per day.

- **Jefferson Boulevard** - An arterial that runs north-south, parallel to and west of the railroad, Jefferson Boulevard provides cross-town mobility and service to abutting land uses. The roadway provides four travel lanes, and presently carries between 13,000 and 15,000 vehicles per day.

- **Post Road** - Also designated as US Route 1, this roadway runs north-south, parallel to and east of the railroad. Post Road provides cross-town mobility and service to abutting land uses. The roadway provides four travel lanes, and presently carries between 26,000 and 31,000 vehicles per day.

- **Coronado Road** - From at an intersection with Post Road, Coronado Road extends westerly, intersects Jefferson Boulevard, and continues westerly as Kilvert Street. Coronado Road provides local east-west mobility in the study area, as well as access to the airport. Current traffic volumes are as high as 10,000 vehicles per day.

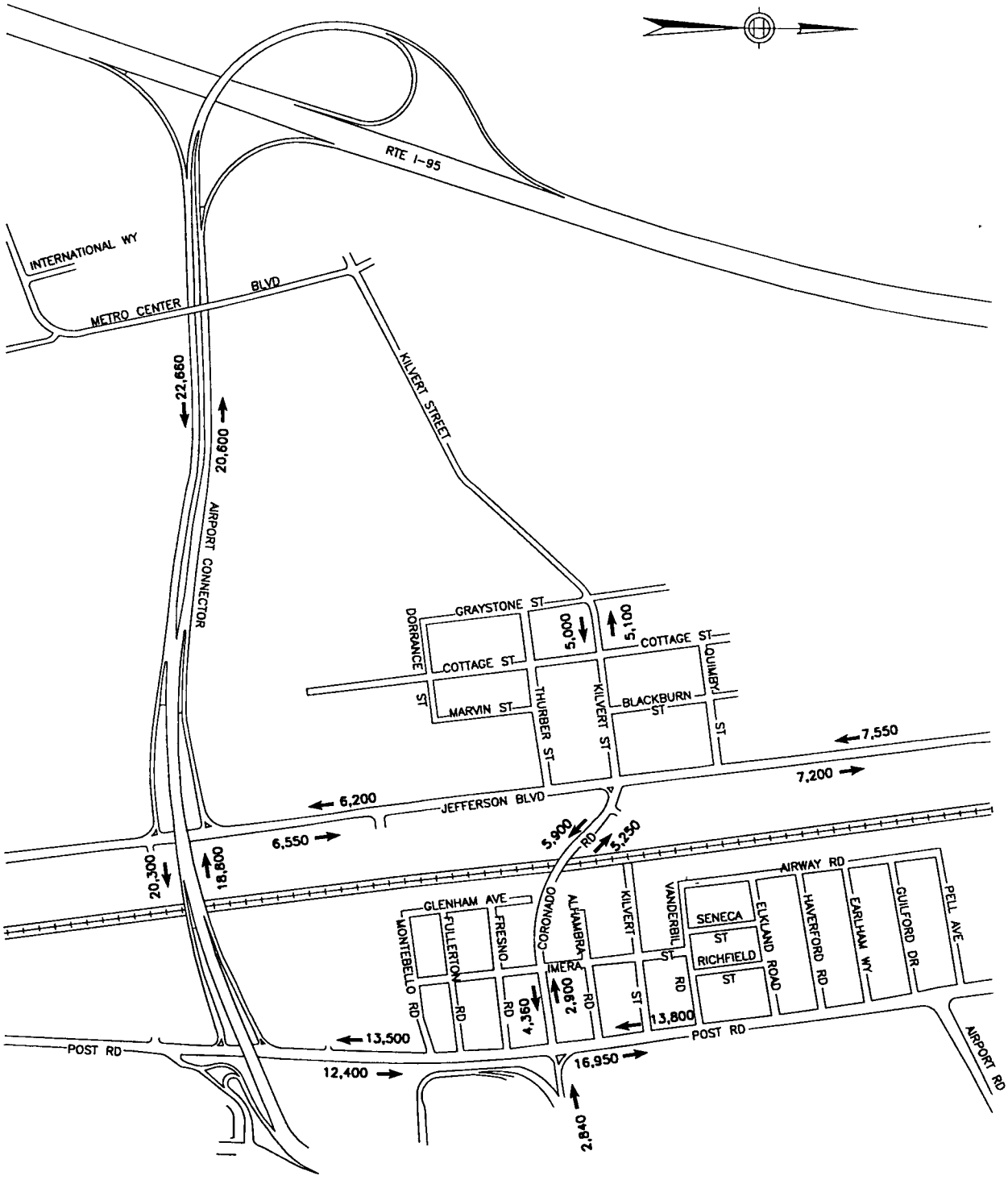
In the study area, two existing intersections are controlled by traffic signals: Post Road at Coronado Road and Airport Terminal Road and Jefferson Boulevard at Coronado Road and Kilvert Street.

3. TRAFFIC DATA COLLECTION AND PROJECTION

A. Existing Traffic Volumes

Data on existing traffic volumes in the study area were obtained from the Rhode Island Department of Transportation and the July 1998 *Site Assessment for the South County Rail Service in the City of Warwick and Town of North Kingston*. This information was supplemented with traffic counts performed at the Airport Connector on and off ramps at Jefferson Boulevard and Post Road. Compilation of the data produced the baseline condition 1998 traffic volumes in the study area. Figure 6.5-4 shows 1998 peak hour volumes for the morning, midday, and evening peak hours.

A travel speed study was performed in the study area using the "floating car" technique, which involved driving the local roads and recording the travel time and distance for each roadway link. The data on travel time and distance were used to calculate average travel speeds. The results of the travel speed study are shown on Figure 6.5-5.



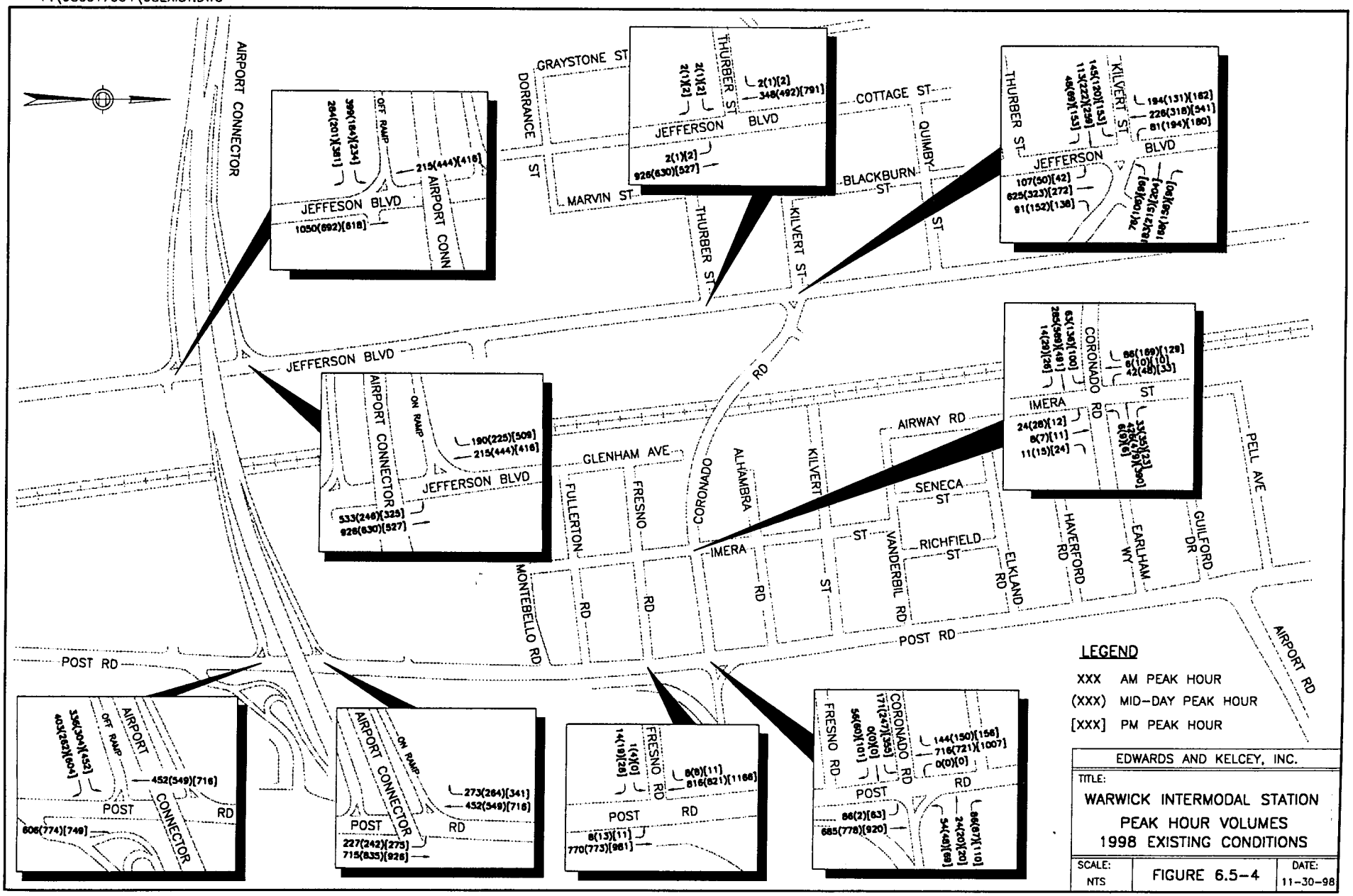
LEGEND

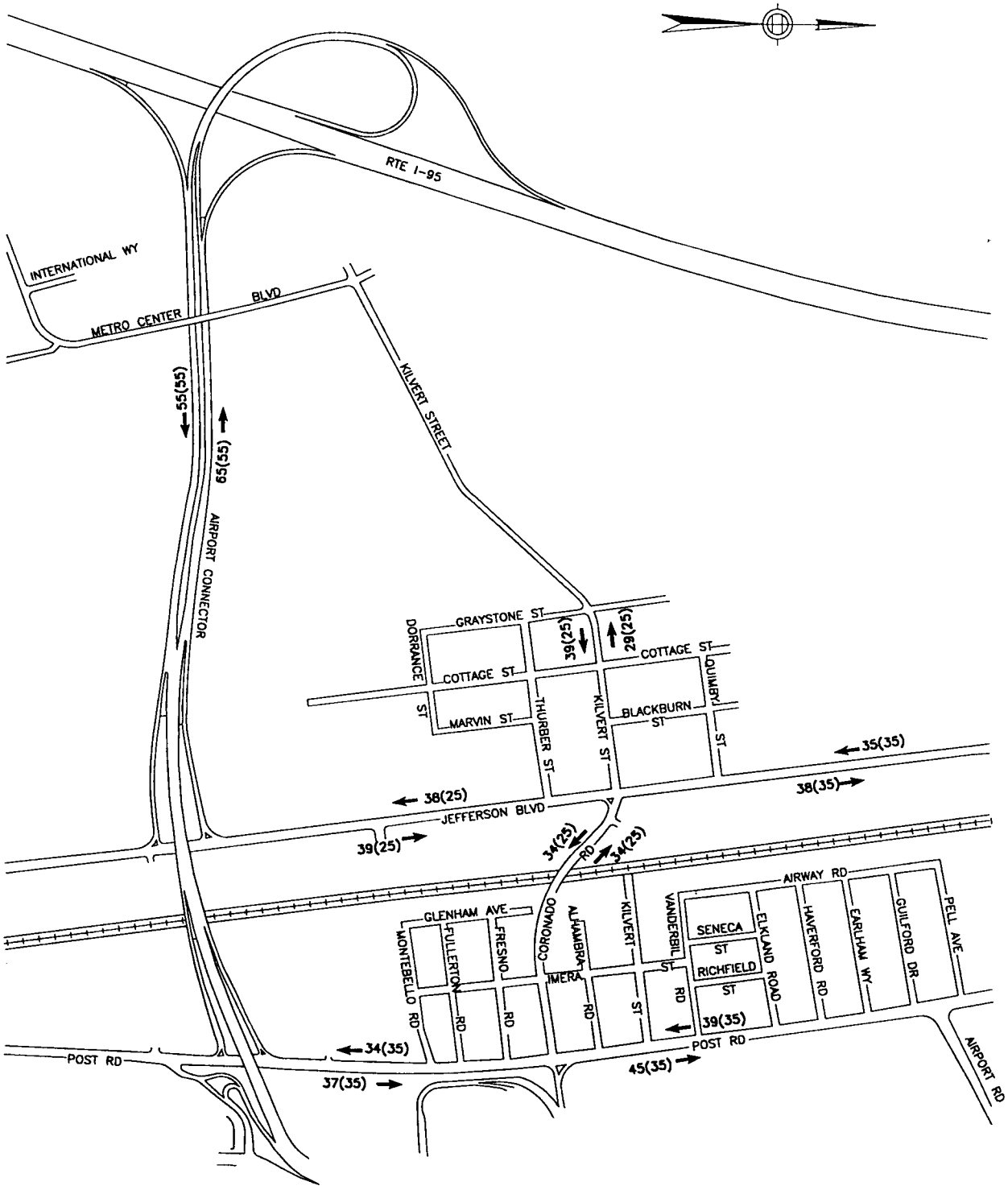
XXX PROJECTED ANNUAL AVERAGE DAILY VOLUME (AADT)

EDWARDS AND KELCEY, INC.		
TITLE: WARWICK INTERMODAL STATION ANNUAL AVERAGE DAILY TRAFFIC YEAR 2000 NO-BUILD		
SCALE: NTS	FIGURE 6.5-3	DATE: 11-30-98

P:\980017.004\T-VOL.DWG

P:\980017004\98EXIST.DWG





LEGEND

XXX AVERAGE TRAVEL SPEED

(XXX) POSTED SPEED LIMIT

EDWARDS AND KELCEY, INC.		
TITLE: WARWICK INTERMODAL STATION AVERAGE TRAVEL SPEEDS 1998 EXISTING CONDITIONS		
SCALE: NTS	FIGURE 6.5-5	DATE: 12-10-98

P:\980017.004\T-SP.DWG

B. Future Traffic Volumes

To assess the effects of the project on traffic operations, it is necessary to develop future traffic volumes, first for the anticipated opening year for the station (2000) and for a horizon planning year (2020). For both years, traffic volumes must be adjusted to reflect conditions without the project ("no-build") and with the project ("build").

The future "no-build" traffic is determined by applying average growth rates to existing volumes, and incorporating known traffic-generating development projects into the growth analysis.

General year to year increases in traffic volumes, typically called background growth, depend on a number of factors, including regional economic and population growth, income levels, and automobile ownership. On the local level, traffic volumes can be increased dramatically by new development projects, or conversely, may be reduced by business closings or construction of alternate travel facilities.

Projection of traffic volumes requires knowledge not only of historical trends and regional planning forecasts, but also awareness of factors pertinent to the study area. The socioeconomic activity in the study area has fluctuated over the past decade, and historical traffic growth trends over this period reflect this fluctuation. Regional planning studies forecast population growth of 0.4% per year between 2000 and 2020.

The project area recently has experienced steady growth due in part to the revitalization of the Airport. Local traffic data indicate current annual growth of 1%, and this value was used to project future traffic volumes.

The traffic data for 1998 existing conditions were projected at 1% per year to establish "no-build" traffic volumes for the years 2000 and 2020. The forecasts for peak hour "no-build" volumes are shown on Figure 6.5-6 for the year 2000 and Figure 6.5-7 for the year 2020.

C. Station Generated Traffic

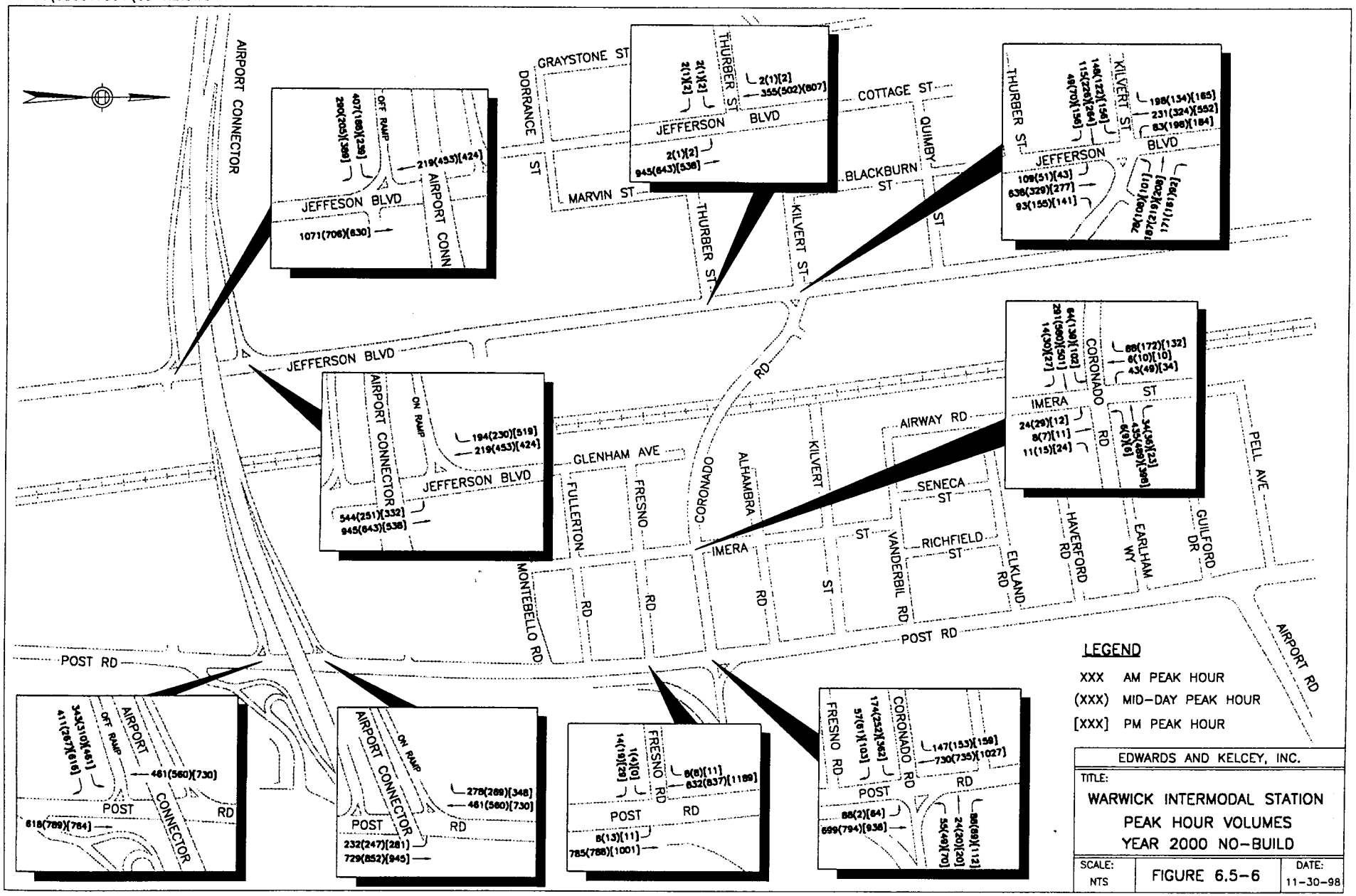
Trip generation for the proposed intermodal station is based on the forecasted ridership and parking spaces at the station. Trip generation rates were developed using the ITE Trip Generation Handbook (6th Edition) factors for light transit stations.

The total station-based trips were then assigned to the adjacent road network, based on probable origin/destination and relative attractiveness of the roadway, as follows:

60% to I-95 via the Airport Connector and Jefferson Boulevard south of the station;
5% to Jefferson Boulevard north of Coronado Road;
20% to Jefferson Boulevard south of Airport Connector;
15% to Coronado Road east of the station;
5% to Post Road north of Coronado Road;
10% to Post Road south of Coronado Road.

Figure 6.5-8 shows the trip distribution percentages for station generated traffic. Figure 6.5-9 shows the station generated traffic volumes distributed to the local roadway network. Figures 6.5-10 and 6.5-11 show peak hour volumes for year 2000 "Build"and year 2020 "Build" conditions, respectively.

P:\980017004\00-NB.DWG

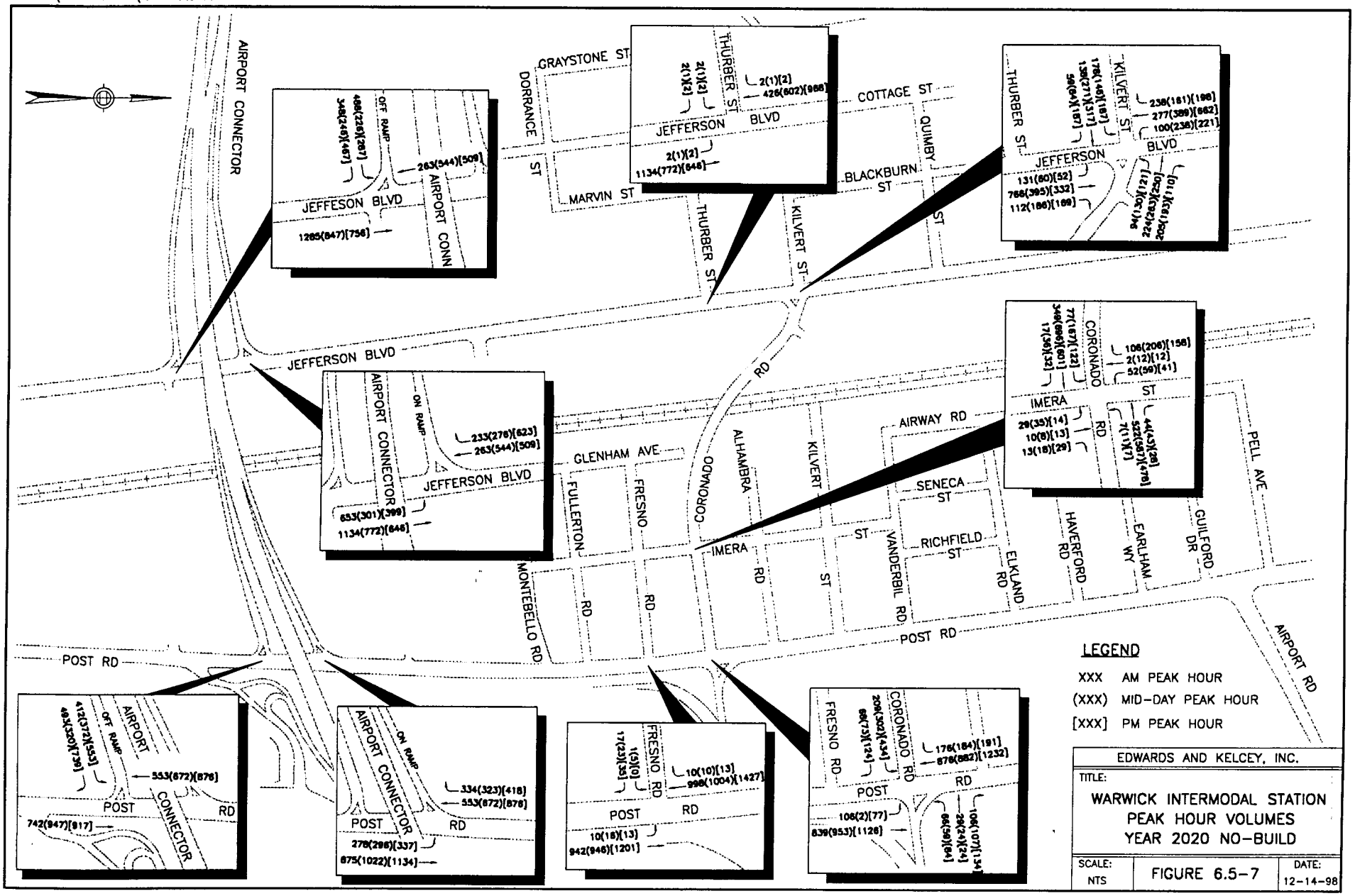


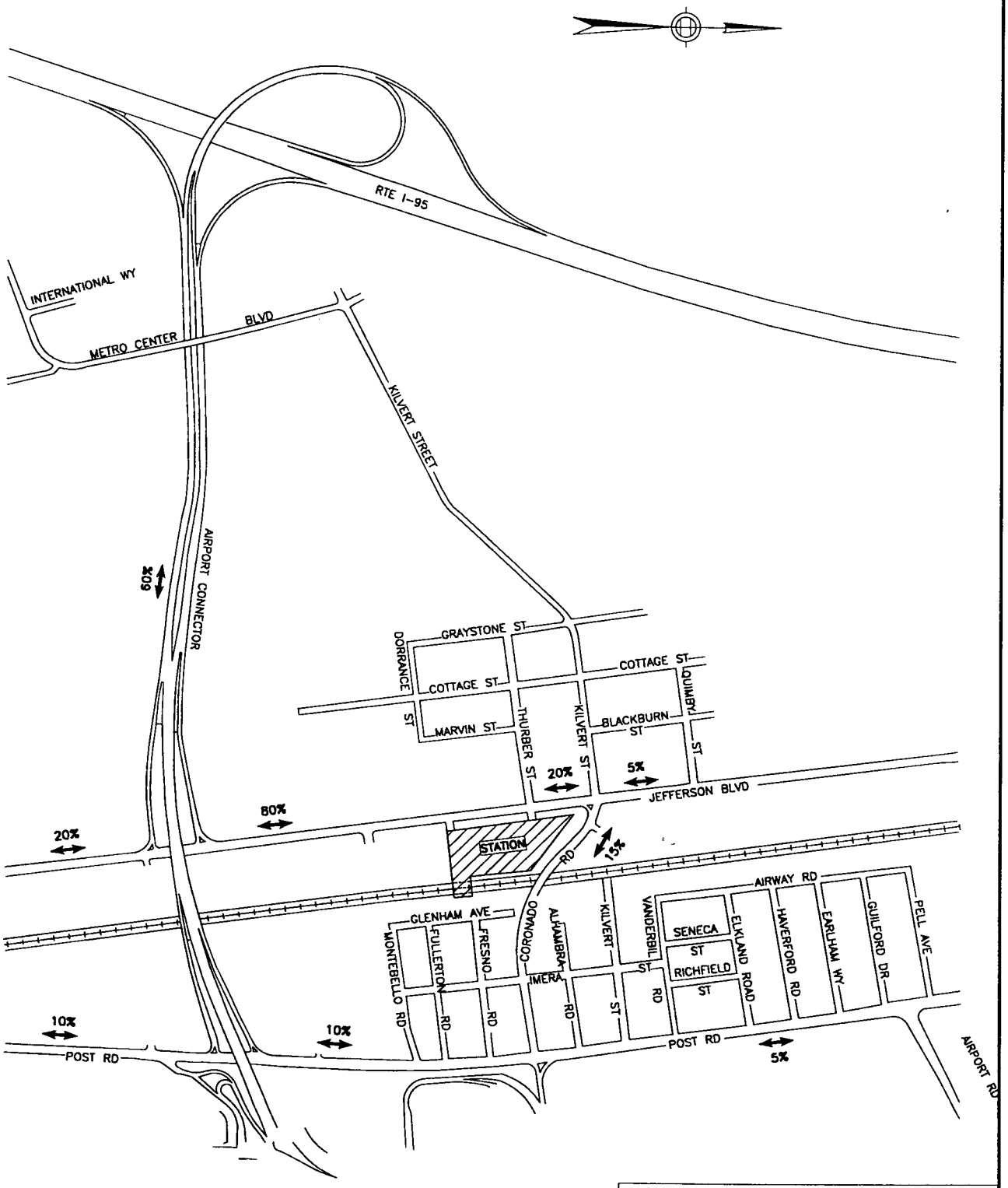
EDWARDS AND KELCEY, INC.

TITLE:
WARWICK INTERMODAL STATION
PEAK HOUR VOLUMES
YEAR 2000 NO-BUILD

SCALE:	FIGURE 6.5-6	DATE:
NTS		11-30-98

P:\980017004\20-NB.DWG

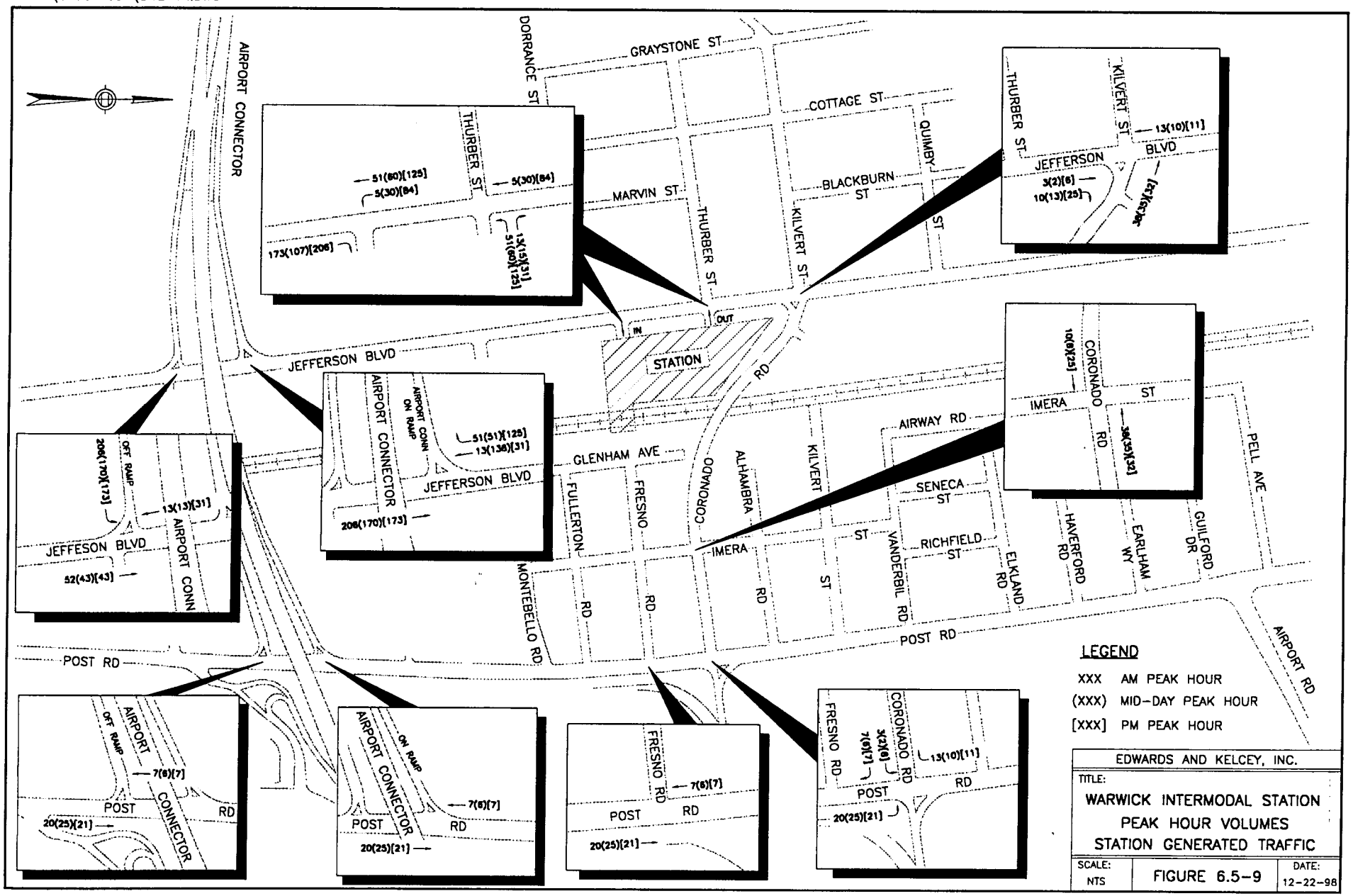




EDWARDS AND KELCEY, INC.		
TITLE: WARWICK INTERMODAL STATION TRIP DISTRIBUTION STATION GENERATED TRAFFIC		
SCALE: NTS	FIGURE 6.5-8	DATE: 12-22-98

P:\980017.004\T-DIST.DWG

P:\980017004\SITE-TR.DWG

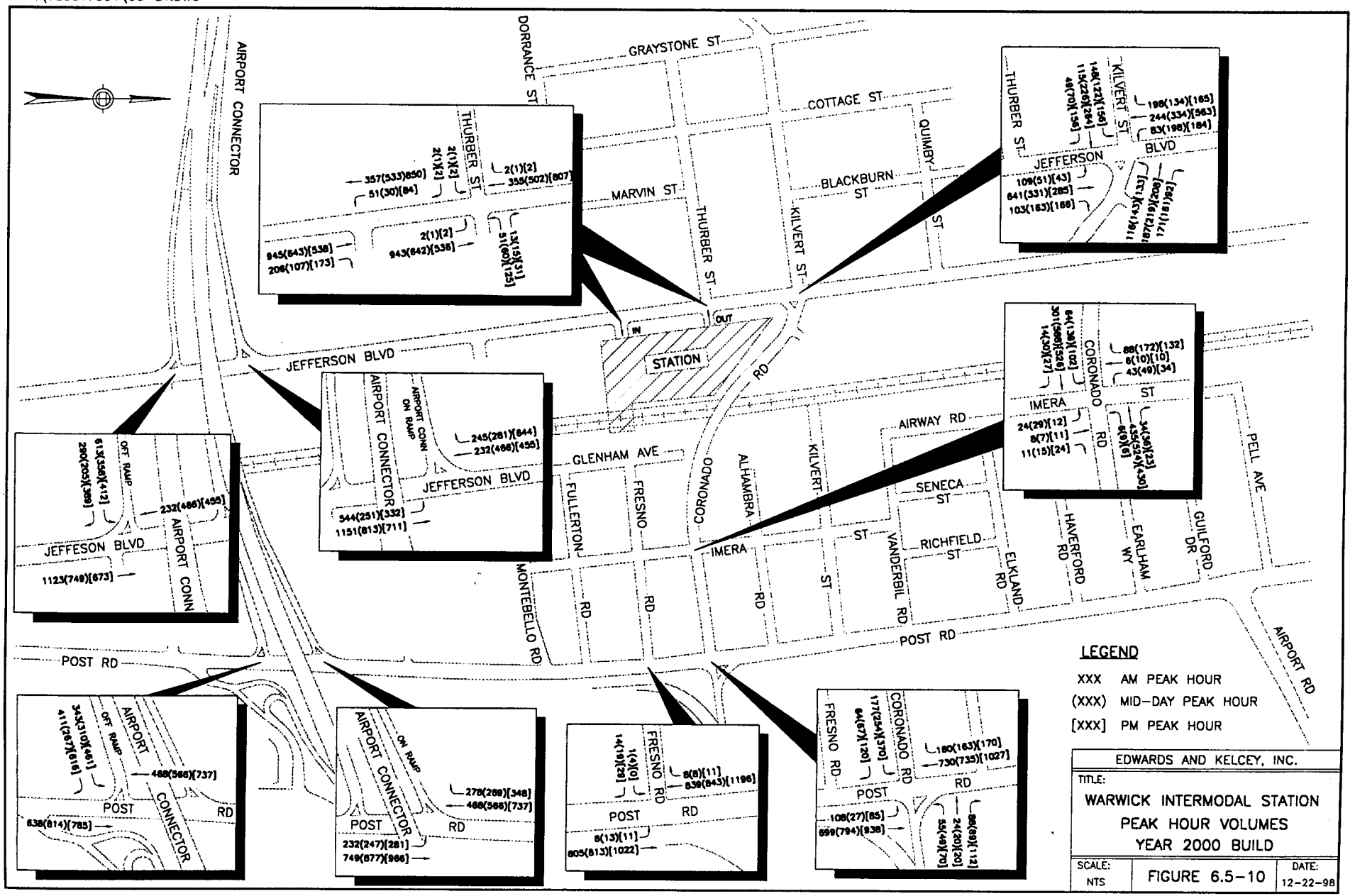


EDWARDS AND KELCEY, INC.

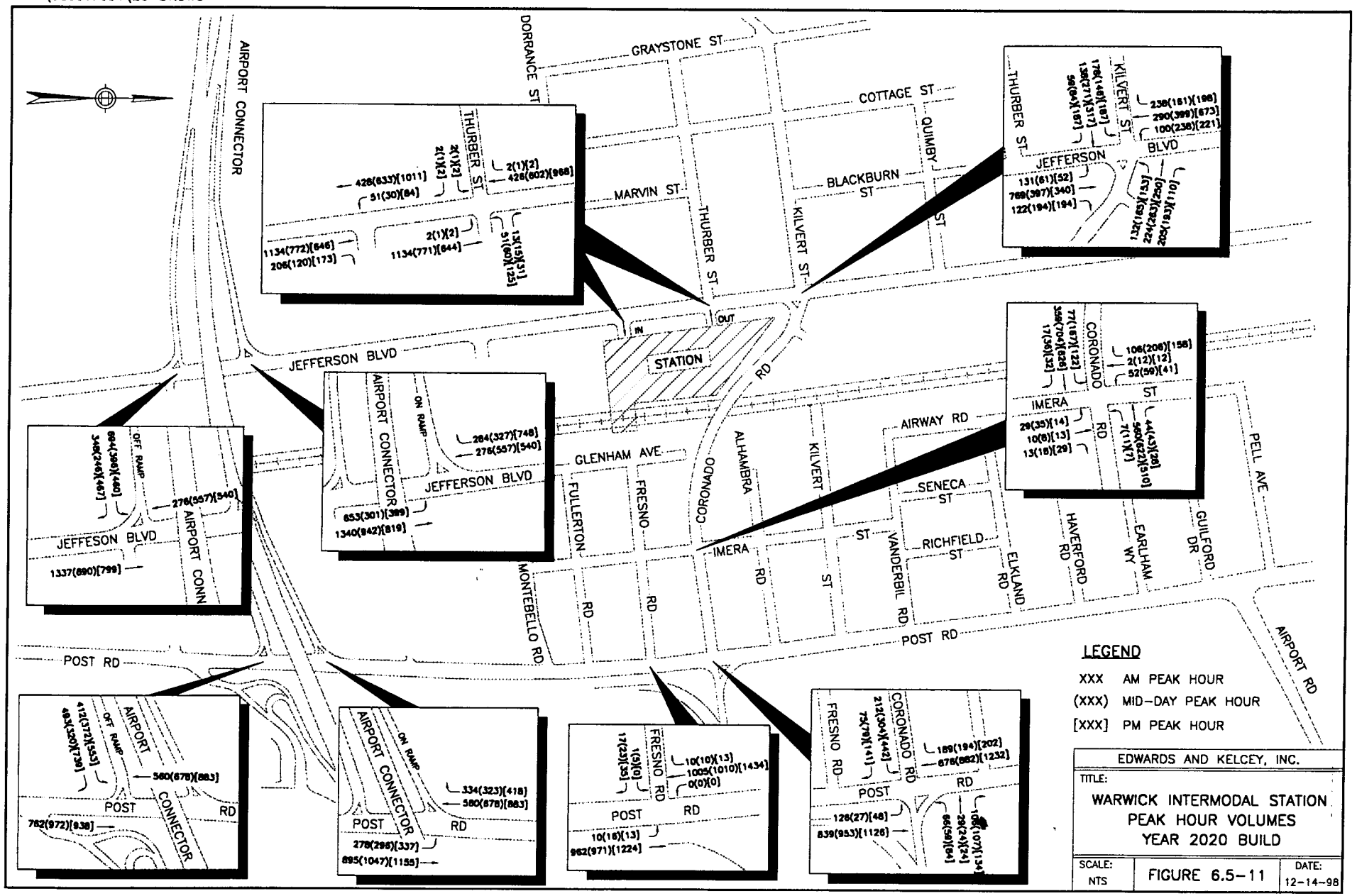
TITLE:
WARWICK INTERMODAL STATION
PEAK HOUR VOLUMES
STATION GENERATED TRAFFIC

SCALE:		DATE:
NTS	FIGURE 6.5-9	12-22-98

P:\980017004\00-BT.DWG



P:\980017004\20-BT.DWG



EDWARDS AND KELCEY, INC.

TITLE:

WARWICK INTERMODAL STATION
PEAK HOUR VOLUMES
YEAR 2020 BUILD

SCALE:		DATE:
NTS	FIGURE 6.5-11	12-14-98

4. CAPACITY ANALYSIS

A. Level of Service Criteria

Level of Service (LOS) is a qualitative measure of operational conditions within a traffic stream along a roadway segment or at an isolated intersection. Six level of service descriptors, designated by the letters "A" through "F", are used to describe the quality of traffic flow for the condition being evaluated. Level of service "A" represents the best operating conditions and LOS "F" represents the worst operating conditions.

For an un-signalized intersection, the measure of effectiveness used to determine the level of service is the *average total delay*. Total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue at an intersection approach until the vehicle departs from the stop line. As the volume at the intersection increases, the queue on a controlled approach gets longer, and traffic experiences longer delay. Table 6.5-1 below shows level of service for un-signalized intersections and the average total delay ranges that define each level of service.

For a signalized intersection, the measure of effectiveness used to determine level of service is *average stopped delay per vehicle*, a mathematical descriptor that has been shown to correlate well with driver discomfort and frustration, fuel consumption and lost travel time. Table 6.5-1 shows level of service for signalized intersections and the average stopped delay per vehicle ranges that define each level of service.

Table 6.5-1
Level of Service Criteria for Intersections

	Un-Signalized	Signalized
Level of Service (LOS)	Average Total Delay (Seconds/Vehicle)	Average Stopped Delay per Vehicle (Seconds)
"A"	0 to 5	0 to 5
"B"	5 to 10	5 to 15
"C"	10 to 20	15 to 25
"D"	20 to 30	25 to 40
"E"	30 to 45	40 to 60
"F"	Over 45	Over 60

Reference: 1994 Highway Capacity Manual, TRB Special Report 209, Third Edition

B. Traffic Capacity Analysis

Analysis of traffic operations at intersections was performed using the latest version of the Highway Capacity Software (HCS), based on the 1994 Transportation Research Board Special Report 209, Highway Capacity Manual (Third Edition). The analyses calculated average total delay for un-signalized intersections and average stopped delay per vehicle for signalized intersections. These calculated values were then used to determine the LOS for each intersection approach and for the overall intersection based on the performance criteria described in the preceding section.

Within the project limits, ten intersections were selected for capacity analysis to evaluate the level of impact resulting from station generated traffic. There are seven existing un-signalized intersections, and two existing signalized intersections. The proposed station will create one new intersection and modify one existing un-signalized intersection.

Un-signalized locations analyzed:

1. Jefferson Boulevard at Airport Connector Eastbound Off-Ramp
2. Jefferson Boulevard at Airport Connector Westbound On-Ramp
3. Jefferson Boulevard at Thurber Street [No-Build]; Jefferson Boulevard at Thurber Street and Station Exit [Build]
4. Jefferson Boulevard at Station Entrance [Build]
5. Post Road at Airport Connector Eastbound Off-Ramp
6. Post Road at Airport Connector Westbound On-Ramp
7. Post Road at Fresno Road
8. Coronado Road at Imera Road

Signalized locations analyzed:

1. Jefferson Boulevard at Coronado Road and Kilvert Street
2. Post Road at Coronado Road and Airport Road

The capacity analyses were performed for each intersection for A.M., midday, and P.M. peak hours, for the following years and alternatives:

- 1998 Existing
- 2000 No-Build
- 2000 Build
- 2020 No-Build
- 2020 Build

The following pages present the results of the traffic analyses.

Jefferson Boulevard at Airport Connector Eastbound Off Ramp

This un-signalized intersection operates with stop sign control on the off ramp approach to the intersection. The capacity analyses show the left turn from the off ramp and the overall intersection to be at "F" level of service for the existing 1998 A.M., midday, and P.M. peak hours. Operations in the years 2000 and 2020 for the No-Build will remain at LOS "F", with increased delays. Addition of station traffic will increase delay further in the Build years 2000 and 2020. Table 6.5-2 summarizes the results of the capacity analyses for the intersection.

Jefferson Boulevard and Airport Connector Westbound On-Ramp

This intersection operates at overall LOS "A" for all years, with and without station traffic. Table 6.5-3 summarizes the results of the capacity analyses for the intersection.

Jefferson Boulevard at Thurber Street [No-Build]
Jefferson Boulevard at Thurber Street and Station Exit [Build]

The proposed construction of the station exit will modify the existing three leg intersection of Jefferson Boulevard and Thurber Street to a four way intersection. As an un-signalized intersection, it will operate at an overall LOS "A" for the A.M. and midday peak hours for the Build years 2000 and 2020, however, the P.M. peak hour will be LOS "E in 2000 and LOS "F" in 2020. Table 6.5-4 summarizes the results of the capacity analyses for the intersection.

Jefferson Boulevard at Station Entrance

This intersection will operate at an overall LOS "A" for Build years 2000 and 2020, for all hours analyzed. Table 6.5-5 summarizes the results of the capacity analyses for the intersection.

Post Road and Airport Connector Eastbound Off-Ramp

This intersection operates at overall LOS "F" for all years and hours analyzed, with and without station traffic. Table 6.5-6 summarizes the results of the capacity analyses for the intersection.

Post Road and Airport Connector Westbound On-Ramp

This intersection operates at an overall LOS "A" for all years and hours analyzed., with and without station traffic. Table 6.5-7 summarizes the results of the capacity analyses for the intersection.

Post Road and Fresno Road

This intersection operates at an overall LOS "A" for all years and hours analyzed, with and without station traffic. Table 6.5-8 summarizes the results of the capacity analyses for the intersection.

Coronado Road at Imera Road

The intersection operates at an overall LOS "A" during the morning peak hours for all years, with and without station traffic. The intersection operates at an overall LOS "F" during the midday peak hours for all years, with and without station traffic. The intersection operates at an overall LOS "A" during the evening peak hours for 1998 and for the year 2000 with and without station traffic. The P.M. peak hour LOS will be "E" in the year 2020 No-Build condition and LOS "E" in the 2020 Build condition. Heavy volumes on the through street (Coronado Road) create long delays for traffic on Imera Road seeking to enter or cross Coronado Road, resulting in a lowered level of service. Table 6.5-9 summarizes the results of the capacity analyses for the intersection.

Jefferson Boulevard at Coronado Road and Kilvert Street

The intersection will operate at an overall LOS "C" during the A.M. peak hour for 1998 and No-Build years 2000 and 2020; LOS will be "F" for Build years 2000 and 2020. For the midday peak hour and evening peak hour, the overall LOS is "F"for all years, with and without station traffic. Table 6.5-10 summarizes the results of the capacity analyses for the intersection.

Post Road at Coronado Road

This intersection has been reconstructed recently, including a new traffic control signal. The intersection operates at an overall LOS "C" during the A.M. peak hour and midday peak hour for all years and hours analyzed. The intersection operates at LOS "C" for No-Build and Build in the year 2000, but will be at LOS "F" in the year 2020, with and without station traffic. Table 6.5-11 summarizes the results of the capacity analyses for the intersection.

Table 6.5-2
Jefferson Boulevard at Airport Connector Off Ramp (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Eastbound Off Ramp	EB Left	F	**	F	883.1	F	999.0
	EB Right	A	4.2	A	4.7	B	6.1
Total Intersection		F	**	F	107.5	F	143.2
Year 2000 No-Build							
Eastbound Off Ramp	EB Left	F	**	F	**	F	**
	EB Right	A	4.3	A	4.8	B	6.3
Total Intersection		F	**	F	**	F	**
Year 2000 Build							
Eastbound Off Ramp	EB Left	F	**	F	**	F	**
	EB Right	A	4.3	A	4.8	B	6.5
Total Intersection		F	**	F	815.0	F	841.9
Year 2020 No-Build							
Eastbound Off Ramp	EB Left	F	**	F	**	F	**
	EB Right	A	4.9	A	5.6	B	8.5
Total Intersection		F	**	F	388.4	F	466.0
Year 2020 Build							
Eastbound Off Ramp	EB Left	F	**	F	**	F	**
	EB Right	A	4.9	B	5.7	B	9.0
Total Intersection		F	**	F	**	F	**

** Indicates that the calculated delays are excessive (greater than 999.9 seconds per vehicle).

Table 6.5-3
Jefferson Boulevard at Airport Connector Westbound On Ramp (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Jefferson Boulevard	NB Left	B	5.2	B	5.7	B	7.1
Total Intersection		A	1.5	A	0.9	A	1.3
Year 2000 No-Build							
Jefferson Boulevard	NB Left	B	5.4	B	5.8	B	7.4
Total Intersection		A	1.5	A	0.9	A	1.4
Year 2000 Build							
Jefferson Boulevard	NB Left	B	5.5	B	6.0	B	8.1
Total Intersection		A	1.4	A	0.8	A	1.3
Year 2020 No-Build							
Jefferson Boulevard	NB Left	B	7.5	B	8.0	B	12.0
Total Intersection		A	2.1	A	1.3	A	2.2
Year 2020 Build							
Jefferson Boulevard	NB Left	B	7.8	B	8.3	C	13.7
Total Intersection		A	2.2	A	1.2	A	2.2

Table 6.5-4
Jefferson Boulevard at Thurber Street and Station Exit (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Thurber Street	EB All	C	12.2	C	10.1	C	14.2
Station Exit	WB Left	NA		NA		NA	
	WB Thru & Left	NA		NA		NA	
Jefferson Blvd	NB Left	A	2.3	A	4.0	B	5.9
Total Intersection		A	0.0	A	0.0	A	0.1
Year 2000 No-Build							
Thurber Street	EB All	C	12.7	C	10.3	C	14.7
Station Exit	WB Left	NA		NA		NA	
	WB Thru & Left	NA		NA		NA	
Jefferson Blvd	NB Left	A	3.4	A	4.0	B	6.1
Total Intersection		A	0.0	A	0.0	A	0.1
Year 2000 Build							
Thurber Street	EB All	C	14.9	C	12.1	C	16.6
Station Exit	WB Left	E	44.1	E	32.6	F	376.7
	WB Thru & Left	A	4.7	A	3.9	A	3.8
Jefferson Blvd	NB Left	A	3.3	A	4.0	B	6.0
Total Intersection		A	1.7	A	1.7	E	31.4
Year 2020 No-Build							
Thurber Street	EB All	C	18.0	C	11.9	D	20.8
Station Exit	WB Left	NA		NA		NA	
	WB Thru & Left	NA		NA		NA	
Jefferson Blvd	NB Left	A	3.7	A	4.0	B	7.5
Total Intersection		A	.01	A	0.0	A	0.1
Year 2020 Build							
Thurber Street	EB All	D	21.8	C	16.7	D	24.7
Station Exit	WB Left	F	97.6	F	61.8	F	**
	WB Thru & Left	B	5.3	A	4.3	A	4.0
Jefferson Blvd	NB Left	A	3.7	A	4.6	B	7.5
Total Intersection		A	3.2	A	2.6	F	96.7

NA = Not applicable. (Station exit does not exist under No-Build).
** Indicates that the calculated delays are excessive (greater than 999.9 seconds per vehicle).

Table 6.5-5
Jefferson Boulevard at Station Entrance (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Jefferson Boulevard	SB Left	NA		NA		NA	
Total Intersection		NA		NA		NA	
Year 2000 No-Build							
Jefferson Boulevard	SB Left	NA		NA		NA	
Total Intersection		NA		NA		NA	
Year 2000 Build							
Jefferson Boulevard	SB Left	C	11.6	B	6.4	B	6.2
Total Intersection		A	0.4	A	0.1	A	0.3
Year 2020 No-Build							
Jefferson Boulevard	SB Left	NA		NA		NA	
Total Intersection		NA		NA		NA	
Year 2020 Build							
Jefferson Boulevard	SB Left	C	14.9	B	7.7	B	7.3
Total Intersection		A	0.4	A	0.1	A	0.3

NA = Not applicable. (Intersection doesn't exist under No-Build).

Table 6.5-6
Post Road at Airport Connector Eastbound Off Ramp (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Eastbound Off Ramp	EB Left EB Right	F B	** 5.9	F A	** 5.1	F C	** 14.6
Total Intersection		F	**	F	**	F	**
Year 2000 No-Build							
Eastbound Off Ramp	EB Left EB Right	F B	** 6.1	F B	** 5.1	F C	** 15.8
Total Intersection		F	357.6	F	418.8	F	**
Year 2000 Build							
Eastbound Off Ramp	EB Left EB Right	F B	** 6.1	F B	** 5.1	F C	** 16.1
Total Intersection		F	382.3	F	450.3	F	**
Year 2020 No-Build							
Eastbound Off Ramp	EB Left EB Right	F B	** 8.1	F B	** 6.1	F F	** 76.6
Total Intersection		F	834.0	F	997.1	F	**
Year 2020 Build							
Eastbound Off Ramp	EB Left EB Right	F B	** 8.1	F B	** 6.1	F F	** 80.7
Total Intersection		F	877.9	F	**	F	**

** Indicates that the calculated delays are excessive (greater than 999.9 seconds per vehicle).

Table 6.5-7
Post Road at Airport Connector Westbound On Ramp (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Post Road	NB Left	B	8.4	B	6.4	B	9.0
Total Intersection		A	1.1	A	0.8	A	1.1
Year 2000 No-Build							
Post Road	NB Left	B	5.2	C	11.8	B	9.5
Total Intersection		A	0.7	A	1.5	A	1.2
Year 2000 Build							
Post Road	NB Left	B	5.3	C	12.0	B	9.6
Total Intersection		A	0.7	A	1.5	A	1.2
Year 2020 No-Build							
Post Road	NB Left	B	6.7	D	25.7	C	17.5
Total Intersection		A	0.9	A	3.3	A	2.1
Year 2020 Build							
Post Road	NB Left	B	6.8	B	9.6	C	17.8
Total Intersection		A	0.9	A	1.2	A	2.1

Table 6.5-8
Post Road at Fresno Road (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Fresno Road Post Road	EB All NB Left	B B	7.1 6.7	C B	13.1 6.6	B B	5.6 9.8
Total Intersection		A	0.1	A	0.2	A	0.1
Year 2000 No-Build							
Fresno Road Post Road	EB All NB Left	B B	7.3 6.9	C B	13.6 6.8	B C	5.7 10.1
Total Intersection		A	0.1	A	0.2	A	0.1
Year 2000 Build							
Fresno Road Post Road	EB All NB Left	B B	7.5 6.9	C B	14.2 6.8	B C	5.7 10.3
Total Intersection		A	0.1	A	0.2	A	0.1
Year 2020 No-Build							
Fresno Road Post Road	EB All NB Left	B B	9.4 8.8	D B	22.5 8.7	B C	6.8 14.2
Total Intersection		A	0.1	A	0.4	A	0.2
Year 2020 Build							
Fresno Road Post Road	EB All NB Left	B B	9.5 8.8	D B	23.5 8.7	B C	6.8 14.3
Total Intersection		A	0.1	A	0.4	A	0.2

Table 6.5-9
Coronado Road at Imera Road (Un-signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Imera Road	NB All	C	15.1	F	120.9	C	18.4
	SB All	C	11.2	F	235.2	C	18.2
Coronado Road	EB Left	A	0.8	B	1.1	A	0.7
	WB Left	A	0.0	B	0.1	A	0.1
Total Intersection		A	2.4	F	55.7	A	3.5
Year 2000 No-Build							
Imera Road	NB All	C	15.7	F	151.7	C	19.2
	SB All	C	11.7	F	339.9	C	19.4
Coronado Road	EB Left	A	4.6	B	5.8	A	4.3
	WB Left	A	3.3	B	5.8	A	4.6
Total Intersection		A	2.5	F	55.7	A	3.7
Year 2000 Build							
Imera Road	NB All	C	16.0	F	207.7	D	22.1
	SB All	C	12.0	F	505.4	D	25.0
Coronado Road	EB Left	A	4.6	B	6.2	A	4.5
	WB Left	A	3.3	B	5.8	A	4.8
Total Intersection		A	2.6	F	79.8	A	4.4
Year 2020 No-Build							
Imera Road	NB All	D	25.1	F	**	E	39.6
	SB All	D	20.1	F	**	F	163.7
Coronado Road	EB Left	B	5.5	B	7.8	B	5.1
	WB Left	A	3.6	B	7.1	B	5.4
Total Intersection		A	4.0	F	535.1	D	24.4
Year 2020 Build							
Imera Road	NB All	D	28.5	F	**	F	49.2
	SB All	D	23.5	F	**	F	308.5
Coronado Road	EB Left	B	5.8	B	8.4	B	5.3
	WB Left	A	3.7	B	7.2	B	5.6
Total Intersection		A	4.5	F	630.1	E	43.0

** Indicates that the calculated delays are excessive (greater than 999.9 seconds per vehicle).

Table 6.5-10
Jefferson Boulevard at Coronado Road and Kilvert Street (Signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Kilvert Street	EB All	D	31.6	C	23.5	F	121.4
Coronado Road	WB Left & Thru	C	18.2	F	**	F	**
	WB Right	C	15.1	B	15.0	B	14.0
Jefferson Blvd	NB All	B	7.0	B	6.0	B	5.8
	SB All	D	27.0	F	**	F	**
Total Intersection		C	17.1	F	**	F	**
Year 2000 No-Build							
Kilvert Street	EB All	D	38.8	C	20.5	F	**
Coronado Road	WB Left & Thru	C	18.7	F	**	F	**
	WB Right	C	15.2	C	15.1	B	14.0
Jefferson Blvd	NB All	B	7.1	B	6.0	B	5.9
	SB All	D	29.4	F	**	F	**
Total Intersection		C	18.8	F	**		**
Year 2000 Build							
Kilvert Street	EB All	F	**	C	24.9	F	**
Coronado Road	WB Left & Thru	F	105.4	F	**	F	**
	WB Right	C	15.2	C	15.1	B	14.0
Jefferson Blvd	NB All	B	7.1	B	6.0	B	6.0
	SB All	D	31.4	F	**	F	**
Total Intersection		F	**	F	**	F	**
Year 2020 No-Build							
Kilvert Street	EB All			C	25.0	F	**
Coronado Road	WB Left & Thru	C	18.7	F	**	F	**
	WB Right	C	15.2	C	15.1	B	14.0
Jefferson Blvd	NB All	B	7.1	B	6.0	B	5.9
	SB All	D	29.4	F	**	F	**
Total Intersection		C	18.8	F	**	F	**
Year 2020 Build							
Kilvert Street	EB All	F	**	F	**	F	**
Coronado Road	WB Left & Thru	F	**	F	**	F	**
	WB Right	C	15.9	C	15.7	B	14.3
Jefferson Blvd	NB All	B	8.2	B	6.4	B	6.7
	SB All	F	**	F	**	F	**
Total Intersection		F	**	F	**	F	**

** Indicates that the calculated delays are excessive (greater than 999.9 seconds per vehicle).

Table 6.5-11
Post Road at Coronado Road (Signalized)

Approach	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
1998 Existing							
Coronado Road	EB Left	C	20.7	D	25.2	D	36.9
	EB Right	B	12.1	B	12.3	B	12.6
Airport Road	WB Left	D	35.4	D	35.5	D	36.6
	WB Thru & Right	E	55.7	F	73.2	F	80.6
Post Road	NB Left	E	40.7	D	33.7	D	35.7
	NB Through	B	8.8	B	8.8	B	9.2
	SB Thru & Right	C	17.1	C	16.8	C	20.5
Total Intersection		C	17.6	C	18.4	C	22.1
Year 2000 No-Build							
Coronado Road	EB Left	C	20.8	D	25.8	D	39.1
	EB Right	B	12.2	B	12.3	B	12.6
Airport Road	WB Left	D	35.4	D	35.6	D	36.7
	WB Thru & Right	E	57.6	F	78.2	F	84.2
Post Road	NB Left	E	41.2	D	33.7	D	35.8
	NB Through	B	8.9	B	8.8	B	9.3
	SB Thru & Right	C	17.3	C	17.0	C	21.0
Total Intersection		C	17.9	C	18.8	C	22.7
Year 2000 Build							
Coronado Road	EB Left	C	20.5	D	26.0	E	42.0
	EB Right	B	12.1	B	12.3	B	12.7
Airport Road	WB Left	D	35.2	D	35.6	D	36.7
	WB Thru & Right	E	50.5	F	78.2	F	84.2
Post Road	NB Left	E	43.8	D	34.3	D	37.6
	NB Through	B	8.8	B	8.8	B	9.3
	SB Thru & Right	C	17.2	C	17.1	C	21.3
Total Intersection		C	17.9	C	19.1	C	23.4
Year 2020 No-Build							
Coronado Road	EB Left	C	21.9	D	34.1	F	86.0
	EB Right	B	12.2	B	12.4	B	12.8
Airport Road	WB Left	D	36.5	D	36.7	D	38.7
	WB Thru & Right	F	94.2	F	148.6	F	**
Post Road	NB Left	E	48.9	D	33.7	D	36.8
	NB Through	B	9.6	B	9.5	B	10.2
	SB Thru & Right	C	20.1	C	19.5	D	34.2
Total Intersection		C	21.6	C	25.0	F	**
Year 2020 Build							
Coronado Road	EB Left	C	22.0	D	25.2	F	71.6
	EB Right	B	12.3	B	12.3	B	12.9
Airport Road	WB Left	D	36.5	D	35.5	D	38.2
	WB Thru & Right	F	94.2	F	73.2	F	**
Post Road	NB Left	F	68.9	D	33.7	D	35.0
	NB Through	B	9.6	B	8.8	B	10.2
	SB Thru & Right	C	20.4	C	16.8	D	32.2
Total Intersection		C	22.9	C	19.8	F	**

** Indicates that the calculated delays are excessive (greater than 999.9 seconds per vehicle).

C. Assessment of Traffic Impacts

The station will attract riders who normally would drive to T. F. Green Airport for the purpose of employment or as passengers, therefore reducing the number of vehicle trips on local roadways and intersections. The intersections that benefit from those shifts are:

- Post Road at Airport Connector Eastbound Off Ramp
- Post Road at Airport Connector Westbound On Ramp
- Post Road at Coronado Road

Based on the traffic projections for the year 2020, construction of the station will not result in a reduction in peak hour volumes that is significant in terms of intersection level of service.

Un-signalized Intersections

Review of the analyses for un-signalized intersections shows the following locations operate at an overall LOS "F" for 1998 traffic volumes, and will remain at LOS "F" under the No-Build and Build conditions in 2000 and 2020:

Jefferson Boulevard at Airport Connector Eastbound Off Ramp - A.M., Midday, and P.M.;
Post Road at Airport Connector Eastbound Off Ramp - A.M., Midday, and P.M.;
Coronado Road at Imera Road - Midday.

The intersection of Coronado Road and Imera Road will operate at overall LOS "A" in the P.M. peak in the year 2000 for No-Build and Build; however, LOS will be "D" for 2020 No-Build and "E" for 2020 Build.

The intersection of Jefferson Boulevard and Thurber Street, with the addition of the proposed Station exit, will operate at overall LOS "E" in 2000 and LOS "F" in 2020 for the P.M. peak hour Build condition.

Signalized Intersections

Jefferson Boulevard at Coronado Road and Kilvert Street will operate at LOS "C" in the A.M. peak for all years under No-Build, but will be LOS "F" for the Build condition in 2000 and 2020. The intersection operates at LOS "F" for the midday and evening peak for all years and hours analyzed, with and without station traffic.

Post Road at Coronado Road and Airport Road will be LOS "F" in the year 2020 Build condition.

D. Potential Mitigation of Adverse Traffic Conditions

Of the un-signalized intersections with adverse operationing conditions identified above, two will be affected significantly by construction of the proposed station. A large percentage of station traffic will use the Airport Connector eastbound off ramp to Jefferson Boulevard, making an existing LOS "F" condition worse. While the Jefferson Boulevard intersection at Thurber Street presently functions acceptably, addition of the proposed station driveway exit will produce LOS "F" conditions in the P.M. peak hour.

Analysis showed that installation of a traffic control signal at these locations can eliminate adverse operating conditions. The results of capacity analyses for installation of signals are shown in Table 6.5-14 and Table 6.5-15.

The intersection of Post Road at Airport Connector Eastbound Off Ramp operates at LOS "F" for all years and hours analyzed. The proposed station will have a minor adverse impact on the intersection; however, this location would benefit from installation of a signal. Table 6.5-14 summarizes operations at this intersection if signalized.

Of the existing signalized intersections, traffic from the proposed station will result in a deterioration in LOS for the intersection of Jefferson Boulevard at Coronado Road and Kilvert Street and the intersection of Post Road at Coronado Road and Airport Road. Improved traffic operations at these intersections can be achieved by adjusting the timing of the signal cycle and phasing to reflect new traffic demand. The intersection at Jefferson Boulevard is anticipated to require a reconstructed traffic control signal; the signal at Post Road is new and likely will require only minor modifications. Tables 6.5-16 and 6.5-17 show the results of capacity analyses using revised signal timing data for these two locations.

The un-signalized intersection at Coronado Road and Imera Road will continue to function acceptably for several years, even with construction of the proposed station. By the year 2020, the P.M. peak hour will be LOS "D" for the No-Build condition and LOS "E" for the Build condition. Installation of a traffic control signal at this location is not required at the present time, and given the close proximity of signals at Coronado and Post Road and Coronado Road at Jefferson Boulevard, installation of a signal at Imera Road may create problems with traffic progression and queuing.

Table 6.5-12
Jefferson Boulevard at Airport Connector Eastbound Off Ramp (If Signalized)

Location	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
2000 Build							
Eastbound Off Ramp	EB Left	C	15.9	B	8.0	B	8.5
	EB Right	B	6.8	B	6.3	B	7.5
Jefferson Boulevard	NB Through	B	9.8	B	7.7	B	7.4
	SB Through	B	6.3	B	6.8	B	6.8
Total Intersection		B	10.8	B	7.4	B	7.5
2020 Build							
Eastbound Off Ramp	EB Left	D	28.0	B	8.4	B	9.2
	EB Right	B	7.2	B	6.5	B	8.3
Jefferson Boulevard	NB Through	B	13.1	B	8.3	B	7.9
	SB Through	B	6.4	B	7.1	B	7.0
Total Intersection		C	15.7	B	7.8	B	8.0

Table 6.5-13
Jefferson Boulevard at Thurber Street and Station Exit (If Signalized)

Location	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
2000 Build							
Thurber Street	EB All	B	8.2	B	8.2	B	8.2
Station Exit	WB Left	B	8.4	B	8.5	B	8.8
	WB Thru & Right	B	8.3	B	8.3	B	8.4
Jefferson	NB Thru & Left	B	6.5	B	5.2	A	5.0
Boulevard	SB Thru & Right	A	4.5	A	4.8	B	5.7
Total Intersection		C	16.9	C	23.6	C	17.9
2020 Build							
Thurber Street	EB All	B	8.2	B	8.2	B	8.2
Station Exit	WB Left	B	8.4	B	8.5	B	8.8
	WB Thru & Right	B	8.3	B	8.3	B	8.4
Jefferson Blvd	NB Thru & Left	B	6.5	B	5.2	A	5.0
	SB Thru & Right	A	4.5	A	4.8	B	5.7
Total Intersection		C	16.9	C	23.6	C	17.9

Table 6.5-14
Post Road at Airport Connector Eastbound Off Ramp (If Signalized)

Location	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
2000 Build							
Eastbound Off Ramp	EB Left	B	6.6	B	6.5	B	6.8
	EB Right	B	7.7	B	6.6	B	11.8
Post Road	NB Through	B	7.3	B	7.9	B	7.8
	SB Through	B	6.8	B	7.1	B	7.6
Total Intersection		B	7.1	B	7.3	B	8.4
2020 Build							
Eastbound Off Ramp	EB Left	B	6.7	B	6.6	B	7.1
	EB Right	B	8.7	B	6.9	C	22.9
Post Road	NB Through	B	7.7	B	8.7	B	8.5
	SB Through	B	7.1	B	7.4	B	8.2
Total Intersection		B	7.5	B	7.8	B	11.1

Table 6.5-15
Jefferson Boulevard at Coronado Road and Kilvert Street (If Signal Timing Revised)

Location	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
2000 Build							
Kilvert Street	EB Left	D	31.7	C	20.6	C	18.7
	EB Thru & Right	B	14.2	C	16.7	C	22.8
Coronado Road	WB Left	E	40.3	C	21.8	C	17.9
	WB Thru & Right	C	23.3	D	22.2	C	15.3
Jefferson Blvd	NB All	B	9.5	B	101	C	18.1
	SB All	B	14.3	D	39.2	C	16.2
Total Intersection		C	16.90	C	23.6	D	17.9
2020 Build							
Kilvert Street	EB Left	E	51.3	C	20.7	C	22.0
	EB Thru & Right	B	14.7	C	17.5	E	45.2
Coronado Road	WB Left	D	26.4	C	22.1	C	19.5
	WB Thru & Right	E	42.5	D	31.0	C	17.5
Jefferson Blvd	NB All	B	11.1	D	30.8	D	31.2
	SB All	D	28.0	B	14.2	D	26.3
Total Intersection		C	24.0	C	22.7	D	28.9

Table 6.5-16
Post Road at Coronado Road and Airport Road (If Signal Timing Revised)

Location	Movement	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
		LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)
2000 Build							
Coronado Road	EB Left	C	20.7	C	19.7	D	35.8
	EB Right	B	11.3	B	9.6	B	10.0
Airport Road	WB Left	D	31.9	D	27.0	D	27.6
	WB Thru & Right	D	36.2	D	31.3	D	35.5
Post Road	NB Left	D	37.8	D	28.1	D	30.1
	NB Through	B	8.6	B	7.6	B	8.1
	SB Thru & Right	C	18.2	C	15.6	C	20.2
Total Intersection		C	17.2	B	14.1	C	18.8
2020 Build							
Coronado Road	EB Left	C	22	C	24.2	E	48.4
	EB Right	B	11.4	B	9.7	B	10.2
Airport Road	WB Left	D	32.3	D	27.3	D	28.1
	WB Thru & Right	E	40.7	D	35.6	E	43.1
Post Road	NB Left	E	41.1	D	28.1	D	31.6
	NB Through	B	9.2	B	8.3	B	10.7
	SB Thru & Right	C	20.8	C	17.9	D	38.8
Total Intersection		C	19.0	C	16.0	D	29.4

5. TRAFFIC SIGNAL WARRANT ANALYSIS

As described in the preceding section, the LOS at some of the intersections analyzed would benefit from installation of a traffic control signal. As an adjunct to the capacity analyses, this study also evaluated traffic signal warrants at these locations. The analysis was performed in accordance with the procedures set forth in the Manual on Uniform Traffic Control Devices (MUTCD) to determine if the intersections met warrants for signalization.

The MUTCD warrant procedure establishes several traffic operation scenarios for analysis. If the specific site traffic operations satisfy the conditions of the particular scenario analyzed, the warrant for that scenario is met. If one or more of the warrants conditions is met, then installation of a traffic control signal is warranted. (Warrant analysis is only the first step in the process; installation of a signal also should be subjected to a justification analysis based on consideration of additional factors.)

Review of the traffic assignments and volumes showed that the locations most affected by the station were the proposed intersection of Jefferson Boulevard at Thurber Street and the Station exit, and the intersection of Jefferson Boulevard at the Airport Connector Eastbound Off Ramp.
Although not significantly impacted by station traffic, the intersection of Post Road at Airport Connector Eastbound Off Ramp would benefit from signalization, and warrant analysis was performed for this location as well.

The P.M. peak traffic is considered more critical than the A.M. peak traffic in the warrant analysis, therefore, the P.M. peak volumes were used. Table 6.5-17 below summarizes the results of the analysis for those warrants applicable to this project.

Table 6.5-17
Signal Warrant Analysis

Location	Warrant Met	
	Warrant 10 (Peak Hour Delay)	Warrant 11 (Peak Hour Volume)
Jefferson Boulevard at Airport Connector Eastbound Off Ramp	Yes	Yes
Jefferson Boulevard at Thurber Street and Station Exit	Yes	Yes
Post Road at Airport Connector Eastbound Off Ramp	Yes	Yes

Reference: Manual on Uniform Traffic Control Devices, Part IV.

H:\-9800-17\004\trafapp.wpd

6.6 Ridership

Ridership study prepared by Edwards and Kelcey, Inc., December 1998.

Warwick Intermodal Train Station
At T.F. Green Airport

RIDERSHIP DEMAND

DECEMBER 3, 1998

The Rhode Island Department of Transportation (RIDOT) is proposing a new rail station in the vicinity of T. F. Green Airport (PVD) in Warwick, Rhode Island. It is proposed that Amtrak, and the Massachusetts Bay Transportation Authority (MBTA), will serve the proposed station. RIDOT requested that ridership estimates for the station be developed, as well as estimates of the anticipated reduction in vehicle miles traveled (VMT). The horizon for the projections is the year 2020. This study includes developing projections of annual rail ridership resulting from projected use of the proposed rail facility.

The total ridership estimate is divided into two parts. The first part projects riders using the rail system to access the airport, in lieu of driving to the airport. The results of these projections are shown in the tables contained in this report. The methodology used in developing these annual ridership projections is included in Appendix I.

The second part of the estimate is riders using the Amtrak intercity system and the proposed commuter rail system at Warwick, in lieu of driving to the existing train station at Providence. Amtrak provided the projected intercity ridership. Projected ridership for the proposed commuter rail system was based on a previous ridership study performed for RIDOT under another project. These ridership projections are included in Appendix II.

Several airports with rail service were investigated. These included Chicago's O'Hare International and Midway Airports, Atlanta's Hartsfield International Airport, San Francisco International Airport, Philadelphia International Airport (PHL), Reagan National Airport, and Baltimore/Washington International Airport (BWI). The type of rail service at each airport was ascertained, as well as the availability of data on ridership and routes for the rail service at the airport. Of the airports reviewed, BWI and PHL were the two airports whose rail service most closely resembled the service proposed for Warwick. The important similarity is the regional rail service in the vicinity of both airports, and the availability of Amtrak service at BWI. Published data on both BWI and PHL was reviewed, and determined that the data from BWI was sufficiently complete to allow us to develop a ridership estimate for the service. A model to predict level of rail ridership at the proposed Warwick station was developed using the relationship between rail network, rail ridership and airport-related use of the rail service at BWI. The model is discussed, and the ridership estimates developed with it, in Appendix 1. Consistent with operations at other airports, three daily employee shifts at the airport were assumed, with the third shift (at night) unlikely to make use of the proposed rail service. Based on discussions with other airports, it is estimated that 5% of the potential employee ridership will actually use the proposed rail system. As is shown in Table 1 in Appendix II, it is projected that there will be approximately 200 employee train trips per day (100 employee trips in each direction).

Also shown in Table 1 in Appendix II, are projected total annual train riders at the Warwick station, the associated employee ridership at the station (representing about 73,000 airport-related users of the facility), and the resulting number of non-employee riders (145,400 riders).

c:\windows\desktop\my briefcase\projects\aviation\pvd\rail\air_ridr\revision\rider1rev.doc

Appendix I

METHODOLOGY FOR THE WARWICK INTERMODAL TRAIN STATION PASSENGER FORECAST

METHODOLOGY FOR T. F. GREEN TRAIN STATION PASSENGER FORECASTS

A. Introduction

This section describe the methodology used to create forecasts of the number of airport employees and airline passengers that will use the new Warwick commuter rail station at T. F. Green International Airport. The forecasts begin in the year 2000 and are projected to the year 2020.

B. Background

Intermodal links between rail transportation and commercial airports is a trend that is well established in Europe and Japan, but has only recently come to the forefront as a major planning option in the United States. Only a few U.S. cities can offer a convenient and viable rail access to their commercial airports. Exhibit 1 below shows current and planned rail lines that connect to major U.S. airports.

Airport	Authority/Rail System	Type of System	Status
Atlanta	MARTA	Metro	Operating
Boston	MBTA	Metro	Operating
Chicago O'Hare	CTA	Metro	Operating
Chicago O'Hare	METRA	Commuter	Operating
Chicago Midway	CTA	Metro	Operating
Baltimore	MARC/Amtrak	Commuter	Operating
Washington-National	WMATA	Metro	Operating
Newark	New Jersey Transit	Commuter	Extension of APM is Under Construction
New York-Kennedy	Port Authority LRS	Light Rail	In Planning Stage
New York-LaGuardia	Port Authority LRS	Light Rail	In Planning Stage
Philadelphia	SEPTA	Commuter	Operating
St. Louis	Metrolink	Light Rail	Operating
San Francisco	BART	Metro	Under Construction

Exhibit 1: Rail to Air Links at U.S. Airports

Standard forecasting procedures use econometric regression models. These models require data observations on various characteristics from different points of time or from like entities during the same time period. The former is called time series analysis, while the latter is called cross-sectional analysis. In the case of the planned T.F. Green rail station time series analysis is unworkable because no historical data exists on passenger traffic. As an alternative, cross-sectional analysis using the airports shown in Exhibit 1 as data observations was investigated. However, a suitable cross-sectional regression model with a sufficient number of degrees of freedom and acceptable r-square could not be found. The main reason is that there are not enough airports with rail links to create a large enough data sample.

The problem of limited data is compounded by the numerous differences among the individual transit systems. Each of these current and planned rail systems is unique. Systems such as MARTA, WMATA, and CTA are extensive subway systems where the airport station is only a small part of the network, while others such as Metrolink and Port Authority LRS are light rail systems designed specifically to connect the airports to the city center. MARC, SEPTA and METRA are commuter rail lines that offer quick access from the airport to the city center but have a limited network.

Since no viable regression model was found an alternative analysis using only Baltimore (BWI) MARC data observations to estimate Providence airport rail traffic was used. This is feasible because of the similar operating circumstances between the rail station located at BWI Airport and the planned rail station at T.F. Green. Differences between Baltimore and Providence are taken into account through the construction of the analytical model. The next section describes these similarities between Baltimore and Providence.

C. Similarities between Baltimore and Providence

Commuter Rail Station Near Airport

Both Providence and Baltimore will have commuter rail stations that are offsite locations less than a mile from the main airport terminal. The main logistical problem of each site is getting train passengers from the station to the terminal. Given their comparable circumstances their solutions to linking their passengers will be similar. Both airports are currently investigating the possibility of building an automated people mover system between their respective airport and the train station. BWI currently runs a shuttle bus every ten minutes between the airport terminal and train station. T.F. Green will most likely offer similar shuttle services.

Similar Train Services

Amtrak has agreed to start service at the Warwick station once it opens and Amtrak already operates at BWI. Both stations are located on the Northeast Corridor, the intercity rail line connecting Boston to Washington.

Amtrak is usually regarded as an intercity service. However, at BWI air passengers are able to use Amtrak services to supplement MARC in order to gain quick and easy access to downtown Washington. Amtrak fares are more expensive than commuter lines,

however, this additional service will benefit time sensitive travelers. Providence passengers will have the same opportunity to use Amtrak to gain access to Boston.

Amtrak is currently electrifying its Northeast Corridor line from New Haven, CO to Boston. This will increase the efficiency and speed of the trains on the system. The Northeast Corridor is already electrified from Washington to New Haven.

The Baltimore airport station is part of the MARC Penn commuter line that runs from north of Baltimore to Union Station in downtown Washington DC. The T.F. Green station will be part of the current MBTA Providence commuter line that runs from downtown Providence to South St. station in Boston. The station will also be a stop in the new RIDOT commuter line running from Westerly, Rhode Island to Downtown Providence. Both regional commuter train systems are designed for the same purpose. They take air passengers from the airport into the downtown of a metropolitan city, i.e. Washington or Boston.[1] Taking passengers into the Baltimore area or Rhode Island is only a secondary goal of these systems.

Southwest Airlines

Southwest Airlines is a low fare carrier that operates most of its services in Texas and in the western half of the United States. The company, however, has begun to expand its operations to the East Coast. T. F. Green and BWI are the two airports from which the airline plans to build its East Coast network. Southwest's low cost structure allows it to charge fares considerably lower than that of its major competitors. The low fares induce large increases in passenger traffic at any airport that Southwest serves.

Southwest's presence at T. F. Green is important to the Warwick station for two reasons. First, Southwest Airlines' presence at an airport increases airport traffic and also increases the size of its catchment area. In BWI's case this means that many more travelers are using the airport living in the Washington DC Metropolitan Area. The MARC line can be a convenient and cost effective option for these travelers. Southwest Airline's presence at T. F. Green has a similar effect. Passengers from Boston use the airport where they would not have done so before. Second, Southwest Airlines attracts a high proportion of leisure/discretionary travelers. The leisure traveler can be more discriminating in how they arrive or depart from the airport and is more likely to consider using rail for ground access. The makeup of passengers will be similar in both airports.

T. F. Green's busiest air route is its Southwest service to Baltimore, while a very busy route for Baltimore is its Southwest Providence service. Since many of the passengers in the Providence-Baltimore market are actually traveling between Washington and Boston many of the passengers will find it convenient to use the commuter rail lines at both ends.

Airport officials at BWI believe that Southwest's presence at the airport has significantly increased the use of the BWI MARC station already and will continue to do so. Given

---

[1] According to sources from the MARC approximately 90% of all passengers using the MARC system either begin or end their train transit at Union Station in downtown Washington. It is assumed that most passengers using the new Warwick station will be originating or destined for South St. station in Boston.

Southwest's prominent role at T. F. Green, the same impact should be felt the Warwick station.

D. Forecast Model

Despite the similarities between Providence and Baltimore, there are some significant differences between the two stations. These include the size of the airports, the population of the surrounding regions, the propensity to use mass transit among the citizens of the two respective regions, and the level of train service that passengers will have available to them. A model was developed that takes into account these differences. The structure of the model is as follows:

$$AirportRailTraffic_i$$

$$= K \times Population_i^{\partial} \times AirportDomesticOD_i^{1-\partial} \times propensitytotravel_i \times EffectiveSchedule_i$$

where α=0.5 and i= individual airports.

K is a constant factor that estimates the relationship between **Airport Rail Traffic** and the independent variables on left side of the equation for any given airport. Given the comparable circumstances of Providence and Baltimore (as discussed section B) we will assume that K is the same for both Providence and Baltimore. This allows for the calculation of an estimate for **Airport Rail Traffic** at Providence.

In order to estimate **Airport Rail Traffic** for Providence two steps are needed. First, estimate **K** by using Baltimore Station (i=BWI) model variable data (i.e. Population, Domestic O&D, Propensity to Travel, and Rail Traffic). Second, insert the value of **K** from the first equation into the Warwick Station (i=T.F. Green) equation to calculate **Airport Rail Traffic**.

The model variables are explained below. A special section is included to discuss the **Effective Schedule** variable. It is the variable that is used to create a scenario analysis for the forecasts to the year 2020.

Airport Domestic Origin & Destination (O&D) Passengers

Annual O&D traffic is the best measure of the intrinsic size of an airport. Every O&D passenger uses ground transportation either to arrive at the airport or to depart from the airport. Obviously, the greater the number of O&D passengers the greater the demand for rail transit.

The FAA's Terminal Area Forecast (TAF) of T. F. Green International Airport was used to grow domestic O&D data to the year 2020 from the year 1997. The TAF gave average annual growth rates of passenger enplanements at the airport. Domestic O&D data for 1997 was obtained from the U.S. Department of Transportation Database 1A.

Regional Mass Transit Catchment Population

This variable is self-explanatory. The size of the population from which a mass transit system draws its customers will determine the number of rail passengers at the new

airport train station. Population data was obtained from the U.S. Bureau of the Census. Census Bureau population projections for Massachusetts and Rhode Island were used to project growth of the catchment area population to the year 2020.

Regional Propensity to Use Mass Transit

Different communities have different propensities to use mass transit. This variable was added to the model to take into account these propensities. In order to measure the relative propensity to use mass transit a proxy variable is used. It is shown below.

$$propensitytotravel = \frac{AnnualPassengerMilesofTransitSystem}{DirectionalRouteMilesofTransitSystem \times TransitySystemCatchmentAreaPopulatic}$$

A passenger-mile is one passenger travelling one mile. For example, two passengers who travel 15 miles and 20 miles, respectively have produced 35 passenger-miles. The larger the system the more passenger miles it has. Passenger-mile data is available from the Federal Transit Administration's annual Transit Database.

A directional route mile is the one way length of a rail or bus system. For example, if the distance between Station A and Station B is 12 miles, then that is equal to 12 directional route miles.

The propensity to travel ratio is the size of the transit system as measured by annual passenger miles adjusting for the size of the system (directional route miles) and adjusting for the population of the region. The larger the propensity to travel the more likely a person in a given region is to use the mass transit.

E. Level of Train Service-Effective Schedule

The Warwick rail station will compete with private cars, taxis and scheduled and charter buses for passengers traveling to and from T. F. Green Airport. Thus, how attractive rail service is in relationship to these other modes of transportation will be an important factor in the number of annual passenger that will use the Warwick station. This relative attractiveness of the rail mode depends on many factors, particularly the frequency and timing of trains. The **Effective Schedule** variable considers the role that different train service levels will have on total passenger use at Warwick station.

Most commuter rail services operate only in the morning and evening rush hours, to serve a sharply peaked traffic demand. Air travel is significantly less peaked. While the mornings and early evenings at T. F. Green are very busy, the airport also generates large numbers of passengers at off peak periods. Many factors influence the distribution of traffic to and from the airport through the day:

- An airline with a large operation must staff its counters from as early as 5AM to as late as 1130 PM to accommodate a wide range of flight times. Its staff must work shifts, and shifts may change at times not corresponding to the traditional peaks of surface commuter travel.

- Certain air markets are highly peaked because of time zones or other aircraft scheduling concerns. For example, many California-Providence passengers may wish

to depart from the West Coast at 9AM, arriving in Rhode Island in the afternoon or early evening. Few transcontinental flights would depart after 3PM, since they would arrive on the East Coast in the middle of the night. Passengers using Midnight "red-eye" departures arrive in Providence in the early to mid morning. Most other routes have similar "windows." The peaks of individual routes differ widely, resulting in traffic flow throughout the day.

- Aircraft are expensive, and profitability requires high utilization. Carriers will tend to reduce the length of station stops, turning around their aircraft shortly after arrival, whatever the time of day.

- Most hub-and-spoke carriers offer a series of up to six "banks" of flights at their major hubs. Many aircraft converge on the hub during a short interval to optimize connection opportunities. The banking of flights often implies off-peak operations at spoke airports.

- Passengers may plan their trips for a 9AM-5PM working period at their destination. If they finish early or late, they may change their flights.

- Airlines have sophisticated yield management systems that allow them to tightly manage the allotment of seats to different fare classes. They will market unpopular departure times by selling seats at low incentive fares. The off-peak periods will be reflected by low fares rather than reduced volumes.

For these reasons, a rail service scheduled entirely around the traditional "rush hour" provides only a modest value to airport users. The airport requires a service operating throughout the day, with convenient connections for a wide range of flights. Because of this requirement, not all trains were considered as providing incremental benefits. Rather, each schedule implied an "effective" number of trains, which corrected for the clustering of schedules around the morning and evening rush hours. It was assumed that train frequency of more than once hourly would not induce additional passengers to use the Warwick station to access T. F. Green. Thus 10 trains operating between 6 AM and 8 AM provided the same appeal as two hourly trains.

The "effective" number of trains was calculated by determining the number of trains serving Warwick during the peak (6 AM-8 AM, 4P M-6 PM) and non-peak periods. Where peak frequencies in each interval exceeded two, the number of "effective" departures was deemed to equal two. All off-peak departures were assumed to be "effective" because they did not exhibit the strong clustering of rush hour services. In some cases, a peak period commuter service resulted in non-peak operations at Warwick. For example, MBTA might schedule a commuter train departing Warwick at 5:50 AM. This was considered "off-peak" because it did not operate during the morning rush hours of 6 AM-8 AM.

Three operators, RIDOT, MBTA and Amtrak will serve the Warwick station. In some cases, their expected departures at Warwick coincided. This overlap was not projected to reduce the effective service frequency, since each operator will serve a slightly different market segment.

The effective service frequency at BWI was calculated to calibrate the forecasting model. The train operators, RIDOT, MBTA and Amtrak, provided little information about their planned services to Warwick. In order to calculate the effective service frequency at Warwick, it was necessary to project their future services. Three scenarios were developed, based on Most Likely, Pessimistic and Optimistic levels of rail service. Tables A1, A2 and A3 show service frequencies by year. A description of each scenario follows:

1. Most Likely Scenario

This scenario assumes that MBTA would extend the five trains presently serving Providence to Warwick. Beginning in 2010, MBTA would extend the trains terminating in South Attleboro to Providence and onwards to Warwick. RIDOT would operate ten trains daily in each direction during the morning and evening peaks. It would boost capacity by 50% in 2005. Beginning in 2010, it would operate trains throughout the day at hourly headways. Amtrak would halt 50% of its trains serving Providence at Warwick. It would double its frequencies in the year 2015.

2. Pessimistic Scenario

Under the Pessimistic case, the MBTA would extend only two Providence trains to Warwick. In 2010, it would extend the remaining three trains to Warwick. RIDOT would operate ten trains daily during the rush hours. In 2010, it would increase frequencies by 50% but would never offer trains outside the rush hour period. Amtrak would halt one half of its 1998 scheduled trains serving Providence at Warwick.

3. Optimistic Scenario

MBTA would extend all Providence trains to Warwick. Beginning in 2005, it would progressively extend all Boston-South Attleboro trains to Warwick. RIDOT would offer 10 daily rush-hour trains in each direction to Warwick. RIDOT would commence an hourly service throughout the day in 2005. In would add two trains daily each year beginning in 2015. Amtrak would schedule all trains serving Providence in 1998 to stop in Warwick. In would increase schedules at Warwick by one train per day in 2004, 2006 2008, 2018 and 2020.

F. Model Results:

Exhibit 2 below shows airport passenger and employee rail traffic forecasts for the Warwick train station. Amtrak, the planned RIDOT commuter line, and the planned MBTA extension of its Providence commuter line base the scenarios on different service frequencies. How much the airport station is used will depend greatly on the convenience and level of train service. Exhibit 3 shows 1997 FAA Terminal Area Forecasts for Enplaned Passenger Traffic on Air Carrier operations.

The FAA forecasts that air traffic will increase significantly in the next ten years at T.F. Green. In addition to the level of service, this is the primary stimulus for increased rail traffic growth at Warwick station.

Year	Most Likely Scenario	Optimistic Scenario	Pessimistic Scenario
2000	64,431	83,760	57,988
2001	66,220	86,086	59,598
2002	67,973	88,365	61,176
2003	69,693	90,601	62,724
2004	71,383	92,798	64,245
2005	87,654	146,090	65,741
2006	89,640	171,811	67,230
2007	91,598	190,830	68,699
2008	93,530	202,648	70,147
2009	95,436	206,779	71,577
2010	136,948	209,450	96,669
2011	155,088	212,226	97,950
2012	173,685	215,038	99,248
2013	175,987	217,888	100,564
2014	178,319	220,776	101,896
2015	206,494	232,305	129,058
2016	209,273	244,151	130,795
2017	212,089	265,111	132,556
2018	214,943	277,635	134,340
2019	217,836	299,525	136,148
2020	218,386	309,379	136,491

Exhibit 2: Airport Rail Passenger Forecasts

Year	Air Carrier Enplanements
1997	956,892
1998	1,019,488
1999	1,082,085
2000	1,144,681
2001	1,207,277
2002	1,269,874
2003	1,332,470
2004	1,395,066
2005	1,457,663
2006	1,520,259
2007	1,582,855
2008	1,645,452
2009	1,708,048
2010	1,770,645

*After 2010 Enplanements were projected to grow at an annual rate of 2.1%.

Exhibit 3: 1997 FAA Terminal Area Forecasts for T. F. Green

G. Daily Warwick Station Ridership Demand

The projected 218,336 annual passenger trips in 2020 at Warwick station corresponds to an average of 598 daily passengers trips. This converts to 299 boardings and 299 alightings per day. Exhibit 4 provides a break down of daily boardings by Amtrak and commuter rail passengers (RIDOT and MBTA). There is the same number of boardings as alightings.

Rail Type	2020 Average Daily Boardings
Amtrak:	76
Commuter Rail:	223
Total (Automated People Mover):	299

Exhibit 4: Daily Warwick Station Rail Passengers by Rail Type 2020

Amtrak is projected to have 55,441 annual passenger trips at T. F. Green in 2020. The projection was estimated using the forecast model and an Amtrak schedule without commuter rail service (See Table A1). The 55,441 annual passenger trips correspond to 152 daily passenger trips or 76 boardings at T. F. Green. Commuter rail boardings of 223 per day were calculated by subtracting Amtrak boardings from projected total boardings.

The total number of Warwick station boardings is equivalent to the number of passengers that would board an Automated People Mover at the station.

Of the 299 daily boardings, it was independently estimated that 200 of those boardings would consist of airport employee work trips. This translates to 400 daily train trips. Based on our experience with other airports, it was estimated that 5% of employees on a given shift would use the proposed rail system to access the airport. Assuming, as is usually the case, three shifts at the airport with the two day shifts using rail, it was estimated that 3.33% (2/3 of 5%) of airport employees would use the rail for trips to work. Exhibit 5 shows the estimated number of airport employees, their projected boardings, and non-employee boardings in 2020. Non-employee trips were estimated to be the difference between Employee Boardings and Total Boardings.

2020 Total Employees	2020 Employee Boardings	2020 Non-Employee Boardings
6,000	200	99

Exhibit 5: Daily Ridership Estimates in 2020

Table A1
PROJECTED NORTHBOUND RAIL OPERATIONS AT WARWICK
MOST LIKELY CASE

	MBTA		RIDOT		AMTRAK		GROWTH ASSUMPTIONS		
	PEAK	OTHER	PEAK	OTHER	PEAK	OTHER	MBTA	RIDOT	AMTRAK
2000	4	1	8	2	1	3	Extend Providence trains to Warwick	10/day peak only	50% Providence Trains
2001	4	1	8	2	1	3	No change	No change	No change
2002	4	1	8	2	1	3	No change	No change	No change
2003	4	1	8	2	1	3	No change	No change	No change
2004	4	1	8	2	1	3	No change	No change	No change
2005	4	1	11	4	1	3	No change	50% growth	No change
2006	4	1	11	4	1	3	No change	No change	No change
2007	4	1	11	4	1	3	No change	No change	No change
2008	4	1	11	4	1	3	No change	No change	No change
2009	4	1	11	4	1	3	No change	No change	No change
2010	5	2	11	8	1	3	Extend 5 South Attleboro trains	Service through day	No change
2011	6	4	11	8	1	3	Extend 5 South Attleboro trains	No change	No change
2012	8	6	11	8	1	3	Extend 6 South Attleboro trains	No change	No change
2013	8	6	11	8	1	3	No change	No change	No change
2014	8	6	11	8	1	3	No change	No change	No change
2015	8	6	11	8	2	6	No change	No change	Double service
2016	8	6	11	8	2	6	No change	No change	No change
2017	8	6	11	8	2	6	No change	No change	No change
2018	8	6	11	8	2	6	No change	No change	No change
2019	8	6	11	8	2	6	No change	No change	No change
2020	8	6	11	8	2	6	No change	No change	No change

Table A2
PROJECTED NORTHBOUND RAIL OPERATIONS AT WARWICK
PESSIMISTIC CASE

	MBTA		RIDOT		AMTRAK		GROWTH ASSUMPTIONS		
	PEAK	OTHER	PEAK	OTHER	PEAK	OTHER	MBTA	RIDOT	AMTRAK
2000	2	0	8	2	1	3	50% of Providence trains to Warwick	10/day peak only	1/2Prov. Trains
2001	2	0	8	2	1	3	No change	No change	No change
2002	2	0	8	2	1	3	No change	No change	No change
2003	2	0	8	2	1	3	No change	No change	No change
2004	2	0	8	2	1	3	No change	No change	No change
2005	2	0	8	2	1	3	No change	No change	No change
2006	2	0	8	2	1	3	No change	No change	No change
2007	2	0	8	2	1	3	No change	No change	No change
2008	2	0	8	2	1	3	No change	No change	No change
2009	2	0	8	2	1	3	No change	No change	No change
2010	4	1	11	4	1	3	All Prov. Ext	50% increase	No change
2011	4	1	11	4	1	3	All Prov. Ext	No change	No change
2012	4	1	11	4	1	3	All Prov. Ext	No change	No change
2013	4	1	11	4	1	3	All Prov. Ext	No change	No change
2014	4	1	11	4	1	3	All Prov. Ext	No change	No change
2015	4	1	11	4	2	6	All Prov. Ext	No change	Doubling
2016	4	1	11	4	2	6	All Prov. Ext	No change	No change
2017	4	1	11	4	2	6	All Prov. Ext	No change	No change
2018	4	1	11	4	2	6	All Prov. Ext	No change	No change
2019	4	1	11	4	2	6	All Prov. Ext	No change	No change
2020	4	1	11	4	2	6	All Prov. Ext	No change	No change

Table A3
PROJECTED NORTHBOUND RAIL OPERATIONS AT WARWICK
OPTIMISTIC CASE

	MBTA		RIDOT		AMTRAK		GROWTH ASSUMPTIONS		
	PEAK	OTHER	PEAK	OTHER	PEAK	OTHER	MBTA	RIDOT	AMTRAK
2000	4	1	8	2	3	6	Extend to Warwick	10/day peak only	All Prov. Trains
2001	4	1	8	2	3	6	No change	No change	No change
2002	4	1	8	2	3	6	No change	No change	No change
2003	4	1	8	2	3	6	No change	No change	No change
2004	4	1	8	2	4	6	No change	No change	Add train
2005	5	2	11	8	4	6	S. Attleboro ext.	Off-peak service	No change
2006	6	4	11	8	4	7	S. Attleboro ext.	No change	Add train
2007	8	6	11	8	4	7	S. Attleboro ext.	No change	No change
2008	8	6	11	8	4	8	No change	No change	Add train
2009	8	6	11	8	4	8	No change	No change	No change
2010	8	6	11	8	4	8	No change	No change	No change
2011	8	6	11	8	4	8	No change	No change	No change
2012	8	6	11	8	4	8	No change	No change	No change
2013	8	6	11	8	4	8	No change	No change	No change
2014	8	6	11	8	4	8	No change	No change	No change
2015	8	6	12	9	4	8	No change	Add train	No change
2016	8	6	13	10	4	8	No change	Add train	No change
2017	8	6	14	11	4	9	No change	Add train	Add train
2018	8	6	15	12	4	9	No change	Add train	No change
2019	8	6	16	13	4	10	No change	Add train	Add train
2020	8	6	17	14	4	10	No change	Add train	No change

TABLE A4
ONE-WAY FARES

	Amtrak	MARC	MBTA
BWI-Washington	15.00	5.00	-
Providence-Boston	12.00	-	4.75

Source: Published fare tables of Amtrak, MARC and MBTA

c:\windows\desktop\my briefcase\projects\aviation\pvd\rail\air_ridr\revision\rider1rev.doc

Appendix II

RIDERSHIP PROJECTIONS FOR THE WARWICK INTERMODAL TRAIN STATION

TABLE 1

Annual Ridership Estimates
May 26, 1999

Estimated Total Employees (at inception):	1,300
Estimated Total Employees (2020)[1]:	3,000
Estimated Daily Employee Train Trips to work[2]:	100
Total Daily Employee Train Trips[3]:	200

[1] Estimated annual growth rate of 4.2% between 2000 and 2020

[2] Assume three shifts with two using rail (5% rail utilization)

[3] Daily employee trips are two-way

	Total[4]	*Employees*	*Non-employees*[5]
Estimated PVD Station annual train riders:	218,400	73,000	145,400
Estimated PVD Station daily train riders:	600	200	400
PVD Station Annual Train Riders Proportion:	100%	33%	67%

[4] From Appendix 1 - Development of Airport-related Train Ridership.

[5] Non-employee trips are the difference between Employee Trips and Total Trips pojected for the station

TABLE II-1

Non-Employee Airport Riders Using Proposed Rail Station
May 26, 1999

	Air Passenger Mode Split	Air Passengers	Air Passengers per Vehicle	Vehicles Off-loaded
Private Vehicle	55%	80,000	1.2	66,700
Taxicab	15%	21,800	1.2	18,200
Limousine	10%	14,500	1.2	12,100
Van Service	5%	7,300	4	1,800
Regional Bus [1]	5%	7,300	1	No Offload
Rental Cars	10%	14,500	1.2	12,100
Total Ridership:	100%	145,400	N/A	N/A
Total Vehicles Removed:	N/A	N/A	N/A	110,900

[1] Assumes at least 16 regional buses during four a.m. and p.m. peak hours. Average occupancies are based on this frequency.

TABLE II-2

Airport Employee's Using Proposed Rail Station (Round Trip)
May 26, 1999

	Employee Mode Split	Airport Employees	Airport Employees per Vehicle	Vehicles Off-loaded
Private Vehicle	85%	62,050	1.2	51,700
Taxicab	5%	3,650	1.2	3,000
Limousine	0%	N/A	N/A	N/A
Van Service	0%	N/A	N/A	N/A
Regional Bus [1]	10%	7,300	1	No Offload
Rental Cars	0%	N/A	N/A	N/A
Total Ridership:	100%	73,000	N/A	N/A
Total Vehicles Removed:	N/A	N/A	N/A	54,700

[1] Assumes at least 16 regional buses during four a.m. and p.m. peak hours. Average occupancies are based on this frequency.

TABLE II-3

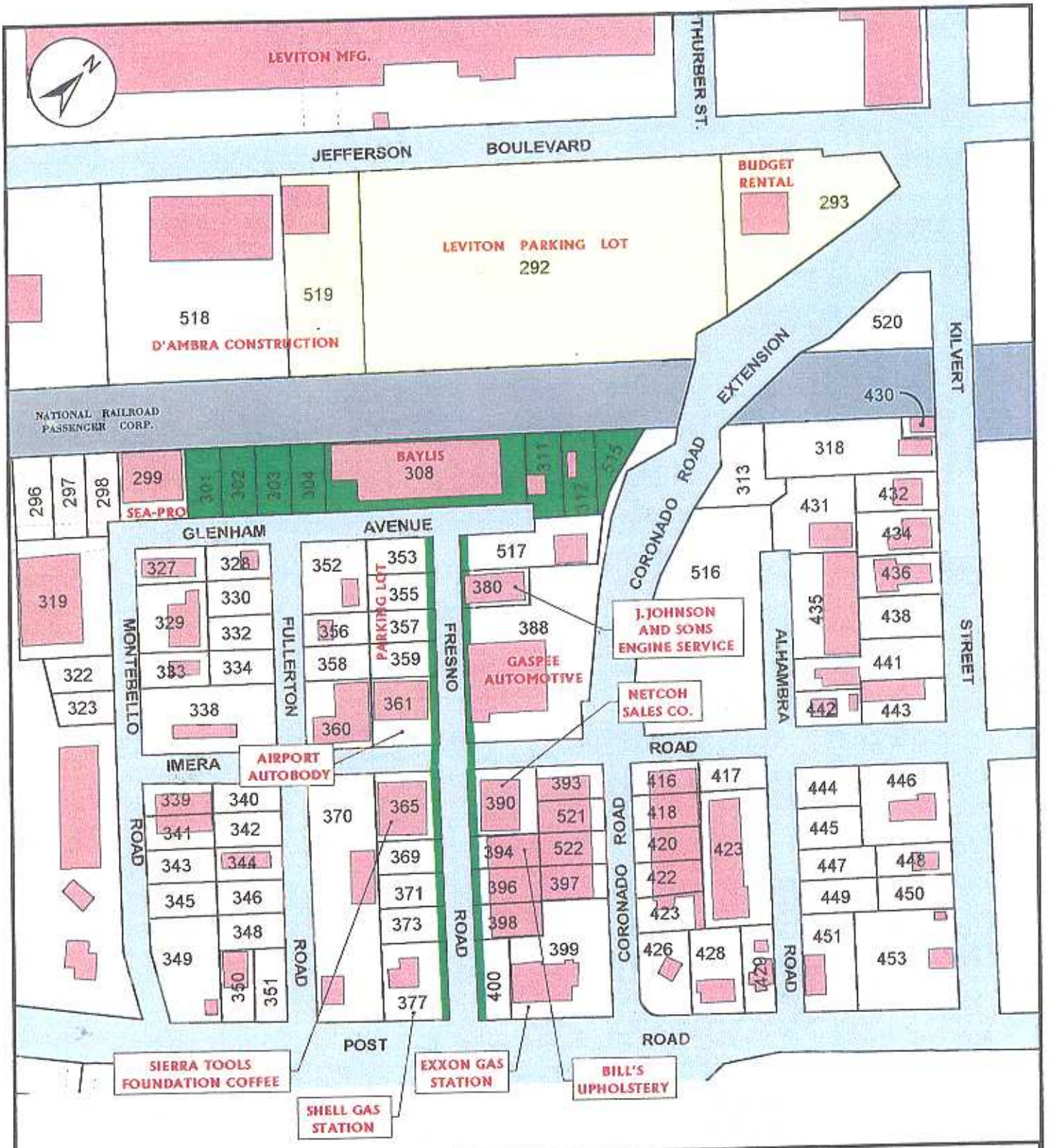
Annual Vehicles Removed Due to the Rail Station.
May 26, 1999

Vehicles Removed:	Private Vehicle	Taxicab	Limousine	Van Service	Regional Bus	Rental Cars	Total Veh. Reduction
Non-Employee Airport Riders [1]	66,700	18,200	12,100	1,800	0	12,100	110,900
Employee Airport Riders	51,700	3,000	N/A	N/A	0	N/A	54,700
Total:	118,400	21,200	12,100	1,800	0	12,100	165,600

[1] Includes passengers, well wishers and greeters. The vehicles removed are for travel in both directions (to and from the airport).

6.7 Relocation Impacts

The tables contained in this section were developed based on the level of conceptual design to date with information gathered from The City of Warwick Clerks Office and The City of Warwick's *Warwick Station Redevelopment District Master Plan.*



SITE LAYOUT AND PARCEL PLAN

INTERMODEL STATION AND PEOPLE MOVER

WARWICK, RHODE ISLAND

TABLE I Land Acquisitions and Displacements

Parcel No.	Size (Sq. Ft.)	Ownership	Assessed Value	Location	Annual Tax Assessment
301	5,013	City of Warwick	$13,200	Glenham Avenue	$420.16
302	5,011	City of Warwick	$13,200	Glenham Avenue	$420.16
303	5,023	City of Warwick	$13,200	Glenham Avenue	$420.16
304	5,029	City of Warwick	$13,200	Glenham Avenue	$420.16
308	30,284	City of Warwick	$448,100	Glenham Avenue	$14,263.02
311	5,846	City of Warwick	$46,500	Glenham Avenue	$1,480.10
312	6,071	City of Warwick	$48,300	Glenham Avenue	$1,537.39
515	4,646	City of Warwick	$34,700	Glenham Avenue	$1,104.50
292	154,725	Ridgeway Realty	$378,700	Jefferson Blvd.	$12,054.02
293	35,109	Donald Watson	$218,300	708 Jefferson Blvd.	$6,948.49

TABLE II Potential Easements or Partial Takings

Parcel No.	Size (Sq. Ft.)	Ownership	Assessed Value	Location	Annual Tax Assessment
352	10,000	City of Warwick	$61,400	Glenham Avenue	To Be Appraised
353	5,000	City of Warwick	$17,700	Glenham Avenue	To Be Appraised
355	5,000	Richard Pariseault	$17,700	Fresno Road	To Be Appraised
357	5,000	Richard Pariseault	$17,700	Fresno Road	To Be Appraised
359	5,000	Richard Pariseault	$17,700	Fresno Road	To Be Appraised
361	10,000	Richard Pariseault	$105,700	40 Fresno Road	To Be Appraised
365	10,000	Vincent Palazzo	$141,800	30 Fresno Road	To Be Appraised
369	5,000	Willard Scheibe	$20,700	Fresno Road	To Be Appraised
371	5,000	Willard Scheibe	$20,700	Fresno Road	To Be Appraised
373	5,000	Shell Oil Co.	$20,600	2025 Post Road	To Be Appraised
377	11,225	Shell Oil Co.	$216,300	2025 Post Road	To Be Appraised
380	5,000	John Harrington	$89,500	65 Fresno Road	To Be Appraised
388	47,122	John Harrington	$343,500	93 Imera Avenue	To Be Appraised
390	10,000	Vincent Nassa	$135,800	35 Fresno Road	To Be Appraised
393	35,000	RI Baseball Institute	$673,100	Fresno Road	To Be Appraised
400	5,781	Exxon	$74,500	2015 Post Road	To Be Appraised
517	12,000	City of Warwick	$102,600	Glenham Avenue	To Be Appraised
519	33,933	Michael D'ambra	$159,200	780 Jefferson Blvd	To Be Appraised
518	79,366	Michael D'ambra	$1,016,600	790 Jefferson Blvd	To Be Appraised
291	164,613	D'Ambra Construction Co.	$459,200	780/800 Jefferson Blvd	To Be Appraised

Warwick Intermodal Station
At T.F. Green Airport, Warwick Rhode Island

REEVALUATION OF ENVIRONMENTAL ASSESSMENT

March 27, 2001

Prepared by Edwards and Kelcey, Inc.
95 Cedar Street
Providence, RI 02903
(401) 272-1969

Rhode Island Department of Transportation

Federal Highway Administration

Warwick Station Intermodal Station
at T.F. Green Airport, Warwick RI

Reevaluation of the May 1999 Environmental Assessment

Prepared by Edwards and Kelcey
March 27, 2001

Introduction 1
Design Concept of the Garage 1
Continuing Public Process 2
Warwick Station Intermodal Garage 2
Environmental Summary of Changes 4
Note 1-Noise 6
Note 2 – Visual 11
Note 3 – Construction 11
Conclusion 12

Appendix

1. **March 15, 2001 correspondence from the Federal Highway Administration to Rhode Island Department of Transportation**
2. **March 19, 2001 correspondence from State Historic Preservation Officer to Rhode Island Department of Transportation**
3. **March 15, 2001 Intermodal Station Design Plans**
4. **March 26, 2001 memo regarding Site Description – Noise readings for Warwick Intermodal Station**

List of Tables

Table 1 - Summary Of Environmental Change 4
Table 2- FHWA Noise Abatement Criteria [Leq(h) in dBA] 10
Table 3- Existing And Future Sound Levels [Leq(h) in dBA] 11

List of Figures

Figure 1 - Land Use 7
Figure 2 - Common Noise Levels 9

Warwick Intermodal Station
Reevaluation of the Environmental Assessment

Introduction

In May of 1999 the Rhode Island Department of Transportation (RIDOT) submitted to the Federal Highway Administration an environmental assessment for the Warwick Intermodal Station at T.F. Green Airport in Warwick Rhode Island. With improvements in Amtrak service and passenger growth at T.F. Green Airport (reflecting operation of the new Sundlun Terminal and Southwest Airline service), RIDOT and state and local transportation officials have sought to create an intermodal gateway connecting the two transportation facilities. The 1998 TEA-21 authorized $25 million for a new Warwick Amtrak/Commuter Rail Station with an elevated people mover to connect the new station to the Airport terminal building.

On July 6, 1999 the Federal Highway Administration issued a Finding of No Significant Impact. The key project elements in the EA and FONSI are identified below:

- A multi-level train station with ticketing, information/waiting areas, restrooms, concessionaires, and access to inbound and outbound tracks and the people mover.
- Adjacent surface parking lot could accommodate 500 commuters with access to Jefferson Boulevard, designed to accommodate passenger drop off and RIPTA bus connections.
- Elevated people mover along Fresno Road, connecting the station and airport terminal. RIDOT has sufficient monies to construct a horizontal elevator. The type of technology ultimately selected will be the result of public/private partnerships formed with adjacent developers.

The EA process identified the 3.5-acre Leviton parking lot and the 1-acre Budget Car Rental property on Jefferson Boulevard, Amtrak property, and the 1.2-acre Baylis Chemical site east of the tracks as the location of the station, parking lot, and people mover lobby.

Design Concept of the Garage

RIDOT and the Rhode Island Airport Corporation (RIAC), in a public/private partnership, have extended the scope of the station to include a parking garage for commuter/Amtrak passengers and a consolidated rental car facility. This effort utilizes the people mover system which will help to produce a reduction in traffic on Post Road.

The key elements of the revised plan include the design of a 5 level (not including ground and mezzanine levels) parking garage which extends from the former Leviton parking lot and Budget property on Jefferson Boulevard, east across Amtrak's Northeast Corridor, to the former Baylis property. The train station will be incorporated within the parking structure. This structure will incorporate the following key elements:

- Intermodal facility on the first floor for short-term station pickup/drop off, intercity and RIPTA bus, taxis, and limousine/van shuttles.
- Approximately 1,200- 1,400 commuter/Amtrak parking spaces.

- Consolidated rental car facility for all nine firms currently operating at T.F. Green Airport with space for approximately 3,000 vehicles.
- Developer parking on ground level, east of the rail line (Baylis).
- Amtrak Station on the 3rd floor, spanning the tracks.
- Rental Car lobby on the 4th floor, adjacent to the people mover lobby.
- People Mover lobby on the 4th floor, adjacent to the rental car lobby.
- Quick Turn Around (QTA) fueling, vacuum, and wash facilities for rental cars on three levels.
- ADA-accessibility to Amtrak and commuter rail platforms (no change from the EA)
- People mover between the station and the airport, 10 feet higher than previously proposed (now 45 feet above ground level)

Continuing Public Process

This briefing paper has been prepared in response to the Federal Highway Administration's March 15, 2001 letter (see Appendix). The RIDOT is committed to communicating any project changes to FHWA. As indicated in the attached correspondence, the FHWA concurs that the additional traffic impacts of the revised facility can be mitigated with the intersection improvements that were set forth. With this mitigation there will be no degradation of the Level of Service of the intersections and there will be no violations of air quality standards for carbon monoxide at the intersections.

As part of the process initiated under Section 106 of the Historic Preservation Act during the development to the Environmental Assessment, the Department has continued to coordinate with the State Historic Preservation Officer (SHPO). As indicated in March 19, 2001 correspondence (see Appendix), three alternatives have been forwarded to the SHPO for comment. The three alternatives are a stand-alone station with surface parking on Jefferson Boulevard (presented in the Environmental Assessment), and two versions of a similar station standing behind a large parking garage on Jefferson Boulevard. All of these alternatives will affect the Hills Grove Historic district indirectly, rather than directly, by changing the stetting of the historic industrial buildings what face the site. The SHPO has concluded that none of the alternatives will change the setting sufficiently to have an adverse effect on the Historic District. The SHPO will need to review more detailed plans and designs as they are developed to confirm this finding. RIDOT will continue to coordinate with the SHPO during final design.

At a public meeting held on December 18, 2000 in Warwick, the Department presented the design plans for the commuter/rental garage. The community commented positively on the new design of the garage. The public meeting, the eighth since the project began in August 1998, was part of the process of keeping the public aware of the project and its changes.

Warwick Station Intermodal Garage

The projected intermodal garage has 254,000 square foot footprint with a five level structure (not including ground and mezzanine levels). The design of the garage is consistent with the projected

parking demand for commuter and rental cars that will use the facility in 2020. The garage can not be constructed in phases because of the following:

- Access to the garage during any future expansion would be physically blocked by the people mover.
- Construction above Amtrak's Northeast Corridor is limited to short periods at night. Because of limited site access, it is important that all construction activities be conducted during one construction period.
- The people mover structure and proposed development in the redevelopment district will limit physical access for construction operations
- Use of the existing garage would be limited during any phased construction.

The garage therefore must be constructed in its totality to accommodate existing and projected use.

The rental car companies are currently operating in a variety of locations both on and off the airport (including Post Road). By consolidating all rental car companies and all rental car functions at one site, rental cars and rental car shuttles will be diverted from the Post Road corridor. Currently, many of the rental car companies store, service and handle vehicles at a variety of locations in the airport area, thereby adversely affecting traffic volumes on local roads, especially Post and Airport Roads. Rental car traffic volumes currently consist of the following:

- Rental car shuttle vans transport customers from the terminal curbfront on the Arrivals level of the airport to the rental car "Ready Return" lot.
- Customers pick up and drop off vehicles at the "Ready Return" lot and travel over local roads to the Airport Connector and I-95.
- Rental car employees move vehicles from the "Ready Return" area to the QTA area for wash, vacuum, and fueling.
- Rental car employees move vehicles from the QTA to the storage lot.
- Rental car employees move vehicles from the storage lot to the "Ready Return" lot for the next rental customer or transfer vehicles to other New England offices.

Many of these moves would be consolidated within the proposed garage: shuttles would be replaced by the People Mover, and the "Ready Return" area, QTA, and storage areas would be located within the proposed garage, eliminating the need to travel on local streets. Impacts associated with increased volumes on Jefferson Boulevard will be mitigated through intersection improvements including the design of new signals, changes to existing signals, and geometric modification. These improvements will make the Jefferson Boulevard/Coronado Road intersection operate more efficiently with dedicated northbound left turn and right turn lanes, in addition to two through travel lanes.

The intermodal aspects the garage will accommodate are the RIPTA bus system, the intercity bus system, taxis, limousines/ van shuttles, short term parking for pick up or drop off, and bicycles. There is no change to the Environmental Assessment aside from the people mover being raised to 45 feet to connect to the 4th floor rental car lobby and to connect directly into the airport terminal building. Overall the station programming has remained the same.

Environmental Summary of Changes

The Environmental Assessment assessed the social and environmental effects of the Preferred Alternative, both qualitatively and quantitatively. Both beneficial and adverse impacts were discussed and, where necessary, mitigation measures were identified. The table below identifies environmental categories addressed in the EA, summarizes comments/issues, and lists the potential changes in impact associated with construction and operation of the proposed 4,000 car commuter/rental garage.

Table 1
SUMMARY OF ENVIRONMENTAL CHANGE

Environmental Category	Comments	Change in Impact from EA
Land Use	▪ Consistent with City-enacted land use plan as part of Redevelopment District ▪ Existing uses: light industrial, misc. commercial and residential	No Change
Park and Recreation Areas	▪ No public parks or recreational facilities within the project area	No Change
Farmland	▪ Soils are not suited for agriculture	No Change
Social/ Environmental Justice	▪ Increased employment opportunities ▪ Supports City's development plan ▪ Consistent with Environmental Justice objectives	No Change
Relocation	▪ Relocation of one business (Budget) ▪ No relocation of housing units	No Change
Economic	▪ Supports City's development plan ▪ Greater employment opportunities ▪ Increased tax revenue due to adjacent development	No Change
Joint Development	▪ Supports development at new intermodal station ▪ Allows concentrated development along people mover alignment	Beneficial Change – Integrates public (RIDOT) and private (rental car companies) revenue for project development.
Pedestrian and Bicycle Movement	▪ Provides for safe pedestrian access between station and airport and alongside roadways ▪ Provides bicycle storage	No Change
Air Quality	▪ Reduction in Vehicle Miles Traveled ▪ Reduction in regional emissions	No Change See March 15, 2001 correspondence

Table 1 SUMMARY OF ENVIRONMENTAL CHANGE		
Environmental Category	**Comments**	**Change in Impact from EA**
Noise	▪ Build Alternative reduces noise from all train sources within project area ▪ Overall decrease in maximum noise levels	No Significant Impact See Note 1
Traffic	▪ Two unsignalized intersections to be signalized ▪ Two signalized intersections to be upgraded	No Significant Impact after Mitigation See March 15, 2001 correspondence
Ridership	▪ Project will result in reduction of vehicle miles traveled ▪ Project will aid in modal shift from car to train	No Change
Water Quality	▪ No surface water resources located within the project area ▪ Not within designated sole source acquirer	No Change – All State and Federal permits will be acquired prior to construction.
Permits	▪ Requires RIPDES Permit and State Water Quality Certification	No Change See Water Quality
Wetland	▪ No wetlands within the project area	No Change
Water Body Modification and Wildlife	▪ No wetland or water resources within project area ▪ No wildlife corridors or significant wildlife habitat	No Change
Floodplain	▪ No impact to the 100-year or 500- year flood zones	No Change
Wild and Scenic Rivers	▪ No designated rivers within the project area	No Change
Coastal Zone	▪ Not located within a coastal zone	No Change
Historic and Archaeological Preservation	▪ Eligibility studies completed	No Change – SHPO design review will continue.
Hazardous Waste Sites	▪ Baylis site to be remediated	No Change
Visual	▪ Project intended to complement the surrounding area	No Significant Change See Note 2
Energy	▪ Design will use latest energy saving features	No Change
Construction	▪ No residential areas affected ▪ Traffic impacts will be coordinated with the City and RIAC	No Significant Change See Note 3

Table 1 SUMMARY OF ENVIRONMENTAL CHANGE		
Environmental Category	**Comments**	**Change in Impact from EA**
Access	▪ Will provide elevators and all necessary ADA components	No Change

Note 1-Noise

Ambient background noise in the project area is generated by industrial processing at numerous locations, passenger and freight trains, vehicular traffic on Jefferson Boulevard and Coronado Road, and flights approaching to and departing from the airport. Although vehicular traffic will increase, mitigation (intersection and traffic signal improvements) will assure adequate level of service and traffic flow.

As indicated in Figure 1, land use in the project area is dominated by industrial, commercial, and airport related services. Despite the current industrial land use, four sensitive noise receptors are located within the project area:

- Site 1 - Jefferson Boulevard neighborhood located north of and adjacent to the Airport Connector on-ramp.
- Site 2 - Residential neighborhood on Blackburn Street, located 330 feet west of Jefferson Boulevard/Coronado Road/Kilvert Street intersection
- Site 3 - St. Francis School, located 630 feet north of the Jefferson Boulevard/Coronado Road/Kilvert Street intersection
- Site 4 - WonderKids, a day care center, located northeast of the proposed intermodal station on Alhambra Road, within 100 feet of Coronado Road.

Ambient decibel readings during peak and off-peak hours are presented in Table 2 for these sensitive receptors. Currently, peak hour traffic volumes exist from 7 to 9 am and 4 to 6 pm, reflecting typical rush hour commuting patterns. Peak hour associated with the station garage will reflect both typical rush hours and airport peak hours. Peak traffic hours are anticipated to extend from 6 to 9 am and 4 to 7 pm.

Noise Background Information - Sound levels are measured in logarithmic units called decibels (dB) – an overall measurement that describes the sound environment taking all frequencies into account. The human ear, however, does not sense all frequencies in the same manner; it is more sensitive to middle and high frequency sounds than it is to low frequency sounds. Therefore, noise measurements utilizing noise equipment are often adjusted or weighted to account for human perception and sensitivities. The "A"-weighted scale (units expressed as dBA) was developed to closely approximate the human sensory response to highway-related noise.

Source data supplied by the Rhode Island Geographic Information System (RIGIS)

RIGIS Datalayer Information:
Roads
Land Use
Airports

Roads
T.F. Green Airport

Land Use
- Airports (and associated facilities)
- Cemeteries
- Commercial (sale of products and services)
- Commercial/Industrial Mixed
- Beaches
- Brushland (shrub and brush areas, reforestation)
- Cropland (tillable)
- Deciduous Forest (>80% hardwood)
- Developed Recreation (all recreation)
- Evergreen Forest (>80% softwood)
- Idle Agriculture (abandoned fields and orchards)
- Industrial (manufacturing, design, assembly, etc.)
- Institutional (schools, hospitals, churches, etc.)
- Low Density Residential (>2 acre lots)
- Medium Density Residential (1 to 1/4 acre lots)
- Medium High Density Residential (1/4-1/8 acre lots)
- Medium Low Density Residential (1 to 2 acre lots)
- High Density Residential (<1/8 acre lots)
- Mines, Quarries and Gravel Pits
- Mixed Deciduous Forest (50 to 80% hardwood)
- Mixed Evergreen Forest (50 to 80% softwood)
- Orchards, Groves, Nurseries
- Pasture (agricultural not suitable for tillage)
- Other Transportation (terminals, docks, etc.)
- Roads (divided highways >200 ft plus related facilities)
- Rock Outcrops
- Sandy Areas (not beaches)
- Transitional Areas (urban open)
- Vacant Land
- Waste Disposal (landfills, junkyards, etc.)
- Water
- Water and Sewage Treatment
- Wetland (not to be classified)

Railroad

Locus

1- 4 Sensitive Noise Receptors

Rhode Island Department of Transportation

Federal Highway Administration

Land Use
Warwick Intermodal Station at T.F. Green Airport
Warwick, Rhode Island

N
W E
S

Under normal conditions, a change in noise level of 3 dBA is required for the average person to perceive a difference in sound levels. Examples of the magnitude of change necessary to result in a 3 dBA increase include the following changes in traffic volume, travel speed, or distance from the noise source to the receptor:

- A 100 percent increase in hourly auto traffic volumes with no decrease in speed; or,
- An increase in vehicular speeds of 24 kilometers per hour (15 miles per hour).

A decrease of 10 dBA appears to the listener to be a halving of noise levels, while an increase of 10 dBA appears to be a doubling of the noise. A list of common noise sources and their associated sound levels are shown in Figure 2. Typically, public reaction to noise levels is a function of location, time of day, fluctuation of noise levels, duration, and individual judgment of the listener.

The noise level descriptor used for this project is the hourly equivalent sound level (L_{eq}). L_{eq} is the steady-state, A-weighted sound level, which contains the same amount of acoustic energy as the actual time-varying, A-weighted sound level over a one-hour period.

Noise Abatement Criteria - Noise Abatement Criteria (NAC) have been established by the Federal Highway Administration (FHWA) to identify noise impacts from highway projects (refer to Table 2). Developed from research data, they represent acceptable maximum desirable noise levels for various land uses and associated human activities. Federal Title 23 CFR Part 772 describes traffic noise impacts as "…impacts which occur when the predicted traffic noise levels (for the design year) approach or exceed the Noise Abatement Criteria or when the predicted traffic noise levels substantially exceed the existing noise levels." "Approach" is defined as 1 dBA below the Noise Abatement Criteria; for residences and schools this would be 66 dBA. The FHWA has left the definition of substantial increase to the states.

FIGURE 2

COMMON NOISE LEVELS

COMMON OUTDOOR NOISE	Sound Pressure (u Pa)	Sound Pressure Level (dB)	COMMON INDOOR NOISES
	6,324,555	110	Rock band at 5m
Jet flyover at 300m			
	2,000,000	100	Inside subway train (New York)
Gas lawnmower at 1m			
	632,456	90	Food blender at 1m
Diesel truck at 15m			
			Garbage disposal at 1m
Noisy urban - daytime	200,000	80	Shouting at 1m
Gas lawnmower at 30m	63,246	70	Vacuum cleaner at 3m
Commercial area			Normal speech at 1m
	20,000	60	
			Large business office
Quiet urban - daytime	6,325	50	Dishwasher - next room
			Small theater
Quiet urban - nighttime	2,000	40	Large conference room
Quiet suburban - nighttime			Library
	632	30	
Quiet rural - nighttime			
			Bedroom at night
	200	20	Large concert hall (background)
			Broadcast and recording studio
	63	10	
			Threshold of hearing
	20	0	

Source: Edwards & Kelcey, Inc.

Table 2 FHWA NOISE ABATEMENT CRITERIA [Leq(h) in dBA]		
Activity Category	**FHWA NAC**	**Description of Activity**
A	57 (exterior)	Tracts of land where serenity and quiet are of extraordinary significance and serve an important public need where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, and parks which are not included in Category A and residences, motels, hotels, public meeting rooms, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	--	For requirements on undeveloped land see paragraphs 11a and c of FHPM 7-7-3.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Source: U.S. Department of Transportation, Federal Highway Administration, Federal-Aid Highway Program Manual, Volume 7, Chapter 7, Section 3, August 4, 1982.

Field Measurements - Ambient sound level measurements were conducted on March 23 and 26, 2001 at the following:

- Site 1 - a residence on Jefferson Boulevard,
- Site 2 - a residence on Kilvert Street,
- Site 3 - school on Jefferson Boulevard, and
- Site 4 - a daycare center on Coronado Road.

A-weighted sound levels were measured for 20 minutes at each site during the AM and PM peak periods. Measurements were taken at a minimum distance of 50 feet from the roadway to ensure the actual roadway noise was recorded, not only the tire noise.

A Bruel and Kjaer Sound Analyzer, calibrated before and after measurements, was used for the noise measurements. This instrument is an approved American Standard Sound Level Meter. The analyzer was tripod-mounted and was equipped with a wind screen to eliminate noise caused by wind blowing across the microphone. Weather conditions were noted to ensure a true reading. The recommended meteorological conditions are:

- wind speed under 12 mph
- relative humidity under 90 percent, and
- temperature above 14EF and below 122EF

The weather on the days the data was recorded fell within the parameters noted above.

Impact Analysis – A noise model was developed using FHWA's TNM version 1.0b. The monitored locations and the traffic data collected during monitoring were input into the model. For locations that were closer than the minimum 50 feet distance from the roadway, the actual locations were also input into the model.

The resulting sound levels for existing conditions are shown in Table 3. Future sound levels are based on the traffic volumes anticipated with the full build-out of operation of the intermodal garage (anticipated in 2020). These traffic volumes have been added to existing traffic volumes to determine future sound levels. Existing traffic volumes have not been projected to the year 2020 (no build). The difference in sound levels therefore accounts only for traffic growth attributable to station/garage volumes. The increase in traffic expected to result from the project was entered into the model to estimate the future sound levels. The future sound levels are also shown in Table 3.

Table 3
EXISTING AND FUTURE SOUND LEVELS [Leq(h) in dBA]

Analysis Location	Existing Sound Levels		Future Sound Levels		Difference in Sound Levels	
	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period
Site 1	71.4	70.1	72.6	71.4	1.2	1.3
Site 2	67.0	65.2	67.4	65.6	0.4	0.4
Site 3	70.2	70.6	70.2	70.6	0.0	0.0
Site 4	59.4	58.3	59.9	58.9	0.5	0.6

Table 3 shows that the sound level increases resulting from the project would be minimal, ranging from 0.0 to 1.3 dBA. As stated above, a 3 dBA increase is required for the average listener to perceive a difference in noise levels. Therefore, the project would not cause a significant increase in sound levels. In addition, the project does not cause the sound levels to approach or exceed the Noise Abatement Criteria established by FHWA; 66.0 dBA for residences and schools. Therefore, increased traffic associated with the project would not cause any noise impacts.

Note 2 – Visual

This larger structure is more in context with the airport terminal and ancillary buildings then with adjacent current industrial uses on Jefferson Boulevard and Fresno Road. This structure will set the tone up for adjacent development in the Warwick Station Redevelopment District. The height of this structure is in accordance with the required variance from the Warwick Zoning Ordinance restriction of 75 feet.

Note 3 – Construction

Fast-track construction is anticipated to take 21 months including the following:

- Initiation of site preparation to the completion of the station building,
- Construction of the platform and overpass over the tracks,

- Construction of the parking structure in the Baylis property, and
- Construction of the station building and parking structure
- Construction of the people mover connection from the station to the airport terminal

This estimate is nine months longer than the preferred alternative addressed in the Environmental Assessment. The land use plan indicates limited residential within the project area (See Figure 1). If required, noise mitigation measure may be instituted to reduce construction noise during this period.

Conclusion

Construction and operation of the Warwick Intermodal Station Garage will not affect the Finding of No Significant Impact issued by the Federal Highway Administration on July 6, 1999, with adequate mitigation as outlined below:

- Intersection improvements, traffic signalization and signal modification on Jefferson Boulevard
- Noise mitigation during construction, if warranted.

Appendix

1. March 15, 2001 correspondence from the Federal Highway Administration to Rhode Island Department of Transportation
2. March 19, 2001 correspondence from State Historic Preservation Officer to Rhode Island Department of Transportation
3. Intermodal Station Design Plans
4. March 26, 2001 memo regarding Site Description – Noise readings for Warwick Intermodal Station

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

380 Westminster Mall, Room 547
Providence, Rhode Island 02903

IN REPLY REFER TO:

March 15, 2001

Mr. William D. Ankner, Director
Rhode Island Department of Transportation
Two Capitol Hill, Room 210
Providence, Rhode Island 02903-1124

RECEIVED
MAR 20 2001

Attention: Mr. Chuck Alves, Chief
Intermodal Transportation

Dear Mr. Ankner:

Subject: ***Warwick Intermodal Station***
F.A.P. No. TFG-STAT(001)
Reevaluation of Finding of No Significant Impact

Reference is made to Mr. Alves' letter of February 19th, submitting a revised traffic study for the subject project. The revised study was submitted to us because the design of the proposed facility has changed from that which was evaluated by the Environmental Assessment (EA) upon which we based our Finding of No Significant Impact (FONSI) of July 6, 1999.

We accept the report as submitted and concur that the additional traffic impacts of the revised facility can be mitigated with the intersection improvements described. We also concur that with mitigation there will be no degradation of the Level of Service of the intersections, and therefore there will be no violations of air quality standards for carbon monoxide at the intersections.

Before we concur that the FONSI is still valid, however, we request the following information.

1. Please state that the Department commits to construction of the necessary improvements at the intersection of Jefferson Boulevard, Kilvert Street, and Coronado Road as part of this project, thereby mitigating the additional traffic impacts.

2. Please forward a succinct description of the revised intermodal facility, stating which design changes has the potential for changed environmental impacts. Examples would include the increased capacity of the parking facilities and the presence of rental vehicle servicing facilities.

3. Please inform us as to whether the Department has evaluated the revised facility in regard to the other potential impact categories as listed in the EA.

4. We ask that you specifically confirm that the revised facility does not have increased impacts in three areas; traffic noise because of the increased volumes, construction noise because of the extensive pile field, and water quality because of the presence of rental vehicle "vacuum, wash, and fuel" facilities.

5. As part of process initiated under Section 106 of the Historic Preservation Act during development of the EA, the Department will consult with the State Historic Preservation Officer (SHPO) to confirm the SHPO's original finding of "no adverse effect." Should the SHPO find an adverse effect because of the design change, the Department will conclude an agreement with the SHPO on appropriate mitigation measures in accordance with Section 106.

The Department is free to continue with the design of the facility while we have these issues under consideration. Please contact us if you wish to discuss this matter further.

Sincerely yours,

RALPH J. RIZZO

Ralph J. Rizzo
Transportation Planner

cc: Mr. Szymanski
Mr. Devine

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
HISTORICAL PRESERVATION & HERITAGE COMMISSION
Old State House • 150 Benefit Street • Providence, R.I. 02903-1209
Preservation (401) 222-2678 FAX (401) 222-2968
Heritage (401) 222-2669 TDD (401) 222-3700

STATE OF RHODE ISLAND DEPT. OF TRANSPORTATION RECEIVED MAR 22 2001 DIV. OF PUBLIC WORKS DESIGN SECTION

March 19, 2001

Mr. Edward S. Szymanski
Chief Transportation Projects Engineer
Office of Environmental Programs
Rhode Island Department of Transportation
2 Capitol Hill
Providence, RI 02903

Re: Warwick Intermodal Train Station
Warwick

Dear Mr. Szymanski:

The Rhode Island Historical Preservation and Heritage Commission staff has reviewed the information you have provided for the three new alternative train station designs under consideration for this project. We understand that the original schematic design presented in the Environmental Assessment is no longer under consideration.

The three alternatives are a stand-alone station with surface parking on Jefferson Boulevard, and two versions of a similar station standing behind a large parking garage on Jefferson Boulevard. All of these alternatives will affect the Hills Grove Historic District indirectly, rather than directly, by changing the setting of the historic industrial buildings that face the site. Based upon our review, we have concluded that the none of the alternatives will change the setting sufficiently to have an adverse effect on the Historic District. We will need to review more detailed plans and designs as they are developed to confirm this finding.

These comments are provided in accordance with the National Historic Preservation Act. If you have any questions or comments, please contact Richard E. Greenwood, Project Review Coordinator of this office.

Very truly yours,

Edward F. Sanderson
Executive Director
Deputy State Historic Preservation Officer

Cc: Mike Hebert, RIDOT

(010319.2)

March 15,2001 Intermodal Station/Garage Plan Set

Edwards AND Kelcey

Transportation
Communications
Facilities/Development

Memorandum

Date: March 26, 2001

To: Pamela Okolita

From: Julie Duncan

Subject: Site Description – Noise readings for Warwick Intermodal Station

Sampling locations must be 50 feet from the roadway, not less than 20 feet from intersections, and not blocked by buildings from the noise source (traffic). Sampling was conducted in 20 minute sessions during the current am and pm peak hours (7-9am and 4-6pm).

1. **D'Ambra Employee Parking Lot**
   This site was chosen to monitor the historic homes located on Jefferson Boulevard between the Airport Connector and the Leviton property. The noise monitoring station number one is located on the north side of the D'Ambra employee parking lot across from one historic duplex (849 and 847 Jefferson Boulevard) and next to another (834 and 832 Jefferson Boulevard). This location was selected because it is not within backyards but is representative of exterior residential noise levels. In this location Jefferson Boulevard is a four-lane road with no breakdown lane. The speed of the average car was approximately 40 mph. The ambient noise measured was the traffic. No noise events were generated by the D'Ambra site with the exception of one idling truck on the south side of the property. A building was located to the east on the D'Ambra property. No processing operations were conducted at D'Ambra during peak traffic period sampling sessions.

   During the morning peak hours a plane flew over after 2 minutes and 10 minutes of time had passed.

2. **Blackburn Street**
   This site was chosen to monitor a neighborhood near the intersection of Jefferson Boulevard and Kilvert Street. Noise monitoring station number two was located in a parking lot 50 feet east of Blackburn Street and 146 feet north of Kilvert Street. This location was selected because it is representative of residential noise levels while not located in a private yard. The station was set up across from 91 Blackburn Street and adjacent to an unnumbered home. The station was aimed at towards Kilvert Street, directed between the Grover Diner and 157 Kilvert Street (a home). Kilvert Street is a two-lane road with no breakdown lane. The average speed is approximately 30 mph. The ambient noise measured was traffic.

During the morning peak hours a truck drove through the parking lot 8 minutes into the monitoring session and a car drove through after 15 minutes.

3. Rollins Truck Rental

This site was chosen to establish a station to replicate noise levels at the St. Francis School on Jefferson Boulevard. Noise monitoring station number three was located in the parking lot 50 feet from the south side entrance. The noise monitoring system was located 670 feet north of the school, 1300 feet north of the intersection of Jefferson Boulevard, Kilvert Street, and Coronado Road. Rollins Truck Rental was the closest area to the school where there was parking available and room to measure 50 feet from the street. In this location Jefferson Boulevard is a four-lane road with no breakdown lane. The speed of the average car was approximately 40 mph. The ambient noise measured was the traffic.

During the evening peak hours there was truck traffic through the parking lot at 1 minute, 2 minutes, 11 minutes, 12 minutes, and 16 minutes into the monitoring session. There was also a horn sounded at the 16 minute mark. During the morning peak hours there was truck traffic through the parking lot at 7 minutes and 17 minutes. A plane also flew overhead at 7 minutes.

4. WonderKids – Side parking lot

This site was chosen to monitor noise levels at the WonderKids Day Care Center. Noise monitoring station number four was located 20 feet from the west side of WonderKids in a dirt parking lot that I accessed by driving down Kilvert Street from Post Road. This location was selected to get an actual reading of the traffic at the Coronado Road and Jefferson Boulevard intersection and the train tracks without being located in the parking lot in front of the day care where there was traffic and background noise from neighboring buildings. The noise monitoring system located in front of the WonderKids building would have been directed at a road embankment.

During the evening peak hours a truck drove into the dirt parking lot after 7 minutes of monitoring. During the morning peak hours a train passed by after 4 minutes and a truck drove into the parking lot after 13 minutes of monitoring.

Warwick Intermodal Station
T.F. Green Airport, Warwick, Rhode Island

REEVALUATION OF THE ENVIRONMENTAL ASSESSMENT D'AMBRA PROPERTY AND INTERMODAL GARAGE/PEOPLE MOVER PARCELS WARWICK, RI

Prepared by Edwards and Kelcey, Inc.
95 Cedar Street
Providence, RI
(401) 272-1969

February 1, 2002

Rhode Island Department of Transportation

Federal Highway Administration

Warwick Intermodal Station Project
Environmental Assessment Reevaluation
D'Ambra Property and Intermodal Garage/People Mover Parcels

Prepared by Edwards and Kelcey
February 1, 2002

Table of Contents

Executive Summary 1
Introduction 4
March 27, 2001 Reevaluation of Environmental Assessment 4
Project Update 5
- Value Engineering 5
- Executive Committee 5
- People Mover and Station Design Refinements 6

Project Change 6
- D'Ambra Property (Plat 323/Lot 519) 6
- Parcel Acquisitions for Intermodal Station Garage and People Mover Station 8

Summary of Environmental 8
- Note 1-Relocation 10
- Note 2-Water Quality 10
- Note 3-Historic/Archaeological Preservation 11
- Note 4-Hazardous Waste Sites 12

Conclusions 13

Appendix

Correspondence:

- April 3, 2001 correspondence from the Federal Highway Administration to Rhode Island Department of Transportation (RIDOT)
- November 9, 2001 correspondence from the Rhode Island Historical Preservation and Heritage Commission to RIDOT
- December 3, 2001 correspondence from Narragansett Indian Tribal Historic Preservation Office to RIDOT
- December 13, 2001correspondence from Rhode Island Historical Preservation and Heritage Commission to RIDOT
- December 19, 2001 correspondence from RIDOT to Narragansett Indian Tribal Historic Preservation Office

List of Figures

Figure 1 Proposed Warwick Intermodal Station Ground Floor Footprint 7

List of Tables

Table 1 Summary of Environmental Change 9

Warwick Intermodal Station Project
Environmental Assessment Reevaluation
D'Ambra Property and Intermodal Garage/People Mover Parcels

Executive Summary

The Federal Highway Administration issued a Finding of No Significant Impact (FONSI) for the Warwick Intermodal Station Environmental Assessment (EA) on July 6, 1999. The EA addressed a stand-alone multi-level station and adjacent surface parking lot. On March 27, 2001, the Rhode Island Department of Transportation (RIDOT) submitted a Reevaluation of the Environmental Assessment to the Federal Highway Administration (FHWA) addressing a proposed consolidated car rental facility with an integrated station. The facility would accommodate commuter/Amtrak passenger parking and a consolidated rental car facility. The FHWA accepted the reevaluation as submitted and concurred that the additional environmental impacts could be mitigated with the actions described in the reevaluation.

Since April 2001 the Warwick Intermodal Station project has undergone value engineering and continued RIDOT, Rhode Island Airport Corporation (RIAC), and Governor's Office review through weekly Executive Committee meetings. A focus of these efforts has been to identify design modifications that would allow a construction cost reduction of $40 million while maintaining the programmed functions of the facility. Through the value engineering process and Executive Committee meetings the footprint of the project has been expanded to include the D'Ambra Construction parcel at 780 Jefferson Boulevard (Plat 323/Lot 519), located south of and adjacent to the Leviton parking lot. Cost savings and increased efficiency of space utilization would result from a squared-off structure that is shifted to the south, away from the irregularly shaped Budget parcel along Coronado Road. In addition, a temporary easement on the adjacent D'Ambra property (south of the subject site) would be required for construction of the facility.

The privately owned 0.779-acre (34,804-square foot) D'Ambra parcel was addressed in the EA as a potential strip taking along the rail alignment to accommodate the Freight Rail Improvement Project and station platform construction. Taking of the entire 0.779-acre parcel was not addressed in either the EA or the March 27, 2001 Reevaluation of the Environmental Assessment. The building and adjacent paved parking lot is currently vacant.

Along with the assessment of extending the intermodal station's footprint southward to the D'Ambra property, the configuration of the station and people mover on the eastern side of the tracks was also examined. The following parcels will be acquired in their entirety and developed in part for the footprint of the intermodal station garage or for construction and/or operation of the elevated people mover station and platforms:

- R. Johnson & Sons: Engine Service, Inc. (Plat 323/Lot 380, 5,000 sf parcel) at 65 Fresno Road, owned by Mr. John T Harrington and Mr. George E. Harrington. Business relocation required.
- Former parking lot (Plat 323/Lot 355, 5,000 sf parcel) located on the southwestern side of Fresno Road, owned by Mr. Richard A. Pariseault and Ms. Grace M. Pariseault. Parcel vacant. Entire lot taken. No business relocation required.

No change in impact would result from incorporation of the three parcels into the overall project development. Two specific environmental categories were evaluated in detail for the D'Ambra parcel as part of this reevaluation: historic/cultural resources and hazardous materials. Four specific environmental categories were evaluated in detail for Fresno Road parcels as part of this reevaluation: relocation, water quality, historic/cultural resources and hazardous materials.

No change in impact is projected to Sections 106/4(f) historic/cultural resources. RIHPHC will review more detailed plans as they are developed to confirm its finding for the March 27, 2001 Reevaluation that shifting the station/parking facility 100 feet south will not change the setting sufficiently to have an adverse effect on the Hills Grove Historic District. With respect to archaeological resources, an archaeological consultant conducted background research concluding prior to construction disturbance and examined soil boring data on the D'Ambra property and within the proposed people mover alignment (subject properties are within 50 feet of borings). The archaeological research and limited data indicated that these areas have been excessively disturbed and that no archaeological testing is warranted. All construction impact areas have been assessed in order to identify any known or potentially significant archaeological resources. The results indicate that there are no resources present in the construction impact areas. The draft Phase I(b) archaeological reconnaissance survey report, which includes the archaeologist's background research and soil boring data on the D'Ambra property and people mover alignment, was transmitted to the RIHPHC for concurrence. Per their November 9, 2001 review, RIHPHC concurs with the results and adds that no additional archaeological investigations are necessary. Coordination with the Narragansett Indian Tribal Historic Preservation Office (NITHPO) has been maintained. The NITHPO was given the opportunity to review and has commented on the archaeological survey results.

No significant impact is anticipated from subsurface hazardous materials issues. It is expected that the groundwater remediation system being installed on the T.H. Baylis site will bear a beneficial impact on the D'Ambra property. A Phase I Environmental Site Assessment was conducted by BETA in December, 1998 for the intermodal station and people mover alignment. The findings of this report were incorporated in the May 1999 Final Environmental Assessment. Phase II testing was recommended along the people mover alignment: "Sampling should also be performed by subsurface test hole drillings along either side of Fresno Road depending on the selected location of the people mover. The Phase II testing will be completed before any property acquisition and the

necessary hazardous waste remediation will be performed before project construction activities are undertaken." [1]

East of the tracks one business will be displaced and one vacant lot will be taken. Proposed uses of these properties are in accordance with the City of Warwick's plan for the Intermodal Zone of the Warwick Station Redevelopment District. As proposed by the City of Warwick in 1999 and 2000, the developer selected by the City of Warwick would conduct all property takings required for redevelopment of the district. To date, however, no takings have been conducted. No relocation of housing units is required.

No significant impact is anticipated to water quality. The project storm drainage system has been designed to meet state requirements. Stormwater collected from the roof of the garage and station will be pretreated to remove 80 percent total suspended solids in accordance with RIDEM water quality requirements. By collecting drainage from the project site and from a half-mile section of Jefferson Boulevard, surcharging should be alleviated for most storm events. Stormwater from the proposed facility will be discharged to a grass swale proposed north of and parallel to the Airport Connector. The proposed discharge is approximately 800 feet from the Three Ponds wetland complex located west of Leviton.

Of the subject 44,804 square feet of property to be taken in the three parcels, 89 percent is currently paved or built upon. Approximately 82 percent of the three parcels will be impervious following construction, a net increase of 3,000 square feet of pervious, landscaped area.

The addition of the D'Ambra Construction parcel and two parcels along Fresno Road to the right of way takings and/or easements for the Warwick Intermodal Station and people mover will not affect the Finding of No Significant Impact issued by the Federal Highway Administration on July 6, 1999 or the conclusions and findings of the reevaluation of the Environmental Assessment conducted in March 2001 which are confirmed by FHWA in its April 13, 2001 correspondence to RIDOT.

[1] Warwick Intermodal Station At T. F. Green Airport Final Environmental Assessment, May 1999.

Warwick Intermodal Station Project
Environmental Assessment Reevaluation -
D'Ambra Property and Intermodal Garage/People Mover Parcels

Introduction

In May of 1999 the Rhode Island Department of Transportation (RIDOT) submitted to the Federal Highway Administration an Environmental Assessment (EA) for the Warwick Intermodal Station at T.F. Green Airport in Warwick, Rhode Island. With improvements in Amtrak service and passenger growth at T.F. Green Airport (reflecting operation of the new Sundlun Terminal and Southwest Airlines arrival), state and local transportation officials have sought to create an intermodal gateway connecting the two transportation facilities. In 1998 TEA-21 authorized $25 million for a new Warwick Amtrak/Commuter Rail Station with an elevated people mover to connect the station to the Airport terminal building.

The EA process identified the 3.5-acre Leviton parking lot and the 1.0-acre Budget Car Rental property on Jefferson Boulevard, Amtrak property, and the 1.2-acre Baylis Chemical site east of the tracks as the location of the station, parking lot and people mover. On July 6, 1999 the Federal Highway Administration issued a Finding of No Significant Impact (FONSI). Key project elements addressed in the EA and FONSI included:

- A multi-level train station with ticketing, information/waiting areas, restrooms, concessionaires, access to platforms on inbound and outbound tracks, and the people mover.
- Adjacent surface parking lot for 500 commuters with access to Jefferson Boulevard, designed to accommodate passenger drop off and RIPTA bus connections.
- Elevated people mover along Fresno Road, connecting the station and airport terminal.

March 27, 2001 Reevaluation of the Environmental Assessment

On March 27, 2001, the Rhode Island Department of Transportation submitted a Reevaluation of the Environmental Assessment to the Federal Highway Administration. The reevaluation addressed a proposed consolidated rental car facility along with parking for commuter/Amtrak passengers with an integrated station instead of the stand-alone multi-level station and adjacent surface parking lot. A key element of the revised plan included the design of a 5 level (not including ground and mezzanine levels) parking facility extending from the former Leviton parking lot and Budget property on Jefferson Boulevard, east across Amtrak's Northeast Corridor, to the former Baylis property. The train station would be integrated within the facility.

The FHWA's response to the March 27, 2001 Reevaluation of the Environmental Assessment was received on April 3, 2001. The FHWA accepted the reevaluation as

submitted and concurred that the additional environmental impacts of the proposed facility could be mitigated with the actions described in the reevaluation. The RIDOT has committed to the improvements described at the intersection of Jefferson Boulevard and Coronado Road/Kilvert Street, and to mitigate any construction noise impacts as necessary as outlined in the reevaluation. Therefore, the FHWA concurred that the Finding of No Significant Impact was still valid. The RIDOT complied with the FHWA request to have the April 3, 2001 letter, the reevaluation, and the revised traffic report of February 19th be made available to all interested parties, in particular the property owner(s) who may be affected by the proposed intersection improvements and the general public.

Project Update

Since April 2001 the Warwick Intermodal Station project has undergone value engineering and continued RIDOT, RIAC, and Governor's Office review through weekly Executive Committee meetings. A focus of these efforts has been to address and identify modifications to the design that would enable a construction cost reduction of $40 million, while maintaining the programmed functions of the facility. Further design analysis has identified additional property takings required along the people mover alignment. Through these processes the footprint of the project has been extended to include three parcels: a parcel owned by D'Ambra Construction on Jefferson Boulevard, a vacant lot on Fresno Road owned by Mr. Richard A. Pariseault and Ms. Grace M. Pariseault , and R. Johnson & Sons: Engine Service, Inc., located on Fresno Road and owned by Mr. John T. Harrington and Mr. George E. Harrington.

Value Engineering

Edwards and Kelcey prepared the July 31, 2001 Value Engineering Study which reports on a one-day working session. The project team consisted of RIDOT, Edwards and Kelcey (project design firm), Robinson Green Beretta Corporation (architect sub-consultant), and a joint venture of Gilbane and Parsons Brinkerhoff Aviation (RIAC's program manager for design and construction). Seventy-eight ideas were generated by the value engineering team for this project. Fifty-nine proposals and design suggestions were developed as a result of the ideas generated. The irregular parcel configuration that results from the alignment of Coronado Road as it bridges the tracks, has led to increased construction costs. Several of the ideas generated reflected the cost savings that could accrue with a more regularly configured parcel and squared-off structure. Although the cost savings were recognized, property takings of the adjacent parcels were not considered during the one-day working session based on RIDOT's previously stated intent to complete construction on parcels now state-owned as part of the original station design concept (as presented in the May 1999 Environmental Assessment).

Executive Committee

In Executive Committee meetings, RIDOT staff reconsidered the potential cost savings with extension of the project site to the adjacent D'Ambra Construction parcel (Plat 323/Lot 519) at 780 Jefferson Boulevard. In early July, a Phase II Site Assessment and Phase 1B Archaeological Study were initiated for the D'Ambra parcel and the people

mover alignment. The findings of this investigation, together with property appraisals, were used by Executive Committee members in their determination that significant construction cost savings could be realized by extending the full-build consolidated rental car facility footprint southward to the D'Ambra parcel.

People Mover and Station Design Refinements

Design refinements have continued east of the rail line. The following parcels will be acquired in their entirety and developed in part for the footprint of the intermodal station garage or for construction and/or operation of the elevated people mover station and platforms:

- R. Johnson & Sons: Engine Service, Inc. (Plat 323/Lot 380, 5,000 sf parcel) at 65 Fresno Road, now or formerly owned by Mr. John T. Harrington and Mr. George E. Harrington. Business relocation required.
- Former parking lot (Plat 323/Lot 355, 5,000 sf parcel) located on the southwestern side of Fresno Road, adjacent to former Baylis parcels now owned by RIDOT. Now or formerly owned by Mr. Richard A. Pariseault and Ms. Grace M. Pariseault Parcel vacant. Entire lot taken. No business relocation required.

Project Change

This January 2002 Reevaluation of the Environmental Assessment has been prepared in response to continuing interagency review and a modification in project scope to include the privately-owned parcels not addressed in the EA or the March 27, 2001 Reevaluation of the Environmental Assessment. Parcels are identified in Figure 1.

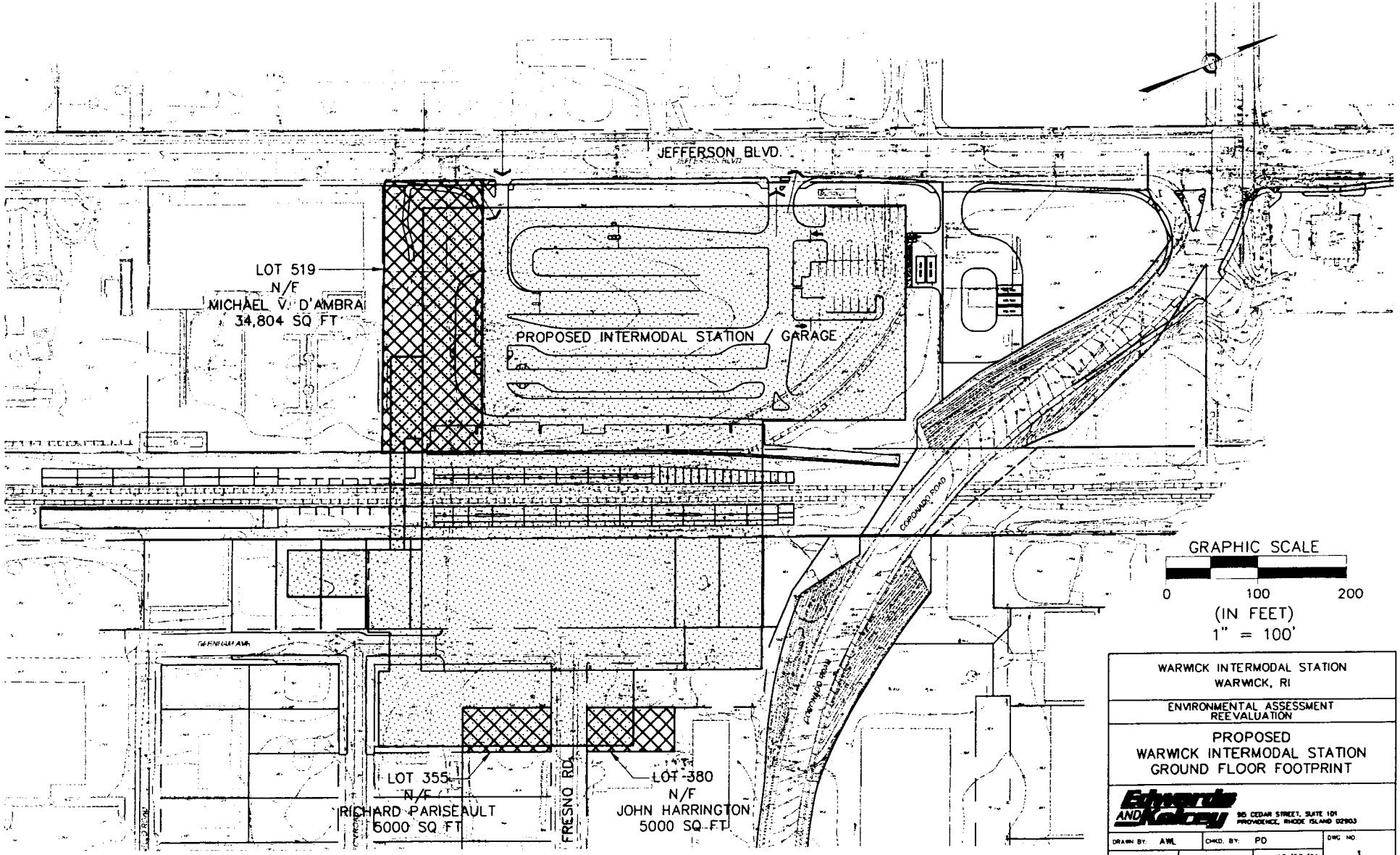
D'Ambra Property (Plat 323/Lot 519)

The City of Warwick Assessor's Map identifies the subject parcel of land as Plat 323/Lot 519 at 780 Jefferson Boulevard. This property is currently occupied by a structure with a footprint of 9,639 square feet. According to the Warwick assessor's field card for the property, the building is serviced by public utilities and is utilized as office space. No records or permits for D'Ambra Construction were present at the building department at the time of the investigation. Information in the assessor's field card indicates that the building was constructed in 1946 and is zoned for general industrial use. According to recent field investigations, the building is currently vacant and the adjacent paved area is not utilized by D'Ambra Construction activities.

The subject 0.779-acre parcel would be developed as exterior landscaping and as the southwestern extent of the footprint for the station and parking facility. Approximately 8,000 square feet at the southwest end of the property along Jefferson Boulevard would be landscaped with a pedestrian walk extending from the sidewalk to the station/garage.

Parcel Acquisitions for Intermodal Station Garage and People Mover Station

Two acquisitions are required to construct and operate the people mover station and loading platforms above Fresno Road, adjacent to the intermodal station and garage facility. Although piers within Fresno Road would support the elevated section (with the



WARWICK INTERMODAL STATION
WARWICK, RI

ENVIRONMENTAL ASSESSMENT
REEVALUATION

PROPOSED
WARWICK INTERMODAL STATION
GROUND FLOOR FOOTPRINT

Edwards and Kelcey
90 CEDAR STREET, SUITE 101
PROVIDENCE, RHODE ISLAND 02903

DRAWN BY: AWL	CHKD. BY: PO		DWG. NO.
SCALE: 1"=100'	APPROVED: PO	DATE: 12/28/01	1

majority of construction above the public right-of-way), a wider footprint is required at the west end of Fresno Road for construction of the lobby/station building.

Unpaved Area (Plat 323/ Lot 355)
Lot 355 is the westernmost of three contiguous 5,000 square foot lots owned by Mr. Richard A. Pariseault and Ms. Grace M. Pariseault on the south side of Fresno Road. These properties are zoned for light industrial use, and are utilized as a fenced parking area for unregistered cars and trucks. The lots appear to function as one property with a single entrance on Fresno Road. The Warwick Assessor's office has designated the class of the Lot 355 as commercial with commercial/industrial vacant land use. No structures are currently located on any of the three lots. Lot 355 does not appear to be critical to the operation of Lots 357 and 359 for the storage of unregistered vehicles.

R. Johnson & Sons: Engine Service, Inc. (Plat 323/Lot 380)
R. Johnson & Sons: Engine Service, Inc. is located at 65 Fresno Road on the northwest end of Fresno Road. The 5,000 square foot lot is occupied by a single 3,977 square feet structure. Information included in the Warwick Assessor's property field card indicates that the current owners are Mr. John T. Harrington and Mr. George E. Harrington. The aluminum sided building was constructed in 1965 and has a concrete foundation. The property is zoned for light industrial use and according to the Assessor's field card, is utilized for light manufacturing. The Warwick Assessor's office has designated the property's land use as Commercial 1 and class as commercial.

The entire 5,000 square foot parcel would require taking for the footprint of the station garage facility. Relocation of the ongoing business would be conducted in accordance with the URARPAPA.

Summary of Environmental Changes

The Environmental Assessment (May 1999) and Reevaluation of the Environmental Assessment (March 27, 2001) assessed the social and environmental effects of the Warwick Intermodal Station. The table below identifies environmental categories addressed in the EA and the March reevaluation, summarizes comments/issues specific to the additional parcels, and lists the potential changes in impact associated with the addition of the new properties to the footprint of the Warwick Intermodal Station Garage Facility and people mover station. The following property takings are included in this analysis:

- D'Ambra Parcel (Plat 323/Lot 519)
- R. Johnson & Sons: Engine Service, Inc. (Plat 323/Lot 380) (business relocation)
- Unpaved Vacant Lot (Plat 323/Lot 355)

Table 1
SUMMARY OF ENVIRONMENTAL CHANGES

Environmental Category	Comments	Change in Impact from EA and March 27, 2001 EA Reevaluation
Land Use	▪ Consistent with City-enacted land use plan as part of Redevelopment District ▪ Existing uses: light industrial	No Change
Park and Recreation Areas	▪ No public parks or recreational facilities at or adjacent to site	No Change
Farmland	▪ Soils not suited for agriculture	No Change
Social/ Environmental Justice	▪ Increased employment opportunities ▪ Supports City's development plan ▪ Consistent with Environmental Justice objectives	No Change
Relocation	▪ West of Tracks: Building currently vacant, no relocation required ▪ East of Tracks: two businesses displaced, three vacant lots taken. Business relocation to be conducted in accordance with the federal URARPAPA. ▪ No relocation of housing units required	No Significant Impact - See Note 1
Economic	▪ Supports City's development plan	No Change
Joint Development	▪ No change in facility use proposed	No Change
Pedestrian and Bicycle Movement	▪ Provides safe pedestrian access from Jefferson Boulevard	No Change
Air Quality	▪ No change in facility use proposed	No Change
Noise	▪ No change in facility use proposed	No Change
Traffic	▪ No change in facility use proposed	No Change
Ridership	▪ No change in facility use proposed	No Change
Water Quality	▪ No change in facility drainage area is proposed. All stormwater systems will be designed in accordance with state regulations	No Significant Impact – Note 2
Permits	▪ No change in facility use proposed	No Change
Wetland	▪ No wetlands within project site	No Change
Water Body Modification and Wildlife	▪ No wetland or water resources within project site ▪ No wildlife corridors or significant wildlife habitat	No Change
Floodplain	▪ No impact to the 100-year or 500-year flood zones	No Change
Wild and Scenic Rivers	▪ No designated rivers within the project site	No Change
Coastal Zone	▪ Not located within a coastal zone	No Change
Historic/Archaeological Preservation	▪ Phase 1(b) archaeological survey completed. No significant archaeological resources within the project site.	No Change – See Note 3
Hazardous Waste Sites	▪ Phase II environmental site investigation conducted. No further action appears to be warranted at this time.	No Change – See Note 4
Visual	▪ Project designed to complement the surrounding area	No Significant Change
Energy	▪ Design utilizes latest energy saving features	No Change
Construction	▪ No residential areas affected ▪ No change in construction traffic ▪ Larger overall project site will facilitate project construction	No Significant Change
Access	▪ No change in facility use proposed	No Change

Note 1 – Relocation

Relocation assistance will be provided in accordance with the URARPAPA for any property taken for project construction. This act provides for business owners to be compensated for their land and building at fair market value. The act also provides relocation assistance including payments for moving costs.

The D'Ambra building is currently vacant and the adjacent land is not integral to the viability of D'Ambra operations on adjacent property to the south. No business or residential relocation is required.

R. Johnson & Sons: Engine Service, Inc. and one lot used to store unregistered vehicles will be taken along Fresno Road. These takings are in accordance with the City of Warwick's plan for the Station Redevelopment District. As proposed by the City of Warwick in 1999 and 2000, the developer selected by the City of Warwick would conduct all property takings required for redevelopment of the district. During the EA it was anticipated that property takings and easements for the people mover would be conducted with the developer. To date (January 2, 2002), the developer, Bullfinch, has not successfully negotiated with any property owners in the district although all owners have reportedly been approached and all owners are aware of both redevelopment efforts in the area and of RIDOT's proposed people mover alignment.

If R. Johnson & Sons: Engine Service, Inc. (Plat 323/Lot 380) continues to operate on Fresno Road and it is taken for project construction, relocation assistance will be provided in accordance with the URARPAPA.

Vacant land or land used for storage of unregistered vehicles (Plat 323/Lot 355) will be required for the footprint of the station garage facility. No business relocation is required for vacant lots.

No relocation of housing units would be required either east or west of the tracks.

Note 2 – Water Quality

No significant impact is anticipated to water quality. The project storm drainage system has been designed to meet state requirements. Stormwater collected from the roof of the garage and station will be pretreated to remove 80 percent total suspended solids in accordance with RIDEM water quality requirements. Stormwater from the proposed facility will be discharged to a grass swale proposed north of and parallel to the Airport Connector. The proposed discharge is approximately 800 feet from the Three Ponds wetland complex located west of Leviton.

Of the subject 44,804 square feet of property to be taken in the three parcels, 89 percent is currently paved or built upon. Soil in the 5,000-square foot unpaved parking area (Lot 355) has been compacted, has limited vegetative value, and has a high runoff coefficient.

Approximately 82 percent of the three parcels will be impervious following construction, a net increase of 3,000 square feet of pervious, landscaped area. Proposed impervious surface includes approximately 23,700 square feet of Lot 519, the majority of Lot 355, and 2,500 square feet of Lot 380. Landscaping an 8,000 square foot area at the southwest perimeter of the parking garage will facilitate groundwater infiltration.

Runoff and storm drainage from the project area currently is collected and discharged via an undersized pipe which contributes to stormwater surcharging on the former Leviton lot and Jefferson Boulevard prior to discharge to the Three Ponds wetland complex. By collecting drainage from the project site and conveying it via a new pipe to a proposed discharge within the Three Ponds drainage area, surcharging should be alleviated for most storm events.

Note 3 - Historic/Archaeological Preservation

In accordance with the July 1999 FONSI issued for the Warwick Intermodal Station, FHWA and RIDOT are committed to conducting additional archaeological studies in areas not covered by studies conducted for the EA. In August 2001, Timelines Inc. prepared a Draft Report of the Phase 1(b) Archaeological Reconnaissance Survey that included an evaluation for the D'Ambra property and the route of the proposed people mover (within Fresno Road). Timelines archaeologists monitored borings, examined the soil samples for artifacts, produced soil profiles, and photographed the drilling process and the transition zones between fill layers and natural soils, when they were encountered. Disturbed soils were identified and no significant archaeological resources were uncovered during the boring monitoring. No archaeological resources indicating Native American habitation were identified. The only artifacts noted were associated with farming and railroad construction and maintenance.

The Rhode Island Historic Preservation and Heritage Commission (RIHPHC) concurs with the report's conclusion that the proposed project will have no effect on any significant archaeological resources as indicated in November 9, 2001 correspondence from RIHPHC to RIDOT (correspondence is presented in the appendix). The Narragansett Indian Tribal Historic Preservation Officer (NITHPO) has reviewed the draft Phase I (b) report. Although NITHPO response was not received by RIDOT within the 30-day comment period specified under Section 106 of the Historic Preservation Act, RIDOT has responded to comments in its December 19, 2001 correspondence (see appendix). RIDOT indicates that no additional archaeological studies are necessary, based on the study results and the concurrence of the RIHPHC.

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, RIDOT will forward plan revisions to RIHPHC for reconfirmation of its finding presented in the March 27, 2001 Reevaluation that the station/garage will not change the setting sufficiently to have an adverse effect on the Hills Grove Historic District. Shifting the station/parking facility 100 feet south along Jefferson Boulevard will bring the structure that much closer to the historic district. RIHPHC has reviewed 35% design

plans for the station and has no objections to the proposed work, as indicated in December 13, 2001 correspondence to RIDOT.

Note 4 - Hazardous Waste Sites

A Phase II Environmental Site Assessment was conducted by BETA Engineering, Inc. (BETA, September 2001) to assess subsurface conditions at the subject D'Ambra Construction parcel as they related to the presence of hazardous materials and petroleum products. This investigation was a "follow-up" to a Phase I Environmental Site Assessment included in the May 1999 Environmental Assessment. The following conclusions and recommendations were presented for Lot 519 (D'Ambra) at 780 Jefferson Boulevard:

- Three soil borings were advanced at the Site on July 23, 2001. Groundwater was encountered in each test boring at a depth of 17 feet below grade.
- Soil samples from depths of 20-22 feet below grade in each boring were submitted for laboratory analysis of TPH and VOCs. No TPH or VOCs were detected above laboratory reporting limits. Soil samples from depths 5-7 feet below grade in each boring were submitted for laboratory analysis of metals. Metals detected in the soil were below the applicable RIDEM Industrial/Commercial Direct Exposure Criteria.
- Groundwater samples were collected from each monitoring well and submitted for laboratory analysis of total metals and VOCs. Metals were detected in each groundwater sample; however, no RIDEM GB Groundwater Objectives have been established for metals at this time. VOCs were detected in groundwater from each monitoring well. Tetrachloroethene was detected in OW-1 above the applicable RIDEM GB Groundwater Objective. Other VOC levels were below the applicable Objectives.

Lot 519 (D'Ambra) is situated south to southwest and down-gradient of the former T.H. Baylis Company site. T.H. Baylis is known to be a source of chlorinated solvent contamination that has impacted both soil and groundwater in the area. Tetrachloroethene detected in one well and the other trace concentrations of solvents detected in groundwater are likely migrating from the T.H. Baylis property. No active source(s) of chlorinated solvents were observed on the subject site. The concentrations of solvents detected in groundwater are not indicative of gross contamination. It is expected that the groundwater remediation system being installed on the T.H. Baylis site will bear a beneficial impact on the subject property. No further action appears to be warranted at this time.

RIDEM issued a Voluntary Procedure Letter, dated November 2, 2001, acknowledging receipt of the Phase II Report for the D'Ambra Property. In the letter, RIDEM states that RIDOT has assumed responsibility for proper remediation of the former T.H. Baylis property. Additionally, RIDEM states that if the Baylis property is the sole source of contamination at the D'Ambra Construction property (780 Jefferson Avenue), then this property shall be considered to be part of the Contaminated Site, in accordance with Rule 3.11 of the Remediation Regulations. As such all restrictions applied to the Baylis property will be applied to the D'Ambra property. RIDEM advises RIDOT that

"identification of the property as a down gradient receptor of migrating contamination does not remove the responsible party of the need to address and remediate that contamination." In addition, RIDEM states that downgradient status does not apply "when the downgradient property owner is the same as the upgradient property owner, and the two properties constitute one Contaminated Site."

The May 1999 Environmental Assessment referenced the Phase 1 Environmental Site Assessment conducted by BETA Engineering in December 1998. The Phase 1 assessment addressed parcels along both sides of Fresno Road with regard to the proposed people mover alignment and included an unpaved parking area (Lot 355) and R. Johnson & Sons (Lot 380). Phase II testing was recommended along the people mover alignment: "Sampling should also be performed by subsurface test hole drillings along either side of Fresno Road depending on the selected location of the people mover. The Phase II testing will be completed before any property acquisition and the necessary hazardous waste remediation will be performed before project construction activities are undertaken." [2]

Conclusions

The addition of the D'Ambra Construction parcel and parcels along Fresno Road to the right of way takings and/or easements for the Warwick Intermodal Station and people mover will not affect the Finding of No Significant Impact issued by the Federal Highway Administration on July 6, 1999 or the conclusions and findings of the reevaluation of the Environmental Assessment conducted in March 2001 which are confirmed by FHWA in its April 13, 2001 correspondence to RIDOT.

\\RI01SHADOW\Docs\980017.004 - Warwick Intermodal Station\Documents\Phase II Environmental\D'Ambra Reevaluation and People Mover Parcels.doc

[2] Warwick Intermodal Station At T. F. Green Airport Final Environmental Assessment, May 1999.

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

380 Westminster Mall, Room 547
Providence, Rhode Island 02903

IN REPLY REFER TO:

April 3, 2001

Mr. William D. Ankner, Director
Rhode Island Department of Transportation
Two Capitol Hill, Room 210
Providence, Rhode Island 02903-1124

RECEIVED
APR 5 2001

Attention: Mr. Chuck Alves, Chief
Intermodal Transportation

Dear Mr. Ankner:

Subject: ***Warwick Intermodal Station***
F.A.P. No. TFG-STAT(001)
Reevaluation of Finding of No Significant Impact

Reference is made to Mr. Alves' letter of March 29th, submitting a revised reevaluation of the Environmental Assessment (EA) for the subject project. The reevaluation was submitted to us because the design of the proposed facility has changed from that which was evaluated by the EA upon which we based our Finding of No Significant Impact (FONSI) of July 6, 1999.

We accept the reevaluation as submitted and concur that the additional environmental impacts of the revised facility can be mitigated with the actions described. The Department has committed to the improvements described at the intersection of Jefferson Boulevard and Coronado Road/Kilvert Street, and to mitigate any construction noise impacts as necessary. Therefore, we concur that the FONSI is still valid.

We ask that you make this letter, the reevaluation, and the revised traffic report of February 19th available to all interested parties, in particular the property owner(s) who may be affected by the proposed intersection improvements, as well as the general public. Please contact us if you wish to discuss this matter further.

Sincerely yours,

RALPH J. RIZZO

Ralph J. Rizzo
Transportation Planner

cc: Mr. Szymanski
Mr. Devine
Mr. Capaldi

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
HISTORICAL PRESERVATION & HERITAGE COMMISSION
Old State House • 150 Benefit Street • Providence, R.I. 02903-1209
TEL (401) 222-2678 FAX (401) 222-2968
TTY (401) 222-3700 Website www.rihphc.state.ri.us

November 9, 2001

Mr. Edward S. Szymanski
Office of Environmental Programs
Rhode Island Department of Transportation
2 Capitol Hill
Providence, RI 02903

Re: Phase I(B) Archaeological Survey
Warwick Intermodal Train Station
Warwick, Rhode Island

Dear Mr. Szymanski:

The Rhode Island Historical Preservation and Heritage Commission has reviewed the above-referenced report prepared by Timelines, Inc. The report describes archaeological investigations at the Budget Rental, Bayliss, Leviton, and D'Ambra properties and along the route of the proposed people mover. We concur with the report's conclusion that the proposed project will have no effect on any significant archaeological resources. Therefore additional archaeological investigations are not necessary.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions please contact Richard E. Greenwood, Project Review Coordinator, or Paul A. Robinson, Principal Archaeologist, of this office.

Very truly yours,

Edward F. Sanderson
Executive Director
Deputy State Historic Preservation Officer

cc: Michael Hebert, John Brown, Michael Roberts

(011109.04)

NITHPO

Narragansett Indian Tribal Historic Preservation Office
Narragansett Indian Longhouse
P. O. Box 700
Wyoming, Rhode Island 02898

3 December 2001
(via fax)

Ed Szymanski, P.E.
Chief Transportation Projects Engineer
Office of Environmental Programs
RIDOT
Engineering Division
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124

RE: Warwick Intermodal Train Station

Greetings, Ed:

With regard to the Warwick Intermodal Train Station, RIDOT's efforts to formally and properly involve NITHPO in determining the presence or absence of Narragansett Indian cultural materials at the D'Ambra parking lot, the Airport parking lot and the areas along Fresno Road have been minimal to non-existent. What happened to the MOU mandated formal notification process regarding this project? Why was NITHPO denied formal input to the development of the testing strategy for these sites? Clearly, NITHPO would not have approved of and does not now approve of "borings" as a sole methodology for determining the presence or absence of Narragansett Indian cultural materials.

Discussions, today, with Deena Duranleau of Timelines regarding Timelines' on site findings leads NITHPO to the conclusion that said findings are based primarily on presumptions that were gleaned solely from borings. If this is the case, NITHPO takes the following positions:

(1) -**Fresno Road** – Since the borings indicate this area is fill, NO FURTHER TESTING IS NECESSARY.

(2) –**Airport Parking Lot** – Since the borings indicate this area is fill, NO FURTHER TESTING IS NECESSARY.

(3) -**D'Ambra Parking Lot** – We are informed by Timelines that the borings indicated that there was a plow zone underneath the asphalt. Timelines, therefore, concluded that since, beneath the asphalt at the Leviton Parking Lot, no Narragansett cultural material or features were found beneath the plow zone, that the same is probably true beneath the D'Ambra asphalt and plow zone. NITHPO CANNOT SUPPORT THIS PRESUMPTION and we request that trenching beneath the asphalt (as was done at Leviton) be the process to confirm presence or absence of Narragansett cultural materials.

(4) -**D'Ambra Parking Lot Building** – We are informed by Timelines that what is beneath this building is still a question mark (basement? slab? cultural materials?). PRESENTLY, NITHPO CANNOT SUPPORT THE PRESUMPTION THAT THERE ARE NO CULTURAL MATERIALS OR FEATURES BENEATH THIS STRUCTURE.

CONCLUSION: Without visual confirmation of what is or is not beneath the asphalt, beneath the plow zone and beneath the building at the D'Ambra site, the presence or absence of Narragansett Indian cultural resources has not been determined.

Completion of the archaeological survey process is called for. Meaningful Section 106 consultation is called for.

Sincerely,

Doug Harris

Doug Harris
Deputy THPO

xc: Carole Edmonds-DOT, Dan Berman-FHWA, Paul Robinson-RIHPHC

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
HISTORICAL PRESERVATION & HERITAGE COMMISSION
Old State House • 150 Benefit Street • Providence, R.I. 02903-1209
Preservation (401) 222-2678 FAX (401) 222-2968
Heritage (401) 222-2669 TDD (401) 222-3700

December 13, 2001

Mr. Edward S. Szymanski
Chief Transportation Projects Engineer
Office of Environmental Programs
Rhode Island Department of Transportation
2 Capitol Hill
Providence, RI 02903

Re: 35% Design
Warwick Intermodal Train Station at T.F. Green Airport
Warwick

Dear Mr. Szymanski:

The Rhode Island Historical Preservation and Heritage Commission staff has reviewed the above-referenced plans for the Warwick Intermodal Train Station. Based upon our review, we have no objections to the proposed work.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions or comments, please contact Richard E. Greenwood, Project Review Coordinator of this office.

Very truly yours,

Richard E. Greenwood

Edward F. Sanderson
Executive Director
Deputy State Historic Preservation Officer

Cc: Mike Hebert, RIDOT

(011213.08)

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3435; TDD 401-222-4971

December 19, 2001

CERTIFIED MAIL

Mr. John Brown
Tribal Historic Preservation Officer
Narragansett Indian Tribe
P.O. Box 700
Wyoming, RI 02898

Re: Warwick Intermodal Train Station at T. F. Green Airport
Warwick, Rhode Island
RIC No. 97102
RIFAP No. TFG-STAT (001)
Phase I (b) Archaeological Reconnaissance Survey

Dear Mr. Brown:

We are in receipt of your December 3, 2001 review letter on the draft Phase I (b) archaeological reconnaissance survey report. The report included a background research and examination of soil data from borings obtained from the D'Ambra property and the location of the people mover along Fresno Road. The report was transmitted to you on November 2, 2001 for a 30-day review.

With respect to the RIDOT/NITHPO Memorandum of Understanding referenced in your letter, this agreement for NITHPO monitoring of archaeological field work is implemented when an archaeological survey is to be conducted subject to an approved RIHPHC permit application. The Timelines, Inc.'s assessment of the D'Ambra property, airport parking lot and people mover location entailed an evaluation of the extent of sub-surface disturbance based on background research and data from soil borings to determine if a Phase I archaeological field survey may be necessary. The excavation of shovel test pits by archaeologists or archaeological monitoring of machine-assisted removal of asphalt was not performed and no RIHPHC permit was warranted. Therefore, no NITHPO monitoring services were necessary. Had Timelines, Inc. recommended testing at these locations, we would have requested a proposal from your office for monitoring the archaeological survey.

In response to item # 3 in your letter, the borings taken at the D'Ambra property indicate the presence of truncated remnants of a plowzone (or A1/B1 horizon) beneath 50-90 cm. of fill. However, as indicated in Figures 16 and 18 of the report, the plowzone and the underlying B2, B3and C1 soil horizons (coarse sand with gravel glacial outwash) were devoid of artifacts. We also note that the D'Ambra property has been previously disturbed by excavations for the installation of a 24-inch drainage pipe that extends through the length of the property from Amtrak railroad property to Jefferson Boulevard

In response to item # 4 concerning the D'Ambra parking lot building, this structure has a full concrete basement; therefore, there are no intact cultural materials or features beneath this structure.

The RIHPHC has reviewed the draft Phase I (b) archaeological reconnaissance survey report and per its November 9, 2001 review letter (enclosed), concurs with Timelines' conclusion that no additional archaeological investigations are warranted. Based on the study results and the concurrence of the RIHPHC on those results, we find that no additional archaeological studies are necessary. Should you have any questions, please contact me at 222-2023, extension 4253.

Sincerely,

Edward S. Szymanski

Edward S. Szymanski, P.E.
Chief Transportation Projects Engineer
Office of Environmental Programs

Enclosure
cc: Messrs. Szymanski, Devine, Alves, Hébert, Berman-FHWA; Thomas-Chief Sachem; Mses. Edmonds, Dove-Jennings-NIT; File; all with enclosure