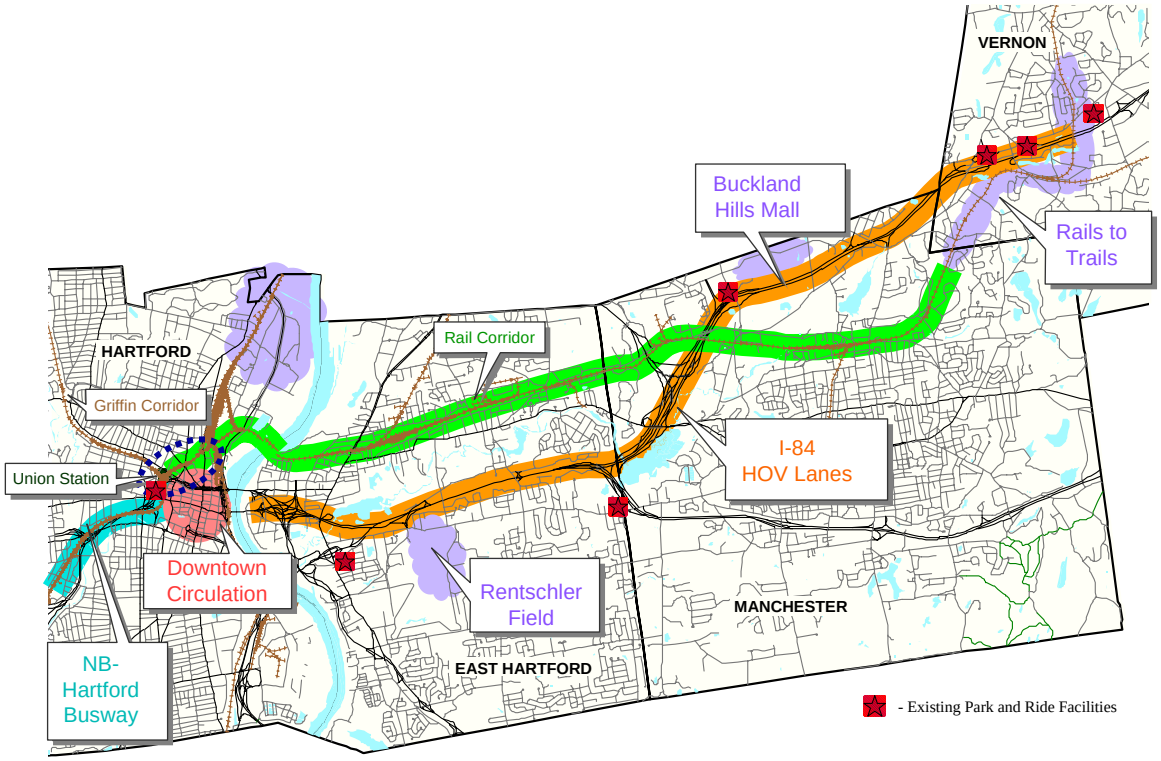
EXECUTIVE SUMMARY

Hartford East
Bus Rapid Transit Feasibility Study

Hartford – East Hartford – Manchester - Vernon



CONNECTICUT DEPARTMENT OF TRANSPORTATION

ENGINEERS PLANNERS ECONOMISTS

Wilbur Smith Associates

December 2004

Hartford East
Bus Rapid Transit Feasibility Study
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EXECUTIVE SUMMARY

Prepared for

Prepared by

ENGINEERS
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In Association With

- Fitzgerald & Halliday, Inc.
- KKO and Associates, LLC
- Parsons Brinckerhoff Quade & Douglas, Inc.

December 2004

Prepared in cooperation with the U.S. Department of Transportation (including its participating agencies) and the Connecticut Department of Transportation.

EXECUTIVE SUMMARY

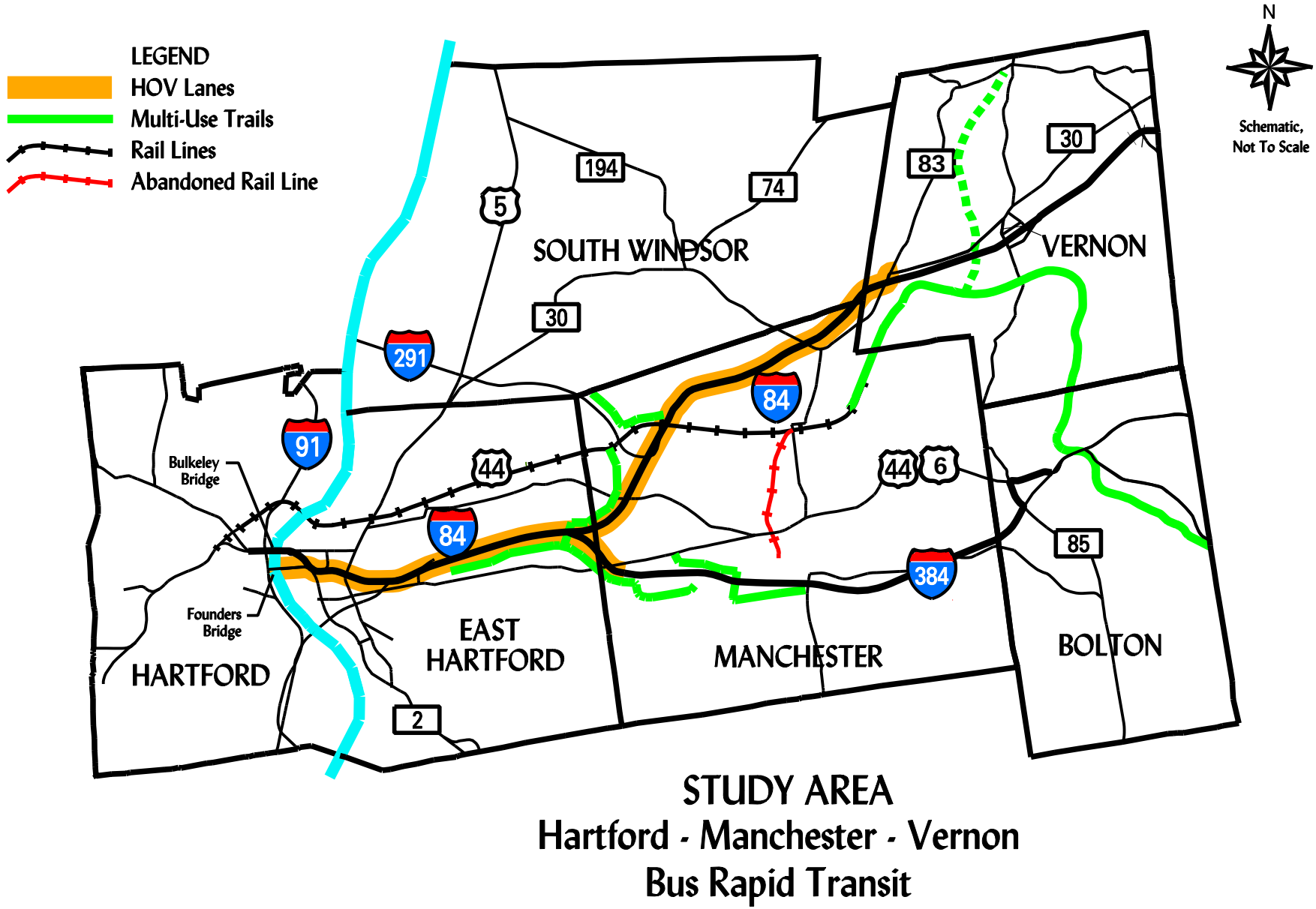
ES-1 INTRODUCTION

In March 2001, the Capitol Region Council of Governments (CRCOG) adopted its Long Range Transportation Plan. The Plan recommended that the Hartford East Corridor be retained as a high priority corridor and that transportation improvement options be assessed in greater detail to determine the most appropriate improvements. In addition, the Regional Transit Strategy (RTS) identified the Hartford East Corridor as a location with high potential for successful implementation of Bus Rapid Transit.

ES-2 STUDY AREA

Figure ES-1 illustrates an overview of the study area. The study corridor is located primarily in the towns of East Hartford, Manchester, and Vernon. Two routing alternatives were examined:

- Existing freight rail line that extends from Hartford through East Hartford terminating in Manchester just south of the Vernon town line. Freight trains generally operate on this line once per day during the overnight hours, and an occasional daytime run on an as needed basis.
- Existing HOV lane system on Route 2 and Interstates 84 and 384. These lanes begin at the Founders Bridge on Route 2 and continue east on I-84 terminating between Exits 66 and 67 in Vernon, and east on I-384 terminating between Exits 1 and 2 in Manchester.



STUDY AREA
Hartford - Manchester - Vernon
Bus Rapid Transit

Wilbur Smith Associates

Figure ES-1

ES-3 GOALS AND OBJECTIVES

Project goals and objectives have been developed to guide the selection of a preferred alternative. The following goals and objectives have been selected in coordination with the steering committee and the public:

- Enhance the quality of life in the Hartford Region
- Protect the environment and improve the region's air, water and land
- Reduce energy consumption
- Protect existing residential neighborhoods
- Improve access to jobs in Hartford and the I-384/I-84 east corridor
- Improve transit service quality for the transit-dependent
- Improve mobility along the I-384/I-84 east corridor
- Provide a viable mass transit choice that provides a rapid trip along the I-84/I-384 corridor in both directions
- Encourage and support economic development
- Develop a recommended action that:
    - Complements other planned transportation initiatives in the region;
    - Would reinforce the City of Hartford and the urban core of the region;
    - Is financially attainable; and would meet the public demand.

ES-4 ALTERNATIVES

Three preliminary alternatives were evaluated during the initial phase of this study, HOV Alternative, Rail Corridor Alternative, and HOV-Rail Corridor Alternative.

After reviewing the initial alternatives, it was decided to further develop the HOV Alternative as a near-term implementation and the HOV-Rail Corridor Alternative as long-term. Hereafter in this Executive Summary, these two alternatives will be known as the Near-Term Alternative, and Long-Term Alternative, respectively. Bus service plans and ridership were refined as these two alternatives were further developed.

Near-Term Alternative

The Near-Term Alternative would consist of the construction of transit stations along I-84 and I-384 that would interface with the existing HOV lanes. Bus services would be configured to use these stations and the HOV lanes. This alternative would comprise the following stations:

- Simmons
- Reservoir
- Buckland
- Manchester
- Hartford Turnpike
- Rockville

Bus service changes would consist of operating existing local and express routes via HOV lanes and stations, and providing local bus connections to HOV stations. Spans of service would also be extended from 6:00 AM (or earlier if current service begins prior to 6:00 AM) to 10:00 PM on weekdays for major routes. For lower ridership routes, service

would be extended from 6:00 AM to 8:00 PM on weekdays. Some current services would be eliminated due to variation of existing service or by recommendations in the Statewide Bus System Study. To date, no elimination of service has occurred in this study corridor. The inner and outer areas of service under the Near-Term Alternative are illustrated in Figures ES-2 and ES-3, respectively.

Long-Term Alternative

The Long-Term Alternative combines elements of the HOV and initial Rail Corridor alternatives in order to provide the most attractive service benefits of those alternatives. In summary, the Long-Term Alternative consists of:

- The construction of a busway and stations within the Connecticut Southern Railroad (CSO) corridor (but not along the Manchester Industrial Spur) between Governor Street in East Hartford and Depot Square in Manchester.
- A busway spur from the busway near JC Penney on Tolland Turnpike to the Buckland Station.
- The construction of transit stations along I-84 and I-384. These stations would be served by routes that operated to and from Hartford via the HOV lanes, and local feeder routes.
- The provision of improved bus services that operate via the busway, the I-84 and I-384 transit stations and HOV lanes, or a combination.

Figure ES-2: Near-Term Alternative: Inner Area Weekday Service

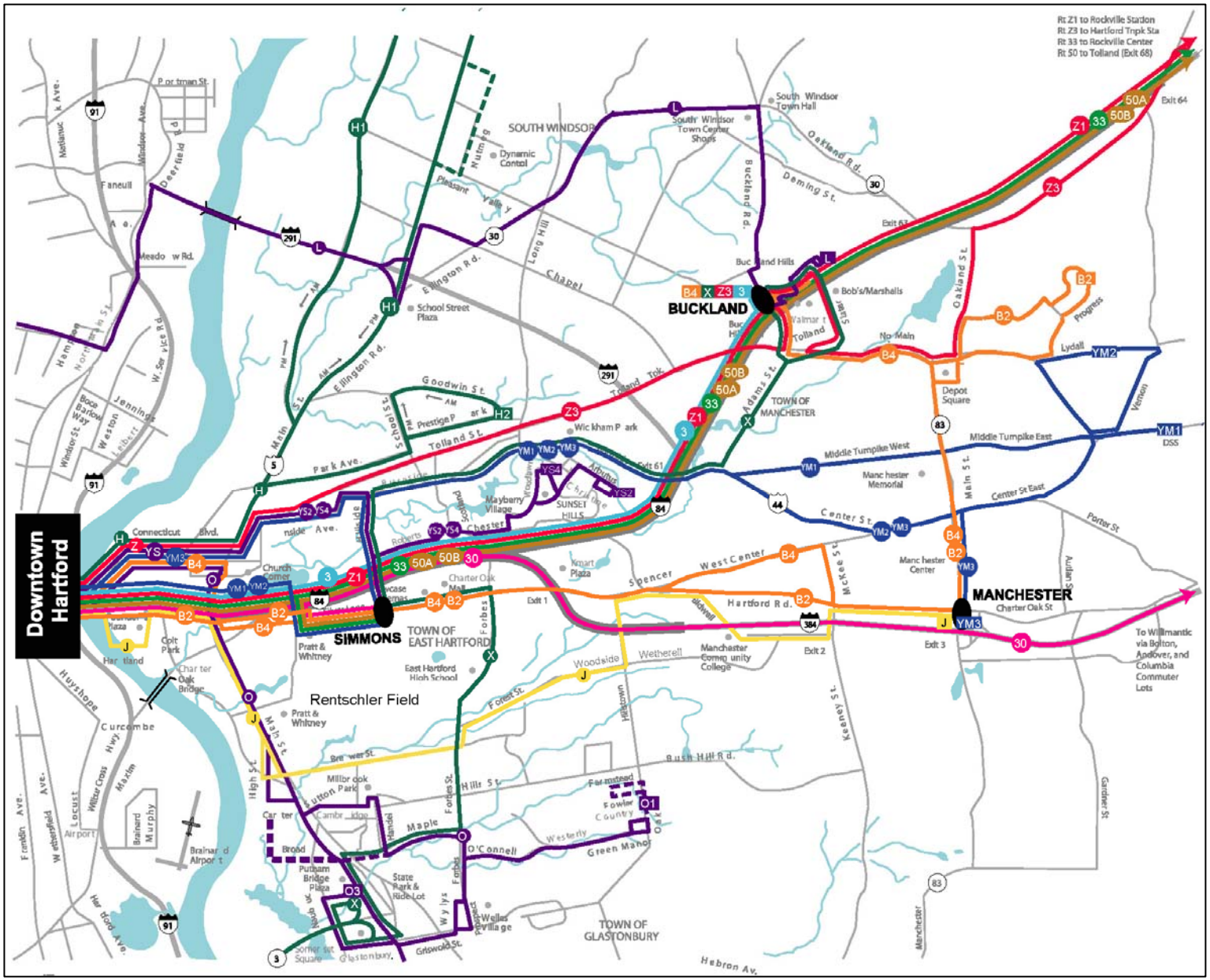
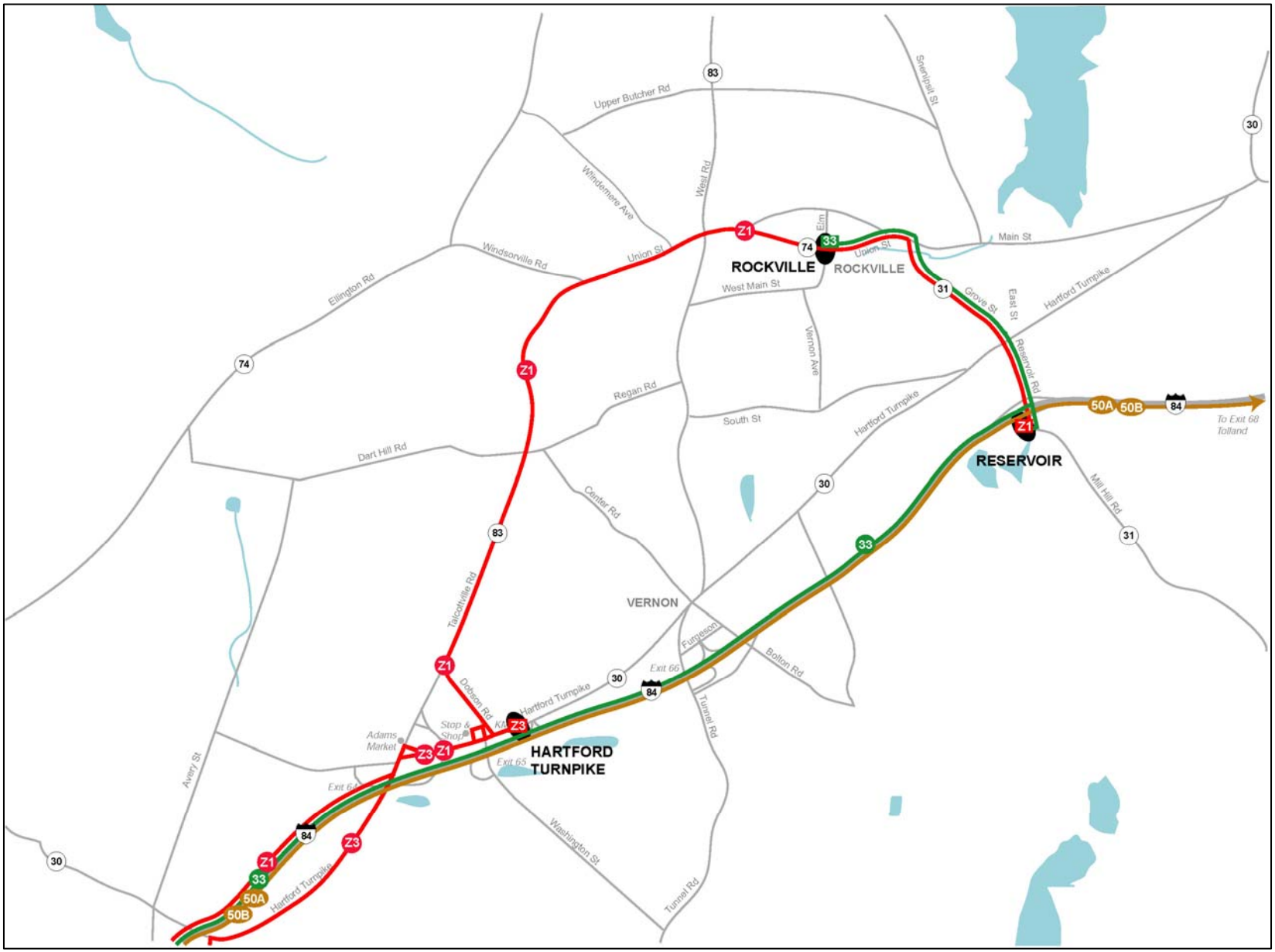


Figure ES-3: Near-Term Alternative: Outer Area Weekday Service



The following stations would be in place under the Long-Term Alternative:

- Main
- Burnside
- Simmons
- Park
- School
- Long Hill
- JC Penney
- Buckland
- Adams
- North Main
- Depot Square
- Manchester
- Hartford Turnpike
- Reservoir
- Rockville

Bus service changes would consist of operating existing local and express routes via the railroad corridor busway and the I-84 and I-384 HOV lanes, and providing local bus connections to busway stations and to Manchester Station. The inner and outer areas of service for the Long-Term Alternative are illustrated in Figures ES-4 and ES-5, respectively.

Figure ES-4: Long-Term Alternative: Inner Area Weekday Service

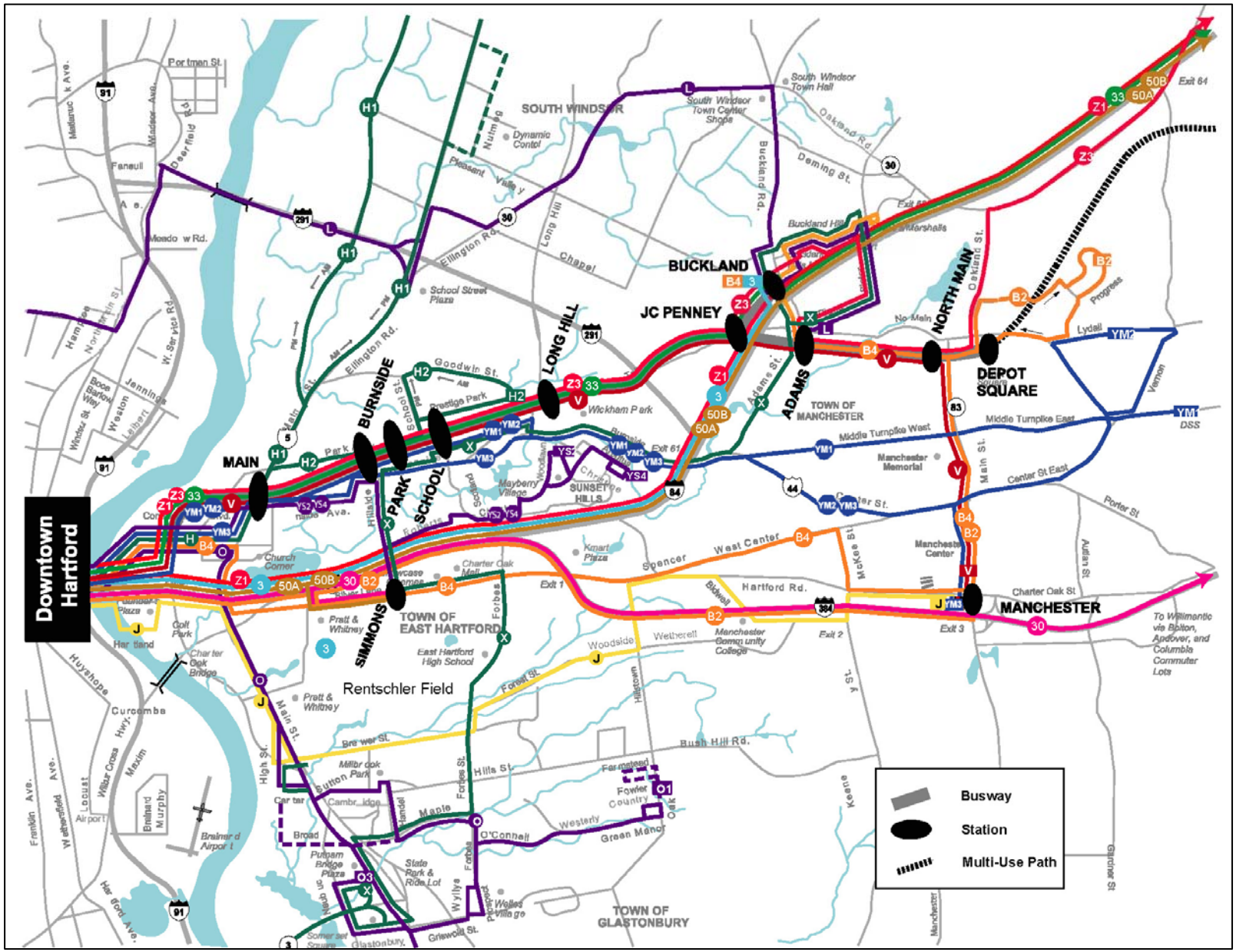
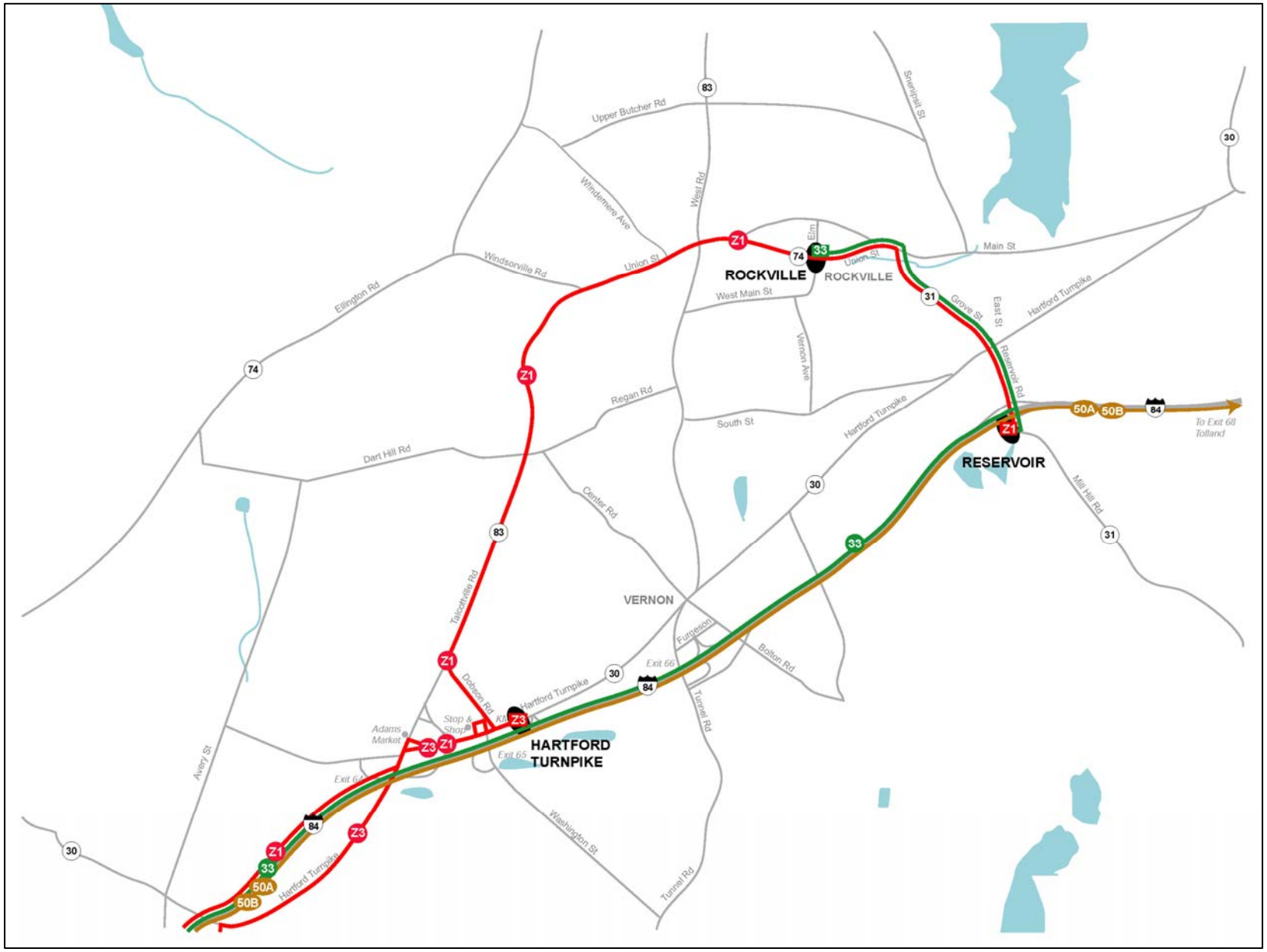


Figure ES-5: Long - Term Alternative: Outer Area Weekday Service



ES-5 RECOMMENDATIONS

The final alternatives were presented such that a BRT system could be phased in incrementally, with a few of the larger transit stations constructed first and other proposed elements such as the busway right-of way constructed later. One of the key advantages of phasing in the station and facilities is that capital and operating costs can be kept at a minimum, while enjoying the benefits of an enhanced transit facility. In addition, incremental implementation allows ridership forecasts to be demonstrated without the investment of a full BRT facility.

The recommendations for implementation of BRT in the Hartford East corridor follow a two-phase program. In the near term, the first phase would include the construction of some of the larger transit stations under the Near-Term Alternative which would tend to be the most visible and forecast ridership that produces some of the greatest use of the system. In the long term, the final phase of implementation would include the busway right-of-way and the associated stations under the Long-Term Alternative.

Near Term
The initial Phase would be a combination of three components; the first component (Phase 1 HOV) would involve the construction of the following stations:

- Buckland
- Hartford Turnpike
- Reservoir
- Rockville

The following services would be impacted by the implementation of Phase 1 HOV:

- B4 Buckland Hills Mall
- L Tower Avenue Crosstown
- X Forbes Street Crosstown
- Z1 Rockville
- Z3 Buckland Hills Mall
- 3 Buckland Express
- 30 Vernon-New Britain
- 50 A Tolland – Hartford

The estimated capital costs for this phase are shown in Table ES-1. It should be noted that these are present day (2003-2003) costs.

Table ES-1: Estimated Capital Costs (2002-03) for Phase 1 HOV

Items	Estimated Capital Cost
Stations	
Buckland	$8,368,000
Hartford Turnpike	$14,815,000
Reservoir	$100,000
Rockville	$250,000
Minor Items (35%)*	$8,236,000
Design & Inspection (10%)	$3,177,000
New Vehicles (31 @ $350,000)	$10,850,000
Right-of-Way	$500,000
Subtotal	$46,296,000
Contingencies (30%)	$13,889,000
Phase 1 HOV Total	**$60,185,000**

* Minor items include clearing and grubbing, maintenance and protection of traffic, and mobilization.

The next two phases, (Phase 2 HOV and Phase 3 HOV), would involve the construction of Simmons and Manchester Stations, respectively. It should be noted, however, that the Simmons and Manchester Stations may be developed independently of one another. The construction of these stations would instead depend upon the development activities around each station.

The following services would be impacted by the implementation of Phase 2 HOV:

- B2 Manchester Industrial Park
- X Forbes Street Crosstown
- YM1 DSS – Downtown Hartford via Middle Turnpike
- YM2 DSS – Downtown Hartford via HOV Lanes
- 30 Willimantic – Hartford
- 33 Vernon – New Britain

The following services would be impacted by the implementation of Phase 3 HOV.

- B2 Manchester Industrial Park
- B4 Buckland Hills Mall
- J Brewer Street
- YM3 Burnside Local
- 30 Willimantic – Hartford

The estimated capital costs are shown in Tables ES-2 and ES-3.

Table ES-2: Estimated Capital Costs (2002-03) for Phase 2 HOV

Items	Estimated Capital Cost
Station	
Simmons	$300,000
Minor Items (35%)*	$105,000
Design & Inspection (10%)	$41,000
New Vehicles (0 @ $350,000)	$0
Subtotal	$446,000
Contingencies (30%)	$134,000
Phase 2 HOV Total	**$579,000**

* Minor items include clearing and grubbing, maintenance and protection of traffic, and mobilization.

Table ES-3: Estimated Capital Costs (2002-03) for Phase 3 HOV

Items	Estimated Capital Cost
Station	
Manchester	$6,300,000
Minor Items (35%)*	$2,216,000
Design & Inspection (10%)	$855,000
New Vehicles (15 @ $350,000)	$5,250,000
Subtotal	$14,650,000
Contingencies (30%)	$4,395,000
Phase 3 HOV Total	**$19,045,000**

* Minor items include clearing and grubbing, maintenance and protection of traffic, and mobilization.

The total costs listed in Tables ES-1, ES-2, and ES-3 include the use of contingencies and the new vehicles required in each implementation phase. It should be noted that, where parking demand differs for the Near Term or Long-Term Alternatives, the lower demand is assumed.

The estimated operating costs include vehicle operations as well as operation and maintenance costs for station facilities. The operating costs for Phase 1 HOV are shown with the estimated incremental operational costs for Phases 2 and 3 HOV below in Table ES-4.

Table ES-4: Estimated Operating Costs (2002-03) for Phases 1 HOV, 2 HOV, and 3 HOV

	Phase 1 HOV	Phase 2 HOV*	Phase 3 HOV*
Vehicle Operations	$8,393,437	$856,280	$3,476,568
Facility O&M Costs			
Stations/Parking	$184,756	$48,770	$48,143
Fare Collection	$55,550	$15,125	$15,125
Additional Admin.	$24,030	$6,390	$6,327
Subtotal	$264,336	$70,285	$69,595
Total	**$8,657,773**	**$926,565**	**$3,546,163**

*Incremental costs.

Long Term

With a successful BRT system operating along HOV facilities, the next logical step would involve the pursuit of the Long-Term Alternative. This final phase would involve utilization of the facilities constructed in the first phase in addition to the busway right-of-way and its associated stations. The additional stations along the busway right-of-way would be:

- Main Street
- Burnside
- Park
- School
- Long Hill
- JC Penney
- Adams
- North Main
- Depot Square

These stations would be constructed together with the right-of way to become part of the Long-Term Alternative. It is anticipated that construction of a full busway and its associated stations would be the final phase in implementation of BRT in the Hartford East corridor.

The following services would be impacted by the implementation of Long Term.

- B2 Manchester Industrial Park
- B4 Buckland Hills Mall
- H1 East Windsor Hill
- H2 Prestige Park
- L Tower Avenue Crosstown
- V Manchester – Hartford Via Busway
- X Buckland Mall/Wethersfield
- YM1 DSS – Downtown Hartford via Middle Turnpike
- YM2 DSS – Downtown Hartford via HOV Lanes
- Z3 Buckland Hills Mall
- 33 Vernon – New Britain

Table ES-5 illustrates the estimated capital costs for the implementation of the Long Term plan.

Table ES-5: Estimated Capital Costs (2003-03) for Long Term Implementation

Item	Cost
Stations (Rail)	$15,876,000
Busway	$39,913,000
Minor Items (35%)*	$19,526,000
Design and Inspection (10%)	$7,531,000
Right-of-way	$5,000,000
New Vehicles (4 @ $350,000)	$1,400,000
Subtotal	$89,245,000
Contingencies (30%)	$26,774,000
Total	**$116,019,000**

* Minor items include clearing and grubbing, maintenance and protection of traffic, and mobilization.

The total costs listed in Table ES-5 include the use of contingencies and the new vehicles required in each implementation phase.

The estimated incremental operational costs for Long Term are shown below in Table ES-6. These costs are based on the full implementation of the Short Term phases.

Table ES-6: Estimated Operating Costs (2002-03) for Long Term Implementation

	Long Term Costs
Vehicle Operations	$982,405
Facility O&M Costs	
Stations/Parking	$227,124
Busway	$176,580
Fare Collection	$84,150
Additional Admin.	$48,785
Subtotal	$536,639
Total	**$1,519,044**

It is important to stress once again that these estimates reflect present-day unit costs. Future estimates may change due to cost fluctuations.

ES-6 RIDERSHIP RESULTS

The estimates of total weekday ridership for the no-build condition in 2000 and 2025 and for the two final alternatives in the year 2025 are shown in Table ES-7. The 2025 no-build condition is based on the recommendations as put forth in the 2000 Connecticut DOT Statewide Bus System Study.

Table ES-7: Total Weekday Ridership

Route	No Build 2000	No Build 2025	HOV Build 2025 (complete)	HOV-Rail Build 2025 (complete)
B Silver Lane	1,633	2,339	2,579	3,521
H E Windsor Hill/Park Ave	814	825	727	706
J Brewer Street	185	121	84	117
L Copaco/Buckland Mall	474	513	557	276
V Manchester Hartford Rocket	NA	NA	NA	709
X Buckland Mall/Wethersfield	496	524	850	783
YM Burnside Ave	2,122	1,355	851	691
YS Burnside Ave	214	252	231	732
Z Tolland Tpk/Rockville/Buckland Hills	1,264	1,580	1,531	1,942
Buckland Express Route 3	660	1,046	1,377	901
Buckland Express Route 12	20	NA	NA	NA
Willimantic Express Route 30	144	188	1,891	1,441
Coventry Express Route 31	66	92	NA	NA
Rockville New Britain Rocket Route 33	NA	NA	2,672	1,999
Vernon Tolland Express Route 50	764	926	1,397	2,473
Total	**8,856**	**9,761**	**14,747**	**16,291**

ES-7 OPERATING COSTS, FARE REVENUE AND VEHICLE REQUIREMENTS

Based on FY 2002-2003 dollars, operating costs, fare revenue, and peak vehicle requirements would all increase significantly from current operations with the implementation of either the Near-Term or the Long-Term Alternative. Annual operating costs would increase by $5.0 million (62%) for the Near-Term Alternative and by $6.5 million (80%) for the Long-Term Alternative. Weekday fare revenue (and ridership) is forecast to increase at a higher rate than annual operating costs.

Vehicle requirements would increase from 60 (including spares) for existing service to 106 for the Near-Term Alternative and 110 for the Long-Term Alternative. These would be increases of 76.7% for the Near-Term Alternative and 82.5% for the Long-Term Alternative. It was assumed that vehicle requirements for the future no-build alternative would remain as in the existing service. These projections are summarized below in Table ES-8 and are based on the full implementation of each alternative.

Table ES-8: Projected Annual Operating Costs and Fare Revenue ($2002-03) and Vehicle Requirements

	Existing (Future No-build) Service	HOV Alternative	HOV-Rail Alternative
Operating Costs	$8,123,206	$13,130,501	$14,649,545
Increase		$5,007,295	$6,526,339
% Increase		61.6%	80.3%
Weekday Fare Revenue	$8,638	$14,930	$17,106
Increase		$6,292	$8,468
% Increase		72.9%	98.0%
Vehicle Requirements	60	106	110
Increase		46	50
% Increase		76.7%	82.5%

ES-8 ESTIMATED CAPITAL COSTS AND FINANCIAL NEEDS

A preliminary engineering estimate was prepared for associated construction costs under each of the final alternatives for this study. These construction costs reflect station and parking lot construction, associated roadway improvements, and more substantial construction of right-of-way for BRT use, including utility relocation, incidentals, contingencies, and design and inspection were also factored into construction costs and lump sum items to give a final cost estimate for each BRT alternative. Tables ES-9 and ES-10 summarize estimated construction costs for the full implementation of the Near-Term and Long-Term Alternatives, respectively.

Table ES-9: Summary of Cost (2002-03) Near-Term Alternative

Item	Cost
Stations	$40,363,000
Minor Items (35%)*	$14,127,000
Design and Inspection (10%)	$5,449,000
Right-of-Way	$500,000
New Vehicles	$16,100,000
Subtotal	$76,538,000
Contingencies (30%)	$22,961,000
Total	**$99,500,000**

* Minor items include clearing and grubbing, maintenance and protection of traffic, and mobilization

Table ES-10: Summary of Cost (2002-03) Long-Term Alternative

Item	Cost
Stations (Rail)	$15,876,000
Station (HOV)	$30,163,000
Busway	$39,913,000
Minor Items (35%)*	$30,083,000
Design and Inspection (10%)	$11,603,000
Right-of-way	$5,500,000
New Vehicles	$17,500,000
Subtotal	$150,637,000
Contingencies (30%)	$45,191,000
Total	**$195,828,000**

* Minor items include clearing and grubbing, maintenance and protection of traffic, and mobilization

These total costs reflect the latest estimate from the Federal Transit Administration regarding contingency factors. In fact, contingencies may indeed need to be higher if deemed appropriate. Right-of-way acquisition costs are an estimate. For the Near-Term Alternative the only right-of-way acquisition that may be required is for Rockville Station. Right-of-way would be required at most of the Long-Term Alternative stations. Upon more detailed station design, another cost estimate could be developed that more closely illustrates required right-of-way acquisition at a station.

It is important to note that these estimates reflect present-day unit costs. Future estimates may change due to cost fluctuations.

ES-9 STATION LAYOUTS

Near-Term Alternative

Under the Near-Term Alternative, transit stations would be located in proximity to I-84 and I-384, and their respective HOV facilities. These stations would consist of a station facility with a structure, platforms, sidewalks, landscaping, and lighting. This facility would generally be located within a parking area; either a surface lot or parking structure

depending on demand and available space. Table ES-11 below summarizes parking inventory and projected demand at each station under this alternative.

Table ES-11: Parking Inventory and Projected Demand at BRT Stations (Near-Term Alternative)

Station Name	Existing Parking Spaces	Total Parking Demand	Additional Spaces Required
Simmons	0	426	426
Buckland	743	1,132	389
Hartford Turnpike	163	544	381
Reservoir	245	230	0
Manchester	0	491	491
Rockville	0	335	335

Source: ConnDOT

In one case, a "storefront" station facility would be provided at Rockville. While there is a projected parking demand of 335 spaces under the Near-Term Alternative, no specific location to provide parking has been determined. There are, however, plans for an intermodal center and parking facility, and the possibilities of coordinating this facility with a BRT station should be considered.

A description of the layout and location of each station under the Near-Term Alternative follows.

Simmons Station

The Simmons facility would be located in the vicinity of I-84 at Simmons Road in East Hartford. As shown in Figure ES-6, parking facilities would potentially be located at the entrance to the new Rentschler Field football stadium on Silver Lane at the intersection of Simmons Road. An alternate location would be on the opposite side of Silver Lane. This site is currently occupied by baseball fields owned by Pratt & Whitney. The anticipated parking demand at this station is 426 spaces.

As currently envisioned, bus access to Simmons Station to and from the I-84 east HOV lanes would be via the existing Silver Lane HOV ramps. Access to and from the west on I-84 would be via general purpose lanes to the Roberts Street ramps and Silver Lane. This routing plan may require some type of bus prioritization program to facilitate efficient movement through the area. This may be achieved through bus priority lanes, queue jump lanes and priority signalization along Silver Lane and Roberts Street.

The proposed location of this station is in close proximity to an extremely large apartment complex. Pedestrian access would be provided to the station by the proposed Charter Oak Greenway extension. Vehicular access to the parking facility would be via existing roads.

The Department is aware of another concept for direct ("flyover") access from Roberts Street to the site. Coordination between this study and alternate proposed concepts would

be continued as this plan progresses further, and as part of the ongoing planning process. This concept is illustrated in Figure ES-7.

Concern was raised by participants that the proposed BRT access to the station would not provide a fast enough connection to be competitive with single occupant automobiles. As a result of those concerns, the manner in which access to this station could be provided has been further explored. Given the regional nature of many of the new proposed services, it was determined that the express regional services from Manchester and beyond would not likely stop in East Hartford, so the most important access considerations were movements to and from Hartford. The goal was to determine the opportunities to add the two ramps required to provide suitable access to/from Hartford and to achieve the desired access with minimal disruption to the existing roadway system, particularly the I-84 mainline. The details of these access opportunities are found in Chapter 8 of the Final Report.

This additional study effort was intended to determine if there was an alternative way to directly access a Simmons Road BRT station to and from Hartford to allow expedited bus travel. This study included new ramp construction and improvement in local on-street operations and identified a potential ramp configuration that would meet the needs of express service making stops at Simmons Station. This configuration, however, would require an exception from design standards to avoid major widening of I-84 in the area. It is estimated that the cost of providing the direct access at Simmons Road to/from Hartford would be $10.4 million. Additionally there is a possibility of providing a bi-directional ramp to/from the east at an estimated cost of $4.9 million. The benefit of committing these funds and receiving an exception from the design standards would be to provide more direct access with the bus rapid transit system for the area around Rentschler Field, and the City of East Hartford in particular.

Figure ES-6: Proposed Layout of Simmons Station

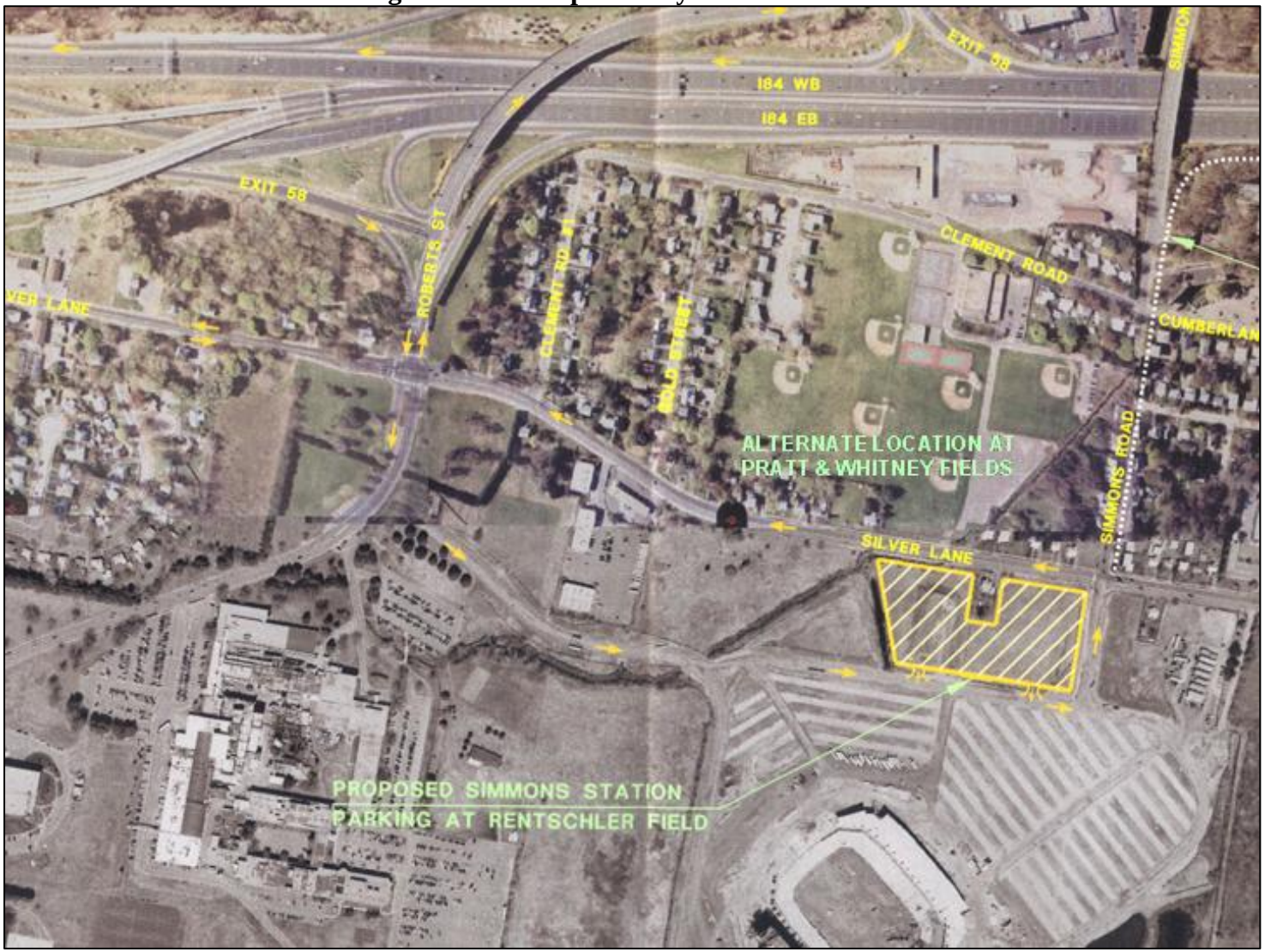
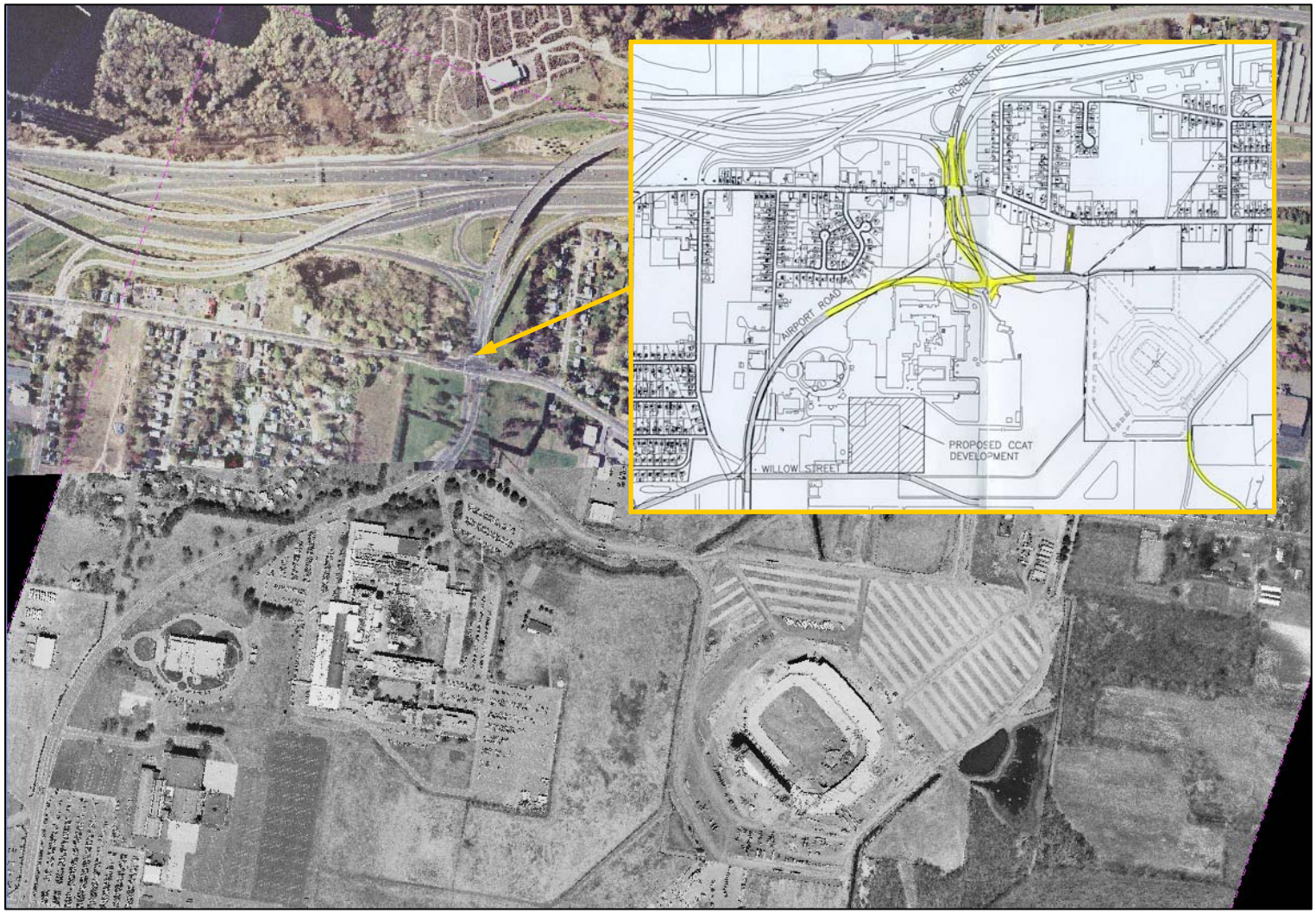


Figure ES-7: Simmons Flyover Concept (Concept proposed by others in another initiative)



Buckland Station

Buckland Station would be located off I-84 at exit 62, Buckland Street as shown on Figure ES-8. This is an area of large retail and commercial development with the nearby Buckland Hills Mall and other large retail centers in close proximity. The proposed site would be located at the current park and ride facility at the intersection of Buckland Street and Buckland Hills Drive. Anticipated parking demand at this location is 1,132 spaces. Taking into account the existing 743 spaces at this location, an additional 389 parking spaces would be required. A parking structure at this location is a potential solution to address the outstanding spaces.

Buses would access this site using existing HOV ramps exiting I-84 eastbound, and entering I-84 westbound. New HOV ramps would be constructed to provide bus access from I-84 westbound and to I-84 eastbound. Bus access to the station would be via Buckland Street and a new roadway connection on exclusive right of way from the I-84 HOV ramp terminus to the southern edge of the parking site where the bus station would be located. Vehicular access to the parking area would be via modified existing roadways.

During the development of this station site, the Town of Manchester identified its consideration to widen Buckland Street (a local road) in this area. If pursued by the town, the overall operation of these HOV ramps may need to be modified to accommodate the proposed changes.

Hartford Turnpike Station

Located on I-84 in Vernon, the Hartford Turnpike Station would consist of one of two possible options. Option 1 would be at the existing park and ride site on Talcottville Road (Route 83). Bus access to and from the station facility would be via existing HOV ramps from I-84 eastbound and to I-84 westbound, and by new HOV ramps to I-84 eastbound and from I-84 westbound. Buses would then use the existing roadways to access the site, with potential signal prioritization along Hartford Turnpike and Talcottville Road.

Option 2 for the Hartford Turnpike Station would be comprised of station platforms within the interstate's median and a parking area, which would be connected to the platforms by an elevated pedestrian walkway. The parking area would be located at an existing park and ride site along Hartford Turnpike (Route 30) adjacent to the I-84 westbound on and off ramps at exit 65. Buses would access the station platforms via new on and off ramps from the extended I-84 HOV lanes. Parking demand at this station is anticipated to be 544 spaces. With the existing availability of 163 spaces at the park and ride facility, an additional 381 spaces would need to be provided at that specific location. In either option, a parking structure is a potential way to address the outstanding parking demand at this station. Figures ES-9 and ES-10 illustrate the two proposed options for this station.

Figure ES-8: Proposed Layout of Buckland Station

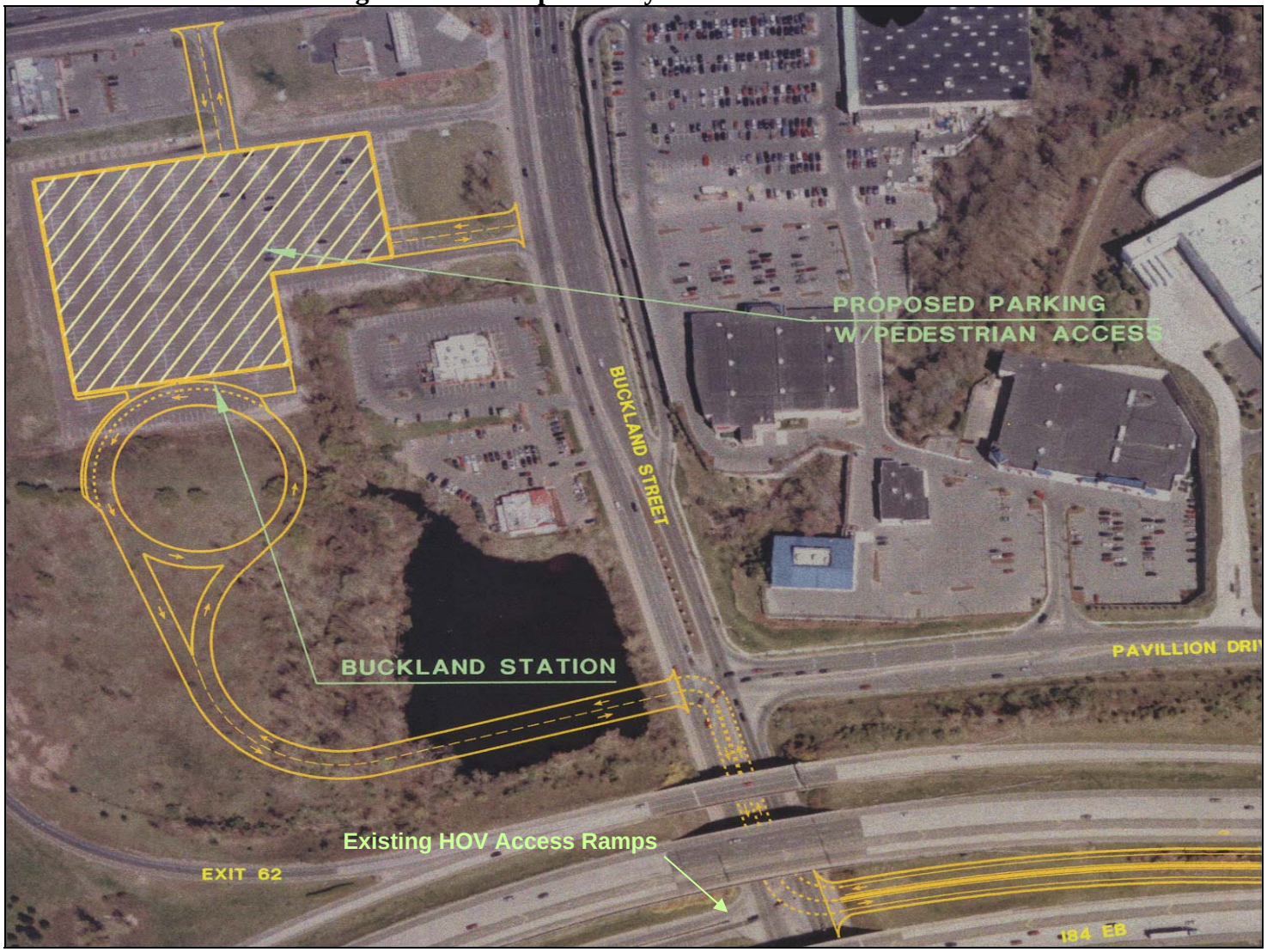
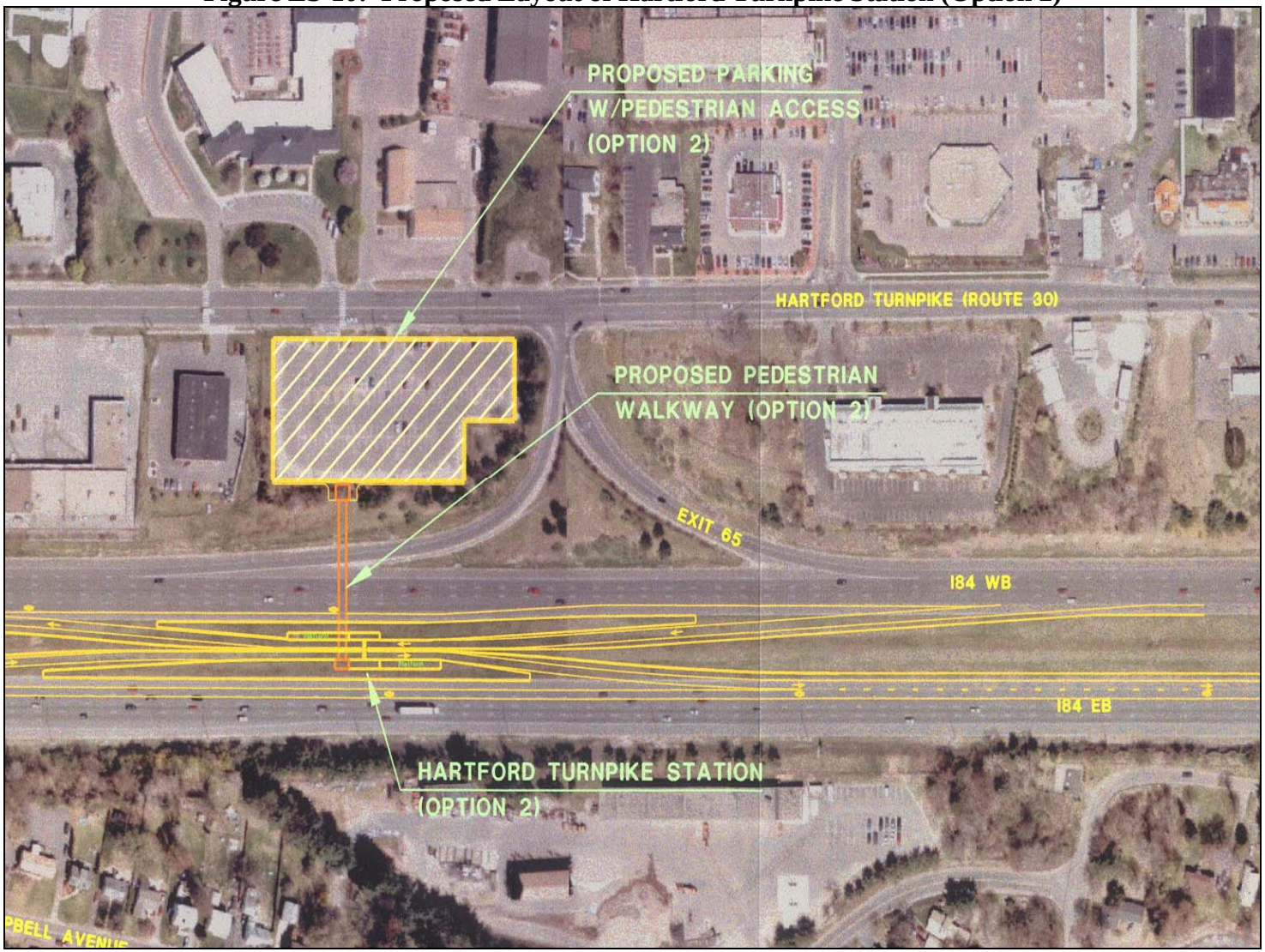


Figure ES-9: Proposed Layout of Hartford Turnpike Station (Option 1)

Figure ES-10: Proposed Layout of Hartford Turnpike Station (Option 2)



Reservoir Station
The Reservoir Station would be located at an existing park and ride facility on Route 31 in Vernon at I-84 exit 67. Little modification would be required at this site, and buses would use the existing general purpose lanes and ramps on I-84. The anticipated parking demand at this station is 230 spaces. Currently, this facility contains 245 spaces; therefore no additional parking would be necessary.

This site would benefit from its proximity to the proposed Vernon multi-use trail. Figure ES-11 shows the proposed layout of this station.

Manchester Station
No site has been determined for the Manchester Station at this time but in discussion with the town board of directors, a site in the vicinity of I-384 Interchanges 2 or 3 is envisioned. The potential for a station at I-384 Interchange 1 was examined, but due to the lack of access to the I-384 HOV facility, the significant ridership projected from a Manchester station would not be fully realized at this location. Figure ES-12 highlights the general areas of station development being considered.

Further input from the Town of Manchester is needed to locate an appropriate site for a potential BRT station that meets the parking, HOV access, and shopping access features that are estimated to produce a 491 parking space demand. A parking structure may be required to address this parking demand**.** The Department would consider potential BRT station locations for development only on the guidance, cooperation, and concurrence of the town of Manchester.

Further site-specific analysis of station location would take place in the next phase of study.

Rockville Station
The Rockville Station would be a "storefront" facility located in the center of Rockville. It is anticipated that usage would be primarily by pedestrians or bicyclists. Therefore, no parking is currently planned for this station. Buses would access this station via existing surface streets. The area under consideration is shown in Figure ES-13.

Figure ES-11: Proposed Layout of Reservoir Station

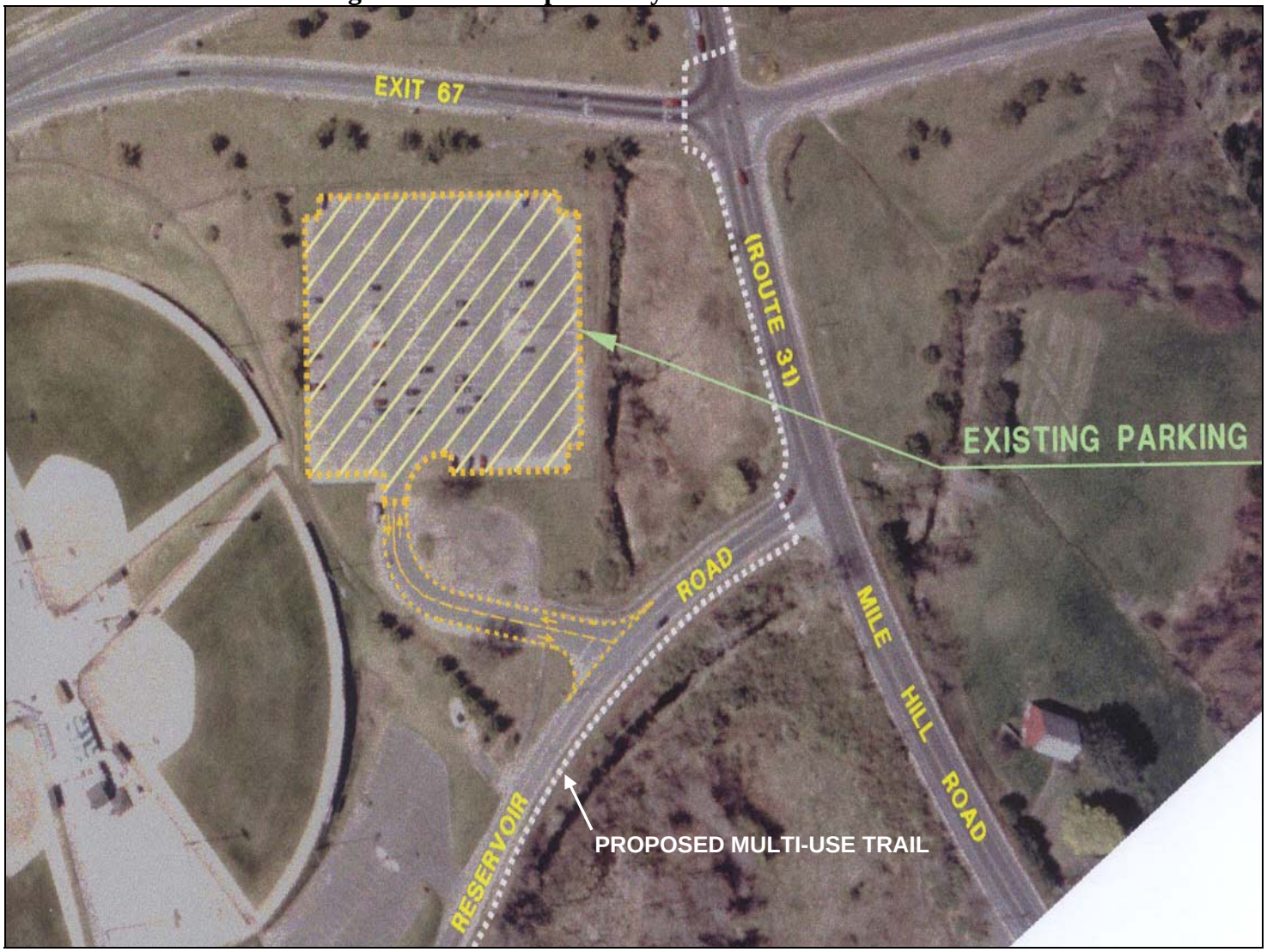
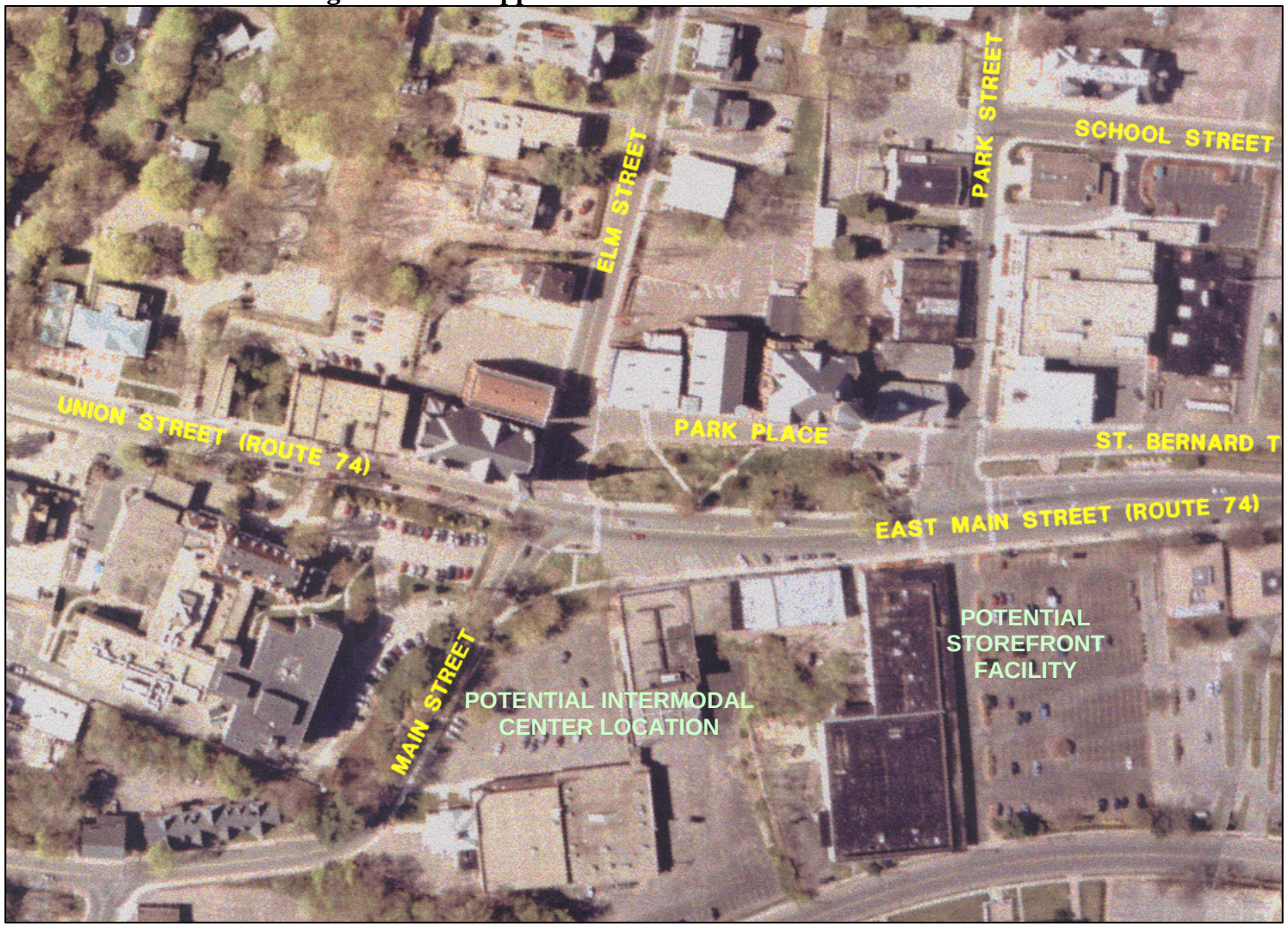


Figure ES-12: General Station Development Area Manchester

Figure ES-13: Approximate Location of Rockville Station



Long-Term Alternative

As previously indicated, this alternative would consist of both the Near-Term Alternative and the preliminary Rail Corridor Alternative. The transit stations that would be constructed under the Long-Term Alternative would be located both along the co-located rail alignment where applicable, and at locations defined under the Near-Term Alternative. Under this alternative, a portion of the BRT would use existing rail right-of-way between East Hartford and Manchester with some diversion on to existing roadways in order to access stations not along the rail alignment. Station facilities would be constructed either as described under the Near-Term Alternative or as required along the rail corridor. The rail corridor stations would consist of a structure, platforms, sidewalks, landscaping, and lighting. Two platforms would be constructed; one on either side of the rail alignment. In addition, a crossover structure would be required for safe access to each platform. Parking facilities would be constructed adjacent to the station. Table ES-12 summarizes parking inventory and projected demand at each station under this alternative.

Table ES-12: Parking Inventory and Projected Demand at BRT Stations (Long-Term Alternative)

Station Name	Existing Parking Spaces	Total Parking Demand	Additional Spaces Required
Main Street	0	56	56
Burnside	0	11	11
Park	0	8	8
School	0	69	69
Long Hill	0	153	153
JC Penney	0	83	83
Buckland	743	536	0
Adams	0	133	133
North Main	0	83	83
Depot Square	0	145	145
Simmons	0	97	97
Manchester	0	533	533
Hartford Turnpike	163	517	354
Reservoir	245	223	0
Rockville	0	294	294

Source: ConnDOT

A description and illustration of each station under this alternative follows. The Simmons, Buckland, Tolland Turnpike, Reservoir, Manchester, and Rockville stations would be as discussed in the Near-Term Alternative, with some variations in access and with the parking requirements noted in table ES-12.

Main Street Station
The Main Street Station would be located in East Hartford at the intersection of Main Street (Rte. 5) and the existing railroad. This location would serve the residential areas to the north and west of the station and the businesses and downtown area to the south of the station. Platforms on each side of the alignment and a crossover would be provided. In addition, the existing railroad bridge over Main Street would be widened to accommodate the co-located busway and rail line. The realignment of Ranney Street at its intersection with Main Street would facilitate the construction of the station and proposed parking. In addition, sidewalks would be constructed to provide pedestrian access from Main Street to the BRT station.

Parking facilities would be constructed either side of Ranney Street. The anticipated parking demand at this station is 56 spaces. Since no parking currently exists at this location, the construction of 56 spaces would be required. Figure ES-14 shows the proposed layout at this station.

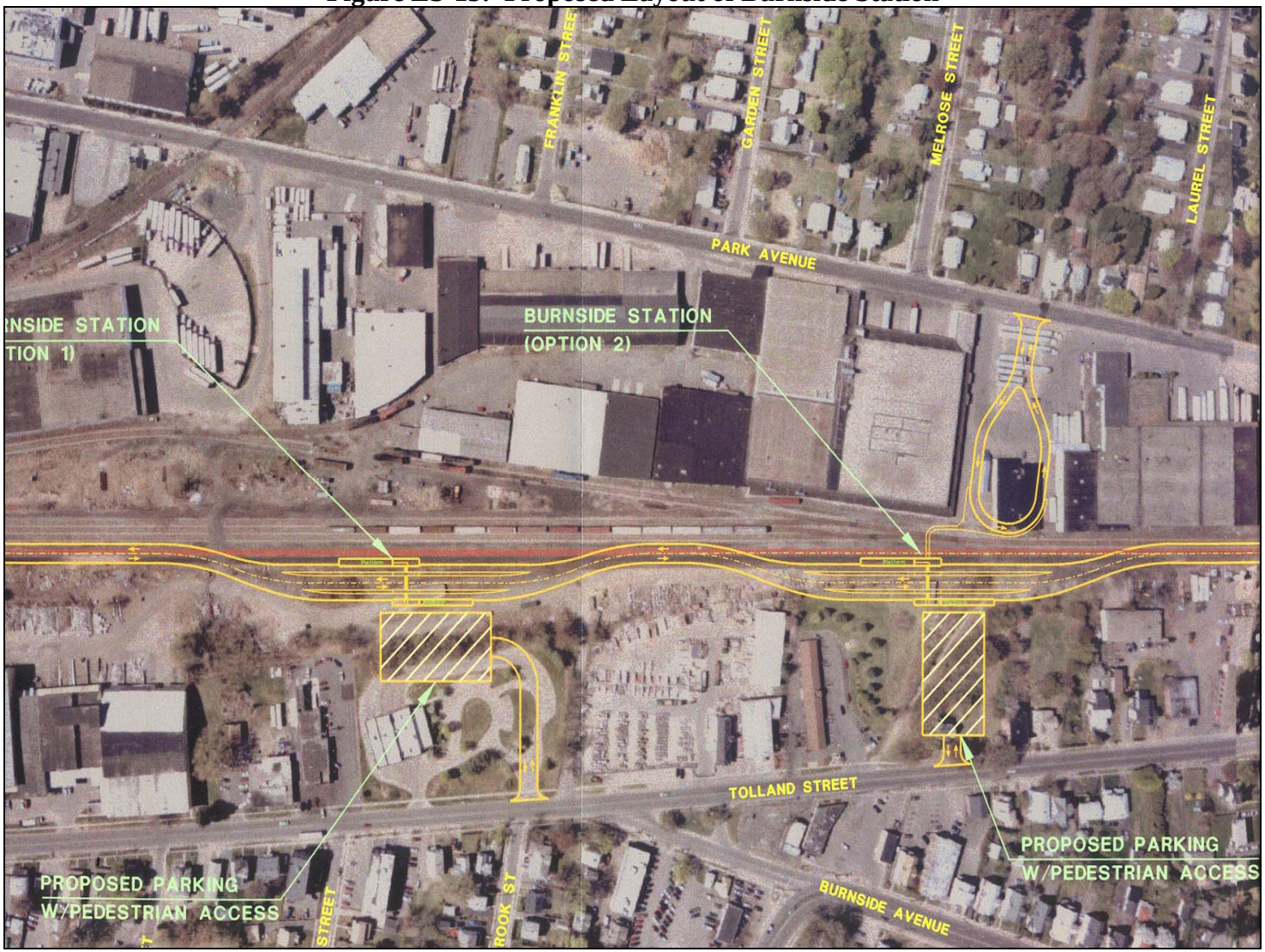
Burnside Station
The Burnside facility in East Hartford would serve the residential areas to the south and north of the BRT facility. There are currently two options for the specific location of the Burnside Station. Option 1 places the station on Tolland Street between Ann Street and Westbrook Street with the parking area on the south side of the rail line. Access to parking would be opposite Westbrook Street. Direct access to the large residential areas to the north would not be provided. This proposed location would be at the former Connecticut Department of Motor Vehicles (DMV) emissions inspection station. Option 2 places the station approximately 1,000 feet to the east. Parking is once again on the south side of the rail line with access from Tolland Street. However, there would be an additional driveway on the north side of the line from Park Avenue. This would accommodate a drop-off area for passengers and provide walk access to many of the apartment complexes to the north of the station.

Both of these options share some common features. As with the other stations along the rail line, both options provide platforms on both sides of the busway with a crossover structure. At each station, the BRT alignment shifts to the south to avoid conflict with a freight yard on the north side of the rail line.

The anticipated parking demand at this station is 11 spaces. No parking currently exists at either location for this station. Figure ES-15 shows the proposed options for this station.

Figure ES-14: Proposed Layout of Main Street Station

Figure ES-15: Proposed Layout of Burnside Station



Park Station
Park Station in East Hartford would primarily serve residential neighborhoods to the north of Park Avenue and to the south of Tolland Street. The station would be located adjacent to Park Avenue between Michael Avenue and St. Regis Street. Access to parking would be via Park Avenue. As with other stations along the rail line portion of this alternative, platforms and a crossover would be provided.

Sidewalks would be constructed to provide greater pedestrian access from residential areas to the station. Specifically, one sidewalk would be constructed to connect the station with Tolland Street to the south. Another sidewalk is proposed along the north side of the BRT alignment to provide pedestrian connections to School Street to the east.

Due to the high-density residential nature of this area there is a high pedestrian component to the projected ridership at this station. Therefore, the anticipated parking demand is 8 spaces. No parking currently exists at this station. Figure ES-16 shows the proposed layout of this station.

School Station
The School Street Station would be located along the rail alignment approximately 1,200 feet east of the existing School Street at grade crossing. The station would serve the residential areas to the south and east of Tolland and School streets respectively. Two platforms and a crossover would be constructed at this station. Sidewalks on the north side of the station would provide access to School Street to the west, and the Prestige Park Industrial Park to the east.

Parking at this location would be on the south side of the station with access from Tolland Street. The anticipated parking demand is 69 spaces. No parking currently exists at this location. Figure ES-17 shows the proposed layout of School Station.

Long Hill Station
The Long Hill Station would be located approximately 300 feet east of where Long Hill Street crosses the rail line. This station would serve adjacent residential neighborhoods to the north and south of this location. Platforms and a crossover would be provided to allow safe passenger access to buses in either direction. The provision of sidewalks would facilitate pedestrian access from Long Hill Street.

Parking at this station would be located on the north side of the rail line. Primary access to parking would be via Long Hill Street with either a driveway opposite Goodwin Street or approximately 500 feet to the north. Other access would be provided on the east side of the parking area. The anticipated parking demand is 153 spaces. No parking currently exists at this location. Figure ES-18 shows the proposed layout of this station.

Figure ES-16: Proposed Layout of Park Station

Figure ES-17: Proposed Layout of School Station

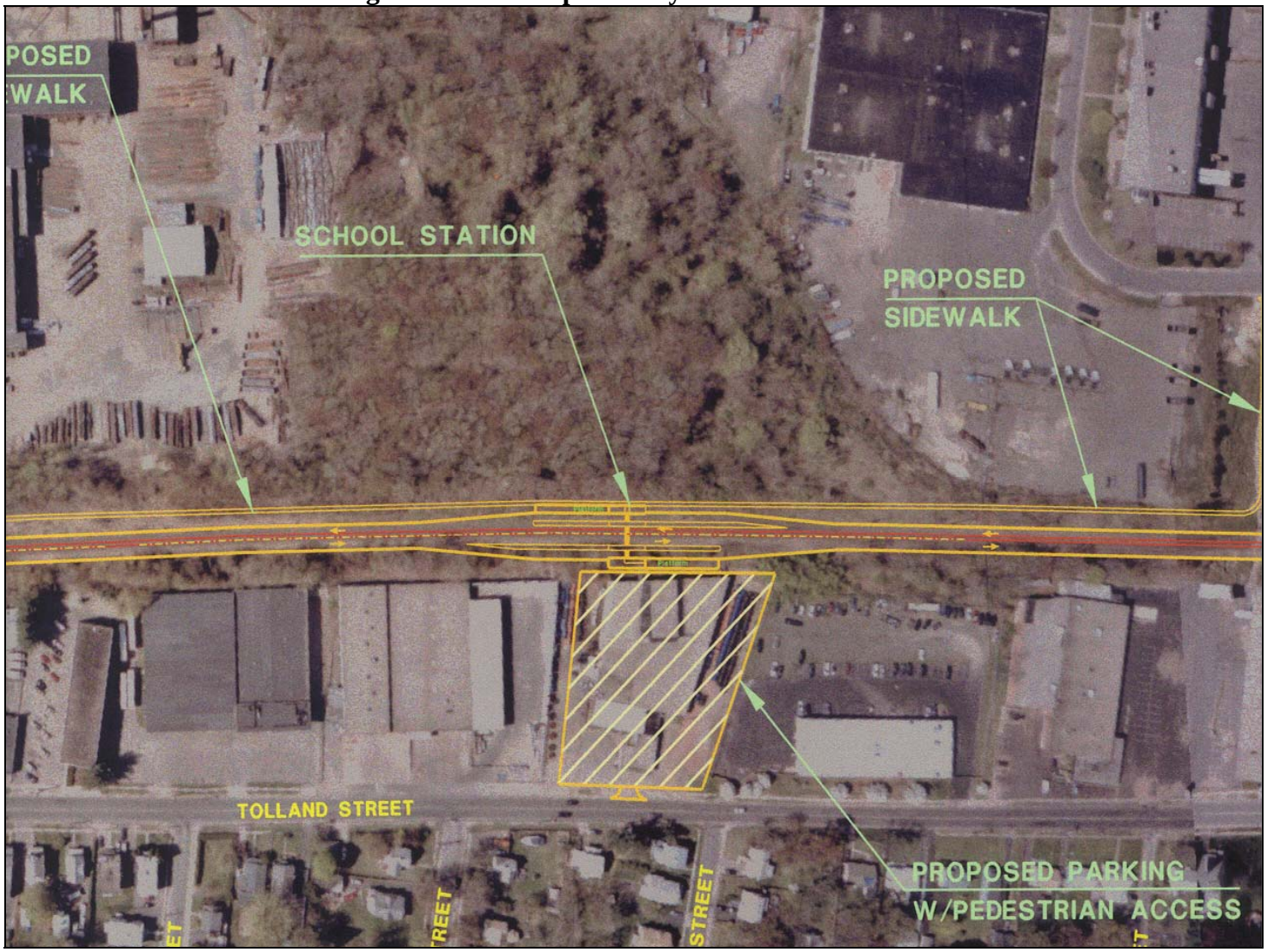
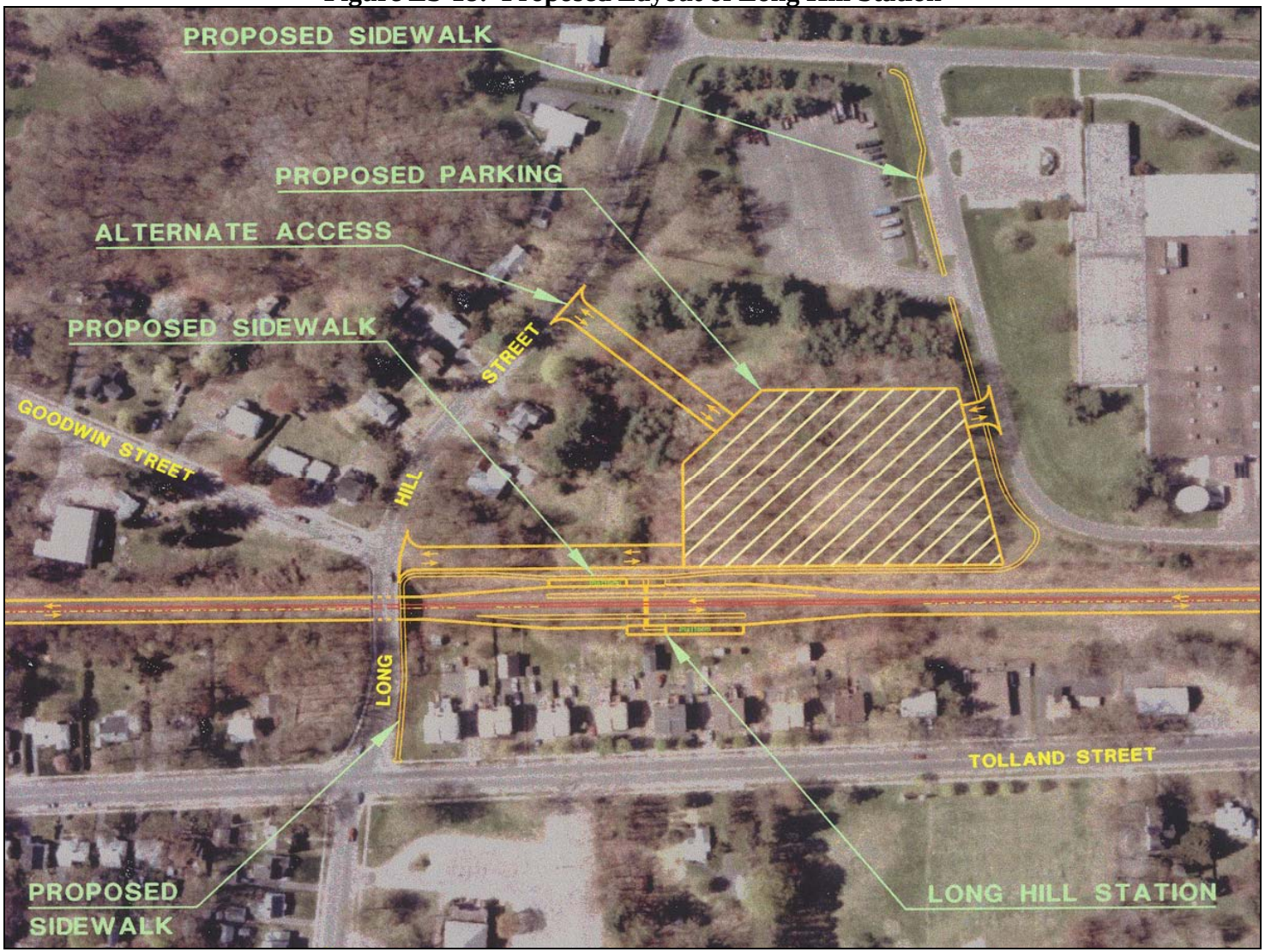


Figure ES-18: Proposed Layout of Long Hill Station



JC Penney Station
This station would be adjacent to the large JC Penney distribution facility in Manchester. The station would not be along the existing rail alignment, but approximately 200 feet to the north. However, the construction of an exclusive right of way would facilitate the movement of bus traffic from the rail line to the station and further east to Buckland Station. This right of way veers off from the rail line approximately 300 feet west of the JC Penney Station. As with stations directly on the rail alignment, the station would feature platforms on each side with a connecting crossover structure to provide safe access for passengers.

To the east of the station, modifications to the JC Penney entrance and Tolland Turnpike intersection would facilitate bus movement either east along the proposed right of way toward Buckland Station, or back to the rail line and on to Adams Station with an access point to the south of Tolland Turnpike. Alternately, buses would use Tolland Turnpike for movement between JC Penney and Adams.

Parking for this station would be located to the north of the platform area. Access would be via the JC Penney entrance roadway on the east side of the parking area, with other access on the north side. Anticipated parking at this site is 83 spaces. Currently, there is no parking at this location. Figure ES-19 shows the proposed layout of this station.

Adams Station
The Adams Station is located approximately 500 feet east of Adams Street and the grade-separated rail line crossing. The station is located along the rail alignment with the characteristic platforms and crossover associated with other stations along the rail line. Historic structures at this site would be incorporated into the station facility. There are currently two options for bus access to and from this station. Option 1 would be the use of the existing rail line from JC Penney Station to the west and continuation of the rail line east to the North Main Station. This option would require replacement of the railroad bridge over Adams Street to accommodate rail and BRT use. Option 2 would require buses to leave the rail right-of-way and use a reconfigured Depot Street to avoid replacement of the bridge. Buses would then use existing surface roads between Depot Square and JC Penney.

Parking at this station is proposed at a site north of the station. Access to the parking area would be via a reconfigured Depot Street. Parking demand is anticipated to be 133 spaces. Figure ES-20 shows the proposed layout for this station.

North Main Station
The North Main Street Station is located in Manchester along the co-located rail line and busway approximately 500 feet west of the at-grade crossing at Main Street (Route 83). The station would include platforms on either side of the busway with a crossover structure for passenger access. Sidewalks are proposed either side of the busway to provide pedestrian connectivity with Main Street.

The proposed parking area would be situated on the south side of the station with access from Hilliard Street. The anticipated parking demand at this station is 83 spaces. No parking spaces exist in this location at the present time. Figure ES-21 shows the proposed layout for this station.

Depot Square Station

The Depot Square Station represents the last such station along the rail line. It would serve a primarily residential area to the south and east of the station, and would be located approximately 500 feet to the east of Oakland Street. The station would consist of two platforms – one either side of the Busway – and a crossover structure. The BRT right-of-way actually veers off from the existing rail alignment approximately 300 feet west of the station. At the station, the busway alignment is south of the rail line. The busway continues east for approximately 200 feet to access the existing Woodbridge Street.

Parking at this station would be located to the east of the station with access from Woodbridge Street. Anticipated parking demand is 145 spaces. Parking does not currently exist at this location. Figure ES-22 shows the proposed layout for this station.

Figure ES-19: Proposed Layout of JC Penney Station

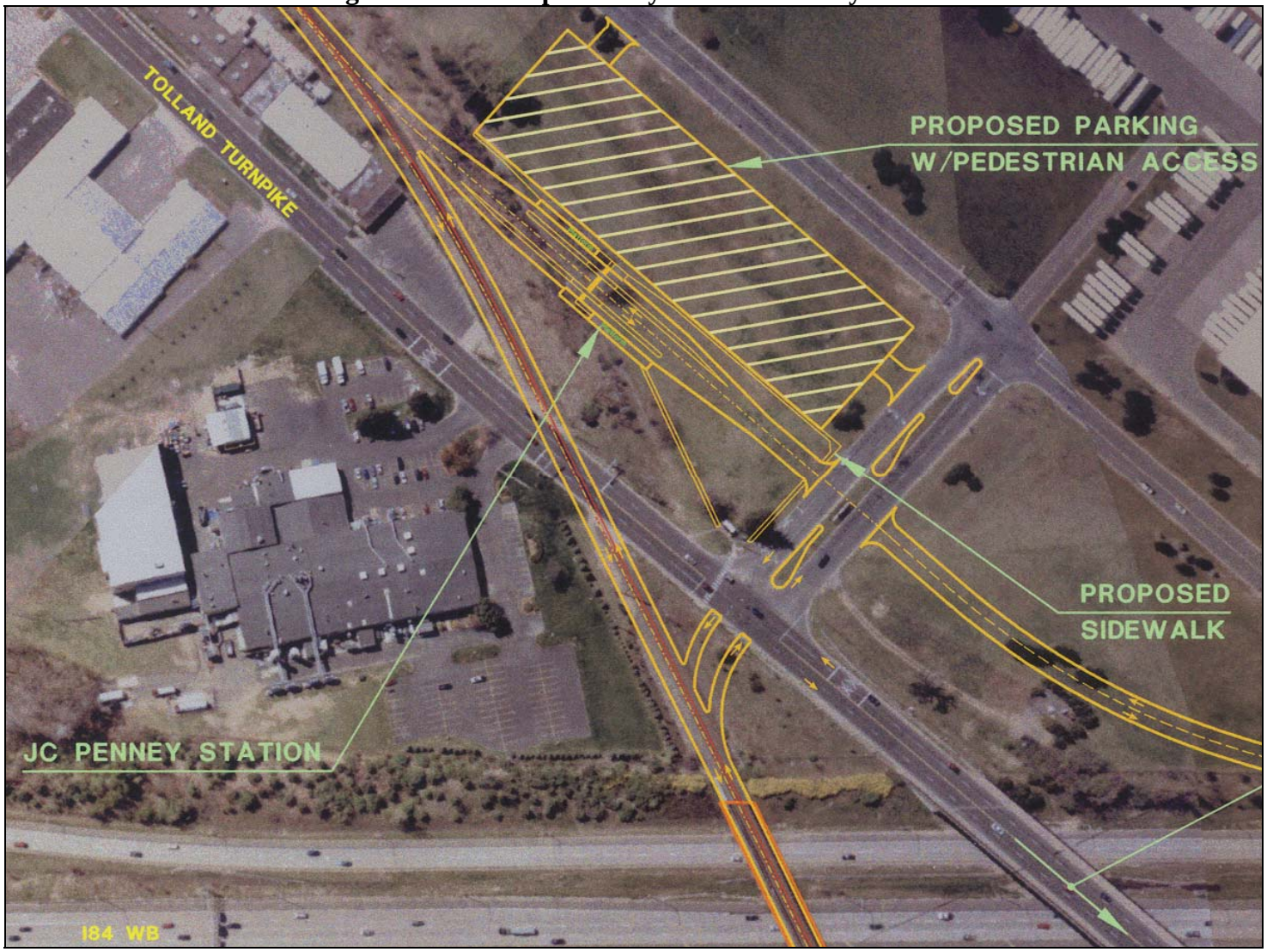


Figure ES-20: Proposed Layout of Adams Station

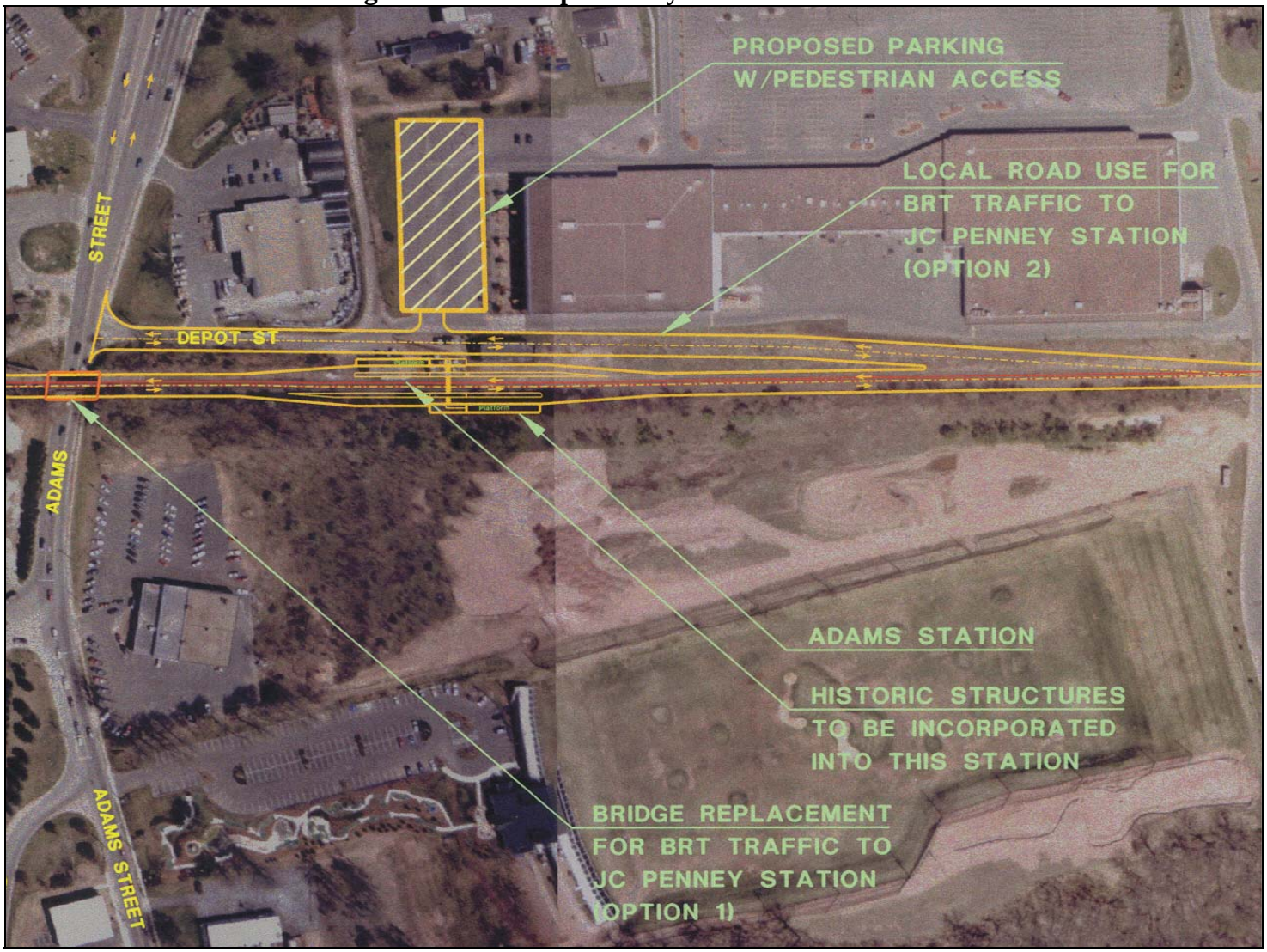


Figure ES-21: Proposed Layout of North Main Station

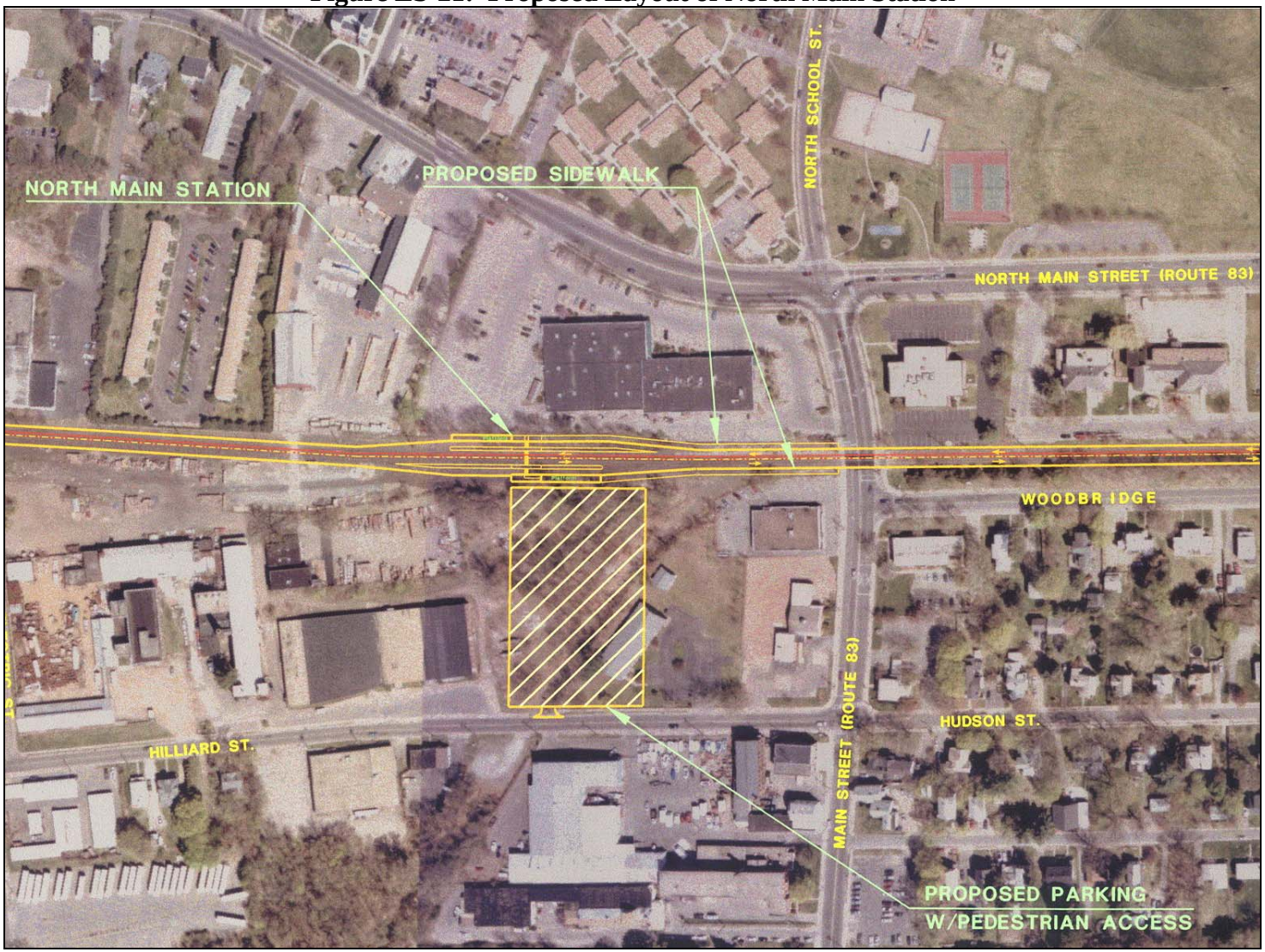
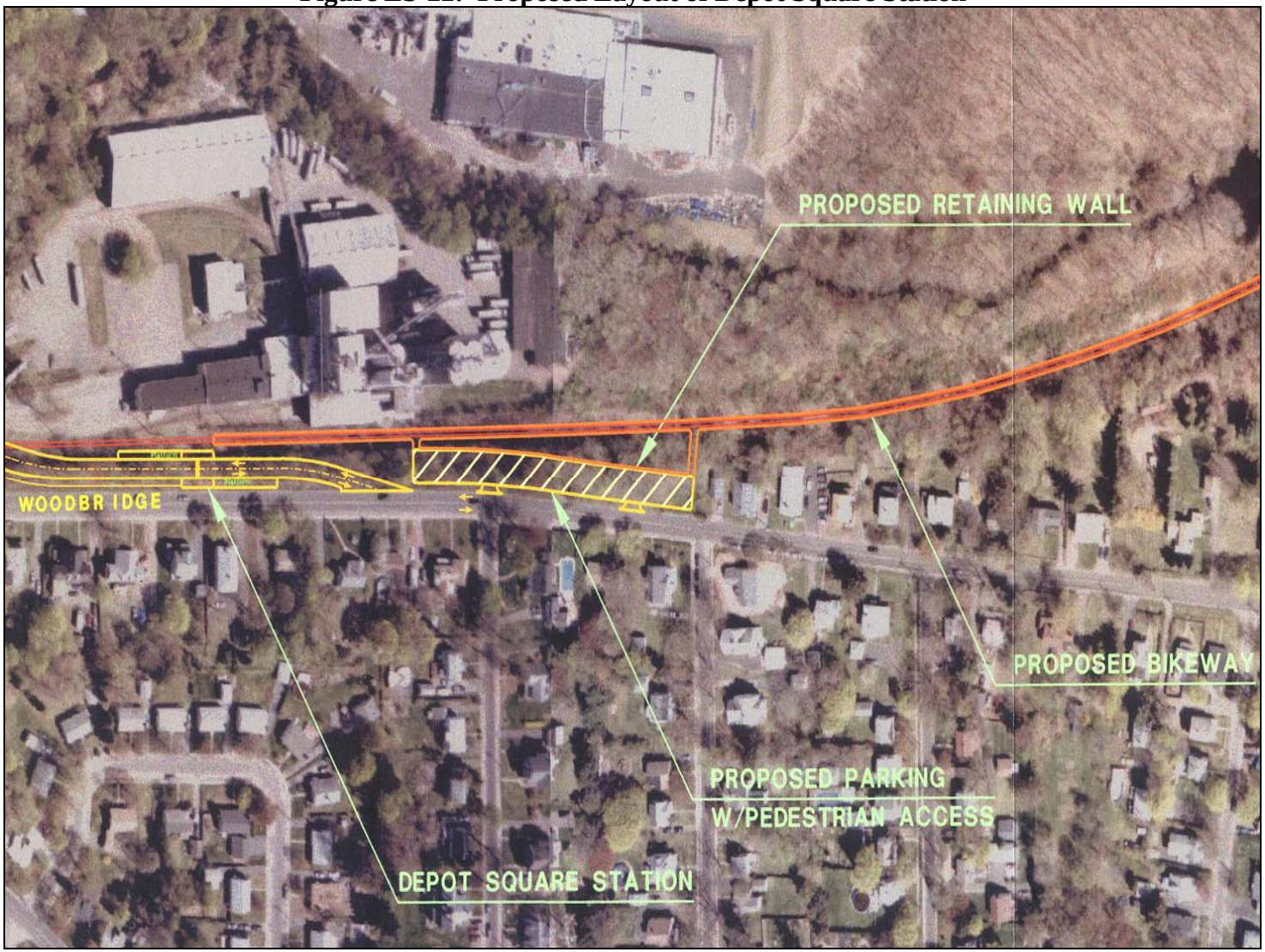


Figure ES-22: Proposed Layout of Depot Square Station



ES-10 TRANSIT ORIENTED DEVELOPMENT (TOD)

Transit oriented development is the opportunity to have development or redevelopment occur around a particular transit station. The development is usually high density, mixed-use, and is supported by the transit services in the area. It is therefore a coordination of transit and land use planning. For instance, there may be opportunities for a significant amount of office space to be developed within the half-mile of a destination station because people have easy access to public transit. Conversely, at an origin station, there may be opportunities for high density housing within one-half mile of the station because of its proximity to public transit. In addition, because of its mixed-use, high density characteristics, TOD promotes a pedestrian-friendly environment and provides a viable alternative to automobile transportation. This environment provides the opportunity for infill and redevelopment as well as supporting a strong local retail community. In general, TOD also includes some kind of incentive to locate businesses in close proximity to a transit station. Incentives may include reduced parking requirements for new development, increased density allotments, and financial incentives for property owners.

In the case of the Hartford East corridor, TOD would be limited by several factors including existing built up areas around the proposed stations, the Interstate 84 and 384 corridors, as well as other physical restrictions. However, incentives such as those noted above, along with opportunities for infill and redevelopment may allow TOD in selected areas. In addition, service frequency, passenger ridership, strategic bus routing would encourage transit usage and the associated development.

ES-11 OPPORTUNITIES FOR MULTI-USE TRAIL DEVELOPMENT

Easy bicycle and pedestrian access is an important component for encouraging transit-oriented development in the vicinity of transit stations. The corridor has numerous existing or planned multi-use trail facilities that can create a network of access to the BRT system (see Figure ES-1.) Some trails, including the Charter Oak Greenway, the Hartford Road Bikeway and the Vernon Rails to Trails Bikeway, parallel or are in close proximity to the Interstates (HOV corridor) or the rail corridor. Some cross the corridor and then provide access to and through the communities. Pedestrian access to each station has been addressed individually in the station descriptions earlier in this report, and will continue to be an important consideration in the design of those stations.

As the design of Hartford East BRT and each station moves forward, consideration would be given to linking the existing and planned trail system to the BRT system, providing facilities for parking bikes at the stations, and providing a means to transport bikes on the buses serving those stations.

ES-12 SUMMARY

The following table summarizes incremental capital and operating costs as well as incremental 2025 weekday ridership for each recommended alternative phase. The 2025 no-build condition is based on the recommendations as put forth in the 2000 Connecticut DOT Statewide Bus System Study. The capital and operating costs and ridership for the year 2025 no-build condition are also shown for comparison purposes. Additionally, this table provides a summary of the bus services predominantly affected as each phase comes on line.

Table ES-13: Summary of Capital Costs, Operating Costs and Ridership for Recommended Alternative Phasing

Recommended Alternative Phasing	Services Predominantly Affected	Capital Costs ($2002-03)		Operating Costs ($2002-03)		Weekday Ridership	
		Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative
No-Build 2025		-	-	-	$8,123,206	-	9,761
Near Term Phase 1 HOV *Buckland, Hartford Tpk, Reservoir, Rockville*	B4, L, X, Z1, Z3,3, 33, 50A	$60,185,000	$60,185,000	$534,567**	$8,657,773	1,079	10,840
Near Term Phase 2 HOV *Simmons*	B2, X, YM1, YM2, YS2, YS4, 30, 33	$579,000	$60,763,000	$926,565	$9,584,338	1,081	11,921
Near Term Phase 3 HOV *Manchester*	B2, B4, J, YM3, 30	$19,045,000	$79,808,000	$3,546,163	$13,130,501	2,826	14,747
Long Term *Rail right-of-way stations*	B2, B4, H1, H2, L, V*, X, YM1, YM2, Z3, 33	$116,019,000	$195,828,000	$1,519,044	$14,649,545	1,544	16,291
TOTALS	-	**$195,828,000**	-	**$6,526,339**	-	**6,530**	-

* Denotes new service on busway
** Based on cost to operate Phase 1 HOV over and above operating cost for 2025 no-build.
Note: Phase order may be changed based upon site availability.

As shown in Table ES-13, the estimated capital cost after all phases are implemented would be just under $200 million with an annual operating cost of nearly $15 million for the year 2025. It should be noted that this estimate is based on present day unit costs, and future estimates may change due to cost fluctuations.

At this level of study, each bus route was simply assigned to a station, even though all bus routes would be affected as each of the above phases is implemented. The services predominantly affected by each phase are also shown in Table ES-13. However, operating costs for each phase are calculated from only the routes assigned to those stations. Therefore, the overall sum of operating costs is accurate, but the next phase of this study will require another run of the travel demand model to determine a more accurate operating cost per implementation phase.

ES-13 NEXT STEPS

This study has been completed to identify the feasibility, cost, and transportation benefits of improved bus transit in the Hartford East Corridor. A series of next steps would be needed to continue toward implementation of each phase of the recommended alternative. The first of these steps would be for the Capitol Region Council of Governments (CRCOG) to evaluate and determine the positioning of the Recommended Alternative in the context of the Long-Range Plan for the CRCOG region. Funding sources need to be identified to proceed to the next round of evaluations, to include the Recommended Alternative or part thereof in the CRCOG Transportation Improvements Program (TIP), and in order to implement the plan. This would chiefly involve the preparation of the appropriate environmental studies and documentation (such as a Draft and Final Environmental Impact Statement (EIS)/Section 4(f) Evaluation). This process would revisit the Recommended Alternative, the rail right-of-way and station locations and perform a more detailed assessment from an environmental standpoint. To do this, the station layouts would be further evaluated and presented in greater detail. The environmental studies would also require further analysis of ridership and service plans to reflect any modifications required for environmental analysis. Following the environmental studies, preliminary work could then proceed.