



Chapter 4

Service Implementation Plan

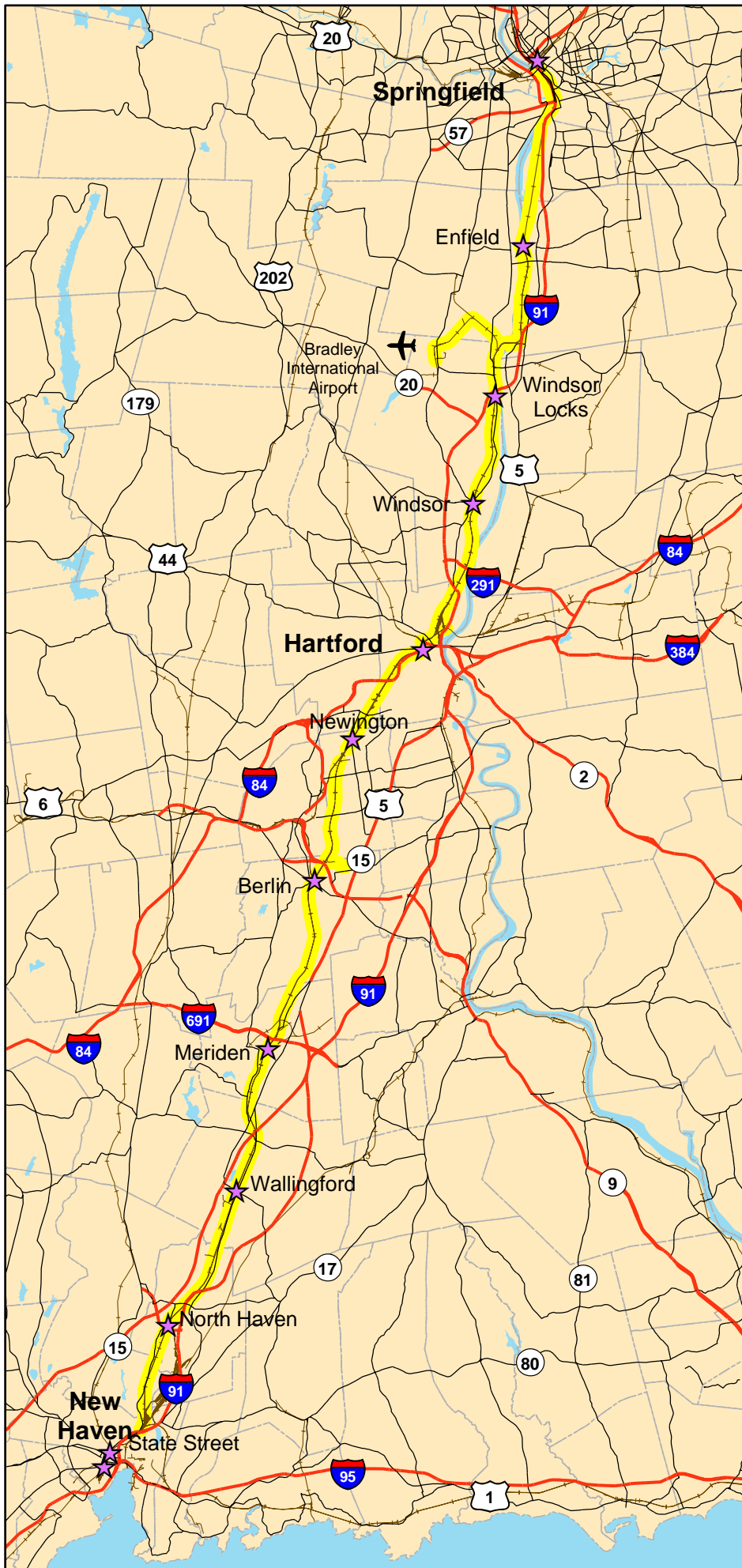
Upon review of the alternatives, the study team and the Steering Committee developed a recommended action plan for initial and potentially future commuter rail service on the Springfield Line. The start-up service recommended by the Steering Committee is based upon the Bi-State service option. The Start-up Service would include the following:

- Service would operate bi-directionally, Monday through Friday on a 30 minute peak hour schedule (at least 14 one-way trips).
- Service would be between New Haven and Springfield.
- A minimum of 18 miles of extended double track sections will be added to improve reliability and provide 30 minute headways meeting critical times in New Haven, Hartford and Springfield;
- Service would supplement existing Amtrak service on the corridor. Adjustments to Amtrak's schedule would be attempted when possible in conjunction with operating agreements with Amtrak.
- Along with the existing nine passenger stations being served along this corridor, three additional stations would be added at North Haven, Newington and Enfield.
- The existing Windsor Locks station would be enhanced to provide facilities to accommodate a waiting area and transfers between the train and the shuttle bus to Bradley Airport.
- Local bus service will be modified to provide appropriate service to the stations;
- All stations would have high level platforms and grade-separated pedestrian facilities, considered to be necessary from an operational standpoint.

4.1 Stations

The Start-up Service described includes three additional new stations and improvements to the existing station areas. The station locations for this scenario, which include those new stations not in use today (are *italicized* below), are shown in Figure 4-1.

- New Haven Union Station
- State Street Station



Recommended Action Stations

New Haven - Hartford - Springfield
Commuter Rail Feasibility Study



Legend

- Rail Study Corridor
- Highways
- Major Roads
- Recommended Action Stations

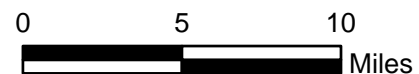


Figure 4-1



- *North Haven / Hamden Station (at Route 40 connector)*
- Wallingford Station
- Meriden Station
- Berlin Station
- *Newington Station (adjacent to New Britain Busway station)*
- Hartford Union Station
- Windsor Station
- Windsor Locks Station
- *Enfield Station (at Bigelow Commons in Thompsonville)*
- Springfield Union Station

All stations would include high-level platforms, pedestrian amenities with grade separated crossings, bicycle storage and racks, and any additional parking required to accommodate projected ridership. Plan-level drawings of each start-up station are shown in Figure 4-2 through Figure 4-12.

4.2 Schedule

Rail Traffic Controller (RTC) simulation software was used to evaluate a Recommended Action schedule. Under ideal operating conditions, the upgraded railroad would easily provide a high degree of service reliability. This alternative calls for a minimum of 18 miles of added double track to accommodate passing points for the proposed passenger service schedule. If emergency or operating conditions should require closing one of the tracks, trains during the peak periods could experience delays up to 10 to 15 minutes due to single track operation. Delays would be less during off-peak periods when trains operate at greater headways. These operations would require adjustment of freight operations on the line to occur outside the peak periods.

Table 4-1 shows the illustrative weekday schedules for the Recommended Action. This schedule includes 8 round-trips per day, with an attempt to meet the following times:

- Morning work start times in New Haven from the north
- Morning work start times in Hartford from the north and south
- Morning work start times in Springfield from the south
- Morning connections to Metro North and Shore Line East service in New Haven from the north
- Morning connections from Metro North and Shore Line East service in New Haven from the south/west/east
- Afternoon work end times in New Haven heading north
- Afternoon work end times in Hartford heading north and south
- Afternoon work end times in Springfield heading south
- Afternoon connections from Metro North and Shore Line East service in New Haven from the south/west/east
- Afternoon connections to Metro North service in New Haven from the north

**Table 4-1
Illustrative Schedules**

Southbound

Station	AM								PM							
	CDOT #1	Amtrak #141	CDOT #3	CDOT #5	Amtrak #495	CDOT #7	Amtrak #471	Amtrak #493	Amtrak #55	Amtrak #437	CDOT #9	Amtrak #475	CDOT #11	CDOT #13	CDOT #15	Amtrak #477
Springfield	5:20	5:50	6:20	6:50	7:20	7:50	8:20	10:40	12:55	2:10	3:30	4:00	4:30	5:00	5:35	6:05
Enfield	5:32	6:03	6:32	7:02	7:33	8:02	8:33	10:53		2:22	3:42	4:12	4:42	5:16	5:48	6:18
Windsor Locks	5:43	6:14	6:43	7:13	7:43	8:15	8:44	11:04		2:33	3:53	4:23	4:53	5:27	5:58	6:29
Windsor	5:49	6:20	6:49	7:19	7:49	8:21	8:50	11:10		2:38	3:58	4:29	4:59	5:33	6:04	6:35
Hartford	5:58	6:29	6:58	7:28	7:59	8:30	8:59	11:19	1:31	2:48	4:08	4:38	5:08	5:42	6:13	6:45
Newington	6:06	6:38	7:06	7:36	8:07	8:38	9:08	11:28		2:55	4:15	4:45	5:16	5:50	6:21	6:53
Berlin	6:13	6:45	7:13	7:43	8:15	8:45	9:17	11:35	1:46	3:02	4:22	4:52	5:23	5:57	6:28	7:00
Meriden	6:23	6:55	7:23	7:53	8:24	8:55	9:27	11:45	1:58	3:11	4:31	5:01	5:32	6:07	6:38	7:11
Wallingford	6:31	7:03	7:31	8:01	8:33	9:03	9:35	11:54		3:19	4:39	5:09	5:40	6:15	6:46	7:20
North Haven	6:38	7:11	7:38	8:08	8:40	9:10	9:43	12:01		3:26	4:46	5:16	5:48	6:23	6:53	7:27
State Street	6:45	7:18	7:46	8:14	8:48	9:17	9:50	12:09		3:34	4:54	5:24	5:55	6:30	7:00	7:35
New Haven	6:49	7:22	7:49	8:18	8:51	9:21	9:54	12:12	2:20	3:39	5:02	5:27	5:58	6:34	7:04	7:39

Northbound

Station	AM						PM									
	CDOT #2	CDOT #4	CDOT #6	CDOT #8	Amtrak #490	Amtrak #470	Amtrak #56	Amtrak #474	CDOT #10	Amtrak #486	CDOT #12	Amtrak #476	CDOT #14	CDOT #16	Amtrak #494	Amtrak #148
New Haven	5:50	6:20	6:50	7:50	9:00	10:15	12:55	2:15	3:30	4:00	4:30	5:00	5:30	6:10	7:25	8:30
State Street	5:53	6:23	6:53	7:53	9:03	10:18		2:18	3:33	4:03	4:33	5:03	5:33	6:13	7:28	8:33
North Haven	6:00	6:30	7:04	8:01	9:11	10:25		2:25	3:41	4:11	4:41	5:10	5:40	6:21	7:36	8:41
Wallingford	6:07	6:39	7:12	8:09	9:19	10:33		2:32	3:48	4:18	4:49	5:18	5:48	6:28	7:43	8:48
Meriden	6:16	6:47	7:21	8:17	9:27	10:41	1:20	2:41	3:56	4:27	4:57	5:27	5:57	6:36	7:51	8:57
Berlin	6:26	6:57	7:31	8:27	9:37	10:51	1:32	2:51	4:06	4:37	5:07	5:37	6:07	6:46	8:01	9:08
Newington	6:32	7:04	7:37	8:34	9:44	10:58		2:58	4:14	4:45	5:14	5:43	6:13	6:53	8:09	9:15
Hartford	6:40	7:11	7:45	8:42	9:52	11:06	1:47	3:05	4:21	4:53	5:22	5:51	6:22	7:00	8:17	9:23
Windsor	6:48	7:20	7:54	8:50	10:01	11:15		3:15	4:31	5:03	5:31	5:59	6:35	7:09	8:26	9:33
Windsor Locks	6:55	7:26	8:00	8:57	10:07	11:21		3:20	4:37	5:09	5:37	6:06	6:41	7:15	8:32	9:39
Enfield	7:05	7:37	8:17	9:07	10:18	11:32		3:31	4:47	5:20	5:48	6:16	6:52	7:25	8:42	9:50
Springfield	7:18	7:50	8:30	9:21	10:31	11:50	2:22	3:44	5:01	5:33	6:06	6:29	7:05	7:39	8:56	10:03

Notes: Commuter schedules are illustrative, based on RTC simulation of train operations. Amtrak schedules are March 2004 schedules, with assumed additional stops. Source: Amtrak, Wilbur Smith Associates



The schedule presented in Table 4-1 demonstrates one potential plan for commuter rail stopping at each station along the line. During further development and refinement of this plan, consideration can be given to including express service directly from the New Haven Line to Hartford and Springfield. The average travel time from New Haven to Springfield, including all stops is 1 hour 30 minutes. If an express train were to operate with stops only in New Haven, Hartford and Springfield (eliminating intermediate stops), the average travel time would be reduced by approximately 15 minutes. However, with the limited stops, corresponding ridership may also be substantially reduced along the line. Further analysis would have to be conducted for such service.

4.3 Ridership Levels

The New Haven to Springfield commuter rail service has the ability to attract the following four different types of potential users:

1. Commuters accessing employment hubs in New Haven, Hartford and Springfield;
2. Intercity rail ridership to points off the corridor, specifically connections to the Amtrak service in New Haven and Springfield;
3. Users that would have access to Bradley International Airport (BDL); and
4. Off-peak non-commuter and weekend users.

In the Maximum Build Scenario, a different approach to developing ridership forecasts was developed for each of the four different types of riders. The primary basis for calculating ridership on the line was the ConnDOT model, which is primarily a commuter model using population and employment to calculate expected trips. In addition, the Maximum Build Scenario included substantial off-peak service (business and recreational trips as well as airport service) and replaced the existing Amtrak trains (intercity trips), therefore additional techniques for developing ridership beyond the ConnDOT model were developed. This ridership is presented in the alternatives report.

The Recommended Action includes primarily peak hour service, plus existing Amtrak service mid-day and on weekends. Therefore, the ridership projection includes primarily commuter ridership, described in further detail below. In addition to the commuter ridership, a factor of 10% was added for non-commuters. Substantial off-peak ridership and airport ridership would not be realized without substantial off-peak and weekend service on the line.

4.3.1 Commuter Ridership

The ConnDOT model is a statewide model encompassing the roadway and transit networks in the entire state of Connecticut. Using the ConnDOT year 2025 no-build model, the nine Connecticut stations from North Haven north were added to the model with service headways of 30 minutes in the peak hours. Because the adjoining states, Massachusetts, New York and Rhode Island are treated as externals to the model, an off-model calculation of trips from Springfield was added to the model results for the



Springfield station. This off-model calculation was based on recently available Census 2000 Journey to Work town to town data, grown to reflect year 2025 population and employment. Expected rail capture rates were applied to the data to determine the number of trips from the Springfield station to the rest of the study area.

The results of the ConnDOT model and the out-of-state ridership evaluation indicate the year 2025 projected daily commuter ridership for the Recommended Action is 2,208 as compared to 1,606 for the Minimum Build Scenario and 3,440 for the Maximum Build Scenario. This projected ridership is higher than the Bi-State Alternatives due to the additional stations.

4.3.2 Total Weekday Ridership

Using the adjusted commuter ridership from the ConnDOT model, a factor of 10% was added to account for non-commuter ridership on the line. The breakdown of total weekday ridership is shown in Table 4-2. The resulting Recommended Action weekday ridership by station is shown in Table 4-3, along with the boardings (ons) and alightings (offs) for the AM peak commuter trips. It is estimated that this new service scenario would generate 2,428 new weekday trips on the corridor without the existing Amtrak ridership, estimated at 616 trips (not including the Vermonter).

Table 4-2
Components of Total Weekday Ridership

Commuters	2,208
Off-peak (non-commuter)	220
Total New Trips	2,428
Amtrak (not including Vermonter)	616
Total Trips	3,044

The ridership projections presented in Table 4-2 and financial estimates developed for this Start-up implementation plan are based upon a rigorous evaluation process and a customized application of ConnDOT's Statewide Travel Model. However, in response to a concern by some stakeholders that these ridership projections may be conservative, additional analysis was conducted to identify a potential high range of ridership for the service. The resulting high range in ridership is 5,000 daily trips. This higher range is anecdotal and so would be viewed as an optimistic figure. Although there is a range in projected capture, the anticipated NHHS ridership and cost analysis in this plan is based upon the evaluation process derived from application of the ConnDOT Statewide Travel Model. It should be noted that this recommended service is to initiate commuter rail along this corridor and that the opportunity remains to enhance the initial service (with additional scheduled trains and stations) as the demand warrants and funding allows.



Table 4-3
Recommended Action Weekday Ridership by Station

	AM Peak Commuter Station Ons	AM Peak Commuter Station Offs	Total Weekday Station Ons
New Haven Union / Metro North / Shore Line East	8	218	249
New Haven State Street	82	139	243
North Haven	159	35	213
Wallingford	160	73	256
Meriden	151	36	206
Berlin	83	40	135
Newington	22	44	73
Hartford	90	378	515
Windsor	75	48	135
Windsor Locks	61	19	88
Enfield	84	49	146
Springfield	129	25	169
Total	1,104	1,104	2,428

Source: Wilbur Smith Associates, Revised ConnDOT Model

4.4 Maintenance Facility

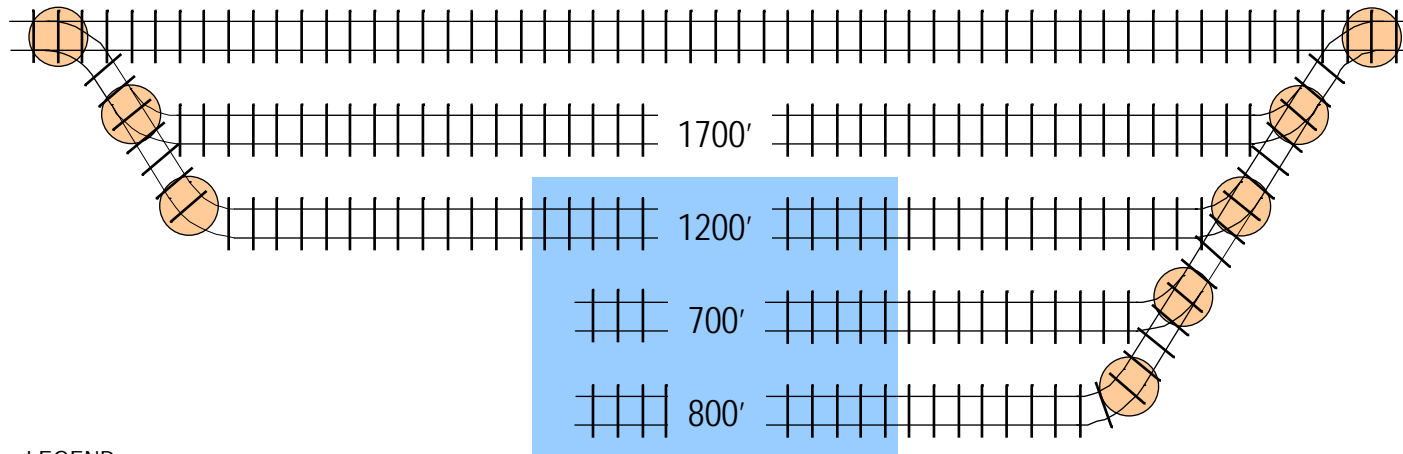
The Recommended Action requires a new maintenance facility in the New Haven area to service the train sets. Discussions with Connecticut Department of Transportation and Amtrak officials maintaining the Shore Line East equipment in New Haven pointed to the need for a new facility, as the existing Shore Line East facility shared with Metro North cannot handle several more train sets as currently configured. A schematic of the facility is shown in Figure 4-13.

4.4.1 Maintenance Facility Configuration


Conceptually, the facility would include the following:

- A 1,700-foot siding off of the main line track where the rail service equipment would be stored overnight. This includes two switches off the main line. The facility itself would have three tracks: a 1,200-foot run through track linking with the siding and two stub-end tracks, totaling 1,500 track feet. This track arrangement would permit three train sets to be maintained without one blocking the other, and would also provide room for fleet expansion. Facility track feet would total 4,400 feet.

Main Line



LEGEND

 250' x 500' insulated pre-fab building

 Switch

Notes:

- 1700' siding off rail line
- 1200' run through track
- 700' stub track for work / storage
- 800' stub track for work / storage

MAINTENANCE FACILITY SCHEMATIC FOR RECOMMENDED ACTION



ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

FIGURE 4-13



- The facility would include a 250-foot by 500-foot insulated prefabricated metal shop building with a cast in-place concrete floor, work bench/shop area, small office area and utility / restroom area.
- The area around the building would be paved, including a paved access road to the facility tracks. The areas on each side of and between the rails would also be paved to facilitate all weather vehicular access to the rail equipment.
- The site improvements around the facility – including the building and surrounding yard area, access roads, and rail equipment tracks – would be illuminated.
- The maintenance facility would be furnished with the appropriate maintenance tools and necessary supplies and equipment for routine servicing and cleaning of the rail equipment including four 100-ton screw jacks, crane or hoist, and welding, grinding, bending and machining equipment and fueling facility. The facility would have its own electrical generator in case of a local power failure.
- The maintenance facility would be furnished with a 4x4 pickup for maintaining the parking areas and maintenance access areas.

4.4.2 Maintenance Facility Location

The first consideration that was given to providing a maintenance facility was to consider existing facilities for both Metro North Railroad and Shore Line East service. Amtrak maintains trains for Shore Line East in a facility near New Haven’s Union Station that is shared with Metro North (which uses that facility for car rebuilding). ConnDOT has indicated that Metro North’s main railroad equipment maintenance facility for railroad equipment in New Haven is obsolete and undersized for the increasing scope and magnitude of its passenger railroad operations. Furthermore, according to Amtrak’s head of Shore Line East maintenance operations, there is not enough room to accommodate the additional train sets that would be needed for a NH-H-S service. Metro North’s activities are already constrained at this facility, and Amtrak’s use of the facility is for three shifts, 24 hours a day. Even if this site had additional capacity for a NH-H-S rail maintenance facility, it would likely be incompatible with the proposed service’s needs as the Metro North facility currently is used for maintaining electric equipment, and the NH-H-S train sets would be diesel sets. There is the future potential for Shore Line East service to be electric trains in the future (with diesel train sets transferred to the NH-H-S operation).

In ConnDOT’s June, 2002 *Fleet Configuration Analysis* study for Metro North’s New Haven Line, it was determined that a newly-available four-acre parcel adjacent to the New Haven yard at Union Station was the most appropriate location for a collection of new or enlarged Metro North maintenance facilities; alternate sites in East Bridgeport and Stamford for Metro North were also evaluated and did not contain adequate space.



The Amtrak-owned Cedar Hill yard (described below) on the New Haven/Hamden/North Haven border was also considered for Metro North in that study, but it not meet Metro North's needs well for several reasons. First, Cedar Hill is two miles off of the end of Metro North service, which would increase operating costs. Also, for Metro North trains to access the yard, trains must cross a restricted single-track segment over an old bridge. Potential environmental cleanup costs were also cited. In addition, the Cedar Hill Yard is not served by overhead electrical catenary as is the Metro North line, and therefore, electrification would need to be extended to this site or else Metro North trains would need to be pulled into and out of the site.

All the sites considered for an NH-H-S maintenance facility were in the vicinity of New Haven for several reasons. First, this location offers the most flexibility to share trains with the SLE service if needed. Secondly, at the end of the line, the New Haven vicinity would minimize offline travel before or after maintenance activities. Finally, a site at the Springfield end was not considered desirable as ConnDOT has indicated that control of the maintenance operations of this facility should remain under their jurisdiction in Connecticut.

For the NH-H-S facility needs, an additional four-track area in the New Haven Union Station yard was considered, but Metro North uses that area for storage and has plans for a truck and wheel shop.

A field review was made of areas that could accommodate a maintenance facility south of Milepost 7 (Springfield Line bridge over Quinnipiac River in North Haven) with a preference for locations closer to New Haven. The evaluation considered the space needs for a maintenance facility. Three sites were identified, all of which had similar shortcomings concerning the cost of potential environmental remediation and distance from the New Haven Station requiring additional operating costs to transport vehicles to the maintenance facility. The following are the sites that were considered to have adequate room for a maintenance facility, shown in order of preference:

Amtrak Cedar Hill Yard

Heading north out of New Haven's Union Station, the Springfield line crosses the Mill River (milepost 1.48) and Mill River interlocking and then opens into a large area historically known as the Cedar Hill Yard. Cedar Hill was historically a major switching point in New England, comprising what is now Amtrak's operations on the New Haven – Hamden border, as well as what is now CSX's Cedar Hill Yard on its Middletown line, located across the Quinnipiac River, several miles north of New Haven (stretching as far north as Universal Drive and I-91 Exit 9 in North Haven). The Northeast Corridor line heading east towards Old Saybrook also diverges from these other two lines in this area.

The Amtrak portion of the Cedar Hill Yard runs between about Milepost 2.1 and Milepost 3.1. The rail yard appears to have a number of open areas that store lumber or



other bulk materials and could be reconfigured in some fashion to accommodate the maintenance facility.

A large petroleum storage tank farm is located on the north end of the yard, and just to the east of this area is an area away from the rest of the yard that follows a set of tracks (which joins back with the main Springfield Line further north). This is a substantial storage area for storing rail and ties. This area could likely accommodate a maintenance facility as well if the bulk materials could be relocated or more efficiently stored.

A previous study by ConnDOT evaluated the potential for siting a maintenance facility in the area of the Cedar Hill Yard. This study did not look at the CSX facility, only the existing Amtrak facility. Amtrak has indicated a willingness to sell this yard to ConnDOT under the condition that ConnDOT would take on the liability associated with contamination at the site (i.e., Amtrak is absolved on liability). Cleanup costs were estimated at \$7 million.

CSX Cedar Hill Yard

In addition to continuing northeast to Middletown, the CSX line also merges back into Amtrak's Springfield Line further north and therefore might serve as an alternative location for a maintenance facility if the Amtrak Springfield Line does not prove feasible. The CSX line diverges from the Springfield Line at the southern end of the Amtrak Cedar Hill Yard. There are piles of building supplies in this area between the Amtrak and CSX tracks, where Anastasio Trucking trans-loads materials from CSX. The Providence and Worcester Railroad also operates along these tracks.

At the north end, the CSX Cedar Hill Yard includes a bulk transfer facility, accessed in several locations off of Universal Drive in North Haven (Exit 9 off of I-91). South of the bulk transfer area is an expansive open stretch of straight track within low-lying land (probably mostly wetland) associated with the Quinnipiac River, visible in the distance from Interstate 91 between Exits 8 and 9. Aerial maps imply that this area historically had many more tracks than it does today, and much of it appears to have been disturbed, and likely filled to raise its elevation. Another issue of concern is that the New Haven landfill (at I-91 Exit 8) abuts this yard.

In general, the CSX Cedar Hill Yard in the bulk transfer area and/or the open areas to the south would appear to offer a substantial amount of room to accommodate a facility. Assuming the yard could be purchased by ConnDOT for NH-H-S services or the existing CSX use of the yard could be accommodated in conjunction with a new commuter rail maintenance facility, it is likely that the maintenance facility could be constructed within the existing "footprint" of filled and disturbed areas without affecting wetlands. It should be noted that similar contamination issues to the Amtrak yard could likely be present here, in part because of the rail operations, and also because the landfill.



Former Dow Chemical/Upjohn Site

A sizable vacant parcel in North Haven, immediately south of Route 40, roughly between Mileposts 6.0 and 6.3 is a vacant site at 41 Stiles Lane that is immediately east of the Springfield Line. The site is signed with notices indicating likely contamination. According to the EPA's Envirofacts Warehouse – Facility Registry System website, it is a Toxics Release Inventory listing site and hazardous waste handler that has gone under several names in the past, including Dow Chemical Company North Haven Laboratories, Upjohn Fine Chemical Division, and Pharmacia. While no further research was performed into the level of contamination at this site, it is clear that this property is likely under remediation or a candidate for remediation.

4.5 Full-build Improvements

This chapter has described the elements necessary for a start-up service for the New Haven to Springfield Commuter Rail service. In addition to these elements, a number of improvements are envisioned for future service on the line. These include:

- Double-track the remaining 20.6 miles of single track sections to improve reliability and allow service at least as frequent as every 15 minutes;
- Construct second high-level platforms and grade-separated pedestrian facilities at Wallingford, Berlin and Windsor Locks Stations, necessary with additional double-track segments;
- Construct an additional station in the Wharton Brook area on the former Pratt and Whitney property as development takes place;
- Provide new commuter rail parking in the new Meriden parking structure to be constructed with downtown development plans in Meriden.

Plan-level drawings of the full-build stations that differ from start-up service are shown in Figure 4-14 through Figure 4-19. Renderings of each full-build station are shown in Figure 4-20 through Figure 4-29.