



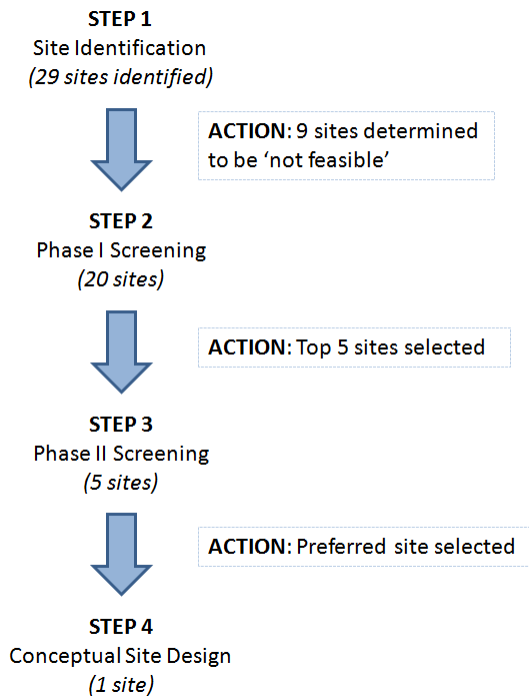
MEMORANDUM – PHASE II SCREENING ASSESSMENT

To: Upper Valley Intermodal Facility – Project Advisory Committee
From: David Saladino, PE
Subject: Phase II Screening Assessment
Date: 12 April 2010

1.0 Introduction

This report presents an overview of the process leading up to and including the Phase II Screening Assessment of the identified Upper Valley Intermodal Facility sites. Figure 1 below shows an overview the full site screening process being employed for this project.

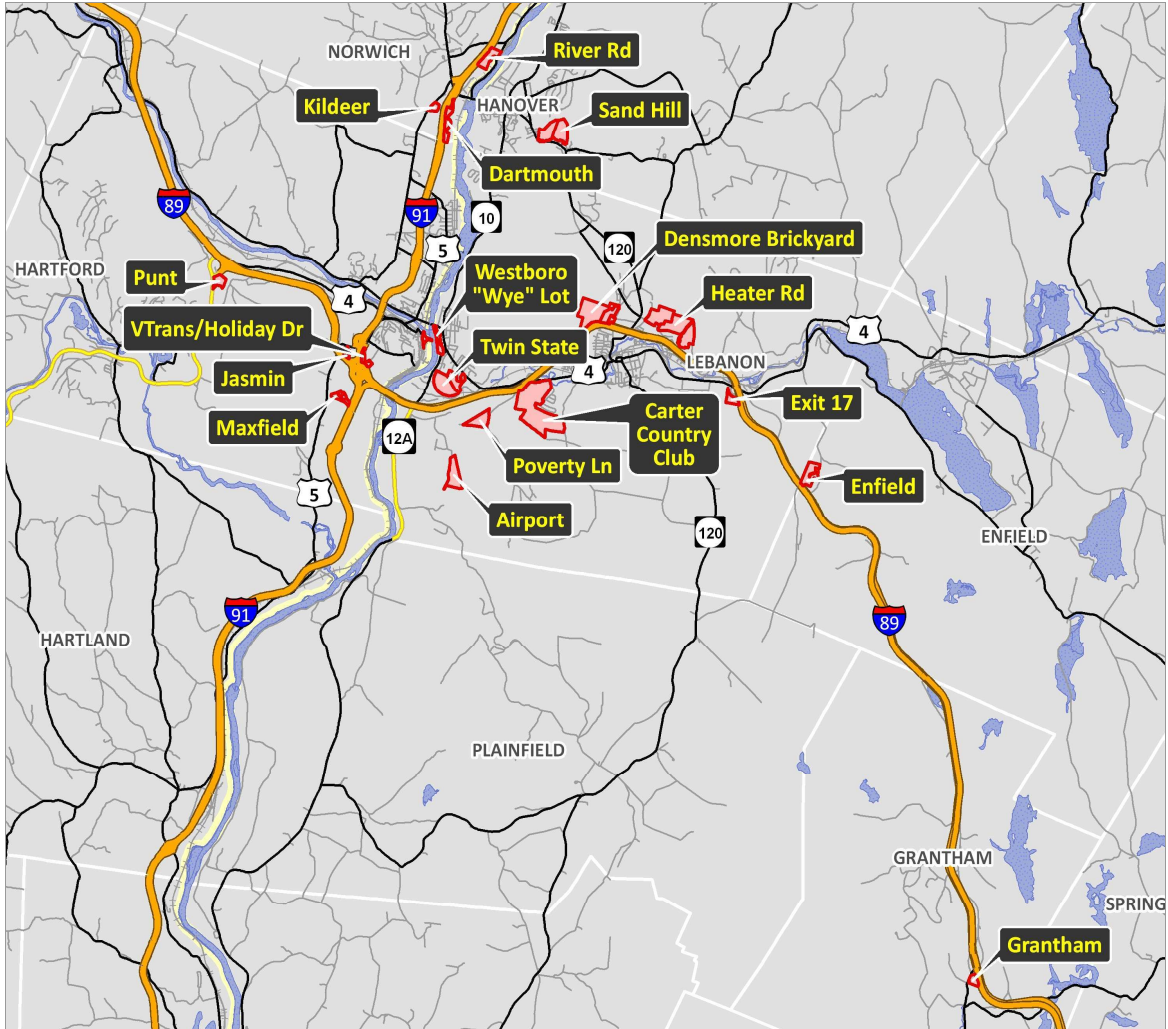
Figure 1: Site Screening Process



The site screening process began with an identification of potential sites throughout the greater Upper Valley area. Sites were identified through public input received at public meetings held in the fall and winter of 2009-10 as well as from land owners, real estate agents, owners' representatives, and other interested parties. A total of 29 sites were identified through this process in six towns ranging in size from 1.5 acres up to 250 acres. These 29 sites went through a preliminary screening process based on owner interest, parcel size, and proximity to I-89 or I-91. This initial screening resulted in the removal of nine sites, which were determined to be not feasible.

The remaining 20 sites deemed to be feasible then moved into a more formal Phase I screening assessment for evaluation and scoring. The locations of the sites evaluated in Phase I are shown in Figure 2 below.

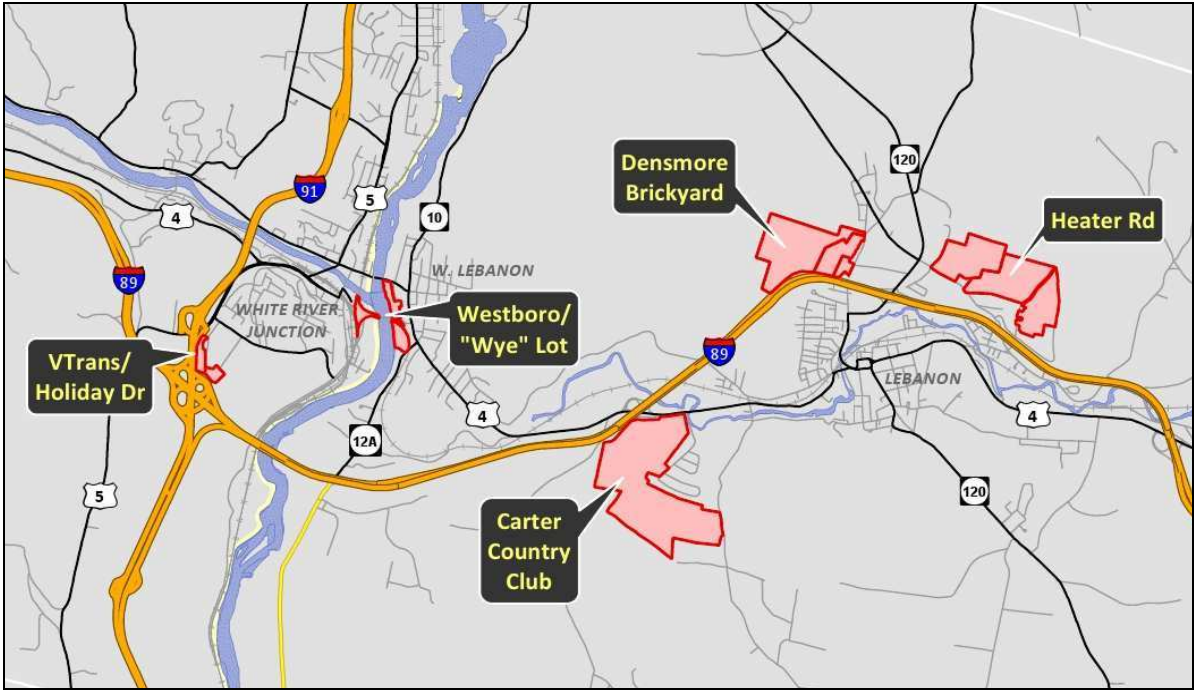
Figure 2. Phase I Sites



These 20 sites were evaluated, ranked, and screened to identify the top five sites to include in the Phase II screening assessment. The ranked projects were presented to the Project Advisory Committee (PAC) on 18 December 2009. At this meeting, the PAC chose to move forward with the top five ranked sites into the Phase II screening assessment. The location of the top five sites is shown in Figure 3.



Figure 3. Sites Selected for Phase II Screening Assessment



The remainder of this report details the Phase II screening process used to score the sites to assist the PAC in identifying a preferred site.



2.0 Overview of Phase II Screening Analysis Methodology

The following fourteen metrics were identified by the Project Advisory Committee (PAC) to evaluate each of the five Phase II intermodal site alternatives.

For each metric, raw scores or values were calculated based on the benchmarks described in the subsections below. For example, Metric 2.1: Impact to Adjacent Property Values, four benchmarks were used to calculate a raw score for this metric. Each of the benchmarks was scored from -2 to +2 and added together to obtain a raw score (Figure 6). For Metric 2.7: Direct Site Costs, the raw values were calculated as the total cost for site acquisition and preparation (a dollar amount, Figure 15).

Once the raw values or scores for each metric were obtained, these values were standardized to a -2 to +2 score using the following equation:

$$\text{Score} = [\text{Raw Value} / \text{Max}(\text{Absolute Values of the Raw Scores for all 5 Sites})] * 2$$

For example, for Metric 2.1, the raw scores ranged from -5 to +4. Using the equations above, a raw score of -5 would be scored as a -2.0, a raw score of -4 would be scored as a -1.6, and vice versa, a raw score of +4 would be scored as a +1.6 (Figure 4).

For some scores, the opposite sign may have been applied to the score so that a positive raw value was scored as a detriment (negative score), and a negative raw value was scored as a benefit (e.g., a reduction in congestion of -35 seconds is actually a benefit for the site and would have a positive score).

The metrics were reviewed by a subcommittee of the PAC before scores were calculated, at which point the subcommittee defined a weight from 1 to 5 for each metric (



Figure 5). This weight was used to identify the relative importance of each of the metrics in the scoring of the five sites and was multiplied to the final score. For example, for Metric 2.1, the weight assigned by the subcommittee of the PAC was a 3. This was multiplied by the scores obtained using the above equation to obtain a weighted score. Figure 4 shows the values obtained after applying the weights. The weighted final scores for each metric were added together to obtain the final weighted score for each site. This score was used to rank the five sites.

Figure 4. Calculating Scores and Applying Weighting, Metric 2.1: Impact to Adjacent Property Values.

	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
Raw Value	4	3	-5	-4	-5
Score	1.6	1.2	-2.0	-1.6	-2.0
Weight	x3	x 3	x 3	x 3	x 3
Weighted score	4.8	3.6	-6.0	-4.8	-6.0

For reference, the No Build scenario was added as an alternative to the scoring matrix, and scored as a zero for each metric, as the baseline condition.



Figure 5. Metrics: Criteria, Weight, and Benchmark.

#	Criteria	Weight	Benchmark
	IMPACT TO ADJACENT PROPERTY VALUES		
2.1	Would the development of the site minimize adverse impacts to adjacent property values?	3	Impact of development on adjacent property values
2.2.1	VMT & CONGESTION REDUCTION	5	VMT reduction
	How would the development of the site as an Intermodal Transportation Facility impact Vehicle Miles Traveled (VMT) and regional congestion?	4	Delay/vehicle reduction
2.2.2			
2.3	LOCAL TRANSIT OPERATIONS & RIDERSHIP	5	How would the development of the site impact local transit access volume and travel times?
2.4	INTERCITY BUS TRAVEL TIME	3	Total additional on-the-road travel times for Dartmouth Coach and Greyhound
	How would the development of the site as an Intermodal Transportation Facility impact Intercity bus travel times within the region?		
2.5	INTERCITY BUS RIDERSHIP	5	Net impact to intercity passengers based on home and terminal location
	How would the development of the site as an Intermodal Transportation Facility impact Intercity bus volumes?		
2.6	BIKE/PED TRAVEL TIMES	2	Qualitative
	How would the development of the site as an Intermodal Transportation Facility impact bicycle and pedestrian travel times?		
2.7	DIRECT SITE COSTS	4	Site acquisition and preparation
	What is the direct cost of acquiring the site and preparing this site for construction including the provision of community facilities?		
2.8	FINAL DESIGN & FACILITY CONSTRUCTION COSTS	4	Soft & hard costs
	What is the cost to design, permit, and construct the facility, including any unusual site characteristics (e.g. structured parking)?		
2.9	OFF-SITE IMPROVEMENT COST	5	Construction cost
	What is the direct capital and O&M cost of the highway, transit, and bicycle/pedestrian infrastructure necessary to link the site to the existing transportation network?		
2.10	REDUCING FUEL CONSUMPTION AND EMISSIONS	4	Reduction in fuel consumption Reduction in CO, CO ₂ , NO _x and VOC emissions
	Would the development of the site as an Intermodal Transportation Facility reduce regional fuel consumption and vehicle emissions?		



#	Criteria	Weight	Benchmark
SITE ENVIRONMENTAL IMPACTS			
2.11	What are the direct costs associated with on-site environmental mitigation/remediation?	4	Environmental mitigation impacts
IMPACT TO LOCAL TAX BASE			
2.12	How would developing the site as an Intermodal Transportation Facility effect future tax revenues in the host community?	4	Land value, potential for site to accommodate other mixed-use development, currently publicly owned, vehicle registration taxes
SITE REDEVELOPMENT			
2.13	Does the site involve the redevelopment of a former use on the site?	3	Is the site undeveloped or will it involve a redevelopment of a previous use

2.1 Impact to Adjacent Property Values

The impacts to adjacent property values were assessed based on a review of consistency with the Town or City zoning district within which the property is located and a qualitative examination of the impacts of an Intermodal Facility on adjacent uses.

We addressed the following questions for each candidate site and summarized the information in Figure 6:

- What is the zoning district for the parcel? Is the project allowed in the zoning district?
- What are the adjacent uses? Is the proposed use compatible with the adjacent uses?
- Does the project revitalize an abandoned property?
- Are there other unique benefits or detriments?

We assigned a numerical rating for each beneficial or detrimental quality identified: benefit (+2 or +1), detriment (-2 or -1), or neutral impact (0).

1. *Consistency with Zoning Ordinance:* If a parking facility is a permitted use or is allowed by conditional use or special exception within the zoning district, it is more likely that the project is consistent with the surrounding uses, which is beneficial (+2 or +1). For parcels in zoning districts that do not specifically allow parking facilities, we deemed this to be detrimental and more likely inconsistent with the surrounding uses (-2 or -1). For this quality, there is no neutral (0) rating.
2. *Compatibility with Adjacent Uses:* We regarded the project as detrimental to abutting property values if the surrounding uses were primarily low to medium density residential (-1), since relatively few riders/commuters would originate from the neighborhood. We regarded the project as enhancing abutting values (+1) if the site was in a commercial area since businesses could benefit from having commuting alternatives for their employees, and users of the facility could be potential customers of commercial businesses.
3. *Revitalization Benefits:* If the project revitalized an abandoned property, then it was regarded as beneficial to adjacent property values (+1). If the project replaced current open space, it was regarded as a detrimental impact (-1).
4. *Other Unique Benefits or Detriments:* If a project site has known unique benefits or detriments, we included those as well, along with a corresponding rating of -1, 0, or +1.

We summed the ratings of these criteria to obtain a raw score for each property. The results are included in Figure 6. We then adjusted the raw score to assign a numerical ranking between -2 and +2 for the Phase II Scoring Matrix.



Figure 6. Impacts to Adjacent Properties

Question	SITE				
	Vtrans/Hotel	Westboro/Wye	Carter Country Club	Densmore Brickyard	Heater Road
1. Consistency with Zoning					
What is the zoning district for the parcel?	I-C2	I-C (Hartford); CBD (Lebanon)	R3	RO1, R1, RL3	RL1, RL3
Is the project allowed in the zoning district?	yes (+2)	yes (Lebanon); conditional use (Hartford) (+1)	no (-2)	no (-1)	no (-2)
2. Compatibility with Adjacent Uses:					
What are the adjacent uses?	business, government office, post office	commercial business, retail	residential on the property and commercial along Route 4	residential, forest, interstate, and school	residential, forest, and commercial along Heater Road
Is the proposed use compatible with the adjacent uses?	brings commuters to WRJ businesses (+1)	brings commuters to White River Junction and West Lebanon businesses (+1)	yes with Route 4, no with existing residential (-1)	no (-1)	primarily low density residential with limited benefits from the project (-1)
3. Revitalization Benefits:					
Does the project revitalize an abandoned property?	revitalizes dormant hotel parcel (+1)	revitalizes dormant land (+1)	replaces golf course/open space with commercial (-1)	brickyard area is not within project footprint and is not redeveloped; replaces open space with commercial (-1)	replaces open space with commercial (-1)
4. Other Unique Benefits/ Detriments					
	No additional development, so no impacts to adjacent property values		Last stretch of "green space" between Lebanon and West Hartford (-1)	parking lots and lights will be visible from a distance due to position of facility on hillside (-1)	parking lots and lights will be visible from a distance due to position of facility on hillside (-1)
Raw Score	4	3	-5	-4	-5

2.2 Impact on Vehicle Miles Travelled (VMT) and Congestion

2.2.1 Vehicle Miles Traveled Reduction Assessment

The Vehicle Miles Traveled (VMT) reduction criterion focused specifically on reductions gained through capturing long-distance Dartmouth Coach-related trips, since these longer-distance VMT reductions (e.g. 120 mile trips to Boston) far outweighed the smaller local VMT reductions gained through shifts to carpooling and local transit use.

The VMT reduction criterion was calculated as a savings or reduction in VMT using each of the proposed sites compared to existing VMT with the current Dartmouth Coach facility at 90 Etna Road. A baseline assumption is that an expanded Intermodal Facility would allow Dartmouth Coach to add service to Manchester Airport at four of the five locations. The Westboro/Wye Lot site would not be able to accommodate the addition of bus service to Manchester due to limitations in parking. Similarly, the VTrans site would only be able to accommodate a little over three-quarters of the buses to Manchester due to limitations in parking. A single day's worth of VMT was estimated for all scenarios (i.e., current and proposed sites).

Dartmouth Coach administered an on-board survey of passengers from 28 January 2010 to 2 February 2010 that collected the following information:¹

¹ Separate data on number of riders per bus were also collected from Dartmouth Coach drivers.



- Home zip code
- Boarding location
- Departing location
- Mode of travel to bus terminal
- Duration of trip
- Frequency of trip

The number of trips generated by Dartmouth Coach was estimated using data on the average number of riders per bus, number of buses scheduled to depart across an average week day, and percent of riders currently utilizing the current Dartmouth Coach site in Lebanon. Each bus is estimated to generate an average of 15 trip boardings in Lebanon. The percent of riders per home zip code were calculated using the Dartmouth Coach ridership survey (Figure 7).

Distances between current riders' home zip codes and the current and proposed Intermodal Center locations were calculated based on the number of people that would be riding a given bus for an entire day. VMT figures were also calculated for the buses driving from the terminal to the destination (i.e., BOS, MHT, NYC).

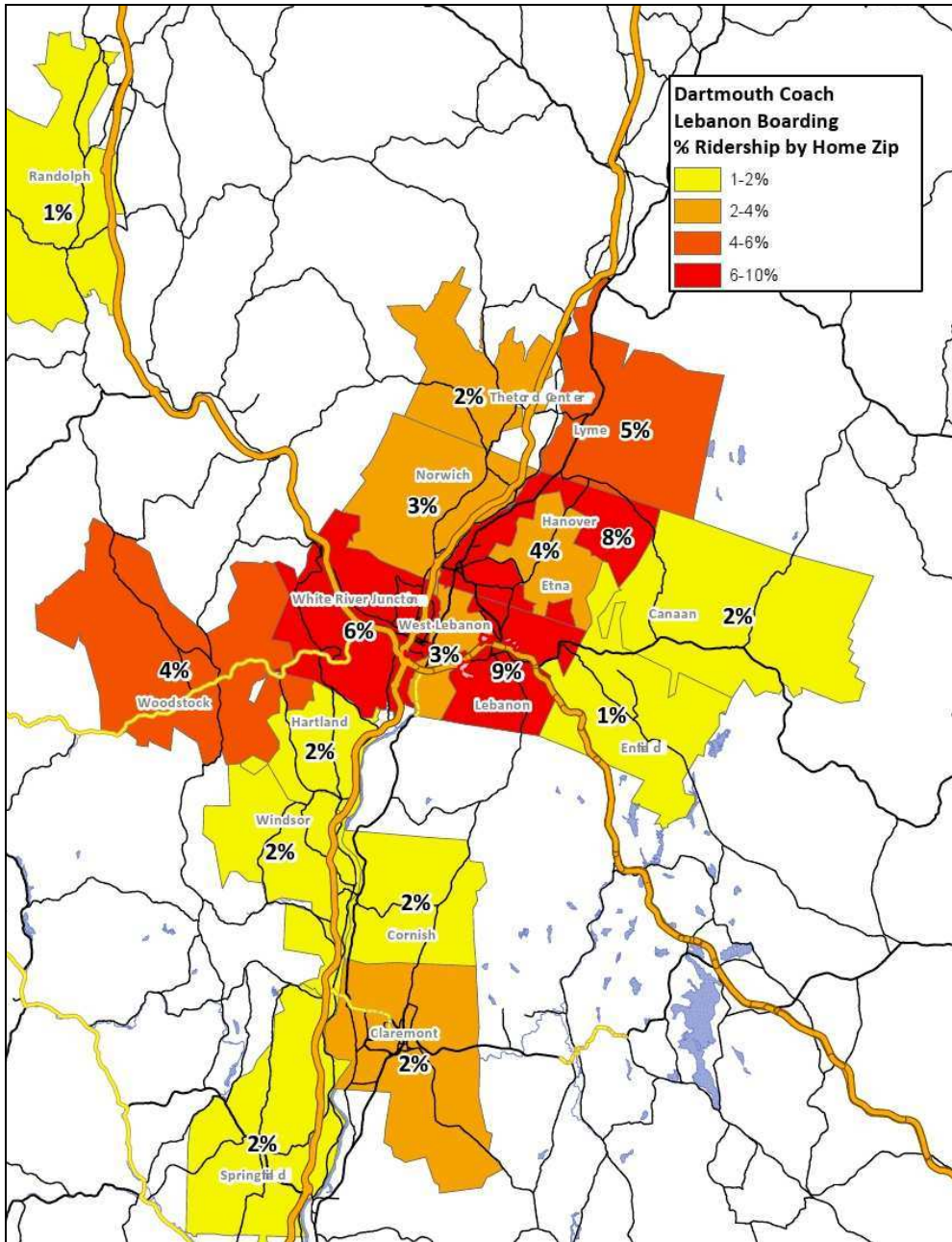
Current VMT Calculation: Current VMT was calculated as: VMT from current riders' home zip codes to the Etna Road terminal, plus VMT from the current riders' home zip codes to Manchester Airport via auto (this number was based on the proposed increase in Dartmouth Coach service to MHT).

VMT Calculation for Each Site: VMT to the five potential locations was estimated as: VMT from current riders' home zip codes to the proposed site, plus VMT for the buses driving to the final destination.

These VMT figures were summed for the entire day for a proposed location and compared to the VMT for current users. The differences in VMT between the proposed sites and the current site (plus MHT) were used as the raw score. The raw scores were adjusted to assign a numerical ranking between -2 and +2 for the Phase II Scoring Matrix.



Figure 7: Distribution of Home Zip Codes of Dartmouth Coach Riders Boarding in Lebanon¹



2.2.2 Congestion Assessment

In order to estimate the impact of the proposed Intermodal Center sites on congestion and delay, peak hour microsimulation models encompassing all five sites were built. Recent turning movement counts for twenty-eight study intersections were assembled and adjusted to represent traffic volumes during the

¹ Data based on Dartmouth Coach on-board ridership survey: 28 January 2010 to 2 February 2010



AM and PM peak hours in 2012.¹ Inputs to the model include lane geometries, background traffic volumes, and optimized signal timings.

Figure 8: Graphic Showing Portion of Synchro Traffic Model



The following scenarios were developed and modeled:

- 2012 No Build
- 2012 Build (for each of the 5 sites)
- 2012 Build plus off-site traffic mitigation improvements (for each of the 5 sites)

A No Build scenario was run for each peak hour to establish baseline conditions. The No Build scenario includes 2012 traffic volumes with the Dartmouth Coach and Greyhound terminals in their current locations.

The Build scenario adds the traffic volume impacts of locating an Intermodal Center at each of the five proposed sites. Traffic volume impacts of the proposal Intermodal Center comes from three primary sources:

- Dartmouth Coach riders
- Greyhound riders
- Commuters using the site as a park-and-ride

The proposed intermodal site generates some new trips due to expanded intercity bus service, causes certain trips to be re-routed, other trips to be consolidated into a single carpool trip from the site, and other trips to be eliminated due to use of public transit. These impacts were estimated for each site based on existing traffic flows, engineering judgment, employee home zip code data for Dartmouth College and DHMC, journey to work information from surveyed Dartmouth College employees, and data from a survey of Dartmouth Coach passengers.

The number of trips generated by Dartmouth Coach and Greyhound bus service was estimated using data on the average number of riders per bus, number of buses scheduled to arrive/depart during the peak hours, mode of travel to the bus terminal, and percent of riders currently utilizing the current Dartmouth Coach site in Lebanon. Based on these sources, we estimated that each bus generates 21 auto trips (15 enters and 6 exits for out bound buses, 6 enters and 15 exits for inbound buses).

¹ Based on traffic volume data, we estimated background traffic to grow 2% per year.



Based on these data, the number of trips currently using Dartmouth Coach and Greyhound service were re-routed to the five proposed sites. Additional future trips due to increased bus service were then added to the network. The zip code data was used to approximate the percentage of transit passengers utilizing various routes throughout the microsimulation model's road network.

The number of trips generated by commuters was estimated using the Institute of Transportation Engineers' *Trip Generation*¹ for *Land Use 90: Park-and-Ride Lot with Bus Service* based on 100 available commuter parking spaces

Figure 9 shows the peak period trip generation estimate for the Intermodal Center.

Figure 9: Intermodal Center Peak Hour Trip Generation Estimate

	Peak Hour	
	AM	PM
Dartmouth Coach	62	83
Commuters	72	62
Greyhound	21	42
<i>Total:</i>	<i>155</i>	<i>187</i>

Based on observed delay and queuing in the Build scenarios, specific roadway improvements were identified to address congested generated by the Intermodal Facility. These roadway improvements (described in Section 2.9.1) were then added into the network to create the Build plus Mitigation scenarios.

The peak hour simulation models were run for one hour five times and the results were then averaged to determine network-wide delay per vehicle during both the AM and PM peak periods. The Phase II Scoring Matrix includes the sum of the AM and PM peak hour network-wide change in average delay/vehicle between the No Build and Build plus Mitigation scenarios. The raw scores were adjusted to assign a numerical ranking between -2 and +2 for the Phase II Scoring Matrix.

2.3 Impact on Local & Regional Transit Access Volume and Travel Time

This criterion seeks to measure how locating an Intermodal Center (and transfer point) at each of the five identified locations would impact local and regional transit access volume and travel time. To score this criterion, the following ten metrics were used:

- Can the intermodal site be served with the current number of regular service local buses?
 - Based on current Advance Transit operations, service to the VTrans/Holiday Drive and Densmore Brickyard (with Hanover Street bridge connection) sites could be served with the current number of busses. All of the other locations would require acquisition of additional bus(es) to maintain existing service levels.
- Are operating funds available at this time to bring Advance Transit buses to the site?
 - Similar to the previous metric, this looks at the availability of funds to provide service to each of the sites. There is currently no funding available to Advance Transit to cover additional capital and operating expenses.
- Are there funding partners who may be interested in supporting expanded operations at the site?
 - Based on local knowledge and previous work on the Advance Transit system, this metric identifies whether there are funding partners who may be interested in supporting expanded operations to each of the sites.

¹ Institute of Transportation Engineers, *Trip Generation* 8th Edition (Washington, D.C.: Institute of Transportation Engineers, 2008).



- Will adding Advance Transit service to the site increase travel times on current routes?
 - This metric identifies whether serving the site would increase travel times on current AT routes.
- Will development of the site result in faster travel times on existing routes?
 - With the re-connection of Hanover Street across I-89, the Blue Route could serve the Densmore Brickyard site and reach DHMC faster than it does as it would avoid the lights on NH 120. Service to all other sites would result in either no change or an increase in travel times on existing routes.
- Will Advance Transit service to the site negatively impact existing transfers between routes?
 - Based on current AT operations, this metric identifies whether there would be a negative impact on timed transfers in West Lebanon or on the Lebanon Green as a result of providing service to each site.
- What headways can be offered with no additional cost?
 - Headways are defined as the time between bus arrivals (e.g., 60-minute, 30-minute, 15-minute headways). That is, the shorter the amount of time between bus arrivals, the better the service.
 - The only two sites that can be served at no additional cost are the Densmore Brickyard site and the VTrans site.
- What midday headways can be offered for \$150,000 per year?
 - This metric looks at the mid-day (i.e. non-commute) headways that could be provided for \$150,000 per year in operating expenses.
- Will regional buses offer commuter access to the site?
 - Based on discussions with representatives from Connecticut River Transit and Stagecoach Transportation, this metric identifies the number of routes that would likely serve each of the sites during the morning and evening commute times per day.
- Will regional buses offer intercity travelers access to the site?
 - This metric identifies the number of regional bus routes that would service each site during the mid-day period.

The above metrics were scored from -1 to +1 in relation to each site and were added to obtain a raw value for this metric. The raw scores were adjusted to assign a numerical ranking between -2 and +2 for the Phase II Scoring Matrix.

2.4 Impact on Intercity Bus Travel Times

Two measures were used to assess the impact on intercity bus operations:

- The number of minutes required for intercity buses heading toward Boston to travel from downtown Hanover and the UVIC site to Exit 18 on Interstate 89
- The number of minutes required for intercity buses heading toward New York City to travel from the UVIC site and downtown Hanover to the interchange of Interstates 89 and 91

Changes to travel times will impact bus operations and costs. This will also have a bearing on the appeal of the resulting intercity service for potential customers. Passengers heading south will not want to begin by traveling north or west to pick up other riders. Shorter travel times are better, because they result in lower operating costs and higher levels of passenger satisfaction.

Calculations were developed separately for Boston and New York City markets. Anticipated local travel times for individual Dartmouth Coach bus trips are shown in Figure 10. The combined daily total for multiple Dartmouth Coach trips is shown in Figure 11.



Figure 10: Local Travel Times for Individual Dartmouth Coach Bus Trips

Minutes to Exit 18			
	Hanover to UVIC	UVIC to Exit 18	Combined Travel Time
Heater Road	15	2	17
Densmore Brickyard	15	2	17
Carter Country Club	20	5	25
Westboro/Wye Lot	18	10	28
VTrans/Holiday Drive	14	11	25
Minutes to I-89/91 Interchange			
	UVIC to Hanover	Hanover to I-89/91	Combined Travel Time
Heater Road	15	11	26
Densmore Brickyard	15	11	26
Carter Country Club	20	11	31
	Hanover to UVIC	UVIC to I-89/91	Combined Travel Time
Westboro/Wye Lot	18	10	28
VTrans/Holiday Drive	14	3	17

Figure 11: Dartmouth Coach Combined Local Daily Travel Times

	Boston buses	NYC Buses	Total Daily Minutes	Total Daily Hours	Extra Hours
Heater Road	238	30	268	4.5	0.0
Densmore Brickyard	238	30	268	4.5	0.0
Carter Country Club	350	35	385	6.4	1.9
Westboro/Wye Lot	392	32	424	7.1	2.6
VTrans/Holiday Drive	350	19	369	6.2	1.7

Calculations are somewhat different for Greyhound, because Greyhound offers a different number of trips on each route, and because Greyhound diverts some Montreal-Boston buses from Interstate I-89 to Hanover. The combined daily total for multiple Greyhound trips is shown in Figure 12.

Figure 12: Greyhound Lines Combined Local Daily Travel Times

	Boston buses w/ Hanover	Boston buses w/o Hanover	NYC Buses	Total Daily Minutes	Total Daily Hours	Extra Hours
Heater Road	160	42	56	258	4.3	0.9
Densmore Brickyard	160	42	56	258	4.3	0.9
Carter Country Club	220	24	44	288	4.8	1.4
Westboro/Wye Lot	215	54	40	309	5.2	1.8
VTrans/Holiday Drive	150	42	12	204	3.4	0.0

The impact on intercity travel times for Dartmouth Coach and Greyhound Lines can be summarized by adding together the combined impact on existing intercity bus operations. Figure 13 shows the number of over-the-road service hours added for both companies by the various sites. This approach provides a



higher relative weight to routes with more frequent service. It offsets time added or saved by one bus company with time added or saved by the other intercity provider.

Figure 13: Combined Impact (service hours) on Intercity Bus Operations

	Dartmouth Coach	Greyhound Lines	Combined Hours	Score (+2 to -2)
Heater Road	0.0	0.9	0.9	0
Densmore Brickyard	0.0	0.9	0.9	0
Carter Country Club	1.9	1.4	3.3	-2
Westboro/Wye Lot	2.6	1.8	4.4	-2
VTrans/Holiday Drive	1.7	0.0	1.7	-1

2.5 Impact on Intercity Bus Ridership

To estimate the impact on intercity bus ridership between the different sites, an incremental logit model was used to estimate the difference in mode share (ridership) that would be achieved between the proposed sites. This incremental logit model with travel time and access/egress time coefficient estimates was derived from intercity mode choice models developed by RSG and Charles River Associates (CRA) for the Toronto to Montreal high speed rail corridor. The following formula was used to estimate changes in mode share:

$$P'_n(i) = \frac{P_n(i)e^{\Delta V_{in}}}{\sum_{j \in C_n} P_n(j)e^{\Delta V_{jn}}}$$

$P'_n(i)$ = new mode share

$P_n(i)$ = current mode share

ΔV_{in} = Beta travel time¹ * the change in access time

This formula was used to estimate the change in mode share (increase or decrease in Dartmouth Coach ridership) based on changes in travel time (i.e., access time to the proposed site, plus travel time on the bus from the proposed sites to their final destination – BOS and NYC). Differences in ridership were calculated between the proposed sites and the current Dartmouth Coach location. The percent change in ridership was estimated for each proposed location and ridership market and then multiplied by the number of riders for each bus in an average week day (based on current bus ridership numbers). These weighted numbers were added to get a raw score or the change in ridership for an average day. The raw scores were adjusted to assign a numerical ranking between -2 and +2 for the Phase II Scoring Matrix.

2.6 Impact on Bicycle and Pedestrian Travel Times

The proximity of the Intermodal Center to residential areas offers the potential for walking or bicycling to the facility to board a local, regional, or intercity bus. This qualitative metric identified whether the site was located within reasonable proximity to a built-up residential area.

¹ Estimated as -0.01 from CRA (1994). *Projections of Ridership and Passenger Revenue for High Speed Rail Alternatives Operating between Windsor and Quebec City*



2.7 Direct Site Costs

2.7.1 Site Acquisition Cost

Site acquisition costs were developed from the following sources:

- City of Lebanon Assessors' record data.
- Interviews with the City of Lebanon Assessors' office.
- Town of Hartford Listers' record data.
- Available Real Data® information.
- Interviews with local real estate agents.
- Asking prices from the representatives of the candidate properties.

Our interviews with the City of Lebanon Assessors' office and local real estate agents produced comparable results. The Assessors informed us that transfer prices and assessed values were generally very similar. Information from the City indicated that the assessed values were approximately 96% of the transfer prices. The real estate agents indicated that assessed values and transfer prices in Lebanon and Hartford tend to be very close. However, the data from both sources was primarily based on the residential market, since there were very few recent transfers of vacant land. The real estate agents also informed us that the recent transfer prices through January 2010 are at the 2005 market levels. Nevertheless, the overall market trend supports using the assessed values as a base line for determining a reasonable purchase price for the candidate properties.

We specifically reviewed the assessment data for the four subject properties in the City of Lebanon with the City Assessors' office. We also obtained the assessment data for the parcels in Hartford from the Hartford Listers' office. Figure 14 summarizes the parcel data provided by both offices. In the last column, "Comments," we included the asking price for those parcels that are currently for sale on the open market.

Figure 14. Assessed Value of Phase II Sites

Site	Map/Lot	Owner Name	Location	City/State	Lot Size (acres)	Zoning District	Land Use	Current Appraised Value		Appraised Value for Site	Comments
								Land	Building		
1	14-22	State of Vermont	122 Beswick Drive	Hartford, VT	7.5	I-C2	highway maintenance	\$149,300	\$515,000	\$664,300	
	14-41	Mascoma Bank	259 Holiday Drive	Hartford, VT	building only	I-C2	hotel - building (abandoned)		\$900,000	\$900,000	hotel and land for sale at \$1.2M
	14-41LND	Valley Land Corp.	259 Holiday Drive	Hartford, VT	5.5	I-C2	hotel - land	\$426,800		\$426,800	
Site 1 Total										\$1,991,100	
2	46-24	State of Vermont	Railroad Row	Hartford, VT	5.69	I-C	vacant with active rail	\$85,500			
	72-5	NHDOT	Westboro Yard, Railroad Ave.	West Lebanon,	19.07	CBD	abandoned rail yard, storage	\$735,200	\$128,600	\$863,800	sales price in 1999 \$700,000
Site 2 Total										\$863,800	
3	132-16	Carter Country Club	Mechanic Street	Lebanon, NH	253.38	R3	9-hole golf course	\$371,000	\$680,600	\$1,051,600	
Site 3 Total										\$1,051,600	
4	48-1	Lane NH Holdings, LLC	174 Hanover St. Ext. (Densmore Brickyard)	Lebanon, NH	101	RL3	undeveloped	\$121,355		\$121,355	sale price 2005 \$805,000; for sale at
	48-2	Lane NH Holdings, LLC	174 Hanover St. Ext. (Densmore Brickyard)	Lebanon, NH	26	R1	undeveloped	\$101,510		\$101,510	
	48-4	Lane NH Holdings, LLC	174 Hanover St. Ext. (Densmore Brickyard)	Lebanon, NH	6.5	RO1	abandoned brickyard	\$318,000	\$137,100	\$455,100	
Site 4 Total										\$677,965	
5	79-52	Jonathan and Jennifer Friedman	Heater Road	Lebanon, NH	66	RL1, RL3	undeveloped	\$388,500		\$388,500	Current Use, assessed value \$6,440; sales price in 2005 \$795,600; for sale at \$1.75M
Site 5 Total										\$388,500	



As noted previously, there have been few land sales in recent years to use as comparables for the subject properties. We compiled the following list of properties from the City of Lebanon and Town of Hanover records in support of our analysis.¹ Many of the properties were comprised of multiple lots; thus, actual acreages and/or sales prices could be different.

1. Lebrun parcel, Route 4 (Dartmouth College Highway), Lebanon – 22.82 acres of vacant land for \$310,000 on January 29, 2008.
2. Lebrun property, Route 4 (Dartmouth College Highway), Lebanon – 252.8 acres of land and improvements, including two units (houses), a barn, and other improvements, for \$1,185,000 on December 10, 2008.
3. Lebrun parcel, Ruddsboro Road, Hanover – 237.7 acres of vacant land for \$700,000 on September 15, 2008.
4. Lebanon School District, Route 4 (Dartmouth College Highway), Lebanon – 27.08 acres of vacant land for \$1,000,000 on November 10, 2008.
5. Timberwood Commons, Mount Support Road, Lebanon – 42.63 acres of vacant land plus permits for 252 units for \$2,445,000 on December 29, 2009.
6. L-A Suncook, Route 120, Lebanon and Hanover – 373.52 acres of land and improvements, including the former Wilson Tire site, for \$15,538,733 on December 4, 2007. It should be noted that these same properties were transferred from a development group for \$10,726,700 between 2004 and 2006, according to City records.
7. Sleeper Village, Old Pine Tree Cemetery Road, Lebanon – 326 acres of land and improvements, including a house and permits for 141 units for \$5,194,000 on July 5, 2006. It should be noted that the same properties were transferred in 2000 for \$900,000 before permitting.
8. Hypertherm, Heater Road, Lebanon – 23.1 acres of vacant land and permits for a 6-lot subdivision for \$2,025,000 on August 24, 2007.
9. Upper Valley Technology Park, Airport parcel, West Lebanon (former Korpela parcel) – 37.83 acres of vacant land for \$2,050,000 on November 26, 2008.

In each case where there were plans to develop and/or where permits were issued, the sales price increased significantly. We would also like to point out that many of these properties were in Current Use; therefore, assessed values on these properties were not listed.

In our opinion, it is reasonable to utilize the purchase price information from the above transactions for #1, #2, #3, #4, #8, and #9 as comparables to develop a reasonable range for the per-acre purchase price for undeveloped land. This range is \$3,000 to \$88,000 per acre, without consideration for anything else. Purchase prices for transactions #5, #6, and #7 are not representative comparables because they included approved permits for multi-unit developments and/or development plans, which drastically increased the price. We applied the range to the candidate sites and their corresponding land acreages, and we arrived at a “Purchase Price Range based on Average Price Per Acre of Representative Land Sales.” These values are summarized in Figure 15. Note that the Westboro Rail Yard is already owned by the state of New Hampshire and requires no site acquisition cost.

¹ Please note the following information on these parcels, corresponding by number:

#2 is currently before the Planning Board for a major subdivision.

#4 is currently before the City voters to develop as a school.

#5 is approved as a 252-unit residential development.

#6 has no application at this time.

#7 is approved as a 141-unit residential development.

#8 received Site Plan approval for a 156,650 square-foot light industrial building.

#9 is approved as a 3-lot subdivision for industrial/office use.



Figure 15. Site Acquisition Cost Summary

	VTrans/Hotel, Hartford	Railroad Row, Hartford and Westboro Rail Yard, West Lebanon	Carter Country Club, Lebanon	Densmore Brickyard, Lebanon	Friedman Parcel, Heater Road, Lebanon
Assessed Value	\$2,084,703	\$909,263	\$1,106,947	\$713,647	\$408,947
Open Market Asking Price	\$1.2M (hotel site only)	n/a	n/a	\$8.9M	\$1.75M
Parcel Size (AC)	13	16	40	133.5	66
High Value Land (AC)	13	16	40	31	30
Low Value Land (AC)	0	0	0	102.5	36
Reasonable Price High Value Land (\$70,400/acre)	\$915,200	\$1,126,400	\$2,816,000	\$2,182,400	\$2,112,000
Reasonable Price Low Value Land (\$3,600/acre)	\$0	\$0	\$0	\$369,000	\$129,600
Reasonable Price All Land	\$915,200	\$1,126,400	\$2,816,000	\$2,551,400	\$2,241,600
Estimated Relocation Cost	\$1,500,000	\$0	\$0	\$0	\$0
Estimated Site Acquisition Cost	\$2,415,200	\$0	\$2,816,000	\$2,551,400	\$2,241,600

We did not perform appraisals of the candidate properties, nor did we develop a comprehensive comparable sales analysis. Ultimately, the true sales price is the price at which there is a willing seller and a willing buyer. It should be noted, however, that because this site feasibility process is a public process, which will end with a single preferred site, the “buyer” in the real estate transaction has forfeited much of its negotiating power with the seller of the preferred site. This situation is similar to the recent purchase of land by the Lebanon School District (#4 above) where the appraised value for the 27-acre parcel was \$177,800 and the sales price was \$1,185,000.

2.7.2 Other Unique Factors Considered in Site Acquisition Cost

VTrans/Hotel Site, Hartford

- *Relocate VTrans Operations:* The VTrans district office and maintenance facilities will need to be relocated to develop the site for an intermodal transit hub. The cost to find and acquire another site and to relocate the VTrans facilities needs to be factored into the cost of the project. It is logical to assume that the costs associated with moving the existing facilities would be reflected in the sale price of the subject parcel. These costs were estimated at \$1,500,000 and are reflected in the site acquisition cost in Figure 15.
- *Hotel Lease Interest:* The hotel property has a lease interest with the following rights and payment schedule, according to information provided by the real estate agent/broker representing Mascoma Bank, the lease holder:
 - Rights with Ground Lease: Right to convert lease to fee simple. The land lease can be subrogated to 90% bank financing. It must continue as a hotel/motel with a restaurant. Signage: the lease includes a signage right-of-way.



- Lease Payment Schedule: Currently and for the next 27 years at 8.2 cents/sq. ft. or \$1,956.76/month. The next 33 years will be at 8.6 cents/sq. ft. or \$2,054.60/month. Approximately 61 years to the end of the lease.

If the hotel property were to be used for the intermodal transit hub, it appears that the lease interest would need to be purchased from the leaseholder. While we understand that Mascoma Bank is offering the hotel site for sale, we are also aware of legal action relative to the lease of the parcel. The actual ramifications of the lease and legal determinations that may exist are not clear to us and should be verified through legal counsel prior to acquisition. (-1)

Carter Country Club, Lebanon

- *Relocation of Golf Course*: The existing 9-hole golf course will need to be relocated elsewhere on the 253-acre parcel or the property will revert to prior ownership. The representative for the owner has indicated that the owner will bear the cost of constructing the new golf course, presumably as an investment toward developing additional portions of the parcel near the proposed intermodal facility. Based on past experience with golf course construction, the actual cost of this effort is expected to be in the range of \$5M, incentives for which are not evident based on the current zoning of the property. Rezoning of any portion of the land is beyond the scope of the intermodal transit hub project and not a realistic basis for acquiring the land. (-1)

2.7.3 Site Preparation Cost

Site preparation costs were based on conceptual layouts for each site that included the circulating roadway, surface parking, and a building footprint between 5,000 and 10,000 square feet, bus parking, and a transit passenger drop off zone. Special site features such as wetland impacts and steep slopes were accounted for where the wetland mapping and topographic data were available. Ledge was assumed to be present on the sites where the WebSoil Survey mapping by the Soil Conservation Service indicated ledge relatively near the surface.

2.8 Final Design & Facility Construction Costs

This metric represents the order-of-magnitude cost estimate for final design, permitting, construction assistance, and construction of the respective sites. It should be noted that these estimates are conceptual in nature and are developed for the purpose of providing a relative comparison of costs between the candidate sites. These costs should not be used for budgeting purposes.

2.9 Off-Site Improvement Cost

2.9.1 Highway Improvements

Based on the traffic analysis and simulation evaluation of the No Build and Build scenarios, combined with local knowledge of the traffic conditions proximate to each site, a series of off-site roadway improvements was identified to address the additional congestion and delay generated by the Intermodal Center. These improvements are cited in the Evaluation Matrix and in Figure 16 along with order-of-magnitude cost estimates.



Figure 16. Off-site Highway Improvements.

	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
Improvement	Expanded Sykes Ave approach to US 5 and expanded roundabout to add 1 circulating lane on northern quadrant	Expand site access road from NH 12A to accommodate frequent bus movements.	New signal at US 4/Buckingham Place intersection	New signal at Old Etna Rd/Heater Rd and new left turn lane on Hanover St approach	Restriping and retiming at NH 120/Heater Rd intersection
Cost	\$500,000	\$100,000	\$250,000	\$350,000	\$20,000
Improvement	New signal at US 5/I-91 NB ramps intersection	Optimize traffic signal timings on South Main Street in West Lebanon		New Signal at Hanover Street/Evans Drive	
Cost	\$250,000	\$20,000		\$250,000	
Improvement	New signal at US 5/I-91 SB ramps intersection			New signal at NH 120/Hanover St	
Cost	\$250,000			\$250,000	
Improvement				Replace pedestrian bridge with full-service bridge	
Cost				\$7,000,000	
Improvement				Restriping and retiming at NH 120/Heater Rd intersection	
Cost				\$20,000	
Highway Improvements Total	1,000,000	120,000	250,000	7,830,000	20,000

2.9.2 Transit Improvements

This metric identifies the annual operating cost to provide mid-day Advance Transit service to each of the sites. As mentioned previously, existing Advance Transit routes can service the Densmore Brickyard and VTrans sites at no additional cost and without diminishing service quality. All of the other sites would require additional operating costs (and buses) to be served.

2.9.3 Bicycle and Pedestrian Improvements

This metric identifies order-of-magnitude cost estimates associated with identified bicycle and pedestrian improvements to tie the site into adjacent major land uses or existing bicycle/pedestrian facilities.

2.10 Impact on Fuel Consumption and Emissions

Construction of a multi-modal transportation facility in the Upper Valley has the potential to positively affect vehicle emission levels and fuel consumption associated with both local and inter-city travel. Build scenario emissions and fuel consumption levels for all proposed Intermodal Center sites were compared to No Build 2012 conditions using SimTraffic microsimulation models. The SimTraffic models project emissions and fuel consumption every 0.1 seconds throughout hour long simulations using lookup tables of emissions and fuel consumption factors based on vehicle speed and acceleration characteristics. Emissions and fuel consumption were also estimated for reductions in VMT due to expanded inter-city bus services using NHDES emissions factors assuming an average highway cruise speed of 65 mph.



Emission levels were estimated for carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and carbon dioxide (CO₂).

While all sites are projected to have a positive impact on overall vehicle fuel consumption and emissions due to inter-city personal vehicle trips being captured by expanded bus services (primarily service to Manchester Airport), differences between sites arise due to their location in relation to major intercity transit destinations, levels of traffic congestion at adjacent and upstream intersections (affecting both transit and carpool related traffic), and indirect effects of network improvements required by the sites.

2.11 Site Environmental Impacts

VTrans/Hotel Site, Hartford

- *Site Contamination:* While no contamination is known to exist on either parcel, given the current (i.e. VTrans maintenance and material storage operations) and former (i.e. hotel) uses on the site, there is the potential for site contamination. (-0.5)

Railroad Row, Hartford and Westboro Rail Yard, Lebanon

- *Site Contamination:* The Westboro Rail Yard is known to contain asbestos and petroleum contamination within the vicinity of the roundhouse building. The State of New Hampshire and the City of Lebanon have been evaluating the contamination for several years, but no known remediation plan has been established as of the date of this narrative. It is very likely that remediation of the site will be a costly and time-consuming effort. (-1)
- *Comprehensive Shoreland Protection Act (CSPA):* The Westboro Rail Yard property is subject to the CSPA, which regulates development within 250' of protected waters, including the Connecticut River. The regulations and review process will influence the location of structures, parking lots, and landscaping on the site, which may translate to a reduction in parking spaces, additional cost for landscaping and screening, and more structured parking. (-1)

Carter Country Club, Lebanon

- *Wetland and Steep Slope Impacts:* The City of Lebanon GIS mapping of the site includes steep slope and wetland overlays. Topographic surveying and wetland delineations are needed to delineate steep slopes and wetlands accurately on the site; the proposed layout should be adjusted to minimize impacts to environmentally sensitive areas. This alteration may result in a reduced number of parking spaces or use of additional acreage to provide the desired number of parking spaces. Given the relatively large size of this particular parcel, it is likely that 650 parking spaces can be designed on the site to avoid (or accommodate the mitigation of) any significant environmental impacts. (-0.5)

Densmore Brickyard, Lebanon

- *Wetland and Steep Slope Impacts:* The City of Lebanon GIS mapping of the site includes steep slopes and wetland overlays. The property representative provided us with recent wetland mapping, but we recommend vetting this with the New Hampshire Department of Environmental Services (NHDES) for reconciliation of actual boundaries based on recent work with the Lebanon School District property analyzed by the same firm. Topographic surveying and NHDES evaluation of wetlands are needed to assess site conditions accurately. The proposed layout should be adjusted to minimize impacts on environmentally sensitive areas. This modification may result in a reduced number of parking spaces or use of additional acreage or structured parking to provide the desired number of parking spaces. Wetland and steep slope impacts may require a special exception from the Zoning Board of Adjustment, which could pose a barrier to development of the project. If wetland impacts cannot be adequately minimized or mitigated on-site, then off-site compensatory mitigation may be required, possibly requiring the purchase and preservation of other wetland resources or upland property. (-1)



Friedman Parcel, Heater Road, Lebanon

- *Aesthetic concerns:* The proposed intermodal facility will be terraced into a relatively steep hillside. The facility will be elevated above the other existing developed lands along the I-89/Heater Road corridor, making it visible from a distance. This feature will likely be considered a negative impact by local regulators. (-1)
- *Steep Slope Impacts:* The City of Lebanon GIS mapping of the site includes a steep slope overlay that impacts much of the site. Topographic surveying is needed to delineate slopes 25% or more on the site accurately. The proposed layout should be adjusted to minimize impacts on environmentally sensitive areas. This change may result in a reduced number of parking spaces or use of additional acreage or structured parking to provide the desired number of parking spaces. Impacts to steep slopes may require a Special Exception from the Lebanon Zoning Board of Adjustment, which could pose a barrier to development of the project. (-1)

2.12 Impact to Local Tax Base

The impacts on the municipal tax base of locating an Intermodal Center in each of the five identified locations was quantified based on the following parameters:

- Vehicle Registration Fees (Excise Taxes): In New Hampshire, registration fees are assessed based on the value and age of vehicles garaged in a specific town. For the purposes of this assessment, it was assumed that Dartmouth Coach would garage an additional four buses (in addition to the eight already used to service their current routes) to provide service to Manchester Airport at the locations that could accommodate such service. Based on a \$800,000 value for new coach buses, the Lebanon City Clerk identified local registration fees to range from \$14,400 for the first year stepping down to \$2,400 for the fifth year and beyond. It was conservatively assumed that each of the buses garaged would provide \$3,000 per year to the City of Lebanon general fund. There is no equivalent municipal component of the vehicle registration fee in Vermont, so no revenues were assumed to be generated in Hartford.
- Cost of Community Services for the Intermodal Facility: To determine an order-of-magnitude Cost of Community Services for the Intermodal Facility, the City of Lebanon's *Cost of Community Services Study*¹ (Economic & Policy Resources, Inc, 2005) which identified revenue and expense ratios by primary land use type². The Intermodal Facility was identified under the 'public institutional lands – exempt' category, which, generates \$0.24 in revenue per \$100 of assessed value and costs \$2.27 per \$100 of assessed value in community services. To be conservative, we assumed that the Intermodal Facility would not generate any revenue. To estimate an assessed value of the Intermodal Center site, we examined the Concord Intermodal Center's assessment record, which identified the total assessed value of the 5.19 acre site at \$274,000. We doubled this figure and assumed the assessed value of the Upper Valley Intermodal site would be approximately \$500,000. Multiplying this assessed value by the estimated cost rate results in an annual community services cost of \$11,350.
- Net Annual Revenue for Likely Development: The potential municipal revenue and community service costs associated with the development that would "likely" occur on each of the five parcels was estimated. This figure serves as an indicator of the "opportunity cost" potentially lost in citing the Intermodal Center on each site. The likely development on each parcel is identified in the Screening Matrix along with estimated revenues and costs derived from the *Costs of Community Services Study*, updated to 2010 values.

¹ No comparable report was identified for the Town of Hartford. The cost and revenue assumptions from this report were used for the assessments on the Hartford parcels.

² These values were updated to reflect 2010 values using the US Bureau of Labor Statistics' CPI inflation calculator, http://www.bls.gov/data/inflation_calculator.htm.



The net impact on local taxes was then estimated using the following equation:

$$\text{Net Impact} = (\text{Additional revenue generated by vehicle registration fees}) - (\text{Net Cost of Community Services for Intermodal Facility}) - (\text{Net Annual Revenue for Likely Development})$$

This metric was then compared to the No Build scenario’s estimated annual municipal revenue to estimate the potential difference between the revenue generated by the No Build Scenario and each alternative.

This metric shows that the likely development at the VTrans parcel is less costly (in terms of community services) than the Intermodal Center (due primarily to the fact that the Town of Hartford would not directly benefit from vehicle registration fees). For all other sites, the Intermodal Center is less costly (in fact, shown to a positive revenue generator) than the likely alternative land use scenario.

For reference, the current local tax revenues were estimated for each site based on the assessed value of the site (both land and buildings) and are included in 17. Both the VTrans and Railroad Row parcels include state owned property which was not included in this calculation. Tax revenues were based on both Hartford and Lebanon’s 2009 local tax rates. Note that the Friedman Parcel on Heater Road is classified as Current Use and has an assessed value of \$6,440.

Figure 17. Current Local Tax Revenue.

	VTrans/Hotel, Hartford	Railroad Row, Hartford and Westboro Rail Yard, West Lebanon	Carter Country Club, Lebanon	Densmore Brickyard, Lebanon	Friedman Parcel, Heater Road, Lebanon
Current Tax Revenue	\$8,867.00	\$7,610.08	\$9,264.60	\$5,980.23	\$56.74

2.13 Site Redevelopment Potential

This metric identifies whether the location of an Intermodal Facility at each site would potentially redevelop an underutilized or undesirable parcel or whether the development would involve development of an undeveloped parcel. Sites involving potential redevelopment were scored higher in this metric.



Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
1. Consistency with Zoning Ordinance										
	What is the zoning district for the parcel?				n/a	I-C2	I-C (Hartford); CBD (Lebanon)	R3	RO1, R1, RL3	RL1, RL3
	Is the project allowed in the zoning district?				n/a	yes (+2)	yes (Lebanon); conditional use (Hartford) (+1)	no (-2)	no (-1)	no (-2)
2. Compatibility with Adjacent Uses										
	What are the adjacent uses?				n/a	business, government office, post office	commercial business, retail	residential on the property and commercial along Route 4	residential, forest, interstate, and school	residential, forest, and commercial along Heater Road
	Is the proposed use compatible with the adjacent uses?				n/a	brings commuters to WRJ businesses (+1)	brings commuters to White River Junction and West Lebanon businesses (+1)	yes with Route 4, no with existing residential (-1)	no (-1)	primarily low density residential with limited benefits from the project (-1)
3. Revitalization Benefits										
	Does the project revitalize an abandoned property?				n/a	revitalizes dormant hotel parcel (+1)	revitalizes dormant land (+1)	replaces golf course/open space with commercial (-1)	brickyard area is not within project footprint and is not redeveloped; replaces open space with commercial (-1)	replaces open space with commercial (-1)
4. Other Unique Benefits/Detriments										
					No additional development, so no impacts to adjacent property values			Last stretch of "green space" between Lebanon and West Hartford (-1)	parking lots and lights will be visible from a distance due to position of facility on hillside (-1)	parking lots and lights will be visible from a distance due to position of facility on hillside (-1)
Adjacent Property Impact Total						4	3	-5	-4	-5
2.1	IMPACT TO ADJACENT PROPERTY VALUES Would the development of the site minimize adverse impacts to adjacent property values?	3	Impact of development on adjacent property values		0	2	1	-2	-2	-2
Estimated Daily VMT for Captured Dartmouth Coach Trips from Each Site By Destination										
				Boston/Logan	4,110	4,194	4,000	4,086	4,093	4,090
				Manchester Airport	22,683	10,929	22,683	4,497	4,507	4,503
				New York City	856	846	824	851	854	854
2.2.1	VMT & CONGESTION REDUCTION How would the development of the site as an Intermodal Transportation Facility impact Vehicle Miles Traveled (VMT) and regional congestion?	5	VMT reduction	VMT Reduction (%)	0%	42%	1%	66%	66%	66%
				VEHICLES MILES TRAVELED (VMT)	0	1	0	2	2	2
				Sum of VMT reduced by site						
				Change in average delay/vehicle (seconds) during the AM and PM peak hour (No Build vs. Build with traffic mitigation)	0	-35	-4	-3	-91	-42
2.2.2	CONGESTION Regional delay/vehicle metric from SimTraffic	4	Delay/vehicle reduction	Congestion Reduction Total	0	-35	-4	-3	-91	-42

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
1. Can the intermodal site be served with the current number of regular service buses?										
	Current buses adequate?				No	Yes	No	No	Yes	No
	Points				0	1	0	0	1	0
2. Are operating funds available at this time to bring Advance Transit buses to the site?										
	Are operating funds available?				No	Yes	No	No	Yes	No
	Points				0	1	0	0	1	0
3. Are there funding partners who may be interested in supporting expanded operations at the site?										
	Are there potential funding partners for new or expanded service?				No	No	No	No	Yes	Yes
	Points				0	0	0	0	1	1
4. Will adding Advance Transit service to the site increase travel times on current routes?										
	Negative impact on bus travel times?				n/a	No	Yes	Yes	No	No
	Points				0	0	-1	-1	0	0
5. Will development of the site result in faster travel times on existing routes?										
	Positive impact on bus travel times?				n/a	No	No	No	Yes	No
	Points				0	0	0	0	1	0
6. Will Advance Transit service to the site negatively impact existing transfers between routes?										
	Negative impact on connections?				No	No	Yes	Yes	No	No
	Points				0	0	-1	-1	0	0
7. What headways can be offered with no additional cost?										
	Headways with no additional cost				n/a	60 minutes	None	None	30 minutes	None
	Points				0	0	-1	-1	1	-1
8. What midday headways can be offered for \$150k per year?										
	Midday headways for \$150k per year				60 minutes	30 minutes	30 minutes	30 minutes	15 minutes	60 minutes
	Points				-1	0	0	0	1	-1
9. Will Connecticut River Transit (CRT) and Stagecoach (SC) offer commuter access to the site?										
	Regional commuter access?				n/a	2 routes	0 routes	0 routes	7 routes	2 routes
	Which provider(s)?					SC			SC-5, CRT-2	
	Points					0	-1	-1	1	0
10. Will Connecticut River Transit and Stagecoach intercity travelers access to the site?										
	Regional intercity access?				n/a	7 routes	7 routes	7 routes	7 routes	7 routes
	Which provider(s)?					SC-5, CRT-2	SC-5, CRT-2	SC-5, CRT-2	SC-5, CRT-2	SC-5, CRT-2
	Points					1	1	1	1	1
	Local Transit Total				0	3	-3	-3	8	0
2.3	LOCAL TRANSIT OPERATIONS & RIDERSHIP	5	How would the development of the site impact local transit access volume and travel times?		0	1	-1	-1	2	0
INTERCITY BUS TRAVEL TIME										
Weighted Additional Service Hours (per day) for Intercity Buses										
	Dartmouth Coach				0	1.7	2.6	1.9	0	0
	Greyhound				0	0	1.8	1.4	0.9	0.9
	Additional Intercity Bus Travel Time (Hours per Day)				0	1.7	4.4	3.3	0.9	0.9
2.4	INTERCITY BUS TRAVEL TIME How would the development of the site as an Intermodal Transportation Facility impact Intercity bus travel times within the region?	3	Total additional on-the-road travel times for Dartmouth Coach and Greyhound		0	-1	-2	-2	0	0

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
				Change in Daily Dartmouth Coach Bus Ridership by Route						
				BOS	0	-3	-5	-3	0	0
				NYC	0	2	2	0	0	0
				Total Change	0	-1	-3	-3	0	0
2.5	INTERCITY BUS RIDERSHIP How would the development of the site as an Intermodal Transportation Facility impact Intercity bus volumes?	5	Net impact to intercity passengers based on home and terminal location		0	-1	-2	-2	0	0
				Bike/Ped Travel Times						
				Located proximate to built-up residential area?	n/a	No (-2)	Yes (+2)	Somewhat (0)	Yes (+2)	No (-1)
				Bike/Ped Travel Times Total	0	-2	2	0	2	-1
2.6	BIKE/PED TRAVEL TIMES How would the development of the site as an Intermodal Transportation Facility impact bicycle and pedestrian travel times?	2	Qualitative		0	-2	2	0	2	-1

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
Site Acquisition Cost										
	Assessed Value (equalized to 2009 value)				\$591,800	\$2,084,703	\$909,263	\$1,106,947	\$713,647	\$408,947
	Open Market Asking Price				n/a	\$1.2M (hotel site only)	n/a	n/a	\$8.9M	\$1.75M
	Parcel Size (AC)				4	13	16	40	133.5	66
	High Value Land (AC)				n/a	13	16	40	31	30
	Low Value Land (AC)				n/a	0	0	0	102.5	36
	Reasonable Price High Value Land (\$70,400/acre)				n/a	\$915,200	\$1,126,400	\$2,816,000	\$2,182,400	\$2,112,000
	Reasonable Price Low Value Land (\$3,600/acre)				n/a	\$0	\$0	\$0	\$369,000	\$129,600
	Reasonable Price All Land				n/a	\$915,200	\$1,126,400	\$2,816,000	\$2,551,400	\$2,241,600
	Relocation Cost				n/a	\$1,500,000				
	Site Aquisition Cost				n/a	\$2,415,200	\$0	\$2,816,000	\$2,551,400	\$2,241,600
Item Description										
	Building Demolition				n/a	\$0.00	\$200,000.00	\$0.00	\$0.00	\$0.00
	Clear and Grub				n/a	\$70,125.00	\$90,000.00	\$66,805.56	\$86,250.00	\$130,000.00
	Earthwork common excavation				n/a	\$271,800.00	\$504,000.00	\$216,666.67	\$490,000.00	\$728,000.00
	Earthwork common fill				n/a	\$135,900.00	\$504,000.00	\$216,666.67	\$490,000.00	\$728,000.00
	Ledge Removal Allowance per acre				n/a	\$18,700.00	\$36,000.00	\$26,722.22	\$57,500.00	\$312,000.00
	Retaining Wall Allowance				n/a					\$200,000.00
	Water Main to Property line				n/a	\$96,000.00	\$40,000.00	\$96,000.00	\$74,160.00	\$120,000.00
	Sewer Line to PL, incl MHs				n/a	\$96,000.00	\$40,000.00	\$96,000.00	\$64,640.00	\$120,000.00
	Underground utilities				n/a	\$150,000.00	\$225,000.00	\$72,222.22	\$69,525.00	\$195,000.00
	Site Preparation Cost				n/a	\$1,048,156	\$2,048,750	\$988,854	\$1,665,094	\$3,166,250
	Site Acquisition + Site Prep				\$0	\$3,463,356	\$2,048,750	\$3,804,854	\$4,216,494	\$5,407,850
	Acquisition + Prep Score				0	-1.3	-0.8	-1.4	-1.6	-2.0
Other Factors										
	Factors					Hotel lease interest (-1)		Relocation of Golf Course (-1)		
	Other Factors Score				n/a	-1	0	-1	0	0
	Combined Total Score				0	-2.3	-0.8	-2.4	-1.6	-2.0
2.7	DIRECT SITE COSTS What is the direct cost of acquiring the site	4	Site acquisition and preparation	SITE ACQUISITION & PREPARATION	0	-2	-1	-2	-1	-2

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
				Item Description						
				New Road, subgrade, sidewalk, pavement, signs, curb, lighting	n/a	\$514,600.00	\$816,720.00	\$367,659.26	\$571,704.00	\$889,096.00
				Parking Lot: pavement, subgrade, curb,	n/a	\$959,310.00	\$610,266.00	\$798,055.56	\$1,040,910.00	\$795,600.00
				Site drainage - closed pipe system (cost/acre impervious)	n/a	\$60,000.00	\$72,000.00	\$37,314.81	\$69,000.00	\$69,333.33
				Stormwater Controls (for pervious pavement and special subgrades, underground detention or pond - cost per acre impervious)	n/a	\$72,000.00	\$86,400.00	\$44,777.78	\$82,800.00	\$83,200.00
				Landscaping allowance (per acre disturbance)	n/a	\$33,500.00	\$42,400.00	\$51,759.26	\$46,000.00	\$83,200.00
				Engineering, Permitting, and Construction Assistance	n/a	\$372,241.88	\$408,348.25	\$261,331.25	\$392,811.13	\$556,678.67
				Site Design and Construction (plus 25% contingency)	\$0	\$2,421,504	\$2,443,081	\$1,885,790	\$2,655,829	\$2,957,215
2.8	FINAL DESIGN & FACILITY CONSTRUCTION COSTS What is the cost to design, permit, and construct the facility, including any unusual site characteristics (e.g. structured parking)?	4	Soft & hard costs	Total cost to design, permit, and construct the site on each parcel	0	-2	-2	-1	-2	-2

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
Off-Site Highway Improvements										
	Improvement Cost			Expanded Sykes Ave approach to US 5 and expanded roundabout to add 1 circulating lane on northern quadrant	n/a	\$500,000	Expand site access road from NH 12A to accommodate frequent bus movements. \$100,000	New signal at US 4/Buckingham Place intersection \$250,000	New signal at Old Etna Rd/Heater Rd and new left turn lane on Hanover St approach \$350,000	Restriping and retiming at NH 120/Heater Rd intersection \$20,000
	Improvement Cost			New signal at US 5/I-91 NB ramps intersection		\$250,000	Optimize traffic signal timings on South Main Street in West Lebanon \$20,000		New Signal at Hanover Street/Evans Drive \$250,000	
	Improvement Cost			New signal at US 5/I-91 SB ramps intersection		\$250,000			New signal at NH 120/Hanover St \$250,000	
	Improvement Cost								Replace pedestrian bridge with full-service bridge \$7,000,000	
	Improvement Cost								Restriping and retiming at NH 120/Heater Rd intersection \$20,000	
	Highway Improvements Total				0	1,000,000	120,000	250,000	7,830,000	20,000
Transit capital & operating cost										
	Cost to provide mid-day local transit service (no commuter express)				n/a	\$0	\$148,750	\$148,750	\$0	\$148,750
	Transit costs Total				0	0	148,750	148,750	0	148,750
Bicycle & Pedestrian Improvements										
	Improvement Cost			New sidewalk from site to Sykes Ave along Beswick Dr (700')	n/a	\$100,000	Rail bridge improvements to allow pedestrian crossing across CT River \$100,000	New sidewalk from site drive to Miracle Mile Plaza (3,400') \$480,000	New sidewalk from site drive to Hanover St/Heater Road intersection (2,400') \$340,000	New sidewalk from site drive to NH 120 (1,800') \$250,000
	Improvement Cost			New Sidewalk from site to Sykes Ave along Holiday Dr (800')	n/a	\$110,000		New sidewalk from site drive to Slayton Hill Rd (2,200') \$310,000		New crosswalk and pedestrian signals at NH 120/Heater Road intersection \$10,000
	Bike/Ped Improvements Total				0	210,000	100,000	790,000	340,000	260,000
	Off-Site Improvement Total				\$0	\$1,210,000	\$368,750	\$1,188,750	\$8,170,000	\$428,750
2.9	OFF-SITE IMPROVEMENT COST What is the direct capital and O&M cost of the highway, transit, and bicycle/pedestrian infrastructure necessary to link the site to the existing transportation network?	5	Construction cost	Off-Site Improvement Costs Costs associated highway, transit, and bike/ped improvements	0	-1	0	-1	-2	0

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

Draft: 4/28/10

#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
2.10	REDUCING FUEL CONSUMPTION AND EMISSIONS Would the development of the site as an Intermodal Transportation Facility reduce regional fuel consumption and vehicle emissions?	4	Reduction in fuel consumption	Fuel Consumption						
				Fuel consumption (No Build vs Build with Mitigation Scenario) for AM and PM peak hours	0%	-6%	0%	-9%	-14%	-12%
				Fuel Consumption Total	0%	-6%	0%	-9%	-14%	-12%
				FUEL CONSUMPTION	0	1	0	1	2	2
				Fuel usage from regional simulation model						
				Emissions Reduction						
				Sum of Changes in CO, CO2, HC, and NOx (No Build vs Build with Mitigation Scenario) for AM and PM peak hours	0%	-25%	-3%	-38%	-48%	-43%
				Emissions Reduction Total	0%	-25%	-3%	-38%	-48%	-43%
				VEHICLE EMISSIONS	0	1	0	2	2	2
				Emission generation from regional traffic simulation model						
2.11	SITE ENVIRONMENTAL IMPACTS What are the direct costs associated with on-site environmental mitigation/remediation?	4	Environmental mitigation impacts	Site Environmental Impacts						
				Factors	None	None identified, however current and former uses may leave site contamination (-0.5)	Site contamination (-1) Comprehensive Shoreland Protection Act (-1)	Wetlands and steep slope impacts, however parcel may be large enough to accommodate mitigation (-0.5)	Wetland and steep slope impact (-1)	Aesthetic impacts (-1) Steep slope impacts (-1)
				Environmental Impacts Total		-0.5	-2	-0.5	-1	-2
					0	-1	-2	-1	-1	-2

Upper Valley Intermodal Center - Phase 2 Scoring Matrix

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#	Criteria	Weight	Benchmark	Scoring Metric	No Build	VTrans/ Holiday Drive	Westboro/ "Wye" Lot	Carter Country Club	Densmore Brickyard	Heater Road
Vehicle Registration Fees										
	# buses garaged in Town (8 buses currently at Etna Road, additional 4 to service Manchester Airport)				8	11	8	12	12	12
	Registration Fees (\$3,000 per bus in Lebanon, \$0 per bus in Hartford)				\$24,000	\$0	\$24,000	\$36,000	\$36,000	\$36,000
	Annual Town Vehicle Registration Fees - Expanded Intermodal Center				\$24,000	\$0	\$24,000	\$36,000	\$36,000	\$36,000
Cost of Community Services for Intermodal Facility (source: Lebanon Cost of Community Services report, 2005)										
	Cost (\$2.27/\$100 assessed value)				\$13,416	\$11,350	\$11,350	\$11,350	\$11,350	\$11,350
	Net Annual Revenue - Intermodal Facility				-\$13,416	-\$11,350	-\$11,350	-\$11,350	-\$11,350	-\$11,350
Cost of Community Services for Likely Development (source: Lebanon Cost of Community Services report, 2005)										
	Likely development if no Intermodal Facility (assumes existing zoning)			No change		VTrans: no change Hotel: new hotel (89,206 sf)	Wye Lot: no change Westboro: 5,000 sf commercial and recreational use	No change	30,000 sf commercial & 100 multi-family units	25 single-family housing units
	Revenue (rate varies based on use)				\$0	\$269,928	\$15,130	\$0	\$470,285	\$189,242
	Cost (rate varies based on use)				\$0	\$278,759	\$17,361	\$0	\$492,345	\$174,755
	Net Annual Revenue - Likely Development				\$0	-\$8,831	-\$2,231	\$0	-\$22,060	\$14,488
	Annual Value of Municipal Revenues with Intermodal Facility vs. Likely Development				\$10,584	-\$2,519	\$14,881	\$24,650	\$46,710	\$10,162
	Difference from No Build					-\$13,104	\$4,297	\$14,066	\$36,126	-\$422
Current Site Tax Revenue - based on Current Assessment (source: Lebanon and Hartford Assessment and 2009 Tax Rates)										
	Current Assessed Property Value				\$591,800	\$1,326,800	\$863,800	\$1,051,600	\$678,800	\$6,440
	Current Tax Revenue				\$5,214	\$8,867	\$7,610	\$9,265	\$5,980	\$57
2.12	IMPACT TO LOCAL TAX BASE How would developing the site as an Intermodal Transportation Facility effect future tax revenues in the host community?	4	Land value, potential for site to accommodate other mixed-use development, currently publicly owned, vehicle registration taxes		0	-1	0	1	2	0
2.13 SITE REDEVELOPMENT										
2.13	Does the site involve the redevelopment of a former use on the site?	3	Is the site undeveloped or will it involve a redevelopment of a previous use		0	1	1	-1	-1	-2
					Weighted Score:	-9	-24	-28	12	-17
					Rank:	2	4	5	1	3